The American Society of Colon and Rectal Surgeons

Annual Meeting Abstracts

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ONCOLOGIC COMPARISON BETWEEN NON-RADICAL MANAGEMENT VERSUS TOTAL MESORECTAL EXCISION IN YCT0-1 AFTER CHEMORADIOTHERAPY FOR PATIENTS WITH MID TO LOW RECTAL CANCER: RESULTS OF A MULTICENTER PROSPECTIVE COHORT.

GS1

J. Lee[1], J. Cho[1], K. Song[2], M. Kim[1], S. Park[2], D. Sohn[2], J. Oh[2], M. Kim[1], J. Park[1], S. Jeong[1], K. Park[1], H. Oh[1], D. Kim[1], S. Kang[1]
[1]Seoul, Korea (the Republic of); [2]Ilsan, Korea (the Republic of)

Purpose/Background: Non-radical management has an oncologic uncertainty for major responders to chemoradiotherapy in patients with rectal cancer, while it has the potential benefits of avoiding morbidity and permanent stoma. This study aimed to compare oncologic outcomes between non-radical management and total mesorectal excision in major responders to chemoradiotherapy for mid to low rectal cancer.

Methods/Interventions: We collected ycT0-1N0M0 subjects with major response after chemoradiotherapy from cT2-3N0-2M0 mid to low rectal cancer patients in three referral hospitals between March 2004 and April 2018, based on MRI images. The non-radical management group included non-operative management (NOM) and local excision (LE), which was compared to the control group of total mesorectal excision (TME). Five-year overall survival (OS) rates and stoma-free rates were compared between the non-radical management and the TME groups.

Results/Outcome(s): Seventy-five patients had ycT0-1N0M0 after chemoradiotherapy (14 NOM, 30 LE and 31 TME). The non-radical management group had more low-lying tumors located less than 5cm from anal verge (84.1% vs. 38.7%, p<0.001) and higher clinical node negative rate (65.9% vs. 29.0%, p=0.002) compared to the TME group. Positive predictive value of MRI for ypT0-1N0M0 was higher in LE than in the TME group (28/30, 93.3% vs. 20/31, 64.5%, p=0.017). The non-radical management group (median follow-up of 35[2-175] months) had 3 (21.4%) regrowths after NOM, and 5 (16.1%) local and 4 (12.9%) distant recurrences after LE, while the TME group (68[10-154] months) had only 1 (3.2%) distant recurrence. Three-year DFS in the non-radical management was not different compared with that of the TME group (80.1% vs. 90.1%, p=0.318). Five-year OS were similar in both groups (95.3% vs. 93.5%, p=0.449). Stoma-free rate in non-radical management group was not different compared to TME group (90.9% vs. 80.6%, p=0.198).

Conclusions/Discussion: This study shows that the non-radical management in ycT0-1 after chemoradiotherapy may achieve similar oncologic outcomes as the TME group; although, it is mainly selected in earlier clinical stage and lower rectal cancers than TME. Prospective long-term study is needed to further extrapolate on non-radical management in major responder after chemoradiotherapy.

ASCL1: A CANDIDATE EPIGENTICALLY-REGULATED TUMOR SUPPRESSOR IN HPV-ASSOCIATED MALIGNANCIES.

GS2

L. Hendrick, A. Elahi, D. Wong, A. Ajidahun, M. Husain, J. Lomax, I. Getun, R. Kansal, E. Glazer, D. Shibata
Memphis, TN

Purpose/Background: Human papillomavirus (HPV) infection is associated with subsequent alterations in host DNA methylation which may contribute to carcinogenesis. By epigenome-wide analysis, we previously identified genes that are differentially methylated during the progression of HPV-associated anal and cervical cancers. ASCL1, a lineage-specific tumor suppressor gene regulated by DNA promoter methylation, is one common target of particular interest. We sought to examine the impact of ASCL1 manipulation in HPV-associated cancers cell lines.

Methods/Interventions: Expression of ASCL1 was evaluated by reverse transcriptase PCR and Western Blot analyses in a comprehensive panel of anal (HPV 16+: ACC), cervical (HPV 16+: SiHa, HPV 18+: HeLa; HPV-: C33), and OP (HPV 16+: CRL3212, HPV-: HTB43) cancer cell lines. The methylation status of ASCL1 was evaluated by quantitative methylation-specific PCR (qMSP) and re-expression confirmed by treatment with the demethylating agent, 5'Aza-2-deoxycitidine (5AzaDC). In cell lines demonstrating downregulation (ACC, SiHa, HeLa), ASCL1 expression was restored by full-length transient transfection. Subsequent impact on cell proliferation was evaluated by MTT assay.

Results/Outcome(s): ASCL1 was significantly downregulated in ACC and HPV+ cervical cancer cell lines with corresponding high levels of promoter methylation. ASCL1 was re-expressed after 5AzaDC treatment in these non-expressing cell lines. ASCL1 expression was maintained in OP and HPV- cervical lines and without evidence of significant methylation. After full-length ASCL1 transfection, HPV 16+ anal (ACC) and cervical (SiHa) cell lines demonstrated significantly decreased proliferation compared to empty vector controls ($p<0.005$, p=0.048). In contrast, HPV 18+ cervical cancer (HeLa) demonstrated increased proliferation after transfection (p=<0.005).

Conclusions/Discussion: We have confirmed that ASCL1 downregulation is mediated by DNA promoter methylation in HPV+ anal and cervical cancer cell lines. Furthermore, methylation and downregulation of ASCL1 as a potential epigenetic driver of carcinogenesis may be specific to HPV16-associated anogenital carcinogenesis.

Further investigation is warranted to elucidate the interplay between different HPV types and ASCL1 in the development of HPV-associated cancers.

"I WANT TO GO HOME": CONSIDERATION OF DISCHARGE DESTINATION FOLLOWING RECTAL PROLAPSE SURGERY.

GS3

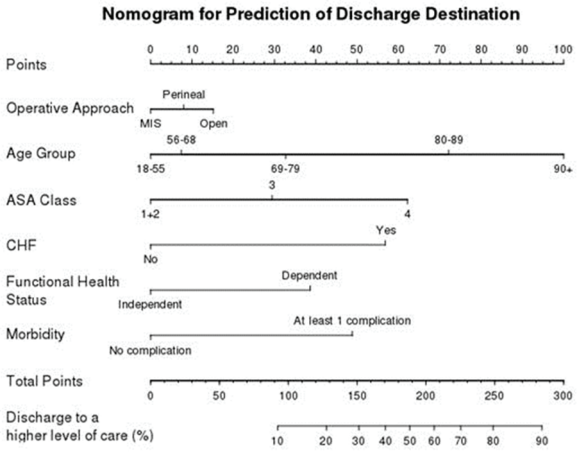
S. Jochum, Y. Zhang, C. Santos, D. Hayden, T. Saclarides, A. Bhama
Chicago, IL

Purpose/Background: Traditionally, prolapse recurrence and 30 day outcomes have been the standards for evaluating the quality of surgical approach for rectal prolapse. However, the significant financial impact and morbidity associated with higher levels of care at discharge have been largely unexamined. The primary goal of this study was to identify risk factors associated with disposition to a higher level of care following rectal prolapse surgery.

Methods/Interventions: The National Surgical Quality Improvement Program database was used to identify patients between 2012 and 2017 with the diagnosis of rectal prolapse who underwent either perineal or open/laparoscopic rectopexy with or without resection. Discharge destination and 30 day postoperative outcomes were compared between propensity matched groups. A nomogram was generated to calculate the risk of requiring higher levels of care upon discharge.

Results/Outcome(s): A total of 7021 patients met inclusion criteria. A total of 3,775 patients underwent the perineal approach and 3,246 underwent the abdominal approach. Patients who underwent a perineal operation had more comorbidities such as congestive heart failure (CHF), smoking, diabetes, hypertension, steroid use, dependent functional status, higher American Society of Anesthesia class (ASA), and advanced age ($p<0.01$). Propensity matched analysis included 3,776 patients (1,888 in the perineal group, 710 in the open abdominal group, and 1,178 in the MIS group). The majority of patients were female (90.7%) and over 55 years old (80.7%); 19.9% of patients were 80 years old or older. Overall morbidity was highest in open surgery ($n=112$, 15.8%) compared to MIS ($n=111$, 9.4%, $p<0.001$) and perineal surgery ($n=168$, 8.9%, $p<0.001$). Overall, patients who received open abdominal surgery were most likely to require elevation of care at discharge (open abdominal 9.2%; perineal 7.3%; minimally invasive (MIS) abdominal 6.1%). Patients who received minimally invasive abdominal surgery were more likely to be discharged home compared to the open abdominal surgery group ($p=0.01$). A nomogram was created to calculate the probability of disposition to a higher level of care (Figure 1). Increased age, higher ASA class, CHF, overall morbidity, dependent functional status, and open abdominal surgery were all independent predictors of discharge to higher level of care (c statistic=0.78).

Conclusions/Discussion: Discharge destination has been recognized as having a significant impact on cost and morbidity in the postoperative setting. While recurrence and procedure safety are important quality measures, discharge destination should be included in surgical planning to optimize quality of surgical care for parents requiring rectal prolapse surgery. To minimize morbidity and maximize likelihood of patients going home, open abdominal surgery should be avoided in surgery for rectal prolapse.



HIGH-RESOLUTION TRANSCRIPTOMIC ANALYSIS OF COLITIS ASSOCIATED CANCER IN VITRO CO-CULTURES.

GS4

R. DeHaan, S. Sarvestani, R. Fisher, E. Huang
Cleveland, OH

Purpose/Background: Colitis-associated cancer (CAC) is a feared consequence of ulcerative colitis. The inflammatory microenvironment, especially the stromal fibroblasts, is associated with increased development of neoplasia. Further, even in the absence of histological neoplasia, transcriptional inflammatory and neoplastic signatures exist. Patient-derived epithelial organoids and fibroblasts, with high-resolution single cell analysis, permit unprecedented dissection of transcriptional expression. Single cell nuclear analysis was used to discriminate cell identity and individual cell transcriptional expression. We hypothesize that co-cultures of CAC epithelial organoids with proximal colitic but histologically normal fibroblasts recapitulates a neoplastic profile when compared to CAC epithelial organoids alone.

Methods/Interventions: Matched patient derived epithelial organoids were cultured alone, or co-cultured with fibroblasts from an area of CAC, or with an area

of proximal colon that was histologically normal. After 7 days of culture, the diameter of individual colonies (N = 150/sample) were measured as an indication of proliferation. Single-nucleus RNA-seq (sn-RNA-Seq) was performed (10x Genomics). Data analysis was performed in R utilizing the Seurat package for clustering and differential expression analysis. Dimensionality reduction was performed using Uniform Manifold Approximation and Projection.

Results/Outcome(s): Colony diameters were found to be significantly increased in both the epithelial/CAC fibroblast co-culture and epithelial/normal fibroblast co-culture vs epithelia alone ($p<0.0001$). SnRNA-Seq was performed on epithelial organoids alone and co-culture with matched proximal and cancerous fibroblasts. Cell clusters were annotated utilizing known marker genes and differential expression analysis was performed between the three samples (Fig. 1). The transcriptomic signature of the co-culture with proximal fibroblasts demonstrates a 45-fold increase in inflammatory and oncogenic driver fibroblast populations compared to epithelia alone or epithelia plus CAC fibroblast co-cultures (Fig. 1C, box).

Conclusions/Discussion: We demonstrate in vitro modeling of colitis-associated cancer epithelia with matched normal colon and CAC stromal fibroblasts. Consistent with neoplasia, co-cultures of epithelia with either type of fibroblast exhibited increased size. Further, we show, for the first time, use of snRNA-seq of patient-derived epithelial organoids in co-culture to deconvolute the transcriptomic changes. Despite the normal histology of the proximal colitic fibroblasts, our data showed enrichment of inflammatory fibroblast and oncogenic drivers in our co-cultures with proximal colon fibroblasts when compared to CAC-fibroblast co-cultures. Therefore, we conclude that these model systems may be used to discriminate patient populations at risk for colitic neoplasia.

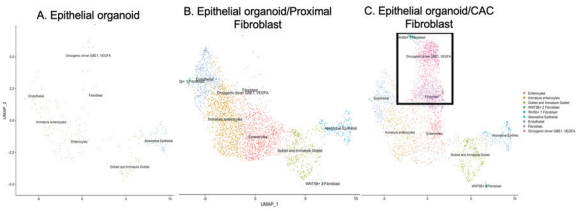


Figure 1. Integrated UMAP analysis of culture conditions. A. Epithelial Organoid alone. B. Epithelial Organoid and CAC fibroblast. C. Epithelial organoid and proximal fibroblast. The area of enriched inflammatory fibroblast and oncogenic drivers is seen in the boxed region.

INTRACORPOREAL VERSUS EXTRACORPOREAL ANASTOMOSIS IN ROBOTIC SURGERY - DOES ANASTOMOTIC TECHNIQUE IMPACT 30 DAY COMPLICATIONS?

GS5

F. Grass, P. Achilli, S. Kelley, D. Larson, K. Behm
Rochester, MN

Purpose/Background: As robotic surgery continues to disseminate into the field of colon and rectal surgery there is a growing interest in the utilization of intracorporeal anastomosis (ICA) to potentially improve surgical outcomes. The purpose of this study was to compare feasibility, safety and short term outcomes of robotic sigmoid and low anterior resections performed with ICA versus conventional extracorporeal anastomosis (ECA) for benign and malignant disease.

Methods/Interventions: A retrospective analysis was performed on a prospectively maintained database of a consecutive series of patients who underwent an elective robotic sigmoid or low anterior resection for benign or malignant disease utilizing either ICA or ECA between August 2017 and November 2019. Overall (Clavien grade I-V), major (grade IIIb-V) and specific surgical complications were assessed until 30 postoperative days and compared between the 2 groups (ICA vs. ECA). Comparative analyses were performed with chi-squared test (categorical variables) and t-test (continuous variables).

Results/Outcome(s): A total of 160 patients were identified; 73 (45.6%) in the ICA group and 87 (54.4%) in the ECA group. Most of the procedures were performed for malignancy (76% of cases). There were no significant differences in baseline demographics, ASA score, indication for surgery, or operation performed between groups. Estimated blood loss was lower in the ICA group (80.7 mL vs. 110.2 mL; $p = 0.048$), while operative times were longer when an ICA was performed (5.9±SD hours vs. 4.9±SD hours; $p = <0.001$). Overall conversion rate was 1.9%, with no conversions in the ICA group. Overall complications occurred in 54 patients (33.8%) with 8.3% representing major complications. There were no significant differences in 30 day outcomes between groups (Table 1). The median length of stay was comparable between the two groups (4.5 days vs. 4.9 days; $p = 0.291$).

Conclusions/Discussion: This pilot study demonstrates feasibility and safety of robotic sigmoid and low anterior resections with ICA. Outcomes for robotic sigmoid and low anterior resections are encouraging regardless of anastomotic technique (ICA vs ECA). Additional adequately powered studies are required to further elucidate the potential impact of ICA on post-operative outcomes.

Table 1 Outcomes

	All (n=160)	Intracorporeal (n=73)	Extracorporeal (n=87)	p
Any complication (I-V) (%)	54 (33.8)	26 (35.6)	28 (32.2)	0.646
Major complication (IIIb-V) (%)	13 (8.1)	5 (6.8)	8 (9.2)	0.586
Minor complication (I-IIIa) (%)	41 (25.6)	21 (28.8)	20 (23.0)	0.404
SSI (%)	9 (5.6)	4 (5.5)	5 (5.7)	0.941
DSI (%)	6 (3.8)	2 (2.7)	4 (4.6)	0.532
Ileus (%)	19 (11.9)	7 (9.6)	12 (13.8)	0.409
Anastomotic leak (%)	6 (3.8)	1 (1.4)	5 (5.7)	0.126
Pooled infection (%)	18 (11.3)	7 (9.6)	11 (12.6)	0.540
Reoperation (%)	6 (3.8)	1 (1.4)	5 (5.7)	0.126
Readmission (%)	18 (11.3)	7 (9.6)	11 (12.7)	0.5405
Length of stay (days) (median, IQR)	4.7 (4.9)	4.5 (3.2)	4.9 (6.1)	0.291

Postoperative complications in patients with intracorporeal anastomosis (n=73) and patients with extracorporeal anastomosis (n=87).

SSI – Surgical site infection, DSI – Deep space infection, POD – postoperative day

Bold characters indicate significant values (p<0.05).

THE MALIGNANT PROGRESSION OF ANAL INTRAEPITHELIAL NEOPLASIA IN PATIENTS AT A TERTIARY COLORECTAL PRACTICE.

GS6

I. Gardner, D. Nguyen, K. Watson, E. Dewey, K. Lu, V. Tsikitis
Portland, OR

Purpose/Background: Anal intraepithelial neoplasia (AIN) is the dysplastic growth of squamous epithelial cells in the transition zone of the anus and is a premalignant lesion for anal cancer. Given the unclear incidence of progression from AIN to anal cancer in the general population with no clear guidelines for surveillance and treatment of AIN, this study aims to better delineate the progression of AIN to cancer in a population undergoing surveillance.

Methods/Interventions: We performed a retrospective review of patients seen in the colorectal clinic of an academic tertiary care hospital between January 2014 and July 2019 with a diagnosis of AIN, anal carcinoma in situ, and anal condyloma. Patients with a prior diagnosis of anal cancer were excluded. Patients underwent surveillance with a physical exam and anoscopy every 3-6 months. Patients with persistent disease after excision or a concerning appearing lesion were seen in 6 weeks. Patients were treated with topical agents, excision, and fulguration based on the surgeon's discretion.

Results/Outcome(s): We identified 356 patients with AIN, with 98 (27.5%) women and a median age of 52 (24-83). Our population included participants with known risk factors, including HIV (40.7%), immunocompromised state (25.0%), current smokers (29.2%), men who have sex with men (55.5%) and women with cervical, vulvar or vaginal intraepithelial neoplasia (49%). Sixty-six percent were initially diagnosed with low-grade squamous intraepithelial neoplasia (LSIL) and 30% were initially diagnosed with high-grade squamous intraepithelial neoplasia (HSIL). The median length of follow up was 2.1 years with a median of 2.8 visits per year. Half of the patients were non-compliant with our follow up recommendations and 13.2% were only seen once. Treatment included tricholoroacetatic acid (58.4%), imiquimoid (16.4%), and excision (clinic 27.5%; operating room 61.5%). Twenty six percent of patients required two or more excisions. The progression rate of LSIL to HSIL was 15.4% at one year and 31.9% at five years. The cancer progression rate was 0.4% at one year and 3.0% at five years. Six patients (1.69%) progressed to anal cancer after a period of noncompliance with surveillance, ranging from 6 months to 9 years. Only two (0.56%) patients undergoing the recommended surveillance and treatment progressed to anal cancer (one anal margin and one anal canal). All of the patients who developed anal cancer had HIV and long standing AIN.

Conclusions/Discussion: In our patient population, six noncompliant patients progressed to anal cancer compared to only two patients undergoing appropriate surveillance and treatment. With strict adherence to surveillance with anoscopy every 3-6 months and treatment of AIN, the rate of progression to anal cancer is very low.

INITIAL EXPERIENCE UTILIZING A NOVEL 3D MAGNETIC RESONANCE IMAGING TECHNIQUE IN EVALUATION OF POST-TREATMENT RECTAL CANCER.

R1

K. Hu, A. Nencka, P. Knechtges, C. Peterson, K. Ludwig, T. Ridolfi
Milwaukee, WI

Purpose/Background: Magnetic resonance imaging (MRI) is the preferred technique for local staging of rectal cancer. The accuracy of restaging MRI following chemoradiation is decreased when compared to initial staging, reducing its utility in selecting patients appropriate for a "watch and wait" treatment approach. Current MRI sequences for rectal cancer involve acquisition of high resolution T2-weighted 2D images at 1.5-3T. The latest techniques allow for 3D image acquisition with isotropic spatial resolution, allowing for reduced scan time, improved resolution, the ability to reformat images in any plane, and reduced interscan variability associated with manual selection of 2-D scan planes. We present our initial experience with this technique in evaluation of post-treatment rectal cancer.

Methods/Interventions: This was a single-institution prospective trial. Patients diagnosed with locally advanced rectal cancer requiring neoadjuvant chemoradiation between 08/2017 and 01/2019 were eligible for inclusion. Following the completion of neoadjuvant therapy, patients underwent an additional 3T MRI with a reduced field of view, variable flip angle, and 3D fast spin echo acquisition

(Hypercube, GE Healthcare version DV26R03). Tumor and lymph node status was evaluated by a single radiologist who was blinded to clinical history. MRI interpretations were compared to pathologic stage or clinical complete response (cCR) status.

Results/Outcome(s): Of 20 patients who underwent study MRI, 13 (65%) underwent total mesorectal excision, of which 4 (20%) had a pathologic complete response (pCR). 7 (35%) had a cCR and were monitored with a "watch and wait" approach. 3 (15%) had insufficient images for assessment and were excluded from further analysis. Using the 3D MRI sequences, radiologic assessment of tumor stage matched pathologic/clinical status in 8 (40%) patients. 2 (10%) were understaged, where radiologic tumor stage was lower than final pathologic stage, and 7 (35%) were overstaged. Lymph node status was correctly matched in 14 (70%) patients, understaged in 1 (5%), and overstaged in 2 (10%) patients. A radiographic complete response had both a specificity and positive predictive value of 71.4% for pCR or cCR.

Conclusions/Discussion: In this preliminary analysis, we demonstrated that a radiographic complete response using a novel 3D-MRI technique was associated with high specificity and positive predictive value for cCR and pCR. This technique shows promise in accurately identifying clinical complete responders who may be candidates for "watch and wait" approaches. Our next steps include optimization of diffusion tensor imaging to compliment the 3D images, to better characterize tumor infiltration and to improve differentiation of treatment scar from residual tumor.

DELAYED SURGERY DOES NOT INCREASE RISK IN URGENT COLECTOMY FOR ULCERATIVE COLITIS.

RF2

S. Tiu, L. Hajirawala, C. Leonardi, K. Davis, G. Orangio, J. Barton
New Orleans, LA

Purpose/Background: With improving medical management of inflammatory bowel disease, surgery for ulcerative colitis is often delayed until patients have attempted multiple medications. As a consequence of this, patients frequently present with advanced disease necessitating more urgent interventions, often in the setting of acute exacerbations or fulminant disease. We hypothesize that in patients undergoing urgent, inpatient colectomy for ulcerative colitis, a greater time from hospitalization to surgery leads to greater morbidity and mortality.

Methods/Interventions: Utilizing the American College of Surgeons National Surgical Quality Improvement Program (NSQIP) database, from 2013 to 2016, adult patients with ulcerative colitis who underwent either open or laparoscopic total abdominal colectomies were identified (CPT 44150, 44151, 44155, 44156, 44157, 44158, 44210, 44211, 44212). We evaluated patients undergoing elective, emergency and non-elective/non-emergency (urgent) surgery. Urgent cases were further divided into those who had surgery within 48 hours of admission (prompt) and had surgery after 48 hours of admission (delayed). Demographics, preoperative risk factors and postoperative outcomes were compared using either ANOVA or χ^2 test (univariate) or logistic regression (multivariate) adjusting for race, dyspnea, and ASA who differed among groups.

Results/Outcome(s): We identified 4157 patients with ulcerative colitis who underwent a colectomy from the NSQIP database. Of these, 2954 underwent elective surgery, 282 emergency surgery, 208 prompt surgery, and 713 delayed surgery. The average amount of days from admission to surgery for the prompt group was 1.2 days, and 9.0 days for the delayed group. When comparing the four groups, there were significant differences in need for

RF2 Multivariate Analysis (controlled for Race, Dyspnea, and ASA Class)

Item	Elective (N=2954)	Prompt (N=208)	Delayed (N=713)	Emergency (N=282)	p-value
	-------- Odds Ratio Estimates (95% CI) --------				
Superficial SSI	1.0 (Ref)	0.72 (0.31-1.66)	1.38 (0.95-2.01)	1.38 (0.95-2.01)	0.2775
Deep SSI	1.0 (Ref)	1.57 (0.61-4.04)	1.50 (0.84-2.70)	1.12 (0.40-3.14)	0.5010
Intraop&Postop transfusion	1.0 (Ref)	1.76 (1.19-2.60)	2.63 (2.12-3.28)	3.08 (2.23-4.24)	<0.0001
Sepsis	1.0 (Ref)	2.35 (1.43-3.87)	2.46 (1.81-3.35)	3.38 (2.18-5.23)	<0.0001
Return to OR	1.0 (Ref)	1.71 (1.05-2.80)	1.62 (1.20-2.20)	1.35 (0.82-2.21)	0.0060
Readmission	1.0 (Ref)	0.92 (0.63-1.34)	1.02 (0.82-1.26)	0.72 (0.48-1.06)	0.3909
Death	1.0 (Ref)	6.03 (1.40-25.98)	6.76 (2.41-18.95)	19.21 (6.76-54.58)	<0.0001

transfusion, sepsis, return to OR, and death ($p < 0.01$). In univariate analysis, there was no significant difference between prompt and delayed surgery in superficial wound infection ($p = 0.10$), deep wound infection ($p = 1.00$), sepsis ($p = 0.75$), return to OR ($p = 0.88$), and readmission ($p = 0.55$), but there was a significant difference in need for blood transfusion (16.8% vs 24.7%; $p = 0.02$). No significant differences were observed in multivariate analysis adjusting for race, dyspnea, and ASA Class.

Conclusions/Discussion: Elective surgery conferred the lowest risk of morbidity and mortality, while emergency surgery was associated with the most risk amongst the four groups. Morbidity and mortality were not significantly different when comparing the prompt and delayed groups, suggesting it is safe to delay surgery and attempt further salvage medical management in patients with acute exacerbations of ulcerative colitis. The ability to convert a patient from urgent to elective surgery carries a lower risk of surgical complication. Additionally, consideration should be given for earlier surgery to cure ulcerative colitis and mitigate the risk of urgent or emergency surgery.

MUCINOUS ADENOCARCINOMA OF THE RECTUM: A WHOLE GENOME SEQUENCING STUDY.

RF3

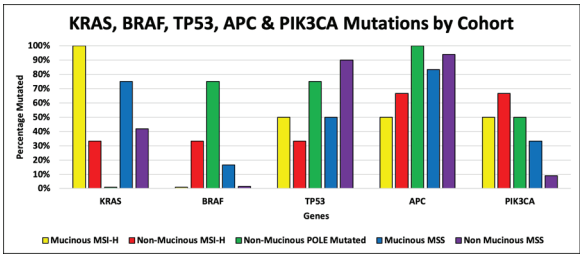
I. Reynolds[1], E. O'Connell[1], M. Fichtner[2], D. McNamara[1], E. Kay[3], J. Prehn[2], S. Furney[2], J. Burke[1]
[1]Dublin, Ireland; [2]Dublin 2, Ireland; [3]Dublin 9, Ireland

Purpose/Background: Mucinous adenocarcinoma (MA) of the rectum accounts for 5-15% of all rectal cancers. To meet the criteria for the mucinous phenotype extracellular mucin must constitute more than 50% of the tumor volume. This histological subtype has been shown to have a worse response to chemoradiotherapy and worse long term outcomes when compared to non-mucinous adenocarcinoma (NMA). In particular, these tumors have been shown to have a reduced rate of pathological complete response, reduced tumor downstaging, an increased rate of positive resection margins and poorer overall survival. The aim of this study was to define the genomic landscape of MA and compare it to non-mucinous adenocarcinoma (NMA) of the rectum.

Methods/Interventions: Using the BGISEQ PE100 platform, paired end whole genome sequencing was carried out on fresh frozen tumor and matched normal tissue from cases of MA. A coverage depth of 60x was used for tumor and 30x for normal. The Cancer Genome Atlas (TCGA) was interrogated to identify further cases of rectal MA and cases of rectal NMA with sequencing data that could be used as a control group. In-depth bioinformatic analysis was undertaken and the genomic landscapes of the two subtypes were compared.

Results/Outcome(s): Fourteen MAs (9 Our Cohort & 5 TCGA) were compared to 74 NMAs. The microsatellite instability-high (MSI-H) rate in the MA group was 14.29% vs 4.05% in the NMA group. *POLE* mutations were found in 5.41% of the NMA group compared to 0.00% of the MA group. *KRAS* (75.00% vs 41.79%), *BRAF* (16.67% vs 1.5%) and *PIK3CA* (33.00% vs 8.96%) mutations were more frequent in the MA group whereas *TP53* (89.55% vs 50.00%) and *APC* (94.03% vs 83.33%) mutations were more common in the NMA group. Significant differences between the groups were identified in the most frequently mutated genes and the cohorts shared only 7 of their 20 most frequently mutated genes in common. The KRAS G12V mutation was the most common mutation in both cohorts accounting for 45% and 31% of KRAS mutations in the mucinous and non-mucinous cohorts respectively. The KRAS G12D was the second most common KRAS mutation in both cohorts accounting for 33% and 24% of all KRAS mutations in the mucinous and non-mucinous cohorts respectively. The remaining 2 KRAS mutations in the mucinous cohort were both Q61H mutations while 7 different mutations made up the remaining 45% of KRAS mutations in the non-mucinous cohort. Copy number alteration, mutational signatures, structural variation and microbiome findings will also be described.

Conclusions/Discussion: MA is a distinct phenotype arising from a distinct genotype and this may have important implications when considering treatment strategies going forward. Sequencing technologies such as whole genome and whole exome sequencing have the potential to help identify the most effective treatment options and possibly improve long term cancer outcomes for patients.



KRAS, BRAF, TP53, APC & PIK3CA mutations in mucinous and non-mucinous cohorts

STOOL AND SCOPE – DO THESE SCREENING TESTS REALLY MAKE A DIFFERENCE IN CANCER OUTCOMES FOR RURAL RESIDENTS?

RF4

H. Smith[1], R. Boushey[1], K. Kandola[2], A. Tessier[2], C. Kuziemsky[3]
[1]Ottawa, ON, Canada; [2]Yellowknife, NT, Canada; [3]Edmonton, AB, Canada

Purpose/Background: Colorectal cancer can be detected earlier and, in some cases, prevented with colonoscopy. In the Northwest Territories (NWT), a northern

region of Canada, colonoscopy is only available in three health centres for a population spread across 1.3 million km2 and where over half of the communities are only accessible by plane. This population experiences a higher incidence of CRC and more advanced disease at presentation than other Canadian residents (Canadian Cancer Society, 2018). The rate of death from CRC is double that of the rest of the Canada (Northwest Territories Health and Social Services, 2014). The reasons for these trends have yet to be explored, and one potential cause is the low rate of CRC screening participation: only 23% of eligible average risk individuals participated in 2018. We aim better understand these trends, and the potential role CRC screening to improve CRC outcomes in the NWT.

Methods/Interventions: A retrospective cohort review was conducted of all patients age 50-74 who underwent CRC screening by fecal immunohistochemical test (FIT) in the NWT and had a positive result between January 1, 2014-March 30, 2019. Individuals were identified through Public Health Registries and details were obtained by manual chart review of any follow-up colonoscopies and their results. To identify all patients diagnosed with colorectal cancer between January 1, 2014 - Dec 31, 2016, the NWT Cancer Registry was also reviewed for the stage, pathology, and tumour location.

Results/Outcome(s): Between 2014-2019, 7,153 FITs were completed among individuals age 50-74, translating to an annual average screening rate of 24.5%, and a 10.9% FIT positivity rate. Among the FIT positive individuals, 631 (80.3%) were found to have had a follow-up colonoscopy. Of these individuals, 33(5.2%) had CRC, and 393(62.2%) had polyps, of which, 147(37.4%) had advanced adenomas. The overall positive predictive value(PPV) of FIT for advanced neoplasia was 28.5%. When comparing screen detected CRC to symptom detected CRC in 2014-16, we found a higher proportion of cases to be early stage (61.9% vs 41.6%, $p<0.01$), and were more likely to be rectal (57.1 vs 33.9, $p<0.01$).

Conclusions/Discussion: The positivity rate of FIT was higher than seen in previous studies at the same FIT threshold of 15ug/g (10.9 vs 8.1%, $p<0.01$), however, colonoscopy outcomes after FIT appear as expected with similar PPV (28.5 vs 25.9, $p=0.053$) (Liles et al., 2018). Based on our analysis, CRC screening appears to assist with detecting CRC early which could translate to a reduction in CRC incidence and associated mortality for the population (Zauber, 2015). Increasing FIT-based screening in the NWT could improve dramatically improve CRC outcomes for this population. Similar interventions may be particularly useful in other regions with limited access to colonoscopy.

PATIENT REPORTED OUTCOME MEASURES (PROMS) AND FUNCTIONAL RECOVERY IN GERIATRIC PATIENTS UNDERGOING MAJOR COLORECTAL CANCER SURGERY. 90-DAY INTERIM REPORT ON 504 PATIENTS FROM THE GERIATRIC ONCOLOGY SURGICAL ASSESSMENT AND FUNCTIONAL RECOVERY AFTER SURGERY (GOSAFE) STUDY.

100

I. Montroni[1], N. Saur[2], A. Spinelli[3], S. Rostoft[4], F. Foca[5], R. Audisio[6], G. Ugolini[1], E. Study Group[1]
[1]Faenza, Italy; [2]Philadelphia, PA; [3]Rozzano, Italy; [4]Oslo, Norway; [5]Meldola, Italy; [6]Goteborg, Sweden

Purpose/Background: Older cancer patients value functional outcomes as much as cancer survival, but surgical studies frequently lack data measuring patients' experience. The international, multicenter GOSAFE study (ClinicalTrials.gov NCT03299270) aims to evaluate patients' quality of life (QoL) and Functional Recovery (FR) after surgery. This is an interim analysis of early study results focused on QoL and predictors of 90-day functional recovery (FR).

Methods/Interventions: GOSAFE prospectively collects functional and clinical data before and after major elective cancer surgery on senior adults (≥70 years). Surgical outcomes were recorded (30-90 days post-operatively) together with QoL (EQ-5D-3L) and FR (ADL ≥5, Minicog >2 and TUG<20 sec) data from 26 international centers.

Results/Outcome(s): From February 2017 to April 2019, 617 patients underwent major colorectal cancer surgery. Median age was 79 (range 70-95); 52.8% males and ASA III-IV were 50.7%. Patients dependent (ADL <5) were 9.1%. Frailty was detected by G8 >14 in 28.4% and fTRST ≥2 in 35.7% of patients. Major comorbidities (CACI>6) were detected in 32.7%. 23% had cognitive impairment according to MiniCog, while for comparision only 2.4% self-reported cognitive deficits. For 504 patients, a 90-day postoperative comprehensive evaluation was available. Overall morbidity was 66.8%, but Clavien-Dindo III-IV complications were only 14.4%. 90-day mortality was 5%. QoL improved 90 days after surgery (mean EQ-5D index from 0.76 to 0.80). Particularly, patients reported significant improvement in anxiety/depression and pain, but a non significant decrease in mobility, self-care and usual activities was noted. 71% of patients were fully independent after surgery (ADL ≥5 and TUG<20 and Minicog≥ 3), partial autonomy (at least two of ADL ≥5 or TUG<20 or Minicog≥ 3) was recorded in 21%, while severe functional decline was observed in 8%. Only 51% of patients experienced complete FR when CD III/IV complications occurred. On logistic regression analysis, FR was associated to age < 80 yo, ASA 1-2, fTRST < 2, G8 <14, ECOG score 1-2, no history of delirium and preoperative ability to walk. Interestingly, nutritional status and minimally invasive surgery were not associated with 3-month restoration of function

Conclusions/Discussion: GOSAFE is the largest prospective study on older cancer patients undergoing major surgery focusing on PROMs and FR. Nearly three-quarters of older colorectal cancer patients regain full independence after surgery with improved QoL secondary to decrease in anxiety/depression and pain. Preoperative frailty assessment tools appear to be accurate in predicticting FR. Based on these data, a user-friendly tool will be made available for clinical practice in order to predict outcomes that matter to patients.

FEASIBILITY AND BENEFITS OF LARGE SCALE QUALITY IMPROVEMENT (QI) STUDIES IN RECTAL PROLAPSE PATIENTS: A CALL FOR ACTION.

101

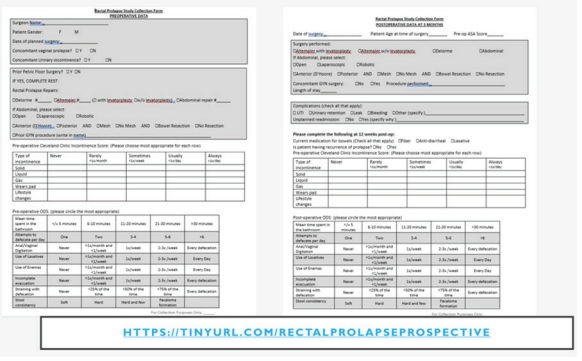
L. Bordeianou[1], S. Vogler[2], K. Evans[3], N. Hyman[4], A. Ky[5], M. Murphy[6], L. Savitt[1], B. Gurland[7]
[1]Boston, MA; [2]Cleveland, OH; [3]Burlington, VT; [4]Chicago, IL; [5]New York, NY; [6]Charleston, SC; [7]Palo Alto, CA

Purpose/Background: Surgical management of rectal prolapse continues to evolve. Single center and small-scale prospective studies have provided insight into the outcomes after different prolapse procedures but randomized trials have failed to reach meaningful numbers. In this pilot, we aimed to determine feasibility of large-scale data collection utilizing a QI data collection model.

Methods/Interventions: On 1/1/2015, we convened a regional multicenter QI collaborative, directed through a regional colorectal society. Once feasibility of on-line REDCAP data collection was confirmed on a regional scale (2015-2017), the collaborative was expanded nationally (2017-current) through invitations to members of the Pelvic Floor Disorders Consortium (PFDC). Surgeons were asked to self-report via a standardized, deidentified one page data collection sheet or via self entry into REDCAP to allow collection of both preop and postop (at 3 months) outcomes. Data collection included critical technical aspects of the procedures, such as approach (robotic, laparoscopic, open, perineal), fixation technique (posterior suture, ventral mesh) and concomitant procedures (Figure).

Results/Outcome(s): Full preop/post up data was collected on 181 patients. The majority were American women (94.5%USA;96% female) with a mean age 61 years. 107 underwent rectopexies (69 suture /56% MIS, 41 ventral/93% MIS). Those offered perineal approaches (N=68) were older (75.5 vs 62.2, p<0.001) and had more comorbidities (ASA3-4: 51.1% vs. 24.1%, p<0.001), but also reported higher pre-intervention rates of FI (Wexner 11.4 ± 6.4 vs. 11.4 ± 6.4, p< 0.002) and ODS (Altomare 11.4 ± 6.4 vs. 8.6 ± 5.8, p<0.002). After accounting for differences at presentation, patients undergoing perineal procedures had similar incremental FI improvement after surgery vs. abdominal cohort (change in Wexner -2.6 ± 6.4 vs. -3.1 ± 5.6, p< 0.573; change in Altomare -2.9 ± 4.6 vs. -2.7 ± 4.9, p< 0.786). Similarly, posterior suture rectopexy vs ventral mesh rectopexy patients had similar incremental improvements in overall scores, (perineal: -0.5 ± 1.9 vs: posterior +0.3 ± 1.7vs ventral -0.8 ± 2.0, 0.001). Interestingly, ventral mesh rectopexy patients had a higher drop in the need to use pads after surgery.

Conclusions/Discussion: Functional outcomes improved in all patients undergoing prolapse surgery. Larger cohorts are necessary to show superiority amongst surgical procedures. QI methods may allow for a systematic yet practical acquisition of information and data analysis. We call for creation of a robust PFDC QI database to benefit this patient population.



Data Collection Sheet/REDCAP Link

CORRELATION OF COLORECTAL SURGICAL SKILL WITH PATIENT OUTCOMES – A CAUTIONARY TALE.

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A. Kanters, S. Evilsizer, S. Hendren, J. Dimick, J. Byrn
Ypsilanti, MI

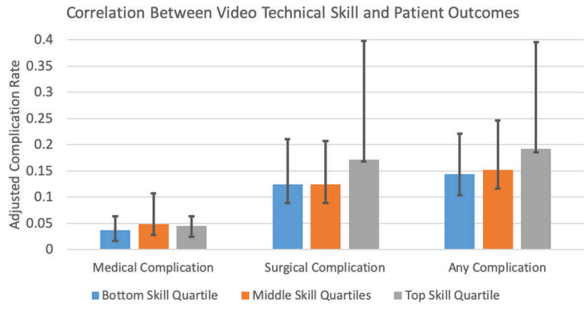
Purpose/Background: Previous work in the fields of bariatric and hepatobiliary surgery has demonstrated a correlation between video ratings of surgical skill and clinical outcomes. As such, experts have proposed the use of video review in the accreditation process as well as for use as a tool for technical skill improvement. Prior to the global adoption of this quality measure, we must first determine if video based surgical skill assessments can predict patient outcomes in a colorectal surgery population.

Methods/Interventions: We conducted a study involving 21 surgeons who perform colectomies in Michigan and participate in a statewide quality improvement collaborative. Each surgeon submitted one representative video of him or herself performing a minimally invasive colectomy. Each video was edited to 20 minutes and highlighted the key steps of the procedure. Each videotape was deidentified and rated by 10 peer surgeons in the nine key domains of technical skills as identified by the ASCRS Assessment Tool for Performance of Laparoscopic Colectomy (scores

ranging from 1 to 5). We then assessed the relationship between skill ratings and risk-adjusted complication rates for each surgeon's minimally invasive colectomies as collected in the prospectively maintained Michigan Surgical Quality Collaborative database. Complication rates were adjusted based on patient and surgery specific risk factors.

Results/Outcome(s): The average technical skill rating for each surgeon ranged from 2.6 to 4.6 ($p<0.01$). We identified 2,342 minimally invasive colectomies performed by the 21 surgeons and the risk adjusted complication rate for these patients ranged from 6.0% to 29.1% ($p<0.01$) per surgeon. Surgeons in the bottom quartile for surgical skill cared for older patients (63 vs 57 years old, $p<0.001$), while surgeons in the top quartile were more likely to treat patients on immunosuppression (13% vs 5%, $p<0.001$). There were no other significant differences in patient populations. After patient and surgery specific risk adjustments, there was no significant difference in complication rates between the bottom and top quartile surgeons (14.3% [95% CI 10.4%-22.1%] vs 19.2% [95% CI 18.5%-39.5%], respectively). Furthermore, there is no significant association between technical skill and medical specific complications (i.e. pneumonia, VTE, respiratory failure, cardiac dysfunction, stroke or renal failure) or surgery specific postoperative complications (i.e. SSI, transfusion, sepsis, or anastomotic leak) across each quartile **(Figure)**.

Conclusions/Discussion: Our study demonstrates that peer rating of operative videos is not a reliable predictor of patient outcomes in our colectomy population. As such, the adoption of video review in the credentialing process should be approached with caution. Additional investigation must be undertaken to understand how to best measure technical skill if we hope to expand our use of technology as a tool for surgical skill improvement.



GENDER BIAS IN COLORECTAL SURGERY FELLOWSHIP LETTERS OF RECOMMENDATION. 103

W. Oslock, S. Lansing, L. Coleman, A. Oslock, T. Pawlik, S. Noria, S. Husain
Columbus, OH

Purpose/Background: Issues of implicit bias and structural sexism are increasingly discussed within surgery. As leaders strive to create equitable pipelines to train future surgeons, one process under scrutiny is letters of recommendation (LORs). The objective of this study was to review LORs for the colorectal surgery (CRS) fellowship, at a single academic institution, for evidence of gender bias through word usage. We hypothesized there would be a gender discrepancy in language related to technical proficiency.

Methods/Interventions: The Colon and Rectal Surgery Resident Candidate Assessment questionnaire includes three short response questions about applicant strengths, weaknesses and additional information, as well as space for a conventional LOR. This study analyzed both the short answers and LORs for one application cycle to an ACGME-accredited CRS fellowship. Linguistic Inquiry and Word Count (LIWC2015) software assessed letter length and 26 language-based themes: 20 established LIWC themes, 4 that were used in prior studies on gender bias, and 2 original themes specific to surgical competencies. A free online calculator was also used to assess for gender bias in employed language. (https://slowe.github.io/genderbias/). Two-sample t-tests and Fisher exact tests were used to analyze differences by applicant gender.

Results/Outcome(s): There were 103 applicants with 303 LORs analyzed. Female surgeons comprised 35% of the applicants and 15% of the referees. Word count varied based on applicant gender. Short answers were longer for female applicants (34 vs 25 words for strengths $p=0.01$, 28 vs 23 for weaknesses $p=0.11$, and 31 vs 22 for additional information $p=0.01$), while LORs were longer for male applicants (368 vs 325 $p=0.06$). There were also differences in theme frequency for both LORs and short answers. Male applicants' strengths had a higher percentage of technical words (5.1 vs 3.0% $p=0.05$) from all writers with an even higher difference for female authors (6.9 vs 1.7% $p=0.06$). Female applicants' strengths were a higher percentile for emotional language for all authors and male authors particularly (88 vs 80th percentile and 88 vs 78th percentile respectively $p=0.01$). Letters for male applicants had a higher percentage of affiliation words (2.4 vs 2.1% $p=0.04$) overall and reward words (1.6 vs 1.1% $p=0.02$) with female letter writers. Female applicants had a higher percentage of cognitive and perceptual words overall (8.0 vs 7.4% $p=0.05$ and 1.8 vs 1.6% $p=0.03$ respectively).

Conclusions/Discussion: This study found significant differences between LORs written for CRS fellowship applicants based on applicant gender. These differences were found in both short answers and letters. Notably technical words were used more often to describe male applicants' strengths and emotional language for female candidates' strength. It is unclear how these differences impact the fellowship selection process, but merit further study given the desire for a meritocratic culture.

EVALUATING NON-OPERATIVE ROBOTIC SKILLS IN COLORECTAL SURGERY TRAINING.

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Y. Al Jamal, S. Kelley
Rochester, MN

Purpose/Background: Robotic assisted surgery has become an increasingly common platform for performing colorectal procedures. Educators must determine how to best teach and train residents (didactics and hands on training) to use the technology safely. Multiple modalities have been incorporated into training including didactic sessions, virtual reality, wet (cadaver) labs, dry labs, case observations, mentoring / proctoring, and the use of validated assessment tools. There is a paucity of literature on how non-operative skills (teamwork, leadership, situational awareness, decision-making) are being taught and integrated into colorectal surgery training. Herein we describe the development of a Robotic Colorectal Objective Structured Assessment of Non-Technical Skills (Robotic-COSANTS) program that is taught in conjunction with the development of technical skills

Methods/Interventions: Since 2016, our colon and rectal surgery residents (N=9) have participated in a Robotic-COSANTS program consisting of two relatively rare scenarios: pelvic bleeding and CO^2 embolism. The scenarios are performed two times per year (fall and spring) in a simulated environment and are video recorded. Using the validated Non-Technical Skills for Surgeons (NOTSS) assessment the videos are evaluated (communication & team skills, leadership, decision-making, & situational awareness) by the residents (self) and faculty surgeons. Residents complete a NASA Task Load Index (TLX) assessment form at the completion of each scenario

Results/Outcome(s): Resident completion of the Robotic-COSANTS program was achieved successfully by all participants. Assessment of the nontechnical skills between residents (self) and faculty members did not correlate for either scenario (median score, CO^2 embolism: 3 vs 5, bleeding: 3 vs 5: $P>0.05$). Residents' nontechnical skills improved between both assessments (mean score, CO^2 embolism: 4.2 vs 5, bleeding: 4.4 vs 5: $P<0.05$). Other than for physical demand, NASA-TLX scores were similar for both scenarios. Residents reported a mean composite NASA-TLX score of 66.7 for CO^2 embolus (max of 100) and 69 for bleeding. For the NASA-TLX subscales (max of 20) CO^2 embolus mean was 15 for mental demand, physical demand was 10.3, temporal demand 17.4, effort 14, and tack complexity 12. For bleeding mental demand was 16.7, physical demand 5.3, temporal demand 21.3, effort 14, and task complexity 14

Conclusions/Discussion: Nontechnical skills should be highlighted in robotic surgical training. The Robotic-COSANTS program can be implemented in a risk-free simulated environment without additional technology or significant financial cost. Its deliberate design for resource-constrained settings allows it to be used both as an educational course and an assessment tool. NASA-TLX scores revealed similar aspects of workload between the scenarios. Our study describes a successful non-operative skills robotic program developed at our institution for colon and rectal surgery residents

PERFUSION ASSESSMENT IN LEFT-SIDED/ ANTERIOR RESECTION (PILLAR III): A RANDOMIZED, CONTROLLED, PARALLEL, MULTICENTER STUDY ASSESSING PERFUSION OUTCOMES WITH PINPOINT® NEAR INFRARED FLUORESCENCE IMAGING IN LOW ANTERIOR RESECTION.

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M. Jafari[1], A. Pigazzi[1], E. McLemore[3], M. Mutch[4], E. Haas[5], S. Rasheid[6], A. Wait[4], I. Paquette[7], O. Bardakcioglu[8], D. Margolin[9], B. Safar[10], R. Landmann[11], M. Varma[12], D. Maron[13], J. Martz[14], J. Bauer[15], V. George[16], J. Fleshman[2], S. Steele[15], M. Stamos[1]
[1]Orange, CA; [2]Dallas, TX; [3]Los Angeles, CA; [4]St Louis, MO; [5]Houston, TX; [6]Tampa, FL; [7]Cincinnati, OH; [8]Las Vegas, NV; [9]New Orleans, LA; [10]Baltimore, MD; [11]Jacksonville, FL; [12]San Francisco, CA; [13]Weston, FL; [14]New York, NY; [15]Cleveland, OH; [16]Charleston, SC

Purpose/Background: Anastomotic leak (AL) after colorectal resection is associated with increased morbidity and mortality. Inadequate perfusion may contribute to AL. We hypothesized that the use of indocyanine green (ICG) angiography to ensure anastomotic perfusion may decrease anastomotic leak rates following low anterior resection (LAR).

Methods/Interventions: We performed a 1:1 randomized, controlled, parallel, multicenter study comparing the rate of post-operative anastomotic leak in LAR patients (defined as anastomosis within 10 cm of anal verge). Patients underwent standard (STD) evaluation of colon and rectal tissue perfusion versus STD in conjunction with perfusion evaluation using ICG fluoroscopy (PFN). Intraoperative data and postoperative data (8 weeks) were collected. Sample size was planned for a minimum of 450 and maximum of 1000 patients accrued over a 2-year

period. However, this study was concluded early due to low and decreasing accrual rates.

Results/Outcome(s): A total of 25 centers recruited 347 patients of which 178 were randomized to PFN and 169 to STD arm. The groups had comparable tumor-specific and patient-specific demographics. Rectal cancer was the preoperative diagnosis in 81.4% of PFN and 84.6% of STD. Neoadjuvant chemoradiation was performed in 63.5% of PFN and 65.7% of STD. Mean BMI was 27.8±5.6kg/m2 of PFN compared to 28.2±5.9kg/m^2 in STD. Mean level of anastomosis was 5.2±3.1cm in PFN compared to 5.2±3.3cm in STD. Minimally invasive surgery was performed on 84.4% of PFN compared to 86.2% of STD. Sufficient visualization of blood flow assessment was reported in 95.4% of patients in the PFN group after 1 injection of ICG. Postoperative abscess requiring surgical management was reported in 5.7% of PFN and 4.2% of STD (p=0.75). Anastomotic leak was reported in 9.0% of PFN compared to 9.6% of STD (p=0.37). On multivariate regression analysis, there was no difference in anastomotic leak rates between PFN and STD (OR 0.845; 95% CI (0.375, 1.905); P = 0.32).

Conclusions/Discussion: Successful visualization of perfusion can be achieved with ICG angiography. However, no difference in anastomotic leak rates was observed between patients who underwent perfusion assessment versus standard surgical technique. In experienced hands, the addition of routine ICG angiography to standard practice adds no evident benefit.

UNBUNDLING BUNDLES: EVALUATING THE EFFECTIVENESS OF INDIVIDUAL COMPONENTS OF A COLORECTAL SURGICAL SITE INFECTION (SSI) REDUCTION BUNDLE IN A STATEWIDE COLLABORATIVE.

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C. Schlick, R. Huang, B. Brajcich, A. Halverson, A. Yang, L. Kreutzer, K. Bilimoria, M. McGee
Chicago, IL

Purpose/Background: Surgical site infection (SSI) reduction bundles are effective, but can be complex and resource intensive. Understanding which bundle elements best drive SSI reduction may allow institutions to efficiently focus implementation on a concise bundle of elements and avoid ineffective components. Thus, we sought to evaluate the effectiveness of individual SSI reduction bundle components after statewide implementation across the Illinois Surgical Quality Improvement Collaborative (ISQIC).

Methods/Interventions: A 16 component SSI reduction bundle for elective colorectal surgery was prospectively implemented across participating ISQIC hospitals. Adherence to individual bundle components was abstracted for each operation. SSI rates and adherence to individual components were compared using Chi-squared tests and multivariable logistic regression adjusting for adherence to other bundle components. Principal component analysis (PCA) identified clustering among bundle component adherence across patients, yielding composites of correlated components. Coincidence analysis (CNA),

106 SSI Reduction Bundle Components Leading to Lower SSI Rates by Evaluation Type

SSI Reduction Component	Bivariate Analysis	Multivariable Logistic Regression	Bundle Component CNA	PCA Component CNA
Oral Antibiotics	X	X	X	X
Mechanical Bowel Preparation	X		X	X
Chlorhexidine (CHG) skin preparation day before surgery				X
CHG skin preparation day of surgery			X	X
Appropriate antibiotics within 1 hour of incision			X	X
Timely redosing of appropriate antibiotics	X		X	X
Normothermia (temperature on arrival to PACU ≥96.8°F)			X	X
Intraoperative skin prep with CHG and alcohol			X	X
Wound protector utilization	X	X	X	X
Dedicated wound closure instruments	X			X
Gown/gloves change prior to incision closure	X		X	X
Wound re-draped prior to closure				X
Wound dressed with occlusive dressing after closure	X	X	X	
Prophylactic antibiotics discontinued ≤24 hours postop				X
Timely removal of occlusive wound dressing POD2				
Daily CHG cleansing until discharge				

X = associated with absence of SSI

a configurational method of causal inference, identified combinations of bundle components and PCA composites associated with the absence of SSI.

Results/Outcome(s): Among 2,722 patients, 192 developed an SSI (7.1%). On adjusted analysis, SSI was less likely when oral antibiotics (6.0% vs. 10.0%; OR 0.63 [95% CI 0.41-0.97]), wound protector (5.4% vs. 10.3%; OR 0.55 [95% CI 0.37-0.81]), and occlusive dressing (5.7% vs. 8.3%; OR 0.71 [95% CI 0.51-1.00]) were used. Based on individual component CNA, adherence with the combination of (1) oral antibiotics, (2) wound protector, or (3) intraoperative antibiotic redosing plus intraoperative chlorhexidine (CHG) skin preparation led to the absence of SSI (consistency=0.94, coverage=0.96). Other bundle components that when combined also lead to absence of SSI with consistency=0.94 and coverage=0.93 are shown (Table). The 16 bundle components were reduced into five PCA composites, which explain 55.1% of the variance in adherence across analyzed patients. Performing CNA on these five PCA composites revealed (1) combined bowel prep or (2) IV antibiotics lead to the absence of SSI (consistency=0.93, coverage=0.82), while postoperative wound care was least likely to reduce SSI (consistency=0.93, coverage=0.40).

Conclusions/Discussion: SSI reduction bundle components had varying effectiveness, with oral antibiotics and wound protector use associated with reduced SSIs in all analyses. We did not find evidence to support timely removal of occlusive dressings and postoperative CHG wound cleansing. Implementation of colorectal SSI bundles should focus on achieving high adherence to bundle elements associated with low SSI rates, while postoperative wound care elements could likely be omitted.

DESPITE MATCH COMMUNICATION CODE OF CONDUCT, APPLICANTS CONTINUE TO BE ASKED INAPPROPRIATE QUESTIONS.

107

A. Ofshteyn, K. Bingmer, J. Bliggenstorfer, E. Steinhagen, S. Stein
Cleveland, OH

Purpose/Background: Few studies characterize adherence to the National Resident Matching Program policies on communication during the match process. The aim of this study was to assess the experience of colon and rectal residency applicants. We hypothesized that women, minorities and competitive applicants experience more violations of the Match Communication Code of Conduct.

107 Table 1. Association between risk of discriminatory questions and applicant demographic, program and competitiveness factors

Applicant factors	No discriminatory questions asked	Discriminatory questions asked	p value
Gender			
Male	6(85.71%)	11(33.33%)	0.029
Female	1(14.29%)	22(66.67%)	
Age			
Age 35 and under	6(85.71%)	28(84.85%)	1
Age over 36	1(14.29%)	5(15.15%)	
Race			
White/Caucasian	3(42.86%)	22(66.67%)	0.392
Non-white/Non-Caucasian	4(57.14%)	11(33.33%)	
US Graduate Status			
US Medical School Graduate	5(71.43%)	27(81.82%)	0.611
Graduate of Non-US Medical School	2(28.57%)	6(18.18%)	
General Surgery Program Type			
Academic	3(42.86%)	7(21.21%)	0.338
Community	4(57.14%)	26(78.79%)	
Applicant colon and rectal residency match status			
Matched into applicant	3(42.86%)	12(36.36%)	1
Matched program lower than top 3 on applicant	4(57.14%)	21(63.64%)	
Applicant colon and rectal residency invitation and match status			
Invited to same number of programs as applied and matched in top 3 program	5(71.43%)	21(63.64%)	1
Not invited to same number of programs as applied or did not match into top 3 program	2(28.57%)	12(36.36%)	

Methods/Interventions: Current 2019-2020 ACGME colon and rectal residents were surveyed at a national Colorectal Resident Career Course about their interview experience. Topics were based on Match Communication Code of Conduct for fellowship interviews. Participants were asked about discriminatory questions (DQ) regarding age, gender, sexual orientation, race, religion and family status, ranking pressure (RP) or communication intended to identify other programs and influence applicant ranking preferences, and post-interview communication (PIC) attempting to influence applicant ranking. Applicant demographics, familiarity with the Code of Conduct, and match competitiveness were assessed. Data was analyzed using Fischer's exact and Mann-Whitney U as bivariate tests, and logistic regression for multivariate testing.

Results/Outcome(s): Of 64 attendees, 40(62.5%) completed the survey, representing 38% colon and rectal residents in ACGME-approved positions. Overall rates of DQ were 82.5%, RP was 80% and PIC was 47.5%. On bivariate analyses, women were significantly more likely than men to be subjected to DQ (95.7% vs. 64.7%, p=0.029, Table 1). Women were most frequently asked questions regarding family status, (91.3% vs. 64.7%, p=0.047), and this persisted on adjusted analysis (OR 19.6 p=0.031). More women experienced RP (65.6 vs. 34.4%), but this difference was not significant (p=0.053). Age, race, general surgery program location or type, foreign graduate status and applicant competitiveness did not increase the risk of DQ or RP. Graduation from an academic (18, 60%) compared to community program (1, 10%) was the only factor associated with risk of PIC (p=0.009). 39(97.5%) of responders stated that they read or were aware of the Match Communication Code of Conduct, but only 37.5% knew how to report a violation and none reported or knew of another applicant who reported a violation.

Conclusions/Discussion: Discriminatory questions and pressure to disclose or influence applicant ranking preference are pervasive. Women are disproportionately affected by this trend and were 20 times more likely than men to be asked about their family status. Although most applicants are aware of the Code of Conduct interview guidelines, no candidate reported an infraction of the code. Further studies should assess the impact of discriminatory questions on applicants and methods to report violations.

IMPACT OF BUNDLED PAYMENT CARE IMPROVEMENT INITIATIVE ON HEALTHCARE EXPENDITURE IN MAJOR BOWEL PROCEDURES.

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R. Goldstone[1], J. Zhang[2], C. Stafford[1], T. Francone[1], H. Kunitake[1], L. Bordeianou[1], C. Cauley[1], R. Ricciardi[1]
[1]*Boston, MA;* [2]*New Haven, CT*

Purpose/Background: The Bundled Payments for Care Improvement (BPCI) initiative links payments for Medicare beneficiaries during an episode of care (limited to 90 days from index surgery). We hypothesized that provider organizations participating in the major bowel BPCI initiative experience greater cost savings for colectomy while maintaining satisfactory outcomes as compared to non-participating BPCI organizations.

Methods/Interventions: First we identified all hospitals participating in the major bowel BPCI initiative (major bowel group) and matched those hospitals to organizations that participated in other BPCI programs outside of the major bowel program (non-major bowel group) and a third group that did not participate in any BPCI program (non-BPCI group). Then we selected patients from the Medicare Standard Analytic Files (SAF) who underwent major bowel procedures in Diagnostic Related Groups 329-331 at one of the above facility types during the time period of 1/1/2011 through 8/30/2016. Next, we calculated average total care expenditure for the 90-day episode as well as postoperative outcomes such as average inpatient hospital stay (LOS), 30-day postoperative complications, and 30-day readmission rate. Last, we constructed multivariable generalized estimating equations to calculate the difference in difference for cost and outcomes before and after participation in BPCI or during the time period of the study for non-participants.

Results/Outcome(s): We abstracted 7,609 major bowel episodes from 23 hospitals participated in BPCI (major bowel group), 19,383 episodes from non-BPCI matched hospitals, and 21,871 episodes from non-major bowel matched hospitals. From the baseline period (1/2011-6/2012) to the last study period (6/2015-8/2016), we noted a $2,955 average reduction in care expenditures. However, the largest decrease in average total episode expenditure occurred within the major bowel BPCI group (14% reduction from baseline to study end) compared to the other groups (6% reduction for non-major bowel and 5% reduction for non-BPCI). After adjusting for patient demographics, comorbidities, and hospital characteristics, the adjusted average total episode expenditure for the major bowel BPCI group decreased by 9% (OR= 0.91, 95% CI, 0.86 to 0.95 p=0.0002) compared to the other groups. In addition, the major bowel BPCI group had similar reductions in LOS, 30/90-day complication, and 30/90-day readmission rate compared to the non-BPCI groups.

Conclusions/Discussion: Major bowel BPCI organizations demonstrated higher average total episode savings as compared to non-participating matched organizations. In addition, major bowel BPCI organizations exhibited similar 30- and 90-day outcomes to non-participating organizations. The major bowel BPCI initiative appears to be an effective model to reducing costs from major bowel surgery while maintaining satisfactory surgical outcomes.

WHEN THE P-VALUE DOESN'T CUT IT: A REVIEW OF THE FRAGILITY INDEX APPLIED TO COLORECTAL SURGERY RELATED RANDOMIZED CONTROLLED TRIALS.

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D. Nelms, H. Vargas, J. Paruch, R. Bedi, D. Margolin
New Orleans, LA

Purpose/Background: The concepts of "statistical significance" and the arbitrary p-value cutoff of 0.05 have come under increasing criticism for misuse and misinterpretation by groups such as the American Statistical Association. The Fragility index is an intuitive metric to help clinicians interpret data from randomized controlled trials (RCTs) with binary outcome measures. The Fragility Index is the minimum number of patients for whom if the opposite outcome occurred then the p-value would increase to above 0.05. For example, a Fragility Index of 1 would mean switching the outcome of only 1 patient would cause the study to lose statistical significance. Previous studies of clinical RCTs have demonstrated that many trials have a low Fragility Index calling their clinical significance into question. The purpose of this study is to review the Fragility Indices of a sample of RCTs in colorectal surgery related literature.

Methods/Interventions: A systematic search utilizing MEDLINE MeSH terms was performed to identify colorectal surgery related RCTs published between Jan 1, 2018 to Dec 31, 2018. From this list, RCTs with a dichotomous primary outcome and a p-value < 0.05 were identified. The Fragility Index for each was calculated utilizing Fisher's Exact test. The number of enrolled patients lost to follow-up or excluded from final analysis for each trial was also recorded.

Results/Outcome(s): A total of 22 RCTs with 25 primary outcome variables meeting the inclusion criteria were identified. The median Fragility Index was 3.5 with a range of 0 to 41. A Fragility Index of 0 was possible due to some studies having a p > 0.05 when statistics were recalculated with the Fisher's Exact test instead of the Chi-squared test. 48% of outcomes reported as statistically significant had a fragility index of 3 or less. The median number of patients lost to follow-up or excluded was 5. In 56% of the outcomes measured, the Fragility Index was greater than the number of patients lost to follow-up or excluded.

Conclusions/Discussion: Many colorectal surgery related RCTs have a low Fragility Index, and often the number of patients lost to follow-up or excluded is greater than the number of patients whose outcome in the study would need to change to lose statistical significance. This highlights both the challenge of performing statistically robust clinical trials in colorectal surgery and the arbitrary nature of having a 0.05 p-value cutoff. While no single number can be used to judge the clinical significance of a trial, the Fragility Index is an intuitive metric that can assist with interpretation of clinical trial data.

MAKING AN IMPACT (INITIAL MEASUREMENT OF PELVIC FLOOR COMPLAINTS TOOLS) THROUGH MULTIDISCIPLINARY CONSENSUS ON STANDARDIZATION OF RADIOLOGICAL IMAGING: A REPORT FROM THE PELVIC FLOOR DISORDERS CONSORTIUM (PFDC).

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L. Bordeianou[1], L. Borgeianou[2]
[1]*Boston, MA;* [2]*Multiple, ID*

Purpose/Background: PFDs are imaged by fluoro (FLUORO), MRI defecography (MRI), and Ultrasound (US). Between institutions, and clinical specialties, there is extensive variation in protocols, definitions of pathology and interpretation templates used. This lack of consensus hinders meaningful large-scale collaborative efforts and undermines transitions in patient care. The goal of the PFDC Radiological Imaging Delphi Consensus Panel was to address this concern.

Methods/Interventions: This was a three- step iterative Delphi process. Three multidisciplinary workgroups with experts from all subspecialties caring for patients with PFDs participated in a). Systematic literature reviews; b). Workgroup conference calls to identify, characterize and recommend existing scoring systems characterizing pathology by imaging modality for discussion and voting by the PFDC membership at large and c). a PFDC consensus expert panel meeting where controversial points highlighted by the workgroup members were discussed and voted upon (Quaker format, consensus defined as >70% agreement on votes). Final recommendations on the clinically relevant grading systems and on shared interpretation templates were made, each summarized into the IMPACT-MRI; IMPACT - US and IMPACT-FLUORO documents.

Results/Outcome(s): 156 clinical experts participated in the structured expert consensus effort initiated by 42 members of the 3 modality- specific workgroups to culminate in the final consensus meeting (June 2, 2019, Cleveland, USA) Multidisciplinary agreement was reached on 48 /65 statements. Recommendations define preferred patient positioning [eg. sitting position recommended for FLUORO (92% agreement) but less essential for MRI

(88% agreement)]; the minimal contrast recommendations [(eg. contrast opacification of both rectum and vagina for FLUORO (90% agreement), gel in rectum only for MRI (92% agreement)]; the recommended imaging sequences (eg. Kegel sequence and strain sequence on MRI and FLUORO not clinically relevant (81% agreement)]; and the definitions of pathology per imaging modality [(eg. rectal intussusception needs to be defined at minimum as intrarectal, intraanal or external on both FLURO and MRI (88% agreement); anal sphincter injury description on US must always include both radius and length of injury (99% agreement)]. These statements, cumulatively, create a minimum reporting standardized template for PFD imaging.

Conclusions/Discussion: Reasonable multidisciplinary consensus was reached between radiologists and pelvic floor surgeons and clinicians caring for patients with PFDs. Standardized MRI, FLUORO and US imaging protocols for PFDs may facilitate interdisciplinary collaboration, improve transitions in patient care, and allow for meaningful research.

CORRELATION BETWEEN PELVIC FLOOR DYSFUNCTIONS, VAGINAL DELIVERY, PARITY AND AGE IN THE FEMALE POPULATION WITH OBSTRUCTED DEFECATION SYMPTOMS ON DYNAMIC 3D ULTRASOUND.

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S. Murad-Regadas, F. Regadas, A. Vilarinho, L. Borges, L. Veras, F. Regadas Filho, M. Macedo, D. Lima
Fortaleza, Brazil

Purpose/Background: The data are inconsistent regarding the correlation between vaginal delivery, parity and age. So, the aim of this study was to evaluate the prevalence of pelvic floor dysfunctions in female patients with obstructed defection symptoms and correlate with vaginal delivery, parity and age using dynamic 3D ultrasound(3D-US)

Methods/Interventions: 889 consecutive female patients complaining of obstructed defecation and 58 with fecal incontinence were assessed by dynamic 3D-US and evaluated from a prospective database. Patients were grouped as vaginal delivery-VD and nulliparous as well as stratified in each two decades (20-39y; 40-59y and ≥60y). Additionally, the VD group was distributed according with the number of delivery (G1=1VD; G2=2VD; G3=3VD; G≥4VD) and associated with the prevalence of dysfunctions (rectocele, intussusception, anismus, enterocele/sigmodecele as well as sphincter defect). The data were assessed with bivariate analysis and Chi-square for trend tests.

Results/Outcome(s): Between 2011 and 2019**,** 552(62%) had VD(153/28% with sphincter defects, 16/3% with previous anorectal surgery and 33 complaining of FI, of them 11 without defect), and 337(38%) had no deliveries (24/7% with previous anorectal surgery and 25 complaining of FI, of them 11 with FI without defect). The mean age was significantly higher in VG (59± 13 / range, 20-90y) than nuliparous (49± 16 /range, 20-90y). The most prevalent dysfunctions were rectocele and anismus in nulliparous and VD. The prevalence of each dysfunction was similar compared nulliparous with VD by age. As shown in the table, vaginal delivery and higher parity did not increase the prevalence of significant rectocele, intussusception, enterocele/sigmodecele, and anismus. However, sphincter defect was found increased in VD group ($p=0.00$) as well as with the number of VD ($p=0.00$) and with the age ($p=0.00$).

Conclusions/Discussion: This study demonstrates that the prevalence of obstructed defecation dysfunctions such as rectocele, intussusception, entero-sigmoidocele and anismus are independently associated with the vaginal delivery and number of deliveries as well as the age by 3D-US. On the other hand, there is a strong correlation between sphincter defect with vaginal delivery, number of deliveries and age in this group. However, there is no association between age and increased number of sphincter defect in nulliparous

121 Prevalence of pelvic floor dysfunctions in female patients with obstructed defecation syndrome by mode of delivery, and parity on dynamic 3D ultrasound

Dysfunctions	Female N=889 (100%)				
Dynamic	Nulliparous	One VD	Two VD	Three VD	≥ Four VD
3D ultrasound	337 (38%)	135 (15%)	140 (16%)	111 (12%)	166 (19%)
Rectocele grade II or III	169 (50%)	77(57%)	90 (64%)	58 (52%)	87(52%)
Intussusception	105 (31%)	41(30%)	49 (35%)	46(41%)	71(43%)
Enterocele-sigmodocele	16 (5%)	7(5%)	6 (4%)	6 (5%)	9 (5%)
Anismus non-relaxation	179 (53%)	80 (59%)	72 (51%)	53 (48%)	80 (48%)
Sphincter defect	17 (5%)	21 (15%)	40 (29%)	35 (31%)	57 (34%)

VD- vaginal delivery

AN EVALUATION OF OPIOID PRESCRIBING AND PERSISTENT USE AFTER AMBULATORY ANORECTAL SURGERY.

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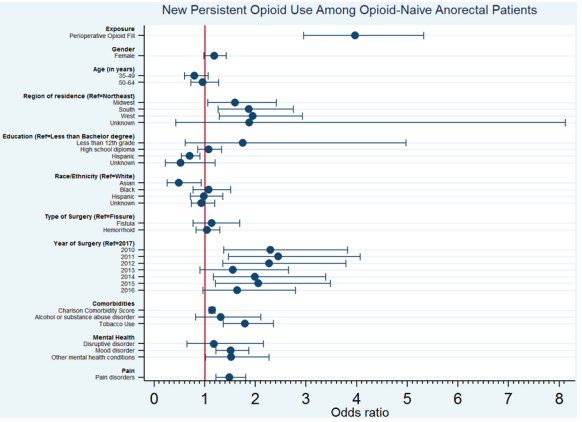
D. Keller[1], B. Kenney[2], C. Harbaugh[2], J. Waljee[2], C. Brummett[2]
[1]*New York, NY;* [2]*Ann Arbor, MI*

Purpose/Background: In colorectal surgery, ambulatory anorectal procedures are common, with opioids commonly prescribed; thus, there is a need to understand the opioid prescribing trends and outcomes. The present study was designed to determine rates and factors associated with new persistent opioid use (NPOU) after ambulatory anorectal procedures.

Methods/Interventions: A retrospective cohort study of the Optum Clinformatics claims database was performed for opioid-naïve patients who underwent outpatient hemorrhoid, fissure, or fistula procedures from 1/1/2010-6/30/2017. Patients were identified as NPOU by a prescription opioid fill 91-180 days post procedure in addition to: an opioid fill during the preoperative (1-30 days prior) and the perioperative period (0-3 days postoperative); two separate fills in the perioperative period, or a fill 4-90 days post procedure. Logistic regression evaluated associations of NPOU to patient and procedure demographics and comorbidities. The main outcome measure was the rate of new persistent opioid use after hemorrhoids, fissure, and fistula cases. Secondary outcomes were unadjusted annual rates of opioid fills during perioperative period window, and the distribution of prescriptions over time, in oral morphine equivalents (OMEs).

Results/Outcome(s): 23,426 opioid-naïve patients were evaluated- 69.09% (n=16185) hemorrhoids, 24.29% (n=5690) fissures, and 6.45% (n=1512) fistulas. The rate of NPOU was 2.1% (n=499). Logistic regression found NPOU was associated with additional opioid fills during the perioperative period (OR 3.97; 95% CI:2.95-5.33; p<0.0001), increased comorbidity (OR 1.15; CI:1.09-1.20; p<0.0001), tobacco use (OR 1.79; CI:1.37-2.36; p<0.0001), and preoperative pain disorders (OR, 1.49; CI, 1.23-1.82, p<0.0001). There was no significant association with procedure performed. Over the study period, the annual rate of perioperative opioid fills decreased 1.2%/year, from 72% in 2010 to 66% in 2017 (p<0.001). The rates were consistently highest for fistulas, followed by hemorrhoids, then fissures. There was a small but significant reduction in OME over the study period, with a median OME(IQR) of 280(250-400) in 2010 and 225(150-375) in 2017 (p<0.001).

Conclusions/Discussion: NPOU occurred in over 2% of ambulatory anorectal procedures. While there have been small reductions in the number of opioid prescriptions provided and amount prescribed annually, there has been little absolute change in prescribing patterns or doses. These results show the potential to reduce unnecessary prescriptions and the amount prescribed to decrease long-term morbidity after ambulatory anorectal surgery. Future studies are needed to determine prescribing standards without compromising postoperative pain or patient satisfaction.



RISKS FACTORS FOR FAILURE FOLLOWING GRACILIS MUSCLE FLAP INTERPOSITION FOR TREATMENT OF COMPLEX ANAL FISTULAS.

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C. Barros de Sousa, S. Yellinek, V. Strassman, R. Akiba, C. Wang, G. Dasilva, S. Wexner
Weston, FL

Purpose/Background: Complex anal fistulas include high transphincteric and suprasphincteric fistulas, fistulas associated with Crohn's disease or radiation therapy, those with secondary tracts, recurrent fistulas, recto-urethral fistulas, and recto-vaginal fistulas. Gracilis muscle flap interposition is one option for the treatment of complex anal fistulas with success rates ranging between 40-70%. The aim of this study was to identify risk factors of gracilis muscle interposition failure for the treatment of complex anal fistulas.

Methods/Interventions: The medical records of all patients who underwent gracilis muscle interposition for complex anal fistulas between 1995 and 2018 were retrospectively reviewed. Patient demographics, diagnosis, prior operations, and operative data were reviewed. Healing was defined as cure of the rectovaginal fistula confirmed by physical exam and imaging. Postoperative results were divided into three groups: cure following gracilis muscle interposition, cure following additional procedures, and failure. Patients who underwent gracilis muscle interposition for fecal incontinence or unhealed perineal wounds were excluded.

Results/Outcome(s): 119 patients were included in the study: 59 (49.6%) females had 45 (76.2%) rectovaginal, 11 (18.6%) pouch-vaginal, and 3 (5.1%) rectoperineal fistulas. 60 (50.4%) males had 58 (96.7%) recto-urethral and 2 (3.3%) rectoperineal fistulas. Healing was observed

in 50/119 (42%) patients following initial gracilis muscle interposition. 69 patients failed initial interposition, 45/53 (85%) of whom underwent 1 to 4 additional procedures: 32 (46.4%) had advancement flap, 13 (18.8%) had perianal fistulotomy, 9 (13%) had redo gracilis muscle interposition, 4 (5.8%) had plug insertion, 3 (4.3%) had primary repair, and 2 (2.9%) had fibrin glue instillation. 16 (23.2%) patient refused further treatment for various reasons. The overall success rate in these 119 patients was 79.8% (82% in males and 78% in females) and 92% when patients who refused additional procedures were excluded. In multivariate analysis, only bedrest ≥3 days was a significant risk factor for failure after initial gracilis muscle interposition (p=0.0086), which was not statistically significant to the overall success rate. Furthermore, in subgroup analysis, bedrest >3 days after interposition was a risk factor for failure only in females.

Conclusions/Discussion: Gracilis muscle interposition is a safe approach in the treatment of complex anal fistulas. Although multiple procedures may be required, the overall success rate is high (92%). Bedrest ≥3 days may be a risk factor for failure following gracilis muscle interposition for rectovaginal fistula.

PROSPECTIVE EVALUATION OF A STANDARDIZED OPIOID PRESCRIBING GUIDELINE FOR ANORECTAL OPERATIONS.

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D. Meyer, S. Hill, A. Resnick, A. Purkayastha, J. Davids, P. Sturrock, J. Maykel, K. Alavi
Worcester, MA

Purpose/Background: In light of the opioid epidemic, reducing excess prescription quantities while tailoring to patient need is key. In a prior study, we used retrospective data to develop an opioid prescribing guideline projected to satisfy 80% of patients following anorectal surgery, based on procedure type. This study seeks to prospectively validate this guideline.

126 Opioid prescribing patterns before and after guideline adoption

Operation	Before Guideline Adoption	After Guideline Adoption	p-value
All Operations, n	174	67	
EOP Prescribed, mean (sd)	22.9 (12.0)	18.9 (9.4)	0.02
EOP Consumed, mean (sd)	8.5 (12.6)	6.3 (9.8)	0.21
EOP Excess, mean (sd)	14.3 (12.4)	12.5 (10.0)	0.29
Refills, %	5.2%	4.5%	1.00
Exceeded guideline or required refill, %	19.0%	19.4%	0.94
Hemorrhoidectomy, n	72	28	
EOP Prescribed, mean (sd)	27.5 (12.3)	24 (7.2)	0.16
EOP Consumed, mean (sd)	13.6 (15.2)	9.9 (11.1)	0.25
EOP Excess, mean (sd)	13.9 (13.8)	14.0 (10.4)	0.96
Refills, %	8.3%	7.1%	1.00
Exceeded guideline or required refill, %	23.6%	17.9%	0.60
Fistula-in-ano, n	55	27	
EOP Prescribed, mean (sd)	22.6 (10.8)	18.2 (9.0)	0.08
EOP Consumed, mean (sd)	6.3 (9.7)	5.2 (9.2)	0.62
EOP Excess, mean (sd)	16.3 (12.8)	13.0 (10.7)	0.26
Refills, %	1.8%	3.7%	1.00
Exceeded guideline or required refill, %	2.0%	2.2%	1.00
Condyloma Fulguration, n	8	2	
EOP Prescribed, mean (sd)	19.4 (8.2)	suppressed	
EOP Consumed, mean (sd)	5.8 (9.6)	suppressed	
EOP Excess, mean (sd)	13.6 (9.6)	suppressed	
Exceeded guideline or required refill, %	0.0%	suppressed	
Miscellaneous, n	39	10	
EOP Prescribed, mean (sd)	15.5 (9.8)	6.5 (3.3)	0.01
EOP Consumed, mean (sd)	2.9 (7.5)	1.0 (2.2)	0.43
EOP Excess, mean (sd)	12.6 (9.3)	5.5 (3.1)	0.02
Refills, %	5.1%	0.0%	1.00
Exceeded guideline or required refill, %	12.8%	20.0%	0.62

EOP = Equianalgesic 5mg oxycodone pills

Methods/Interventions: Our opioid guideline created cutoffs for prescribing: 27 Equianalgesic 5mg Oxycodone Pills (EOP) for hemorrhoidectomies, 13 for fistula-in-ano operations, 20 for condyloma fulgurations, and 4 for miscellaneous (sphincterotomies, anal biopsies/skin tag excisions, and transanal rectal lesion excisions). This guideline was adopted at a single academic institution in September 2019, and interim analysis was performed on patients who underwent anorectal operations until November 2019. Opioid prescribing and consumption patterns were compared before and after guideline adoption.

Results/Outcome(s): Interim analysis included 67 patients for analysis: 28 hemorrhoidectomies, 27 fistula-in-ano operations, 2 condyloma fulgurations, and 10 miscellaneous operations (6 transanal polyp excisions, 2 sphincterotomies, 2 perianal lesion excisions). Guideline adherence improved from the first six weeks of implementation (52%) to the second six weeks (68%). Adherence differed by operation type (100% for condyloma fulgurations, 79% for hemorrhoidectomies, 48% for fistula-in-ano operations, and 20% for miscellaneous, $p=0.01$), attending surgeon (42%-84%, $p=0.04$), and prescriber training level ($p=0.02$). After guideline adoption, average prescribed pill quantity decreased by 17%, consumption by 25%, and excess pills by 13% compared to historical data. Overall, there was a significant reduction in mean prescribed pill quantity (22.9 EOP vs. 18.9, $p=0.02$). There was no significant increase in average reported opioid consumption, refill rate, or proportion of patients who either exceeded the guideline or required a refill. In the miscellaneous operation group, there was a significant reduction in both average prescription quantity (22.9 EOP vs. 18.9, $p=0.01$) as well as excess pills (12.6 EOP vs. 5.5, $p=0.02$). Odds of a patient exceeding the guideline or requiring a refill were 6.3 times higher ($p=0.01$) for those with opioid exposure in the past year.

Conclusions/Discussion: In this study aimed at standardizing opioid prescribing after anorectal operations, early results show incomplete guideline adoption, though adherence is improving. Despite limited sample size in this interim analysis, there were significant reductions in average prescription quantity compared to historical controls with no change in refill requirement. By aligning prescription quantity with patient need, guideline adoption could result in a meaningful reduction in excessive prescribing, although meaningful change will demand more comprehensive provider education and training.

HIGH FAILURE RATES FOLLOWING LIFT FOR TRANS-SPHINCTERIC ANAL FISTULA: CAN PREOPERATIVE MEASUREMENTS OF THE FISTULA TRACT WITH MRI DETERMINE CAUSATION?

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M. Sarmiento Cobos, L. Rosen, E. Wasser, F. Yang, S. Wexner
Weston, FL

Purpose/Background: Treatment of trans-sphincteric fistula (TSF) with primary fistulotomy is tempered by the risk of fecal incontinence. As a result, LIFT has been popularized as an alternative surgical option. We previously reported a 54% success rate in 107 patients who underwent LIFT. Posterior fistulas were identified as the only variable that correlated with failure. Analysis of measurements of the location and course of TSF on preoperative MRI may explain persistence or recurrence of the fistula following LIFT.

Methods/Interventions: An IRB-approved retrospective analysis of our prospective complex anal fistula database from 1/1/2011 to 08/31/2019 identified TSF patients who underwent perioperative MRI and LIFT. Anterior, posterior and lateral TSF were measured on MRI according to length, depth, and width of the tract, percent involvement of the external sphincter, and type and rate of recurrence (Table1). Pearson chi square was used to compare categorical variables, ANOVA test was used for all continuous variables and comparison among groups.

Results/Outcome(s): 173 patients had an MRI for complex fistula; 85 patients had TSF (49%), and 40/85 (47%) underwent a LIFT. Thirty five (87%) were male, 22 of whom (55%) had a preoperative MRI. The recurrence rate at a mean of 18 (range 2 to 39) months following LIFT in patients who had preoperative MRI was 9/22 (41%). 7/9 (78%) posterior TSF had the highest recurrence rate of 71%. There was no difference in the length, depth or width of anterior, posterior, or lateral tracts. (Table 1). The portion of the external sphincter involved in all fistulous tracts exceeded 30%.

Conclusions/Discussion: The recurrence rate following LIFT for TSF in patients who had preoperative MRI was 9/22 (41%). Posterior TSF had the highest recurrence of 71%, and only 22% of all recurrences were down staged to inter-sphincteric fistula. There was no difference in the length, depth or width of anterior, posterior, or lateral fistula tracts. The portion of the external sphincter involved in all fistulous tracts was over 30% indicating appropriate selection of the LIFT procedure. Continued investigation for a more successful treatment of TSF is warranted as LIFT still remains a surgical option, especially for anterior trans-sphincteric fistulas.

Table 1

Variables	Anterior N=9 41%	Posterior N=7 32%	Lateral N=6 27%	*p* value
Length (cm)	4.8 ± 0.89	4.4 ± 1.34	5.4 ± 1.13	0.57[a]
Width (cm)	0.6 ± 0.31	0.4 ± 0.36	0.3 ± 0.38	0.27[a]
Depth (cm)	3.0 ± 0.78	3.1 ± 0.97	3.4 ± 1.8	0.85[a]
Involvement of external sphincter (%)	36.11 ± 3.44	39.14 ± 5.33	30.33 ± 3.83	0.005[a] lateral
Recurrence rate	11.1% (n=1)	71.4% (n=5)	50% (n=3)	0.045[b]
Recurrence type	1 trans-sphincteric	3 trans-sphincteric	3 trans-sphincteric	0.045[b]

a= ANOVA, b= Pearson Chi Square

ADVANCED AGE ALONE SHOULD NOT PRECLUDE SURVEILLANCE COLONOSCOPY IN THE OCTOGENARIAN AND OLDER POPULATION.

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I. Sapci, K. Guyton, J. Church, D. Liska, E. Gorgun, S. Steele, M. Valente
Cleveland, OH

Purpose/Background: Although the risk of colorectal cancer increases with advancing age, guidelines discourage surveillance in the very elderly. The aim of this study is to document the yield of surveillance colonoscopies, and to analyze adenoma characteristics, interval cancer development, complications, and survival in asymptomatic octogenarian and older patients undergoing adenoma surveillance colonoscopy.

Methods/Interventions: Surveillance colonoscopies performed at a tertiary level hospital colorectal surgery department between January 2010 and September 2018 were queried from a prospectively maintained institutional colonoscopy database. Patients 80 years old or older undergoing routine surveillance colonoscopy after having had an adenoma or advanced adenoma diagnosed on a prior exam were included in the study. Patients with a history of colorectal cancer, hereditary colon cancer syndromes, inflammatory bowel disease, previous negative screening colonoscopies or symptoms were excluded. Data were augmented by a review of the electronic medical record to determine polyp characteristics, interval cancer development and survival. Pearson's chi-square test or Fisher's exact test was used for categorical factors, and ANOVA was used for continuous factors.

Results/Outcome(s): 604 patients were included in the study with a median age of 82 (range 80-94) and 43% were female. Median follow-up after the included colonoscopy was 52 months (range 2-110 months), with 511(85%) patients alive at their last available follow-up. Four patients were diagnosed with an interval cancer at surveillance (0.6%). In total, 105 (17.4%) patients had advanced adenomas. Overall, 292 (48%) patients had at least 1 precancerous lesion, with a median of 1 lesion (range 1-8) per patient. The most common type of lesions were tubular adenomas (n=268) followed by sessile serrated lesions (n=41) and tubulovillous adenomas (n=18). Five patients had high-grade dysplasia found on the resected adenoma. Adenoma location details are listed in the Table. Increasing age was not associated with increased rate of sessile serrated lesions (p=0.2) however, there was an association between increasing age and advanced adenoma rates (p=0.01). Advanced adenomas were more commonly found to be right-sided (p=0.02). Only one patient had vasovagal reaction during colonoscopy, there were no other intra-procedural complications. 11 patients (0.01%) experienced 30-day complications and these included rectal bleeding, appendicitis and fall after colonoscopy. 88 patients had additional follow-up surveillance colonoscopies and 39 had a subsequent adenoma detected

Conclusions/Discussion: Patients 80 years of age or older with a previous history of colorectal adenomas have a high risk of future advanced lesions and should be considered to undergo surveillance colonoscopy while accounting for comorbid illness and life-expectancy.

LOSS OF INDEPENDENCE AFTER COLORECTAL RESECTION.

131

E. Pettke[1], N. Ilonzo[1], J. Scanlan[1], J. Griffin[1], R. Whelan[2]
[1]*Seattle, WA;* [2]*New York, NY*

Purpose/Background: Loss of independence (LOI) after surgery has been associated with significant morbidity and mortality. In the era of prehabilitation, identifying patients at risk for LOI prior to elective colorectal resection may help to focus resources and time prehabilitating patients most at risk. Our objective is to identify patient

130 Adenoma location and characteristics

	Overall lesion	Advanced adenoma	Sessile serrated lesions
Total	292	105	41
Right-sided only	191 (65%)	62 (59%)	26 (63%)
Left-sided only	46 (16%)	15 (14%)	6 (15%)
Right+Left	55 (19%)	28 (27%)	9 (22%)

Advanced adenoma is defined as lesion >10mm or presence of high-grade dysplasia or villous component.

and procedural characteristics as well as 30 day complications associated with LOI.

Methods/Interventions: The NSQIP database was queried from 2016 to 2017. Patients undergoing elective colorectal surgery were identified using ICD 10 and CPT codes. LOI was defined as discharge to a Skilled Care facility, rehab, or separate acute care facility in patients who previously were independent or partially dependent (i.e. required some support at home to perform activities of daily living).

Results/Outcome(s): 131,177 patients met inclusion criteria. Ten percent (n=13,351) had loss of independence after elective colorectal surgery. The two cohorts were different as regards many demographic characteristics as well as disease and surgical characteristics (all results shown significant at p<.0001). A greater percentage of patients who experienced LOI were 75 years or older (45.0% vs 15.9%), had a pre-existing comorbid condition (COPD, 13.0% vs 4.8%; CHF, 4.2% vs 1.0%; ESRD, 4.2% vs 0.9%; ASA class status 3, 61.3% vs 48.4%; ASA class 4, 26.5% vs 7.0%), had history of preoperative weight loss (7.9% vs 4.3%) and a BMI greater than 40 (8.2% vs 5.9%). LOI was also associated with open procedures (71.9% vs 41.0%), ostomy creation (42.0% vs 21.8%) and neoadjuvant treatment (7.5% vs 2.2%). Of note, LOI was not associated with any specific preoperative diagnosis; the breakdown of surgical indications (neoplasm, IBD and diverticular disease) was similar for the LOI group and no LOI groups. The incidence of many complications was higher for the LOI group including organ space infection (13.3% vs 5.3%), pneumonia (11.7% vs 2.2%,), bleeding (26.0% vs 9.1%), prolonged intubation (14.0% vs 2.3%), sepsis (13.2% vs 5.0%) and return to the OR (13.6% vs 4.5%). The most significant risk factors associated with LOI are: preoperative partial dependence (OR 3.9, CI 3.6-4.2), age greater than 75 years old (OR 3.5, CI 3.3-3.6), postoperative stroke (OR 3.4, CI 2.6-4.4), pneumonia (OR 2.1, CI 1.9-2.2), ostomy creation (OR 1.8-2.0), open procedure (OR 2.0, CI 1.9-2.1), and prolonged intubation (OR 2.0, CI 1.8-2.2).

Conclusions/Discussion: Ten percent of patients undergoing elective colorectal resection experience LOI; this group tend to be older and has more co-morbidities and risk factors. LOI is also associated with notably higher complication rates. Perhaps prehabilitation (PT, greater attention to co-morbidities, weight management, etc) and avoidance of open methods and ostomies (where feasible) would decrease LOI.

HOW DOES MICROSATELLITE INSTABILITY AFFECT PROGNOSIS IN STAGE II COLON CANCER WITH HIGH RISK FEATURES?

132

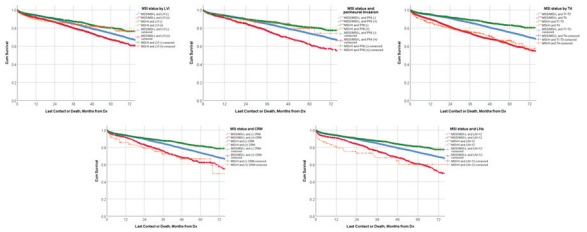
P. Cavallaro, C. Stafford, D. Berger, L. Bordeianou, T. Francone, H. Kunitake, R. Ricciardi
Boston, MA

Purpose/Background: Tumor characteristics such as T4 invasion, lymphovascular invasion (LVI), perineural invasion (PNI), <12 lymph nodes resected, and positive resection margins are considered high risk leading to the use of chemotherapy in Stage II colon cancer. However, the influence of microsatellite instability (MSI) on prognosis in high risk stage II colon cancer is unknown.

Methods/Interventions: We queried the National Cancer Database from 1/2010 through 12/2016 to identify patients with adenocarcinoma of the colon (cecum to rectosigmoid) who underwent tumor resection, were identified as stage II on final pathology, and had MSI testing data. We considered high risk features to include T4 tumors, lymphovascular invasion (LVI), perineural invasion (PNI), <12 lymph nodes resected, and positive resection margins. Patients with MS stable or MSI-low (MSS/MSI-L) status were compared to patients with MSI High (MSI-H) tumors. The primary outcome was overall survival (OS) and we used Cox regression analysis to adjust for age, comorbid status, chemotherapy, and tumor characteristics.

Results/Outcome(s): The cohort included 16,918 MSS/MSI-L patients and 1,850 MSI-H patients. The MSI-H patients were more often female, of white race, had right sided tumors with high grade features, and underwent treatment at academic centers. Patients with LVI+ tumors had worse OS than LVI- patients when the tumor was MSS/MSI-L (5 year OS LVI+ 67% vs LVI- 74%, p<0.001), but had equivalent survival when tumor was MSI-H (5 yr LVI+ OS 80% vs LVI- 81%, p=0.1). The same relationship was observed for PNI, as PNI+ tumors had worse survival than PNI- tumors in MSS/MSI-L tumors (5 yr OS PNI+ 62% vs PNI- 74%, p<0.001) but similar OS in MSI-H tumors (5 yr OS PNI+ 78% vs PNI- 81%, p=0.6). MSI-H status did not change OS for other high-risk features such as T4 tumor, <12 LNs resected, or positive resection margins (Figure). The beneficial effect of MSI-H status on LVI+ and PNI+ tumors was confirmed in adjusted Cox analyses (PNI HR 0.98, 95%CI 0.58-1.63, p=0.9 and LVI HR 0.88, 95%CI 0.61-1.28, p=0.5). In subgroup analysis of patients that did not receive adjuvant chemotherapy, MSI-H still mitigated the negative prognostic effect of PNI+ (5 yr OS PNI+ 77% vs PNI- 80%, p=0.7) and LVI+ tumors (5 yr OS LVI+ 80% vs LVI- 80%, p=0.2). Lastly, LVI+ tumors that were MSI-H did not have an OS benefit from chemotherapy.

Conclusions/Discussion: In patients with stage II colon cancer and MSI-H status, LVI and PNI were not associated with worse OS, while other high-risk features (T4 tumors, positive resection margin, and <12 LNs) were associated with worse survival regardless of MSI status. Our data show that LVI and PNI, features typically considered high-risk, may be mitigated by MSI-H features. Given the previous evidence that MSI-H tumors are significantly less responsive to chemotherapy, these data support lack of benefit for adjuvant chemotherapy when LVI or PNI is present.



Kaplan Meier analysis of overall survival for high risk colon cancer patients when stratified by microsatellite status and specific high risk features (Lymphovascular Invasion [LVI], Perineural Invasion, T4 tumor, positive circumferential resection margin [CRM], and <12 lymph nodes [LN])

OLIGOMETASTATIC COLORECTAL CANCER IS CHARACTERIZED BY DISTINCT IMMUNE MICROENVIRONMENT.

133

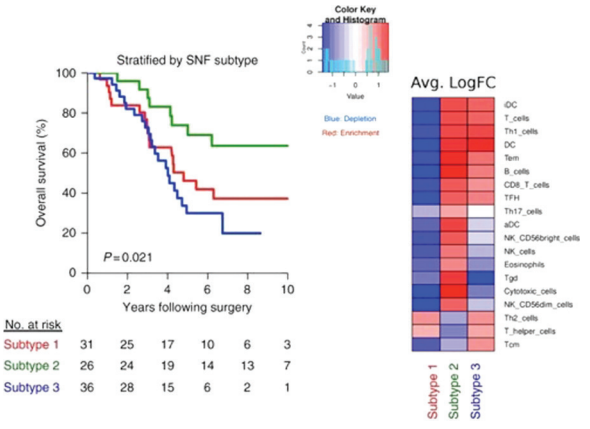
L. Xue, N. Khodarev, M. Posner, R. Weichselbaum, S. Pitroda
Chicago, IL

Purpose/Background: The oligometastasis hypothesis proposes a distinct clinical state on the spectrum of metastatic virulence where certain metastases are limited in number and organ involvement and potentially curable with localized therapies. A subset of patients with metastatic colorectal cancer achieves prolonged survival after resection of liver metastases (CRCLM) consistent with an oligometastatic phenotype. We analyzed the immune microenvironment of CRCLM to identify patterns of host immune responses associated with an oligometastatic phenotype with emphasis on major histocompatibility complex class I (MHC-I) as a key modulator of host immunity.

Methods/Interventions: Via integrative transcriptional analysis of tumor mRNA and miRNA expression in 93 clinically annotated *de novo* CRCLM, we identified three intrinsic molecular subtypes of CRCLM associated with distinct clinical outcomes (10-year OS: 37%, 64%, and 20% for subtypes 1, 2, and 3). We characterized the immune contexture of the 3 molecular subtypes of CRCLM using gene set enrichment analysis and immunohistochemistry (IHC). Using transcriptional profiles derived from major human immune cell subtypes, unique gene expression signatures for T, B cells and 17 unique subpopulations of immune infiltration were generated. Gene Set Enrichment Analysis was utilized to compare the relative contribution of each immune subpopulation among the CRCLM molecular subtypes. Confirmatory expression of T cell markers CD3 and CD8, as well as, MHC-I was conducted using IHC.

Results/Outcome(s): Distinct patterns of immune infiltration were found across the 3 subtypes of CRCLM. Subtype 2 and 3 metastases were enriched for major immune cell subpopulations while immune infiltration of Subtype 1 tumors was relatively poor. Subtype 2 metastases were highly enriched for cytotoxic cell subpopulations (NK, Tgd, and activated CD8+ T cells) relative to Subtype 3 (Figure 1). IHC verified robust intratumoral CD8 T cell infiltration of Subtype 2 metastases, stroma-restricted T cells in Subtype 3, and absent T cells in Subtype 1. Furthermore, Subtype 2 metastases exhibited significantly greater MHC-I expression as compared to Subtypes 1 and 3. Higher intratumoral MHC-I expression in CRCLM was associated with improved OS after resection of liver metastases.

Conclusions/Discussion: Cytotoxic host immune responses in Subtype 2 CRCLMs are associated with an oligometastatic phenotype. In contrast, poor clinical outcomes of CRCLM reflect either a paucity of immune infiltration (Subtype 1) or infiltration of predominately immunosuppressive cell subtypes with a concomitant restriction of T cells in the peritumoral stromal (Subtype 3). Increased intratumoral MHC-I expression in CRCLM was associated with improved cytotoxic immune cell infiltration and survival. Our findings support the notion that tumor intrinsic expression of MHC-I may influence host antitumor immunity in potentially curable CRCLM.



INCIDENCE AND MANAGEMENT OF ANAL TRANSITIONAL ZONE NEOPLASIA IN PATIENTS WITH FAMILIAL ADENOMATOUS POLYPOSIS.

135

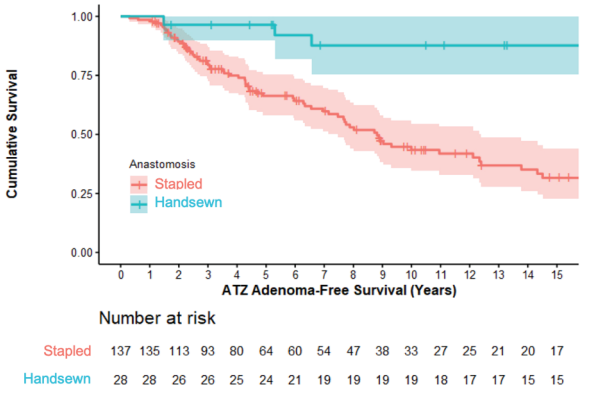
C. Lee, M. Kalady, M. Abbass, J. Church
Cleveland, OH

Purpose/Background: Anal transitional zone (ATZ) dysplasia in familial adenomatous polyposis (FAP) patients who have undergone restorative proctocolectomy (IPAA) is an increasing challenge. The true incidence, range of severity, and effectiveness of treatment are poorly documented. We reviewed our experience with ATZ surveillance and management in these patients.

Methods/Interventions: This is a retrospective study of patients who had IPAA for FAP at Cleveland Clinic. Patients who had redo pelvic pouch surgery or pouch excision, and patients who did not have surveillance pouchoscopy at our institution were excluded. Primary outcomes was ATZ neoplasia. Severity of ATZ adenomas was classified based on size (1 - 3 points), distribution (1 -3 points) and histopathology (1 - 3 points); Stage 1: 3-4 points; Stage 2: 5-6; Stage 3: 7-9. A secondary outcome was the rate of anal stenosis after ATZ treatment.

Results/Outcome(s): 165 patients were analysed. The median age at time of IPAA was 31 years (range 9-73) and 52% were male (86/165). 117 had a primary IPAA and 48 had colectomy before IPAA. Indications for IPAA included uncontrolled polyposis (134/165), and cancer (28/165). Most patients had stapled IPAA (83%, 137/165) and 17% had a mucosectomy with hand-sewn (HS) anastomosis. 22% of patients had desmoid disease (37/165) and 14% of patients (23/165) took sulindac at some point during their surveillance. Median follow-up was 10.1 years (interquartile range 4.5 & 17.2) and the average number of pouchoscopies per patient was 5.5. The overall rate of ATZ adenomas was 78/165 (47.3%), higher in the stapled group (52.3%; 72/137) than the HS group (21.4%; 6/28) (p<0.005) (Figure 1). Median time from pouch surgery to first ATZ adenoma diagnosis was 12.1 years. At initial ATZ adenoma detection, 45 patients had stage 1 severity, 18 stage 2, and 15 stage 3. 12 patients progressed to a higher severity stage during surveillance: 11/45 in stage 1, 1/18 in stage 2. Two patients with initial stage 1 and one with initial stage 3 developed ATZ cancer during surveillance. Three other patients developed ATZ cancer without prior history of ATZ adenoma with unscreened intervals of 3, 8 and 23 years. Average number of treatments per patient was 2 in stage 1, 3 in stage 2, and 4 in stage 3. These included 42 forcep polypectomies, 92 snares, 51 transanal excisions, and 6 mucosectomies with pouch advancement. 5 patients developed symptomatic anal stenosis secondary to repeated ATZ clearance (median of 9 procedures; range 2 -10)

Conclusions/Discussion: Nearly half of FAP patients with IPAA develop ATZ neoplasia which progresses over time. Surveillance should be performed annually from the time of pouch surgery. Effective endoscopic and transanal treatments limit progression, however repeated procedures of severe lesions may lead to anal stenosis.



HIGH-RISK HPV TESTING IN ANAL PAP SMEAR: CAN IT OPTIMIZE THE SCREENING FOR ANAL CANCER?

136

C. Kimura, C. Nahas, E. Vieira da Silva Filho, V. Lacerda Ribeiro, F. Ferraz de Paes Alcantara, A. Mendes Paiva, S. Nahas, I. Cecconello
São Paulo, Brazil

Purpose/Background: Anal Pap smear is currently the most accessible and employed method for anal cancer screening. Whereas its sensitivity and specificity remain highly variable in literature, testing for HPV strains has emerged as a possible alternative tool to better select patients for high-resolution anoscopy (HRA). The aim of the study is to evaluate the role of high-risk (HR) HPV anal testing in diagnosing high-grade anal dysplasia.

136 Sensitivity, specificity, PPV, NPV and CI for sensitivity

	Anal cytology	HR HPV anal testing	Combined methods
Sensitivity*	59.0%	70.5%	85.2%
Specificity	72.9%	52.1%	43.2%
PPV	30.5%	22.9%	23.2%
NPV	89.8%	89.8%	93.6%
*CI 95% for sensitivity	0.42-0.75	0.57-0.84	0.75-0.94

Methods/Interventions: A prospective study was conducted with 364 consecutive patients enrolled in a screening program for anal dysplasia as part of routine care from July/18-Aug/19. Anal Pap smear was collected and submitted to cytological analysis and testing for HR HPV (16, 18 and other 12 HR strains). Immediately after, the patients were submitted to HRA guided biopsy of any lesion suspicious for dysplasia. In cases where no lesions were found, an aleatory biopsy was made of the "visually normal" epithelium of the anal transitional zone. Considering histology as the standard, the sensitivity, specificity, positive and negative predictive values (PPV and NPV, respectively) to diagnose high-grade anal dysplasia were calculated for anal cytology alone, HR HPV anal testing alone, and the two methods combined.

Results/Outcome(s): Most of the patients were male (72.8%) and HIV+ (81.8%). Mean age was 49 years. The sensitivity of the presence of HR HPV in detecting high-grade dysplasia was better than the cytology alone (70.5% vs 59.0%). However, specificity was lower (52.1% vs 72.9%), as well as PPV (22.9% vs 30.5%). NPV was the same in both methods (89.8%). When combining abnormal cytology with HR HPV positivity, the sensitivity increased to 85.2% and NPV to 93.6%. Specificity and PPV were 43.2% and 23.2%, respectively. These data, as well as the confidence interval for sensitivity are summarized in the table attached. If the combined results were used as a first line screening, there would be a reduction in 36% of unnecessary HRA with an acceptable rate of 2.4% of false negatives, against 5.0% for the HR-HPV testing alone and 6.8% for the cytology alone.

Conclusions/Discussion: HR HPV testing combined with cytology has a high sensitivity to detect high-grade dysplasia with a high negative predictive value. Therefore, it can be a useful tool to optimize selection of patients to high-resolution anoscopy, especially when access to this exam is limited.

ENDOSCOPIC OVER-THE-SCOPE CLIP MANAGEMENT OF NON-ACUTE, FULL-THICKNESS COLORECTAL DEFECTS.

137

D. Morrell, N. Jeganathan, E. Pauli
Hershey, PA

Purpose/Background: Endoscopic management of full-thickness gastrointestinal defects (FTGID) such as anastomotic leaks and enteric fistulae is an attractive alternative to potentially morbid surgical intervention. Over-the-scope clips (OTSC) are a promising endoscopic treatment modality for FTGID management. OTSC use is

137 Demographics and Defect Characteristics Stratified by Success versus Failure

Variable	Success (n =12)	Failure (n=18)	P value
Age,			
years, mean (SD)	64.4 (10.2)	62.4 (13.2)	0.5250
Sex			0.7650
Male	6 (50.0%)	8 (44.4%)	
Female	6 (50.0%)	10 (55.6%)	
BMI,			
kg/m^2, mean (SD)	25.2 (7.5)	29.4 (8.3)	0.1687
IDDM	0 (0.0%)	3 (16.7%)	0.2550
Smoking History			
Current smoker	2 (16.7%)	2 (11.1%)	1.0000
Previous Smoker	9 (75.0%)	11 (61.1%)	0.6940
Immunocompromised	3 (25.0%)	3 (16.7%)	0.6600
History of IBD	1 (8.3%)	2 (11.1%)	1.0000
Prior Radiation	0 (0.0%)	3 (16.7%)	0.2550
Prior Percutaneous Drain	4 (33.3%)	7 (38.9%)	1.0000
Associated Abscess	5 (41.7%)	8 (44.4%)	0.8800
Number of GI Defects,			
mean (SD)	1.3 (0.5)	1.3 (0.6)	0.9313
Defect Diameter,			
mm, mean (SD)	4.2 (2.7)	4.0 (2.7)	0.9614
Defect Age,			
months, mean (SD)	2.9 (3.6)	4.1 (5.8)	0.8158

SD standard deviation; BMI body mass index; IDDM insulin dependent diabetes mellitus; IBD inflammatory bowel disease; GI gastrointestinal

commonly reported in foregut FTGID (such as post-bariatric surgery leaks), but is less well described for the management of colorectal defects. This study describes the outcomes of OTSC management of non-acute, colorectal FTGID.

Methods/Interventions: An IRB-approved retrospective analysis was undertaken of patients undergoing OTSC management of non-acute, colorectal FTGID between 2013 and 2019. Acute perforations immediately managed with OTSC and non-acute FTGID requiring endoscopic suturing or stenting were excluded. The primary outcome was successful OTSC FTGID management, defined strictly as clinical or radiographic evidence of closure at the conclusion of follow-up. Successful closures were stratified and compared using chi-squared and Student's t-tests for parametric data and Fisher's exact and Mann-Whitney U tests for non-parametric data.

Results/Outcome(s): A total of 33 patients with 40 FTGID (23 fistulas, 17 leaks) were identified with 24.2% having more than one FTGID managed simultaneously. The most common indications for therapy were colonic fistula or contained perforation from diverticulitis (n=23) and anastomotic leak (n=13). The patients underwent a total of 47 endoscopic interventions with OTSC (mean 1.30±0.52 interventions per FTGID). The OTSC device (Ovesco Endoscopy, Germany) was utilized in all cases. Three patients (4 defects) were lost to follow-up. With a mean follow-up period of 4.7 months, the overall defect closure success rate was 42.5% (35.0% for fistulae, 58.8% for leaks; p = 0.1010). Neither patient characteristics nor defect age were associated with success (**Table 1**). Additional OTSC closure attempts were required in 22.5% of patients. Ablation of defect edges was performed in 59.6%, use of a tissue grasping device prior to OTSC firing in 34.0%, and foreign body removal in 25.5%. There were no complications related to endoscopic intervention and no patients required urgent surgical intervention. Of the patients that failed endoscopic management, only 44.4% underwent definitive operative management. Notably, only 24.2% of all patients referred for endoscopic management ultimately underwent operative intervention.

Conclusions/Discussion: OTSC management of non-acute, colorectal FTGID represents a safe alternative to potentially avoid morbid operative intervention. Successful management of these defects can be undertaken regardless of patient or GI defect characteristics. Although closure rates may be lower than for foregut FTGID managed with similar methods, the low rate of definitive surgeries suggests that OTSC has a role in managing FTGID in patients that are poor operative candidates.

NEOADJUVANT IMRT + CONSOLIDATION CAPEOX FOLLOWED BY 'WATCH AND WAIT' APPROACH OR ORGAN PRESERVATION FOR MRI DEFINED LOW-RISK RECTAL CANCER: INTERIM ANALYSIS OF PKUCH-R01 TRIAL (NCT02860234).

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L. Wang, T. Sun, P. Chen, A. Wu
Beijing, China

Purpose/Background: To determine the clinical complete response (cCR)/near-cCR rate and the organ preservation rate (OPR) in MRI defined low-risk rectal cancer treated by neoadjuvant intensity modulated radiotherapy (IMRT) plus consolidation CAPEOX in a prospective, single arm study.

Methods/Interventions: Low-risk rectal cancer with following MRI features was recruited: mid-low tumor, mrT2-3b, mesorectal fascia invasion (MRF) (-), extramural venous invasion (EMVI)(-), differentiation grade 1-3. Patients received IMRT 50.6Gy/22f with concurrent capecitabine and 4 cycles of consolidation CAPEOX. We used MSKCC criteria to evaluate the response. Patients with cCR/near-cCR were recommended for 'watch & wait' approach or local excision (LE). The OPR and sphincter preservation rate (SPR) at 2 years were analyzed.

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Response	n (%)	Watch & Wait	Local regrowth	"W&W, no regrowth"	Local Excision	LAR	APR	Refused surgery
cCR	16 (42.1%)	15 (39.5%)	2/15 (13%)	13	1(salvage)	1 (1 pCR)	0	1 (after regrowth)
near-cCR	9 (23.7%)	5 (13.2%)	2/5 (40%)	3	1	5 (1 pCR, 2 salvage)	0	0
non-cCR	13 (34.2%)	-	-	-	2	6 (2 pCR)	1	4
Overall n (%)	38 (100%)	20/38 (52.6%)	4/20 (20%)	16/38 (42.1%)	4/38 (10.5%)	12/38 (31.6%)	1/38 (2.6%)	5 (13.2%)
OPR		20/38 (52.6%)		16	4	-	-	-
SPR		32/38 (84.2%)		16	4	12	-	-

Table 1. The response and management of low risk rectal cancer treated by IMRT+consolidation CAPEOX. cCR: clinical complete response; W&W: watch & wait; LAR: low anterior resection; APR: abdominoperineal resection; OPR: organ preservation rate; SPR: sphincter preservation rate;

Results/Outcome(s): Thirty-eight patients (24 male/14 female) were eligible for interim analysis, including 9 mrT2, 14 mrT3a and 15 mrT3b cases. The median tumor height is 4cm (range 1-8 cm) and the median follow-up time is 23.5 months. The initial cCR and near-cCR rate were: 42.1%(16/38) and 23.7%(9/38), respectively. Twenty patients (20/38, 52.6%) of cCR or near-cCR underwent "watch & wait" approach, with a local regrowth rate of 20% (4/20). Four patients received LE, including one salvage LE. In 13 patients who received radical resection including 10 initial low anterior resection (LAR)/1 initial APR/2 salvage LAR, 4 patients were ypCR. The OPR and SPR were 52.6% (20/38) and 84.2% (32/38), respectively. Only one patient occurred lung metastasis and no local recurrence occurred after radical resection or LE.

Conclusions/Discussion: Neoadjuvant IMRT plus consolidation CAPEOX for low-risk rectal cancer achieves high cCR/near-cCR rate, with considerable probability of organ preservation for this subgroup.

FINANCIAL AND OCCUPATIONAL IMPACT OF LOW ANTERIOR RESECTION SYNDROME IN RECTAL CANCER SURVIVORS.

201

R. Garfinkle, A. Ky, A. Singh, N. Morin, G. Ghitulescu, J. Faria, C. Vasilevsky, M. Boutros
Montreal, QC, Canada

Purpose/Background: The financial impact of cancer has been well described in many patient populations. However, rectal cancer survivors may face the added burden of Low Anterior Resection Syndrome (LARS), a long-term sequela of treatment which may uniquely impact their financial well-being. The purpose of this study was to assess bowel-related financial stress and strain and evaluate its association with global quality of life (QoL).

Methods/Interventions: This was an Institutional Review Board–approved cross-sectional survey study of all patients who underwent restorative proctectomy for neoplastic disease of the rectum at a single university-affiliated hospital from July 2007 to July 2018. Bowel function was assessed using the LARS Score. Objective bowel-related financial stress and subjective bowel-related financial strain were assessed using published validated questionnaires, and bowel-related financial impact was defined as either financial stress or strain. Global QoL (score out of 100) was based on the European Organisation for Research and Treatment of Cancer QLQ-C30 questions on global health status and QoL. The impact of LARS on the ability to work was assessed using a five-item, investigator-generated questionnaire. Multiple logistic regression was performed to evaluate the association between LARS, bowel-related financial impact, and low global QoL (defined as the lowest quartile), adjusting for relevant confounders.

Results/Outcome(s): Of 180 eligible rectal cancer survivors who were contacted, 154 completed the questionnaires (response rate: 85.6%) at a median follow-up of 57.5 months (IQR: 34.1-98.1) after proctectomy. Major LARS was reported in 30.5% of participants, while 69.5% reported minor/no LARS. Bowel-related financial stress and strain were reported in 20.1% and 16.2% of the cohort, respectively. Participants with major LARS reported a higher prevalence of bowel-related financial stress (53.2% vs. 5.6%, $p<0.001$) and strain (42.2% vs. 5.6%, $p<0.001$) compared to those with minor/no LARS. Among those who were working preoperatively (n=100), the majority of participants with major LARS reported an impact of their new bowel function on ability to work (70.6%), including delayed return to work (44.1%), the need to change schedules (35.3%) or roles (20.6%), and complete medical absence from work (14.7%). Global QoL was worse in participants with major LARS (58.3 vs. 75.0, $p<0.001$). On multiple logistic regression, major LARS with financial impact (OR: 4.48, 95% CI 1.60-13.46), but not major LARS without financial impact (OR: 2.52, 95% CI 0.85-7.56), was associated with low global QoL compared to minor/no LARS.

Conclusions/Discussion: Rectal cancer survivors report significant financial and occupational hardships due to their new bowel function, and patients with major LARS experience the greatest burden. Major LARS and bowel-related financial impact are associated with low global QoL.

QUALITY OF LIFE ASSESSMENT OF PATIENTS WITH LOW ANTERIOR RESECTION SYNDROME AFTER TRANSANAL IRRIGATION.

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R. Campanati, F. Rodrigues, K. Buzatti, M. Profeta da Luz, B. Deoti, R. Gomes da Silva, A. Lacerda Filho
Belo Horizonte, Brazil

Purpose/Background: Low anterior resection with low colorectal or coloanal anastomosis represents the standard treatment of tumors of the extraperitoneal rectum. After this operation, many patients will have functional symptoms such as anal incontinence, urgency, increased bowel movement frequency and difficulty with bowel emptying, characterizing the Low Anterior Resection Syndrome (LARS), with a significant negative impact on quality of life. Intestinal irrigation is a method of intestinal lavage in which the patient undergoes and perform the procedure at home, thereby promoting a scheduled evacuation to empty the intestinal contents and thus avoiding losses during the day. The aim of this work was to implement the Transanal Irrigation (TAI) technique for patients classified as moderate and severe LARS and to evaluate the functional results and their impact on quality of life in a Brazilian tertiary cancer center.

Methods/Interventions: Patients classified as moderate and severe LARS after 12 months of the operation were selected for TAI. It was used a kit developed for intestinal

irrigation via stoma and applied in transanal irrigation. Patients participated in individualized training for three consecutive days to learn the technique and develop the ability to perform the procedure at home. Questionnaires assessing patients' bowel function (LARS score), quality of life (SF-36 Quality of Life Questionnaire), severity of anal incontinence (Wexner Score), and specific questionnaires were applied before and after treatment research that measured the impacts of intestinal function on quality of life.

Results/Outcome(s): Twenty-two patients were studied, 20 with severe LARS and two with moderate LARS. More than 90% of patients reported involuntary loss of stool daily (soiling), 95% fragmented bowel movements and incomplete bowel movements, and 77.3% complained of bowel urgency. The adaptation of the stoma irrigation kit for transanal intestinal irrigation proved to be efficient, since 100% of the patients were able to handle it easily and independently after three days of training, and no complications were reported during the 12 months of treatment. After the first month of irrigation, 86.4% of patients no longer had involuntary losses and fragmented bowel movements and 81% reported improvement in bowel urgency. The period of greatest positive impact on the classification of LARS was the first month after initiation of treatment when 86% of patients, initially classified as having severe LARS, were classified as "without LARS". Improvement in quality of life after the first month occurred in 90.9% of patients.

Conclusions/Discussion: The TAI irrigation technique was successfully implemented, with good tolerance and reproducibility by the patients, leading to significant improvement of intestinal function and quality of life of patients with moderate and severe LARS.

DOES LOCAL EXCISION OF RECTAL CANCER FOLLOWING NEOADJUVANT CHEMOTHERAPY PROMOTE IMPROVED ORGAN PRESERVATION AND LOWER LOCAL REGROWTH VERSUS WATCH-AND-WAIT STRATEGY?

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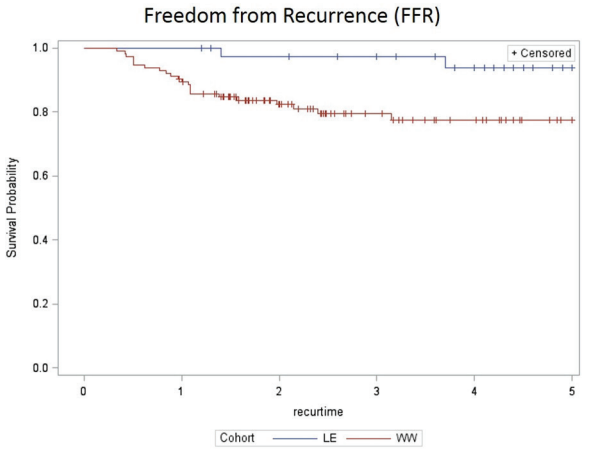
J. Konen[1], P. Callas[2], P. Cataldo[1]
[1]*South Burlington, VT;* [2]*Burlington, VT*

Purpose/Background: Neoadjuvant chemoradiotherapy (NAT) followed by radical resection is the standard treatment for locally advanced rectal cancer. While rectal resection provides excellent local tumor control, it carries significant morbidity and can adversely impact quality of life. Therefore, NAT followed by either local excision (LE) or a watch-and-wait strategy (WW) has been proposed as an alternative to radical excision. We sought to determine relevant oncologic outcomes and rectal preservation rates, by examining a cohort of patients who underwent NAT followed by LE with pathologic complete response (pCR), compared to those who underwent NAT with complete clinical response (cCR) and subsequent WW.

Methods/Interventions: Patients in the LE group were derived from the ACOSOG Z6041 trial, and underwent NAT and subsequent LE. Those that had pCR on final pathologic evaluation of local excision specimens (ypT0 or ypTis) made up this cohort (N=38). Patients in the WW group underwent NAT with subsequent cCR and entered a WW program (N=113). Patients in the LE cohort were T2N0, while the WW cohort were clinical stage I-III (10%; 25%; 65%, respectively). Freedom from recurrence (FFR) was defined as lack of any evidence of recurrence, including local regrowth.

Results/Outcome(s): Organ preservation rate for the LE cohort was higher compared to WW (100% vs 81%). Within the WW cohort, there were 22/113 (19.5%) patients with local regrowth necessitating proctectomy, and 15 of these patients (68%) had no further evidence of disease during the study period. There were no local recurrences or local regrowth in the LE group. FFR was improved for LE vs WW (HR 0.21 (95% CI 0.05-0.90)). However, when adjusting for those who underwent salvage proctectomy and remained disease-free within the WW cohort, freedom from disease did not significantly differ for LE vs. WW (HR 0.74; 95% CI 0.15-3.74)). Both groups had similar distant metastasis rates (LE: 2/38, 5.2% vs. WW: 8/113, 7%). Mean age for LE cohort and WW cohort were similar (63 vs. 65, respectively, P>0.05).

Conclusions/Discussion: NAT followed by local excision (confirming pCR) for rectal cancer resulted in higher organ preservation rates (100% vs 81%) and no local regrowth compared to a watch-and-wait strategy for patients with cCR. However, it should be noted that WW patients had more advanced disease at diagnosis. Both LE and WW after NAT resulted in similar rates of cure. Patients who underwent local excision after NAT with pCR had no local regrowth, as well as 100% rectal preservation. Perhaps LE in select patients following NAT may improve rectal preservation rates versus WW alone. Future studies should prospectively evaluate the role of LE versus WW after cCR following NAT.



A COMPARATIVE ANALYSIS OF NSQIP, NCDB, AND NIS FOR RECTAL CANCER: IS THERE A ROLE FOR COMPREHENSIVE INTEGRATION OF LARGE NATIONWIDE DATABASES?

204

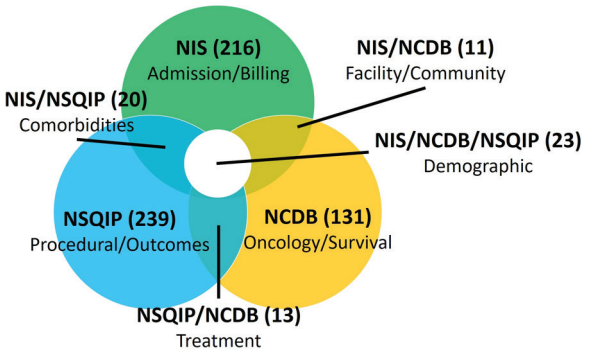
S. Sharp[1], M. Skancke[1], H. Gilshtein[1], C. Jahansouz[1], R. Malizia[2], A. Ata[2], B. Valerian[2], E. Lee[2], S. Stain[2], S. Wexner[1]
[1]*Weston, FL;* [2]*Albany, NY*

Purpose/Background: There is significant variation in rectal cancer outcomes in the USA, and reported outcomes have been inferior to those in other countries. In recognition of this fact, the American College of Surgeons (ACS) recently launched the Commission on Cancer National Accreditation Program for Rectal Cancer (NAPRC) in an effort to further optimize rectal cancer care. Large surgical databases will play an important role in tracking surgical and oncologic outcomes. Our study explored the similarities and differences of three major national databases used for evaluation of rectal cancer care outcomes.

Methods/Interventions: The ACS National Surgical Quality Improvement Outcome (NSQIP) and National Cancer Database (NCDB) from 2008-2016, and the National Inpatient Sample (NIS) from 2010-2015 were queried for the treatment of rectal cancer. Variables were identified for each respective database and similarities pertaining to rectal cancer treatment between the three were identified. NSQIP includes perioperative and tumor-specific variables, while NCDB includes tumor-specific, treatment, and survival data. NIS includes hospital volume, geographic, insurance, and hospital census region data.

Results/Outcome(s): The NSQIP database contained a total of 34,159 patients. NCDB contained a total of 29,194 patients, and NIS contained a total of 95,440 patients. NSQIP and NCDB had relatively similar distributions of patient age and gender, whereas NCDB had a slightly higher composition of white patients compared to NSQIP (86% vs. 71%). Mortality rates were similar between NCDB and NSQIP. The rate of permanent colostomy (APR) was slightly higher for NSQIP compared to NCDB (32% vs. 26%). In terms of demographic and treatment variables across the three databases, there are 20 shared variables between NSQIP and NIS focused on patient comorbidities, 11 between NCDB and NIS focused on facility and community information, and 13 between NSQIP and NCDB focused on treatment regimens. There are 23 variables shared amongst all three databases focusing primarily on patient demographics and clerical data (operative year, diagnosis code, and death).

Conclusions/Discussion: Analyzing surgical and oncologic outcomes using large national databases will be critical in the future for improving the treatment of rectal cancer. Each of the major national databases contain significant outcomes data but individually are insufficient for adequately tracking rectal cancer outcomes. Data were found to be lacking within each of the major databases for several important metrics including perioperative variables, oncologic variables, pathological variables, long term outcomes, and geographic/hospital volume data. A newer, more comprehensive and tumor specific database is needed in order to improve short- and long-term outcome measurements for the comprehensive treatment of rectal cancer.



PRIMARY TUMOR-RELATED COMPLICATIONS AND SALVAGE OUTCOMES IN PATIENTS WITH METASTATIC RECTAL CANCER AND AN UNTREATED PRIMARY TUMOR.

205

W. Tan[1], S. Patil[2], J. Guillem[2], P. Paty[2], M. Weiser[2], G. Nash[2], J. Smith[2], E. Pappou[2], I. Wei[2], J. Garcia-Aguilar[2]
[1]*Singapore, Singapore;* [2]*New York City, NY*

Purpose/Background: In metastatic rectal cancer with unresectable metastases, current practice favors omitting interventions directed at the primary tumor in asymptomatic patients. We aim to determine the proportion of patients with primary-tumor-related complications, characterize salvage outcomes, and measure survival in metastatic rectal cancer patients who did not undergo upfront intervention for their primary tumor.

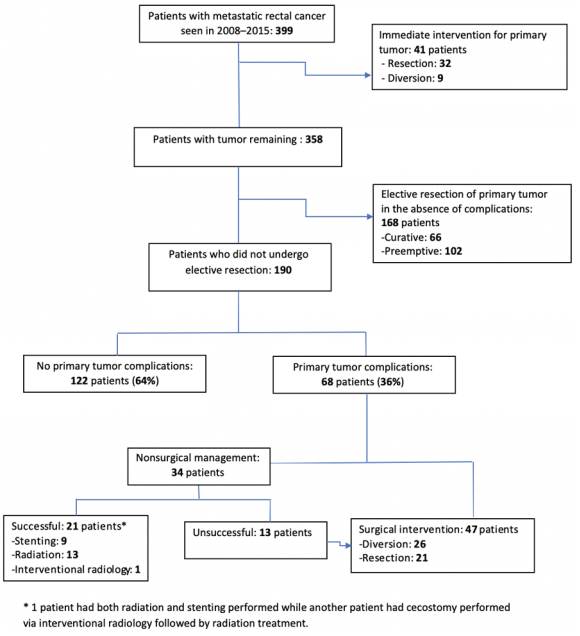
Methods/Interventions: Retrospective analysis of all patients who presented at a comprehensive cancer center between January 1, 2008, and December 31,2015, with synchronous, stage IV rectal cancer, an unresected primary, and no prior primary-tumor-directed intervention (resection, diversion, stenting, or radiotherapy). Rate of primary-tumor related complications in the cohort was determined. Kaplan-Meier method and Cox regression analysis were used to determine whether complications are associated with survival.

Results/Outcome(s): The cohort comprised 358 patients with median age of 56 years (22-92). 330 (92%) patients received oxaliplatin or irinotecan-based chemotherapy as first line treatment. Median follow-up was 26 months (range, 1 to 93 months). 168 patients (46.9%)

eventually underwent elective resection of the primary tumor—with curative intent in 66 patients (18.4%) and preemptive intent in 102 patients (28.5%). Of the 190 patients who did not undergo an upfront or elective intervention for the primary tumor, 68 (35.8%) experienced complications. Nonsurgical intervention for complications was attempted in 34 patients with an overall success rate of 61.8% (21 out of 34). Surgical intervention was performed in 47 patients (including 13 patients for whom nonsurgical intervention failed): diversion in 26 patients and resection in 21 patients. Of those 47 patients, 42 (89.4%) ended up with a colostomy or ileostomy.

Conclusions/Discussion: A significant proportion of patients with metastatic rectal cancer and untreated primary experience primary tumor-related complications. These patients should be followed closely by the surgeon and pre-emptive intervention (resection, diversion or radiation) considered if the primary progresses despite systemic therapy.

Figure 1



* 1 patient had both radiation and stenting performed while another patient had cecostomy performed via interventional radiology followed by radiation treatment.

ACTIVE SURGERY DID NOT BENEFIT PATIENTS WITH LOCALLY ADVANCED LOW-THIRD RECTAL CANCER WHO ACHIEVED CLINICAL COMPLETE RESPONSE FOLLOWING NEOADJUVANT CHEMORADIOTHERAPY.

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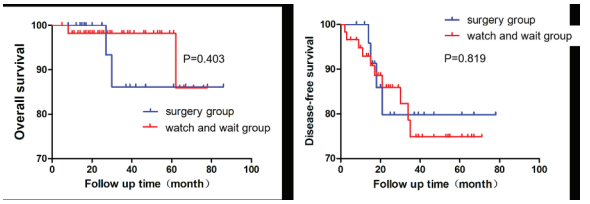
J. Gu, M. Li, Z. Han, C. Du
Beijing, China

Purpose/Background: Purpose: We clarified if patients who achieve cCR after neoadjuvant chemotherapy benefit from active surgery. Neoadjuvant chemoradiotherapy (nCRT) has become a standard treatment modality for locally advanced low-third rectal cancer. The "watch and wait" (WW) strategy has been adopted for a small number of patients who achieve clinical complete response (cCR) following neoadjuvant chemoradiotherapy.

Methods/Interventions: A prospective controlled study methodology was employed. Patients with locally advanced low-third rectal cancer who had cCR following neoadjuvant chemoradiotherapy were assigned to the WW group and TME (total mesorectal excision) surgery group based on voluntary choice. The WW group received intensive follow-up, and the surgery group underwent TME procedures. Long-term follow-up was performed in both groups

Results/Outcome(s): This study included 84 cCR patients, of whom 58 were assigned to the WW group and 26 underwent TME. The mean follow-up time was 34.8 months. In the surgery group, 76.9% of patients achieved pathological complete response (pCR), whereas 23.1% had residual tumors. The tumor recurrence and metastasis rate of the surgery group and WW group were 15.4% (4 out of 26) and 18.9% (11 out of 58), respectively, which were not significantly different. Nine patients of the WW group who experienced tumor recurrence underwent salvage surgery. Overall survival of the WW group was not significantly different from that of the surgery group (96.6% vs 92.3%, P>0.05). In addition, patients of the WW group could retain their anal sphincter function and were spared from surgery-related complications.

Conclusions/Discussion: In the present study, 84 clinical cases were analyzed, which is the largest number of cases among all relevant prospective cohort studies published thus far. Through comparative analysis, we found that active surgery may not have benefited patients with locally advanced rectal cancer who achieved cCR following NCRT. Active surgery did not prolong patient survival compared with the WW group, and more than 20% of the patients who received surgery had to endure the pain and discomfort caused by surgery-related complications. For patients who experienced tumor recurrence during the WW period, active salvage surgery could still provide radical treatment effects; therefore, their survival was not affected.



Overall survival and disease-free survival. Overall survival among[A1] patients treated with surgery or the watch-and-wait strategy (92.3% versus 96.6%, Log-rank test *P*=0.403; A). Disease-free survival among cCR patients treated with surgery or the watch-and-wait strategy (84.6% versus 81.1%, Log-rank test *P*=0.819; B).

PERIOPERATIVE BLOOD TRANSFUSIONS ARE ASSOCIATED WITH WORSE DISEASE-FREE SURVIVAL AND OVERALL SURVIVAL AFTER CURATIVE RECTAL CANCER RESECTION: A PROPENSITY WEIGHTED ANALYSIS.

207

D. Hanna[1], A. Gamboa[4], G. Balch[4], S. Regenbogen[2], J. Holder-Murray[3], S. Abdel-misih[5], M. Silviera[6], A. Hawkins[1]
[1]Nashville, TN; [2]Ann Arbor, MI; [3]Pittsburgh, PA; [4]Atlanta, GA; [5]Stony Brook, NY; [6]St. Louis, MO

Purpose/Background: Several studies have demonstrated that pre-operative anemia is associated with worse disease-free and overall survival in patients undergoing rectal cancer resection. However, these findings can be due to other prognostic factors associated with anemia, such as age, tumor stage, and other comorbid conditions. Furthermore, the immunomodulating effects associated with blood transfusion is thought to play a central role in decreased survival. Thus, the authors hypothesize that receiving peri-operative blood transfusions are associated with worse disease-free and overall survival.

Methods/Interventions: We performed a multicenter retrospective cohort study with propensity score-adjusted analysis using data from the US Rectal Cancer Consortium. Patient demographics, comorbidities, operative data, and survival data were obtained. Patients were excluded due to mortality within 90 days, need for an emergent operation, recurrent or metastatic disease at time of resection, loss to follow-up, or missing pre-operative hemoglobin. Transfusion was defined as receiving allogenic blood either intra-operatively or prior to discharge. The primary and secondary outcomes were disease-free survival (DFS) and overall survival (OS), respectively. We compared the outcomes of patients who received a transfusion (TRANS) and patient who did not (NO TRANS) with a Cox proportional Hazard model using a propensity-score weighted (for transfusion) adjusted analysis, which included pre-operative anemia.

Results/Outcome(s): A total of 882 patients were eligible for the analysis, with 129 (14.6%) receiving blood transfusions. Multivariate analysis demonstrated ASA 3-4 (OR: 2.35; 95% CI: 1.49-3.70), high estimated blood loss (OR: 2.63; 95% CI: 1.72-4.00), and pre-operative anemia (OR: 4.12; 95% CI: 2.41-7.05), to be independently associated with receiving transfusion. The overall 5-year recurrence rate was 17.5%, and the un-adjusted 5-year disease-free survival was not associated with receiving a blood transfusion (TRANS: 72.9% vs NO TRANS: 77.7%; p=0.31). However, in a propensity-adjusted analysis, transfusion was significantly associated with recurrence within 5 years (HR: 1.30; 95% CI: 1.05-1.61). In an analysis of overall survival, transfusion was significantly associated with decreased OS in both an unadjusted (TRANS: 55.3% vs NO TRANS: 82.6%; p=<0.001) and propensity-weighted analysis (HR: 0.51; 95% CI: 0.40-0.65).

Conclusions/Discussion: In this propensity-weighted analysis, allogenic blood transfusions were associated with both decreased disease-free and overall survival. These findings suggest that the association between receiving a blood transfusion and worse oncologic outcomes may not be due to a surrogacy effect. Thus, further studies investigating restrictive blood transfusion protocols and pre-operative correction of anemia should be considered.

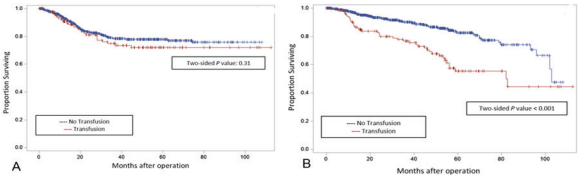


Figure 1: Kaplan-Meier curve for (A) disease-free and (B) overall survival: (A) Transfusion was not associated with un-adjusted disease-free survival (HR: 1.30; 95% CI: 1.05-1.61), (B) but was associated with decreased overall survival in a propensity-weighted analysis (HR: 0.51; 95% CI: 0.40-0.65).

MESENCHYMAL STEM CELLS AND THEIR ACELLULAR DERIVATIVE, EXTRACELLULAR VESICLES, SHOW VARIABLE COLONIC HEALING WHEN DERIVED FROM HEALTHY VERSUS CROHN'S DISEASE PATIENTS.

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Y. Li, J. Altemus, A. Lightner
Cleveland, OH

Purpose/Background: Mesenchymal stem cells (MSCs) isolated from bone marrow, and adipose exhibit varying phenotypes and immunosuppressive capabilities. It remains unclear whether MSCs isolated from variable adipose sources within the same patient or across disease states exhibit the same variability in phenotype and restorative function. We isolated MSCs from multiple adipose locations within Crohn's disease (CD) and healthy patients to determine 1) variability in phenotype/restorative function, 2) differing ability to heal colonic CD tissue, and 3) uncover the mechanism of MSC healing.

Methods/Interventions: Following IRB approval, four grams of adipose tissue (subcutaneous tissue, omentum, non-inflamed mesentery, and inflamed mesentery) was harvested from CD (n=6) and control patients (n=4; functional bowel disorders) at the time of abdominal operative intervention MSCs were isolated and expanded to P3 in DMEM/F12 serum-free medium, then tested for cell surface markers (CD45-CD105+CD73+), and adipogenic differentiation capacity. Extracellular vesicles (EVs) harvested from the supernatant of MSC culture (MSC-EVs) were isolated by the ultra-speed differential centrifugation, and the quality and concentration determined by ZetaView nanoparticle analyzer. Colonic tissue harvested

at the time of abdominal operation (CD/control) was digested and cultured by DMEM/ F12 media. Once colonic epithelium reached a confluent monolayer, a scratch assay using a sterile pipetting tip was performed. MSC-EVs were then added to cell culture system containing 10^8–10^9 particles/mL, and pictures were taken every 12 to assess wound healing. Epithelial cells were isolated and tested for the inflammatory/repair responses, and culture media collected for cytokine quantification.

Results/Outcome(s): Adipose derived MSCs have variable surface marker expression level, cytokine production (Fig 1a) and differentiation capacity when isolated from subcutaneous fat, omentum, non-inflamed mesentery and inflamed CD mesentery. Following colonic injury, healing was variable based on adipose source of MSC-EVs, with the best ingrowth from subcutaneous control patients, and most impaired ingrowth from inflamed CD mesentery. (Fig 1b) Inflamed CD mesentery MSC-EVs showed limited RAF-Caspase specific inflammatory responses (Fig 1c), decreased epidermal growth factor (EGF), and transforming growth factor-β1 secretion which coordinates repair of the epithelial barriers.

Conclusions/Discussion: MSCs and their acellular EV product exhibit variable phenotype and ability to heal colonic CD tissue based on the adipose source and disease state from which they are derived. MSC-EVs from CD patients exhibit the most impaired function, especially when derived from inflamed mesentery. This is due to the limited response by the RAF-Caspase pathway, providing a novel target pathway for engineered MSCs for the treatment CD.

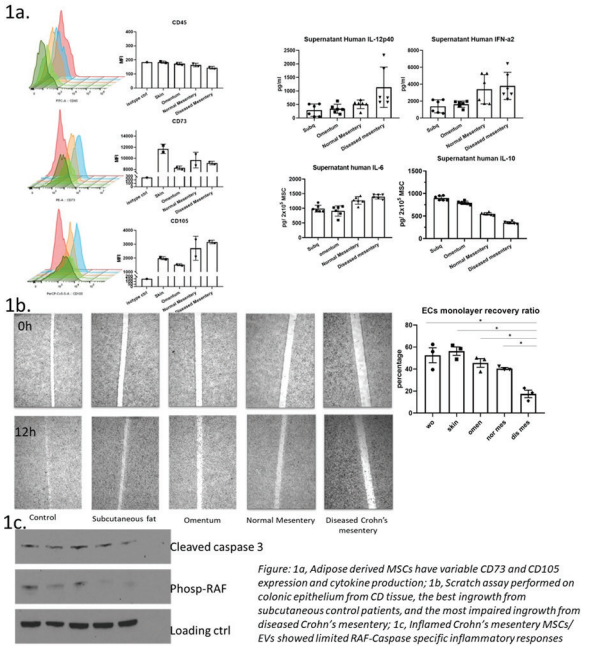

Figure: 1a, Adipose derived MSCs have variable CD73 and CD105 expression and cytokine production; 1b, Scratch assay performed on colonic epithelium from CD tissue, the best ingrowth from subcutaneous control patients, and the most impaired ingrowth from diseased Crohn's mesentery; 1c, Inflamed Crohn's mesentery MSCs/ EVs showed limited RAF-Caspase specific inflammatory responses

Figure 1

INFLIXIMAB VS COLECTOMY IN ACUTE SEVERE COLITIS; PERSPECTIVE IN SINGLE INSTITUTION IN AUSTRALIA.

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A. Arachchi
Melbourne, VIC, Australia

Purpose/Background: Acute severe colitis (ASUC) has significant morbidity and mortality and early expert intervention has been shown to have a major impact on long-term outcomes. Given the recent Pharmaceutical Benefits Scheme (PBS) listing of infliximab (IFX) for ASUC, we aimed to assess the durability of response to IFX as medical salvage therapy in a single Inflammatory Bowel Disease (IBD) centre, and if there is a benefit in healthcare utilization, cost, for IFX vs colectomy.

Methods/Interventions: Hospital and IBD databases were searched and cross-checked to ascertain all ASUC cases at Eastern Health between 2004-2014, meeting Truelove-Witts criteria on admission and who, having failed intravenous corticosteroids, were given either infliximab 5mg/kg IV and/or colectomy as first line therapy. Long-term follow-up from ASUC to 30/4/2014 assessed healthcare utilization (total number of admissions and cumulative total length of stay and post-IFX, whether colectomy eventually occurred. Non-parametric statistics were used to evaluate data

Results/Outcome(s): 120 patients with ASUC received IFX (n=88, 73%) or colectomy (n=32, 27%) as first-line salvage therapy over 9 years. Median follow-up period from ASUC onset was 5 years [range 0,10] and 65% were male, with median age & disease duration at ASUC onset 35 years [16,82 years] & 4 years [0,33 years]. 30-day mortality for this cohort was 0.8%. Of those given IFX, 41(47%) had a single salvage dose, 26 (30%) received two and 21(24%) had ≥3 doses. 51/88 (58%) of IFX salvage recipients avoided colectomy to 30/4/2014. Overall, IFX recipients had subsequent colectomy rates of 9, 18, 22, 24, 27% at 3 months, 1, 2, 3 and 5 years post initial IFX salvage dose respectively; i.e., IFX overall delayed subsequent colectomy by a median of 9 months (range 7,140 months). There was higher likelihood of colectomy free survival in those who received 2 or more IFX doses compared with only a single dose (log-rank test, p=0.04). Finally post-ASUC, healthcare utilization was much greater in those who had first-line colectomy compared to first-line IFX (median number of admissions 2, TLoS 15 days versus 3 and 30 days, respectively to 30/4/14 (each p<0.001). There was no difference in healthcare utilization between IFX salvage recipients who then had colectomy compared to recipients of colectomy alone (median admissions 4, TLoS 40 days vs 4 and 38 days respectively, each p>0.12).

Conclusions/Discussion: Infliximab salvage therapy for ASUC is efficacious with impressive early and long-term colectomy free outcomes. A 2 to 3 dose induction has additional benefit to a single dose IFX in mitigating

colectomy risk. with PBS-funded IFX doses 2 and 3 for ASUC, the results suggest that IFX is cost effective for health providers, given that on average for the cost of one dose there is a >50% chance of preventing colectomy and by doing so, reducing future TLOS by over 2 weeks.

WHAT CAN AN AGING POUCH TELL US? OUTCOMES OF ILEOANAL J-POUCHES OVER 20 YEARS OLD.

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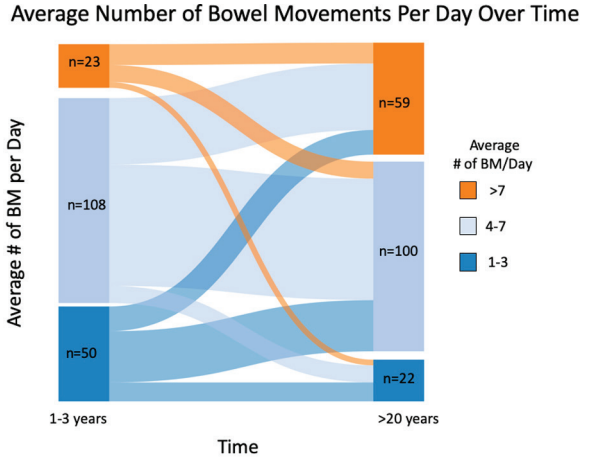
O. Beresneva, A. Al Jabri, E. Breen, A. Kuhnen, J. Saraidaridis, P. Roberts, D. Schoetz, P. Marcello, D. Kleiman
Burlington, MA

Purpose/Background: Proctocolectomy with ileal pouch anal anastomosis (IPAA) has become a popular option for surgical management of ulcerative colitis and FAP, but little is known about the long-term function of early J-pouches. The aim of this study was to examine IPAA outcomes more than 20 years after their construction.

Methods/Interventions: Patients who underwent IPAA between 1980 and 1994 were identified from a single institutional registry. Those who had ≥ 20 years of follow-up were included. Demographics, diagnosis, J-pouch function, stoma creation, and pouch excision were analyzed. Pouch function in the early postop period (1-3 years) was compared to function at most recent follow-up (≥ 20 years).

Results/Outcome(s): 588 patients underwent IPAA during the study period. 203 patients had at least 20 years of follow-up and were included. Of those, 71 had ≥30 years of follow-up. The mean age of patients at surgery was 33.5 ±9.5 years and mean length of follow-up was 28.2 years. The most common diagnosis was ulcerative colitis (83%), followed by indeterminate colitis (9%), FAP (4%), and Crohn's disease (CD) (3%). Average BM per day was 7 (IQR 6-8), 38% experienced nighttime seepage, 31% had anal stenosis, 47% experienced pouchitis. 18% had pouch failure with 9% requiring pouch excision and 9% needing a stoma. Five percent of patients had pouch failure within the first 4 years of pouch creation, 22% in years 5-10, 38% between years 11-20, 32% between years 21-30; and 3% >30 years. When comparing early postop function (1-3 years postop) to ≥ 20-year function, 41% of patients reported increased number of BM/day, 16% had decreased number of BM, and 43% stayed the same. Seepage became more frequent over time (18% vs 23%, p=0.029). Compared to patients under age 50 at the time of IPAA creation, patients over age 50 had more BM's per day (median 8 vs. 6, p=0.017) and more seepage (77% vs. 35%, p=0.005). Twenty one percent of patients had a later transition to CD. Patients with a diagnosis of CD had more BM/day (median 8 vs. 6, p<0.001), higher rates of anal stenosis (44% vs. 26%, p=0.015), pouchitis (70% vs. 40%, p<0.001), stoma creation (38% vs. 12%, p<0.001), and pouch excision (22% vs. 5%, p=0.001). Patients with ≥30 years of follow-up had a median of 7 (IQR 5-8) BM/day and an overall pouch failure rate of 17%. There were no significant differences in function or pouch failure rates when compared to patients with 20-30 years of postop follow-up.

Conclusions/Discussion: After ≥ 20 years, many patients maintain reasonably good function and retain their pouches. Over time, changes in the number of bowel movements per day are common and seepage becomes more prevalent. Older age at the time of J-pouch creation and a later transition to Crohn's phenotype are associated with worse functional results. Beyond 30 years, many patients continue to experience good J-pouch function.



DOES PREOPERATIVE ENDOSCOPIC COLONIC DYSPLASIA PREDICT CANCER AT THE TIME OF TOTAL PROCTOCOLECTOMY WITH END ILEOSTOMY IN PATIENTS WITH INFLAMMATORY BOWEL DISEASE?

213

P. Vaidya, B. Hollis, M. Regueiro, B. Click, S. Steele, T. Hull, A. Lightner
Cleveland, OH

Purpose/Background: The risk of colorectal cancer in the setting of preoperative colorectal dysplasia in inflammatory bowel disease (IBD) remains controversial and potentially variable for Crohn's disease (CD) and ulcerative colitis (UC). National guidelines have recently changed regarding the type of endoscopy used in surveillance, the nomenclature of dysplastic lesions, and recommended subsequent screening when high (HGD) or low-grade dysplasia (LGD) lesions are identified. We sought to primarily determine the rate of colorectal adenocarcinoma at the time of total proctocolectomy and end ileostomy (TPC+EI) when LGD or HGD was identified preoperatively in UC and CD patients, and secondarily

assess if there was any difference in visible/invisible lesions using modern advanced endoscopic techniques.

Methods/Interventions: A retrospective review of all UC and CD patients who underwent TPC+EI between 2005 and 2019 was conducted. Data collected included patient demographics, disease characteristics, HGD/LGD/adenocarcinoma at preoperative endoscopy, type of endoscopy performed, visible versus invisible lesion, and surgical pathology at the time of TPC+EI

Results/Outcome(s): 213 patients underwent TPC + EI for IBD; 50.7%(n=108) had UC and 49.3%(n=105) had CD. Median age at surgery was 53 years(14-85), median duration of disease 11 years (1 – 60), and 103(48.4%) were male. 28(13.1%) had active tobacco use at surgery, 61(28.6%) had preoperative exposure to corticosteroids, and 63(29.6%) to biologics. Overall, 30(14.1%) had LGD or HGD on preoperative endoscopy; 27 (12.7%) had adenocarcinoma(Adeno-ca). Of the 108 UC patients, preoperative endoscopy reported no dysplasia in 56%(n=60), LGD in 12% (n=13), HGD in 12%(n=13), and cancer 20.4%(n=22). At the time of TPC+EI, 8.3%(n=5) of the no dysplasia were found to have LGD; of the 13 with LGD, 3(23.1%) had LGD and 1(7.7%) had Adeno-ca; of the 13 with HGD, 2(14.4%) had LGD, 4(30.7%) had HGD, and 4(30.4%) had Adeno-ca; of the 22 with Adeno-ca preoperatively, 1(4.5%) had LGD, 1(4.5%) had HGD, and 17(77.3%) had Adeno-ca. Of the 105 with CD, preoperative endoscopy reported no dysplasia in 93(89%), LGD in 2 (2%), HGD in 3(3%), and Adeno-ca in 5(5%). At the time of TPC+EI, the 2 with LGD had 1 LGD and 1 Adeno-ca, the 3 with HGD had 1 with no dysplasia and 2 with LGD, and 5 with Adeno-ca 1 had LGD, and 4 had Adeno-ca. (Table 1) Of all colonoscopies performed, only one had chromoendoscopy and one had narrow-band imaging. Of the 13 HGD in UC, 10(77%) were visible lesions completely excised; 3 (75%) of the 4 were later found to have Adeno-ca.

Conclusions/Discussion: Nearly one-third of UC patients with preoperative endoscopic HGD had adenocarcinoma at the time of surgical resection, and 75% had cancer in the setting of completely excised visible lesions. In this patient cohort, surgical resection versus ongoing surveillance may be the best approach.

Table 1: Preoperative Endoscopy versus Surgical Pathology for Patients Who Underwent TPC+EI for IBD

Ulcerative Colitis	SURGICAL PATHOLOGY				
ENDOSCPIC	N = 108	NEGATIVE	LGD	HGD	CANCER
NEGATIVE	60 (55.6%)	55 (91.7%)	5 (8.3%)	0 (0%)	0 (0%)
LGD	13 (12.03%)	9 (69.2%)	3 (23.1%)	0 (0%)	1 (7.7%)
HGD	13 (12.03%)	3 (23.1%)	2 (15.4%)	4 (30.7%)	4 (30.4%)
CANCER	22 (20.4%)	3 (13.6%)	1 (4.5%)	1 (4.5%)	17 (77.3%)
Crohns Disease	SURGICAL PATHOLOGY				
ENDOSCPIC	N = 105	NEGATIVE	LGD	HGD	CANCER
NEGATIVE	93 (88.6%)	93 (88.6%)	0 (0%)	0 (0%)	0 (0%)
LGD	2 (1.9%)	0 (0%)	1 (50%)	0 (0%)	1 (50%)
HGD	3 (2.8%)	1 (33.3%)	2 (66.7%)	0 (0%)	0 (0%)
CANCER	5 (4.8%)	0 (0%)	1 (20%)	0 (0%)	4 (80%)

Table 1: Preoperative Endoscopy versus Surgical Pathology for Patients who Underwent TPC+EI for IBD.

TRANSABDOMINAL REVISIONAL ILEAL POUCH ANAL ANASTOMOSIS: INDICATION DICTATES OUTCOME.

214

A. Pooni, M. Brar, E. Kennedy, R. Gryfe, H. MacRae, Z. Cohen, A. de Buck van Overstraeten
Toronto, ON, Canada

Purpose/Background: Approximately 5-15% of patients will experience pouch failure following restorative proctocolectomy and ileal pouch anal anastomosis (IPAA). Following failure, management options include excision, permanent diversion or pouch revision. Presently, there is limited data evaluating predictors and outcomes for revisional surgery. In view of this, the objective of this study was to describe our institutional experience with pouch revision over a 35-year period with a focus on pouch survival outcomes.

Methods/Interventions: The Mt. Sinai Hospital inflammatory bowel disease database was queried to identify all patients undergoing trans-abdominal revisional surgery for failed IPAA between 1982-2018. Patient demographics, primary pouch characteristics, operative details and follow up data were abstracted. Descriptive statistics were performed as appropriate. The primary study outcome was IPAA failure defined by permanent diversion or excision. Failure was evaluated by Kaplan-Meier estimates of survival over time. An additional exploratory analysis was conducted applying univariate cox proportional hazard models to evaluate the effect of indication, prior revisional surgery and pouch salvage on revision failure.

Results/Outcome(s): One hundred and fifty-nine patients underwent trans-abdominal revision over the study period. Most patients were women (64.2%), had a primary diagnosis of ulcerative colitis (79.7%), and had their original pouch created at Mt Sinai Hospital (66%). Median age at revision was 36 years (IQR: 28.5-46.5) with a median time to revision from initial pouch construction of 2.5 years (IQR:1.1-6.6). Operative details were available for 144 patients. The most common indication for revision was leak/pelvic sepsis, representing 41% of the cohort, followed by pouch vaginal fistula (22.2%), mechanical factors (20.4%) and poor pouch function (14.6%). Over the study period 56 patients (35.2%) experience pouch failure. The 3, 5- and 10-year pouch survival probabilities were 82.3% (95% CI: 75.5%-87.5%), 77.2% (95% CI: 69.8%-83.0%) and 70.6% (95% CI: 62.6%-77.2%), respectively. On exploratory analysis, a significant association was observed between indication for revision and outcome. Compared to mechanical factors (i.e. long outlet, strictures etc), pelvic sepsis (HR=3.3, 95% CI: 1.3-8.7) and pouch vaginal fistula (HR=3.7, 95% CI: 1.4-10.1) were associated with a significantly higher risk of failure. There was no significant association between revision failure and prior revision (HR=1.45, 95% CI: 0.74-2.83) or new pouch construction (HR=1.29, 95% CI: 0.73-2.30).

Conclusions/Discussion: Revisional IPAA can be undertaken with favorable long-term outcomes at high volume centers. Consideration should be given to indication for revision when counseling patients regarding risk of failure. Further research on risk stratifying patients prior to revision is required.

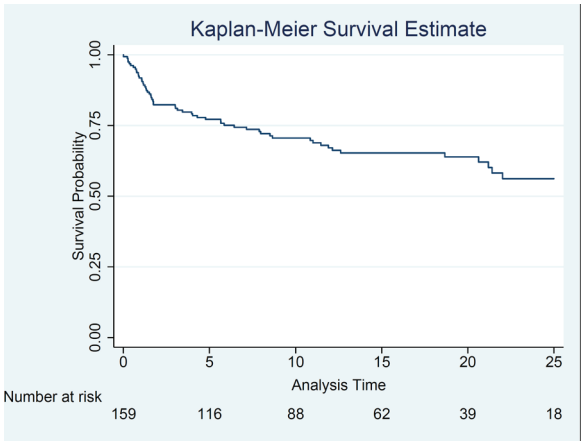


Figure 1: Kaplan-Meier Curve for Pouch Survival Following Transabdominal Revision

DEVELOPMENT OF A PREDICTION MODEL FOR THE NEED OF A PRIMARY STOMA FOR PATIENTS UNDERGOING ILEOCOLIC RESECTION FOR CROHN'S DISEASE.

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M. Brar, J. Saini, A. Boughn, R. Gryfe, E. Kennedy, Z. Cohen, H. MacRae, A. de Buck van Overstraeten
Toronto, ON, Canada

Purpose/Background: Almost half of all patients with Crohn's disease (CD) will require an ileocolic resection during their disease course, with a 2-5% risk of anastomotic leak and an (temporary) ileostomy in 5-20%. Primary stomas reduce the risk for anastomotic leaks but are associated with stoma-related morbidity. Therefore, risk stratification of patients that would most benefit of a primary stoma may lead to a decrease in anastomotic leaks while keeping the stoma rate low. However, no consensus exists about risk factors associated with anastomotic leaks. Therefore, this study aimed to generate a predictive model for anastomotic leak or need for primary stoma in patients undergoing an ileocolic resection for Crohn's disease.

Methods/Interventions: The Mount Sinai Database for Inflammatory Bowel Diseases was queried for patients having undergone primary or redo ileocolic resection for CD between 2000 and 2019. Baseline demographics and surgical details, including postoperative outcome were extracted using an institutional database and chart review. The composite outcome for our prediction model was leak or need for stoma. We selected variables as putative predictive risk factors for our outcome, and multiple imputation using chained equations were employed for missing values (under a missingness-at-random assumption). We constructed a logistic regression model using backwards elimination to select variables with a p-value <0.15 (with adjustment for surgeon). We assessed the discrimination of the model by calculating the C-statistic, and calibration using the Hosmer-Lemeshow test and a calibration plot. Internal validation was performed using bootstraping.

Results/Outcome(s): 936 patients (females: 54%; mean age at surgery of 37 years) underwent an ileocolic resection during the study period. Primary surgery occurred in 590 patients (63%), while laparoscopic access was attempt in 64%, with conversion rate of 26%. Additional bowel resection was performed in 189 patients (20%). Penetrating disease was the indication in 556 patients (60%), associated with an intra-abdominal abscess at the time of surgery in 22% of the surgeries. In total, 121 patients (13%) either received an ileostomy or had an anastomotic leak. In our final model, phenotype, gender, age, ASA of 3 or 4, preoperative steroids, preoperative biologics, perianal disease, malnourishment, anemia, surgical approach, and simultaneous resection were predictive of the need for a stoma or leak. The model demonstrated both good discrimination with AUC of 0.80 (95% CI 0.76, 0.85), and was well calibrated both by the Hosmer-Lemeshow test (p=0.99) and visually on calibration plot.

Conclusions/Discussion: This model adequately predicts the risk for need for a stoma with good discrimination and calibration. This model will allow surgeons to select patients that would most benefit from a primary stoma and minimize anastomotic complications.

LONG-TERM IMPLICATIONS OF PERSISTENT DIVERTICULITIS: A RETROSPECTIVE COHORT STUDY OF 997 PATIENTS.

216

A. Alnaki, R. Garfinkle, T. Almalki, N. Morin, G. Ghitulescu, J. Faria, C. Vasilevsky, M. Boutros
Montreal, QC, Canada

Purpose/Background: Persistent (or ongoing) diverticulitis is a well-recognized outcome following treatment for acute sigmoid diverticulitis; however, its definition, incidence and predictors, as well as its long-term implications, remain poorly described. The purpose of this study was to assess the incidence, predictors, and long-term outcomes of persistent diverticulitis.

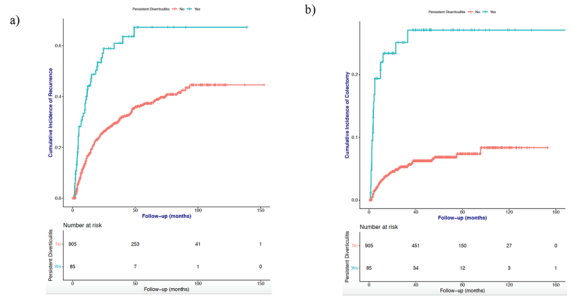
Methods/Interventions: This was a multicenter retrospective cohort study of all patients managed nonoperatively for acute sigmoid diverticulitis at two university-affiliated hospitals from 2007-2017. CT scans pertaining to the index admission of diverticulitis were reviewed by two blinded radiologists. Persistent diverticulitis was defined as treatment for signs and symptoms of ongoing diverticulitis within the first 60-days following treatment of the index episode. A multiple logistic regression was performed to

evaluate predictors of persistent disease. The association between persistent diverticulitis and long-term outcomes, including recurrent diverticulitis and sigmoid colectomy for diverticulitis, was assessed using Cox proportional hazards models.

Results/Outcome(s): In total, 997 patients were discharged following an index episode of diverticulitis managed nonoperatively. Ninety-two patients (9.2%) presented within 60-days with persistent diverticulitis. Factors associated with persistent diverticulitis were younger age (OR: 0.98, 95% CI 0.96-0.99), previous history of diverticulitis (OR: 2.58, 95% CI 1.35-4.72), immunosuppression (OR: 1.98, 95% CI 1.09-3.55), and abscess (OR: 1.97, 95% CI 1.07-3.53). Among the 92 patients with persistent disease, 50 (54.3%) required hospital admission, 8 (8.7%) percutaneous drainage, and 7 (7.6%) resection. After a median follow-up of 3.29 (1.36-5.62) years, the overall recurrence rate in the entire cohort was 32.3% (322/991). The cumulative incidence of recurrent diverticulitis (log-rank: $p<0.001$) and sigmoid colectomy (log-rank: $p<0.001$) were higher among patients who experienced persistent diverticulitis after the index episode **(Figure 1a and 1b)**; however, stoma rates were similar (log-rank: $p=0.11$). After adjustment for relevant patient and disease factors, persistent diverticulitis was associated with higher hazards of recurrence (HR: 2.33, 95% CI 1.69-3.20) and colectomy (HR: 4.21, 95% CI 2.47-7.15).

Conclusions/Discussion: Approximately 10% of patients experience persistent diverticulitis following treatment for an index episode of diverticulitis. Persistent diverticulitis is a poor prognostic factor for long-term outcomes, including recurrent diverticulitis and colectomy.

Figure 1 – Cumulative incidence of a) recurrent diverticulitis, and b) sigmoid colectomy, among patients with and without persistent diverticulitis



NONOPERATIVE VERSUS SURGICAL MANAGEMENT OF DIVERTICULITIS BEFORE AND AFTER SOLID ORGAN TRANSPLANTATION: A SINGLE INSTITUTION RETROSPECTIVE STUDY.

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C. Klos, N. Bath, E. Carchman, G. Leverson, E. Lawson, C. Geltzeiler, R. King, C. Heise
Madison, WI

Purpose/Background: Current practice guidelines suggest that transplant recipients are more likely to fail nonoperative management of acute diverticulitis than the general population, resulting in a higher likelihood of undergoing operative intervention. Elective colectomy to prevent complications in patients anticipated to need an organ transplant remains controversial. The objective of this study was to evaluate outcomes and risk of recurrence associated with nonoperative versus surgical management of diverticulitis in a large series of solid organ transplant recipients.

Methods/Interventions: This is a retrospective analysis of a prospectively collected registry of patients that underwent solid organ transplant (kidney, liver, pancreas) from 2000-2015 at a single tertiary referral center. All patients with a diagnosis related to diverticular disease were categorized into those with an index episode of diverticulitis pre-transplant (preTXP) *versus* post-transplant (postTXP). The diagnosis of diverticulitis was confirmed by chart review. The outcomes of diverticulitis management were compared between the two groups, including success rate of nonoperative management, incidence of elective or urgent colectomy, postoperative complications and mortality. Chi-square test was used to determine significance ($P<0.05$).

Results/Outcome(s): Among 6,152 solid organ transplant patients (4,125 kidney, 843 pancreas, 1,184 liver), 1.5% (n=93) experienced at least one episode of diverticulitis. The majority of index episodes (74%, n=69) occurred in the postTXP group. About two thirds of patients in the preTXP and postTXP groups underwent nonoperative management at iniial diagnosis (63% vs 68%) and there was no significant difference in rate of urgent colectomy for failure of nonoperative management between the groups (7% vs 9%, p=1.0). Similarly, there was no significant difference in percentage of patients who had an elective colectomy after successful nonoperative management (33% vs 23%, p=0.51). Overall, 63% (n=15) of preTXP and 54% (n=37) of postTXP patients underwent colectomy (p=0.45). PostTXP patients were significantly more likely to have a complication after colectomy than preTXP patients (43% vs 13%, p<0.04), but there was no significant difference in postoperative mortality rates (8% vs 0%, p=0.55). None of the preTXP patients had recurrent diverticulitis after undergoing organ transplantation.

Conclusions/Discussion: PreTXP and postTXP patients with diverticulitis had similar rates of urgent colectomy and elective colectomy. However, surgical complication rates were significantly higher for the postTXP patient population. These findings should be taken into consideration when counseling patients on the relative risks and benefits of nonoperative versus surgical intervention in the preTXP and postTXP periods.

A PROSPECTIVE RANDOMIZED TRIAL OF TRANSVERSUS ABDOMINIS PLANE (TAP) INTRAOPERATIVE BLOCK WITH BUPIVACAINE/DEXAMETHASONE AGAINST LIPOSOMAL BUPIVACAINE (EXPAREL®): THE TINGLE TRIAL.

218

A. Truong, H. Tran, J. Mirocha, R. Shane, P. Fleshner, K. Zaghiyan
Los Angeles, CA

Purpose/Background: Postoperative pain control following major colorectal surgery is challenging. A transversus abdominis plane (TAP) block extends the postoperative analgesic window and limits the use of opioids and their associated side effects. A liposomal-depo formulation of bupivacaine (Exparel®) (LB) has been shown to provide extended analgesia duration (72 hr) compared to standard bupivacaine (18-24 hr). Still, the adoption of LB has been limited as it is considerably more expensive than standard bupivacaine. Other studies have suggested that the addition of dexamethasone to the TAP block may prolong the anesthetic effect beyond 24 hours but no prior studies have compared this with LB. We hypothesized that a LB-TAP block would provide superior pain control vs. bupivacaine/epinephrine/dexamethasone (BED)-TAP block.

Methods/Interventions: We conducted a single-institution, prospective, randomized clinical trial comparing intraoperative laparoscopic LB-TAP vs. BED-TAP block. Consecutive patients between October 2018 to November 2019 undergoing laparoscopic or robotic colorectal surgery (with bowel resection or ostomy creation) were randomized 1:1 to treatment groups. All patients were maintained on a standard opioid-sparing multimodal analgesia protocol. The primary outcome was total oral morphine dose equivalents administered in the first 48 hours postoperatively. Secondary outcome measures included opiate usage in the recovery unit through the first 72 hours after surgery and pain scores.

Results/Outcome(s): 101 patients were consented and enrolled. The median age for the study cohort was 42 years (IQR 29-60) and 50% were male. The most common surgical approach was multi-port laparoscopy (92%). The largest incision was most often an off-midline transverse incision (64%) with a median length of 4 cm (3-7). Patients assigned to LB-TAP and BED-TAP groups were similar with respect to demographic, preoperative, and operative characteristics. The primary end point, median total oral morphine dose equivalents administered in the first 48 hours, was similar between LB-TAP and BED-TAP treatment groups (69 mg (IQR 20-110) vs. 47 mg (18-112) respectively, p=0.60). Patients received similar morphine equivalents in recovery, during the first 24 hours, and first 72 hours (Table 1). Pain scores were similar between groups as well. There were no significant differences in time to ambulation, time to diet tolerance, time to bowel movement, length of stay, overall complications, or readmission rate.

Conclusions/Discussion: This first randomized trial comparing LB-TAP block against BED-TAP block in colorectal surgery patients showed no significant difference in postoperative opioid consumption or pain scores. Contrary to our hypothesis, a liposomal bupivacaine TAP block does not provide superior or extended analgesia in the era of standard multimodal analgesia protocols.

COMPARABLE MORTALITY, IMPROVED MORBIDITY AND GASTROINTESTINAL RESTORATION RATES FOR DIVERTING LOOP ILEOSTOMY WITH COLONIC LAVAGE VS. TOTAL ABDOMINAL COLECTOMY FOR FULMINANT CLOSTRIDIOIDES DIFFICILE COLITIS: RESULTS OF A MULTICENTER RETROSPECTIVE COHORT STUDY.

219

M. Abou Khalil[1], K. Mukherjee[3], A. Liberman[1], H. Sebajang[1], M. Poirier[1], P. Montpetit[2], C. Vasilevsky[1], M. Boutros[1]
[1]Montreal, QC, Canada; [2]Laval, QC, Canada; [3]Loma Linda, CA

Purpose/Background: Limited data exist on the role of diverting loop ileostomy and colonic lavage (DLI) for fulminant *Clostridioides difficile* colitis (FCDC) compared to total abdominal colectomy with end ileostomy (TAC). Prospective surgical trials are difficult to conduct given the rarity of this condition and the changing epidemiology of the disease. Our objective was to compare outcomes of TAC and DLI for patients with FCDC.

Methods/Interventions: After institutional review board approval, a multicenter retrospective chart review was conducted at 11 North American centers for patients who underwent a TAC or a DLI for FCDC(2010-2018). Demographic, perioperative and postoperative data were collected. Outcomes of interest were overall 30 and 90-day postoperative mortality, postoperative major morbidity and gastrointestinal (GI) restoration rates. Univariate analyses were conducted to compare both procedures and multiple logistic regression was used to adjust for patient demographics and markers of disease severity.

Results/Outcome(s): Of 159 patients with FCDC, 125(78.6%) had TAC and 34(21.4%) had DLI. Patients who had TAC were similar to those who had DLI with regards to preoperative factors such as patient age (71.6 vs. 71.1,p=0.84), male sex (57.6% vs. 61.8%, p=0.66), immunosuppression (30.5% vs. 34.5%, p=0.68), preoperative lactate (3.8mmol/L vs. 2.4mmol/L, p=0.06), mean white blood cell count (28,766 vs 24,898 cells/mm3,p=0.37), mean creatinine level (2.2 vs. 3.6mg/dL, p=0.09) and mean APACHE II score (34.1 vs. 34.4, p=0.89). Overall 30 and 90-day post-operative mortality was 26.5% vs. 41.8% (p=0.10) and 35.3% vs. 49.6% (p=0.104) for DLI compared to TAC, respectively. Major morbidity was 47.1% with DLI compared to 65.6% with TAC (p=0.049). Conversion to TAC after DLI occurred in 3 patients (8.8%), however overall 30-day reoperation was similar between groups (14.7% vs. 12.0%, p=0.67). Median length of ICU stay was similar for TAC (6.6[3,13] days) and DLI (10.0[2,20] days) (p=0.34), and median hospital length of stay was comparable (21[12,40] vs. 29[15,56], p=0.16). GI restoration occurred in 18 patients (52.9%) with DLI compared to 12 patients (9.7%) with TAC

218 Postoperative Outcomes

	Cohort (n=101)	BED-TAP (n=50)	LB-TAP (n=51)	p-value
Operative time (min)	171 (130-234)	166 (130-231)	174 (131-244)	0.61
Intraoperative blood loss (mL)	50 (25-100)	50 (36-100)	50 (20-100)	0.18
Converted to open	6 (6)	4 (8)	2 (4)	0.44
Number of incisions	4 (3-4)	4 (3-4)	4 (3-4)	0.21
Largest incision (cm)	4 (3-7)	5 (4-7)	4 (3-7)	0.26
Opioid usage (OME)	-	-	-	-
Intraoperative	24 (7.5-30)	30 (8-38)	16 (0-30)	0.15
Postoperative recovery unit	9 (0-20)	6 (0-17)	10 (0-20)	0.46
1st postoperative day	20 (10-45)	20 (4-60)	20 (12-40)	0.78
2nd postoperative day	20 (5-50)	19 (5-39)	25 (5-50)	0.59
3rd postoperative day	10 (0-30)	10 (0-30)	10 (0-30)	0.86
Cumulative first 24-hours	30 (13-68)	28 (9-71)	30 (15-63)	0.76
Cumulative first 48-hours	54 (20-107)	47 (18-112)	69 (20-110)	0.60
Cumulative first 72-hours	70 (25-144)	66 (22-145)	80 (25-145)	0.63
Pain score (VAS)	-	-	-	-
Postoperative recovery unit	3 (0-5)	2 (0-6)	3 (0-5)	0.62
Average 1st postoperative day	4 (3-6)	4 (3-6)	4 (3-6)	0.92
Average 2nd postoperative day	4 (2-5)	4 (2-5)	4 (2-5)	0.94
Average 3rd postoperative day	3 (2-5)	4 (2-5)	3 (2-5)	0.47
Average 72-hours	4 (2-5)	4 (2-5)	4 (2-5)	0.71
Time to first ambulation (days)	2 (1-2)	2 (1-2)	2 (1-2)	0.25
Time to diet tolerance (days)	1 (0-1)	1 (0-1)	1 (0-1)	0.65
Time to first bowel movement (days)	1 (1-2)	1 (1-2)	1 (1-2)	0.91
Time to Foley removal (days)	1 (1-1)	1 (1-1)	1 (1-1)	0.26
Length of stay (days)	3 (2-4)	3 (2-4)	3 (2-5)	0.07
Postoperative complications	-	-	-	0.25
None	61 (60)	29 (58)	32 (63)	-
CD I	9 (9)	7 (14)	2 (4)	-
CD II	15 (15)	8 (16)	7 (14)	-
CD III	16 (16)	6 (12)	10 (20)	-
Postoperative emesis	22 (22)	8 (16)	14 (28)	0.23
Diet regression	16 (16)	7 (14)	9 (18)	0.79
Nasogastric tube decompression	6 (6)	1 (2)	5 (10)	0.21
30-day readmission	21 (21)	12 (24)	9 (18)	0.47

Table 1: Postoperative outcomes. Data presented as n (%) or median (interquartile range). BED-TAP bupivacaine/epinephrine/dexamethasone TAP block, LB-TAP liposomal bupivacaine (Exparel®) TAP block, OME oral morphine dose equivalents, VAS visual analog scale, CD Clavien-Dindo complication classification.

($p<0.001$). On multivariate analysis, only patient age and preoperative vasopressor use were found to be independent predictors of 30 and 90-day post-operative mortality (Table 1). Recurrence after GI restoration occurred in 3(17%) patients with DLI and one (8%) patient with TAC.

Conclusions/Discussion: DLI is a comparable alternative to TAC for patients with FCDC with regards to overall 30 and 90-day postoperative mortality. However, DLI is advantageous with decreased morbidity and greater GI restoration rates. Despite the limitations of the retrospective design of this study, DLI can be considered an alternative to TAC.

Table 1. Predictors of 30-day and 90-day Post-Operative Mortality following Emergency Surgery for Fulminant *C. difficile* Colitis

	30-day postoperative mortality		90-day postoperative mortality	
	OR	95%CI	OR	95%CI
Diverting loop ileostomy	0.36	0.89-1.46	0.42	0.11-1.57
Age	1.06	1.00-1.12	1.05	1.00-1.10
Preoperative intubation	0.76	0.21-2.82	1.01	0.29-3.52
Preoperative vasopressors	5.87	1.56-22.17	4.55	1.33-15.60
Immunosuppression	1.82	0.55-6.06	1.37	0.42-4.44
APACHE II score	1.08	0.99-1.16	1.07	0.99-1.16

EVALUATING DISPARITIES AND LONG-TERM SURVIVAL IN IDEAL GUIDELINE-BASED NEOADJUVANT CARE FOR RECTAL CANCER.

QS300

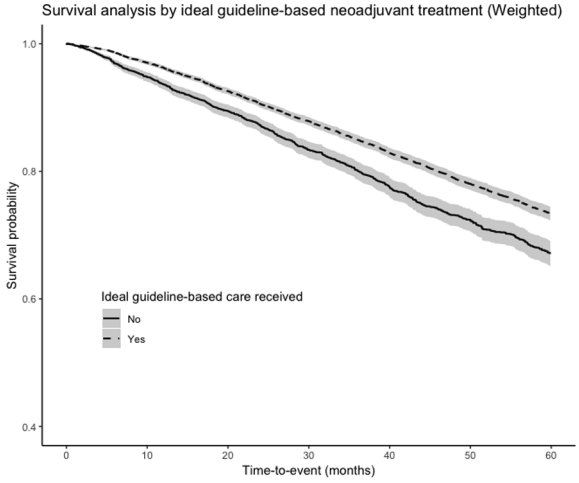
W. Kethman, K. Bingmer, A. Ofshteyn, E. Steinhagen, R. Charles, D. Dietz, S. Stein
Cleveland, OH

Purpose/Background: Disparities exist in complex multi-disciplinary cancer care. The primary aim of this study was to evaluate the impact of ideal guideline-based care on survival in rectal cancer and understand disparities that might influence receipt of this care.

Methods/Interventions: The National Cancer Database was queried for patients who underwent surgical intervention of non-metastatic rectal adenocarcinoma from 2010-2015. National Comprehensive Cancer Network guidelines were utilized to define ideal guideline-based neoadjuvant care (iNGBC) for early (T1-2, N0) and later-stage (T1-4, N1-2) non-metastatic disease. We evaluated success of oncologic resection and long-term mortality at 5 years using propensity score-weighted logistic regression modeling and Kaplan-Meier statistics. Oncologic resection success was defined by margin negativity and adequate lymph node yield.

Results/Outcome(s): Among 17,954 individuals treated for non-metastatic rectal cancer, 13,219 (74%) received iNGBC. After propensity score-weighting, there were no significant differences among the cohorts for age, sex, facility type, Charlson-Deyo score, clinical staging, or tumor grade. iNGBC was not associated with a greater likelihood of successful oncologic resection ($OR_{adj}=0.94$, 95% C.I. 0.86-1.02). However, iNGBC was associated with a reduced likelihood of 90-day mortality ($OR_{adj}=0.56$, 95% C.I. 0.44-0.72) and improved long-term survival (Figure 1). Patient factors associated with a reduced likelihood of iNGBC include age >65 years (OR=0.67, 95% C.I. 0.6-0.74), Medicare insurance (OR=0.81, 95% C.I. 0.73-0.91), Community facility (OR=0.85, 95% C.I. 0.74-0.98), West South Central geography (OR=0.75, 95% C.I. 0.61-0.92), later-stage disease (OR=0.28, 95% C.I. 0.26-0.31), and Charlson-Deyo score >3 (OR=0.67, 95% C.I. 0.53-0.85).

Conclusions/Discussion: Ideal NCCN-guideline based neoadjuvant care does not impact the likelihood of successful oncologic resection, however, patients who receive iNGBC have improved short- and long-term survival. Elderly individuals with later-stage disease and greater co-morbidities are particularly susceptible to receipt of less than ideal neoadjuvant care in rectal cancer. Mechanisms for optimizing care in these high-risk individuals are needed.



Weighted KM-survival analysis (with 95% C.I.) of non-metastatic rectal cancer by receipt of ideal NCCN guideline-based care.

THE IMPACT OF PHYSICIAN AND HOSPITAL VOLUME ON GUIDELINE RECOMMENDED CARE IN PATIENTS WITH RECTAL CANCER: A SYSTEMATIC REVIEW.

QS301

S. Candy[1], L. Zhang[1], D. Yu[1], S. Merchant[1], A. Caycedo[2], S. Patel[1]
[1]*Kingston, ON, Canada;* [2]*Sudbury, ON, Canada*

Purpose/Background: Background: Patients with rectal cancer may encounter barriers to care during the staging, treatment and surveillance phases. Studies have demonstrated improved outcomes for patients with rectal cancer at high volume centers. The association between hospital and physician volume and phases of care are not well

established. Our objective was to determine the relationship between hospital or physician volume and the receipt of guideline recommended care in patients with rectal cancer.

Methods/Interventions: Methods: EMBASE and MEDLINE were searched for eligible studies published between 2000-2018. Studies were included if they assessed the association between hospital or physician volume and guideline recommended staging, treatment or surveillance in patients with Stage I - III rectal cancer. Data abstraction was completed in duplicate. Study quality was assessed using the Newcastle-Ottawa Scale.

Results/Outcome(s): Results: Out of 5,869 search results, 3 staging, 27 treatment and 1 surveillance studies met the inclusion criteria. All were retrospective cohort studies and included between 382 and 68,182 patients. All three staging studies had a significant increase in the use of magnetic resonance imaging or transrectal ultrasound with higher surgeon or hospital volume. Treatment studies reported mixed results. Four studies found that higher volume centers were more likely associated with sphincter preservation and a conventional laparoscopic or robotic approach, but three studies showed no significant difference. Surgeons with higher case volumes had a significantly increased rate of clear surgical margins in four studies, although one study demonstrated no difference. The use of radiation and chemotherapy was increased at higher volume hospitals in five studies; however four studies identified no difference. There was only one study reporting on surveillance, that showed a significantly increased rate of colonoscopy surveillance at higher volume centers.

Conclusions/Discussion: Discussion: Higher volume hospitals and physicians were associated with increased adherence to recommended staging, treatment and surveillance modalities for rectal cancer. Referral of patients to high volume centers should be considered for all phases of rectal cancer management.

INFLUENCE OF HOSPITAL VARIATION ON SPHINCTER PRESERVATION RATES IN RECTAL CANCER: OUTCOMES OF A NATIONWIDE POPULATION-BASED STUDY.

QS302

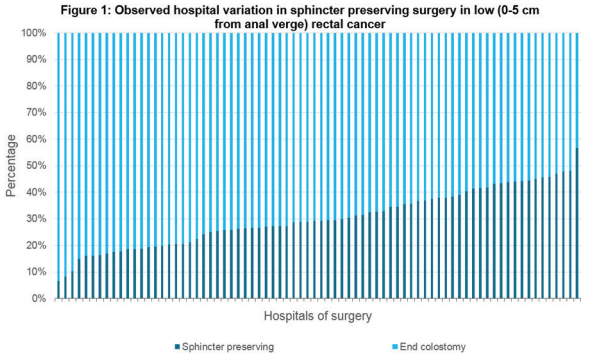
T. Koëter[1], L. de Nes[1], D. Zimmerman[2], D. Wasowicz[2], R. Verhoeven[3], H. de Wilt[1], M. Elferink[3]
[1]Nijmegen, Netherlands; [2]Tilburg, Netherlands; [3]Utrecht, Netherlands

Purpose/Background: The aim of this study was to examine hospital variation on sphincter preservation in rectal cancer. Secondly, short-term outcomes (anastomotic-leakage (AL), 30-day mortality) related to hospital variance in sphincter preservation and the influence of hospital volume of abdominoperineal resections (APR) on positive circumferential resection margin (CRM) were analyzed.

Methods/Interventions: Patients with non-metastasized rectal cancer diagnosed in all Dutch hospitals (N=78) between 2009 and 2016 and who underwent surgery were selected from the Netherlands Cancer Registry. APR and Hartmann's procedure were defined as the End Colostomy group. Low Anterior Resection (LAR) was assigned to the sphincter-preserving surgery group. Patients were divided in three subgroups based on tumor distance from the anal verge, <= 5 cm, > 5 <= 10 cm and >10 cm, respectively. Multivariable multilevel logistic regression models were generated to estimate the probability to undergo sphincter-preserving surgery according to hospital of surgery. Furthermore, to assess a potential influence of the variance in experience regarding sphincter preserving surgery on short-term outcomes (AL, 30-day mortality), multivariable logistic regression analyses were performed. The influence of annual hospital APR volume (<15, 15-24, 25-34, >35) on positive CRM rate in the distal tumor group (<=5cm) was examined with multivariable logistic regression.

Results/Outcome(s): A total of 19,729 patients who underwent TME-surgery were included in the analysis regarding sphincter-preservation. After adjustment for patient and tumor characteristics, hospital of surgery was a significant factor for patients' likelihood for (p<0.001) sphincter preservation in all three subgroups of tumor distance from the anal verge. The observed median sphincter preservation rate was 29.3% (range 6.7% to 56.7%), 75.6% (range 37.1%-93.6%) and 87.9% (range 65.4%-100%) in the groups of < 5 cm, 5-10cm and >10cm to anal verge, respectively. No effect of annual hospital APR volume was identified on the likelihood of a positive CRM in the distal tumor group (<=5cm) (p=0.60), positive CRM rates were 10.6%, 9.1%, 9.3% and 9.5% in the groups of <15, 15-24, 25-34 and >35 annual resections, respectively. No differences in short-term outcomes (AL / 30-day mortality) were seen between hospitals based on sphincter preserving experience (AL; p=0.51, 30-day mortality; p=0.87).

Conclusions/Discussion: This nationwide population-based study showed that a significant hospital variation is present in rectal cancer surgery. This variation did not influence short-term outcomes and annual hospital volume of performed APRs did not influence the likelihood of a tumor-positive CRM. However, from a patient perspective, this variability in sphincter preservation is undesirable and warrants ongoing centralization and regional multidisciplinary teams.



A SNAPSHOT OF THE GLOBAL TENDENCIES OF THE TREATMENT OF RECTAL CANCER.

QS303

A. Caycedo[1], S. Patel[2], C. Verschoor[1], M. Chand[5], S. Wexner[3], J. Mayol[4]
[1]Sudbury, ON, Canada; [2]Kingston, ON, Canada; [3]Weston, FL; [4]Madrid, Spain; [5]London, United Kingdom

Purpose/Background: The management of rectal cancer has evolved, with a multitude of potentially appropriate alternatives for each patient. Decision making about individual patients may be difficult due to the plethora of possible therapeutic options. Dissemination of information and multidisciplinary care conferences (MDTCC) are methods of setting standards for care to help facilitate therapeutic choices. Despite acceptance of standards, practices may vary according to local, regional, and national considerations. Therefore the objective of the present study was to create a global map of the different opinions about controversial areas in the management of rectal cancer patients.

Methods/Interventions: A 10 question-survey was designed using a Delphi methodology. Enquiries focused on the accepted number of cases for surgeon and hospital to provide adequate treatment, acceptable surgical margins, clinical scenarios comparing surgical approaches and techniques, the use of watch and wait (W&W) strategies and total neoadjuvant therapy (TNT). Major colorectal surgery societies across the world were contacted to distribute the online survey among their members. Frequency of responses across regions within each question was compared by chi square test, and p values determined for statistical significance.

Results/Outcome(s): 753 participants from 60 countries responded. 6 regions were identified, 4 of which had sufficient representation to allow for comparisons. Europe (EU;237), North America (NA;220) South America (SA;187) and Oceania (O;86). There were important similarities and differences in the therapies amongst these regions. A 1 cm distal margin was favored in all 4 regions. Surgeons in EU are more likely to discuss patients at MDTCC rounds as compared to other geographic regions, acceptance of W&W is more common in SA compared to other regions. What defined a "high volume" surgeon or institution required less numbers in NA and O. Robotic surgery is far more commonly offered in NA than any other regions while taTME penetration is highest in Europe. Patients in O are more likely to receive a diverting ileostomy. The concept of TNT is most accepted in NA and EU.

Conclusions/Discussion: This survey found some commonalities between surgeons in different geographic regions, while identify other areas of disagreement. Although not comprehensive, this approach provides a snapshot of the global tendencies of surgeons treating patients with rectal cancer. In determining geographic differences areas of controversy have been identified. The reasons for differing approaches may be due to a lack of evidence supporting one approach or the other, or the need for dissemination of current evidence.

1. What is the minimum annual number of TME operations to be considered a high volume rectal cancer surgeon?
2. What is the minimum annual number of rectal cancers operated on to be considered a high volume rectal cancer centre?
3. Which rectal cancer cases should be presented at multidisciplinary conference?
4. Do you include watch & wait as part of your practice?
5. 57 yo female had a poorly differentiated rectal cancer at 4 cm , she underwent a long course of chemoradiation after 8 weeks she seems to have developed a complete clinical response, what option would you consider for her?
6. A 65 yo obese male (BMI 35) has a T2N0 rectal cancer at 6 cm from the anal verge, without adverse features. What surgical approach would you choose for this case in **your** practice?
7. A 52 yo female (BMI 25) undergoes a laparoscopic LAR for a T2N0 rectal cancer a 10 cm from the anal verge (No neoadjuvant therapy). Anastomosis is below peritoneal reflection. Would you create a diverting ileostomy?
8. What is the minimum acceptable distal margin following TME?
9. A 55 yo male with a posterior T3bN1 rectal CA at 4 cm from the anal verge, with evidence of EMVI , apparent complete response after neoadjuvant therapy is suggested. He is very anxious about his cancer prognosis but is also interested in sphincter preservation. What option would you recommend?
10. In a 54 yo male with a T2 N2 poorly differentiated mid rectal cancer with evidence of EMVI on MRI would total neoadjuvant therapy (TNT) rather than split chemoradiation be considered as an option in your practice?

EARLY-ONSET RECTAL CANCER PATIENTS ARE SIMILAR TO OLD, YET MANAGED DIFFERENTLY.

QS304

J. Bliggenstorfer, A. Ofshteyn, K. Bingmer, A. Sarode, S. Stein, E. Steinhagen
Cleveland, OH

Purpose/Background: Data suggests that there may be biological differences in colon cancer between young and old patients. However, no studies have evaluated if these differences persist in rectal cancer patients, exclusive of colon cancer. We hypothesized young rectal cancer patients also differ from older patients with respect to demographics, tumor factors and treatment.

Methods/Interventions: The National Cancer Database from 2004-2014 was queried for rectal cancer patients with adenocarcinoma. Patients were grouped by age at diagnosis, with early onset (EO) defined as <40 years and late onset (LO) ≥50. A third age range, mid-age onset (MO) 40-49, was created to further delineate young from old and isolate differences. Propensity matching was performed based on gender, race, urban or rural location, income and insurance status. Chi square analysis and pairwise Chi square with Bonferroni correction were used for analysis.

Results/Outcome(s): 30,978 patients were analyzed: 1,249 (4%) EO, 4,156 (13%) MO, and 25,573 (83%) LO. Majority were male (60.1%), white (87.1%), privately insured (48%), in metropolitan areas (79%) and presented with stage II (29.6%) adenocarcinoma. Pairwise analysis demonstrated no differences between EO and MO in race, location, histology and radiation dosing, while EO and LO were significantly different in all metrics. Propensity matching between EO and MO demonstrated significant differences in stage (≥stage III 58.2% EO vs 49.5% MO, P<0.001), lymph node yield (≥12 nodes 71% EO vs 65.3% MO, P=0.008), chemotherapy regimen (multiagent therapy 47.9% EO vs 40.9% MO, P=0.002) and chemotherapy timing (receipt of both neoadjuvant and adjuvant therapy 28.1% EO vs 25.1 MO, P=0.028). However, differences in treatment between EO and MO were eliminated when controlling for stage. Propensity matching between EO and LO also differed in stage (≥stage III 58% EO vs 39.4% LO), histology (adenocarcinoma 89.5% EO vs 94% LO), lymph node yield (≥12 nodes 71.2% EO vs 60.4% LO), chemotherapy regimen (receipt of multiagent therapy 47.6% EO vs 32.4% LO), chemotherapy timing (receipt of adjuvant and neoadjuvant therapy 28.1% EO vs 18.1% LO) and radiation timing (neoadjuvant 65.6% EO vs 53.2% LO) all P<0.001. Unlike the EO and MO comparison, treatment differences persisted when controlling for stage (Table 1).

Conclusions/Discussion: In examining rectal cancer alone, many of the age-related differences described in colon cancer were not seen on propensity-matched analysis. In fact, the only differences noted were those in stage at presentation and treatment. Further research on rectal cancer biology is needed to determine if young patients with rectal cancer should truly be treated differently than old.

	Stage II			Stage III			Stage IV		
	EO (%)	LO (%)		EO (%)	LO (%)		EO (%)	LO (%)	
Radiation Timing									
Adjuvant	32 (11.43)	44 (13.33)	NS	58 (11.24)	46 (12.53)	P=0.021	14 (8.14)	9 (9.38)	NS
Neoadjuvant	215 (76.79)	246 (74.55)		421 (81.59)	273 (74.39)		94 (54.65)	37 (38.54)	
Both	3 (1.07)	2 (0.61)		5 (0.97)	3 (0.82)		3 (1.74)	0 (0)	
None	30 (10.71)	38 (11.52)		32 (6.20)	45 (12.26)		61 (35.47)	50 (52.08)	
Radiation Dose									
<45 Gray	8 (2.83)	9 (2.68)	NS	13 (2.50)	9 (2.40)	P=0.015	16 (9.14)	7 (7.14)	P=0.037
45 to 50 Gray	183 (64.66)	206 (61.31)		332 (63.72)	234 (62.40)		69 (39.43)	24 (24.49)	
> 50.4 Gray	62 (21.91)	82 (24.40)		144 (27.64)	87 (23.2)		29 (16.57)	17 (17.35)	
None	30 (10.60)	39 (11.61)		32 (6.14)	45 (12.00)		61 (34.86)	50 (51.02)	
Chemotherapy									
Given	36 (12.9)	32 (9.58)	P=0.004	50 (9.6)	33 (8.82)	P=0.003	5 (2.91)	8 (8.42)	P=0.038
Single Agent	108 (38.71)	166 (49.7)		188 (36.08)	145 (38.77)		25 (14.53)	17 (17.89)	
Multiagent	117 (41.94)	100 (29.94)		270 (51.82)	167 (44.65)		138 (80.23)	63 (66.32)	
None	18 (6.45)	36 (10.78)		13 (2.49)	29 (7.75)		4 (2.32)	7 (7.36)	
Chemotherapy Timing									
Adjuvant	32 (14.75)	25 (10.29)	P=0.02	61 (14.73)	49 (16.5)	P<0.001	36 (24.32)	29 (32.95)	P=0.006
Neoadjuvant	100 (46.08)	132 (54.32)		197 (47.58)	130 (43.77)		56 (37.84)	31 (35.23)	
Both	67 (30.88)	53 (21.81)		144 (34.78)	87 (29.29)		49 (33.11)	15 (17.05)	
None	18 (8.29)	33 (13.58)		12 (2.9)	31 (10.44)		7 (4.73)	13 (14.77)	

Table 1: Propensity matched EO and LO groups, demonstrating significant difference in treatment regimens by stage.

SHORT-TERM OUTCOMES OF TOTAL NEOADJUVANT TREATMENT (TNT) FOR MRI STRATIFIED HIGH-RISK RECTAL CANCER: A SINGLE-CENTER, SINGLE ARM, PROSPECTIVE PHASE II TRIAL.

QS305

P. Chen, L. Wang, T. Sun, A. Wu
Beijing, China

Purpose/Background: To analyze the short-term outcomes of total neoadjuvant treatment(TNT)for MRI stratified high-risk rectal cancer

Methods/Interventions: From Aug 2017 to Aug 2018, a total of 81 MRI stratified high-risk rectal cancer patients (anycT3c/3d/T4a/T4b or cN2 or MRF+ or EMVI+) were prospectively recruited in this trial. All patients received 24 weeks of neoadjuvant induction chemotherapy (3 cycles of oxaliplatine plus capetitabine, CAPEOX) + radiochemotherapy (Cape-IMRT, 50.6Gy/23f) + consolidation chemotherapy (2 cycles of oxaliplatine plus capetitabine, CAPEOX), followed by radical resection or a strategy of watch and wait (W&W) after re-evaluation. The short outcomes of surgery and W&W analyzed.

Results/Outcome(s): Finally, 66 patients were eligible for analysis. Sixteen patients had Grade 3 toxicity (fatigue, thrombocytopenia, leukopenia, vomitting and diarrhea) and five patients had grade 4 toxicity (thrombocytopenia, leukopenia and allergy). Ten patients with clinical complete response (cCR) enter into the W&W, including one received salvage addomnoperineal resection for local regrowth. Five patients had distant metastasis after TNT and received palliative chemotherapy thereafter. Fifty-one patients received surgical resection of primary tumor, including 10(19.6%) pCR, 14(27.5%) ypStage I, 13 (25.5%) ypStage II and 14(27.5%) ypStage III, respectively. The postoperative 30-d morbidity and mortality rate were 9.8% and 0% in the whole group.

Conclusions/Discussion: Using the TNT consist of IMRT plus induction/consolidation CAPEOX for high risk locally advanced rectal cancer achieves good tumor downstaging effect with tolerable toxicity and postoperative complications.(clinicaltrial.gov NCT: 02864849)

UPFRONT SYSTEMIC CHEMOTHERAPY AND SHORT-COURSE RADIOTHERAPY WITH DELAYED SURGERY FOR LOCALLY ADVANCED RECTAL CANCER WITH LIVER ONLY METASTASES.

QS306

H. Bae, N. Kim
Seoul, Korea (the Republic of)

Purpose/Background: Optimal treatment for locally advanced rectal cancer (LARC) with distant metastasis has been a challenge issue and remains a dilemma and controversial. Liver first approach; induction systemic chemotherapy followed by liver resection and preoperative chemoradiation followed by total mesorectal excision has been proposed by European countries. We previously reported preliminary results from phase II single arm study (NCT 01269229). In this study, we added historical data to the patient group of the previous study. The aim of this study was to evaluate a safety and the efficacy of upfront systemic chemotherapy followed by short course radiotherapy (SCRT) and delayed surgery in patients with locally advanced rectal cancer and liver-only metastases as well as oncologic outcomes.

Methods/Interventions: 45 LARC patients (cT4 or cT3, <2 mm from the mesorectal fascia) with synchronous metastatic only liver disease who underwent upfront chemotherapy and SCRT with delayed surgery between January 2010 and June 2017 were reviewed retrospectively. SCRT was administered to patients between chemotherapy cycles. All primary and metastatic liver lesions were resected simultaneously with curative intent (Liver metastatectomy and total mesorectal excision). At first, upfront systemic chemotherapy with 4cycles of FOLFOX or FOLFIRI followed by SCRT (5 Gy for 5 days, total 25Gy) was performed. Thereafter restaging, surgical treatment only or additional chemotherapy followed surgery was done. Above treatment protocol and all treatment decision was proceeded based on multidisciplinary team meeting.

Results/Outcome(s): The median patient age was 59 years (range 34-73). At the time of initial diagnosis, 64.4% of patients had liver metastases less than 4, and 35.6% of patients had more than 4 liver metastases. 23 patients (51.1%) were confined to hemi-liver and 22 patients (48.9%) had bilobar liver metastasis. Median treatment duration from diagnosis to surgery was 5.4 months. R0 resection of rectal lesions was achieved in 40 patients (88.9%). Negative liver resection margin was obtained in 43 patients (95.6%). The ypCR rate was 15.6% and sphincter saving rate was 95.6%. Postoperative complication (≥Clavian-dindo GIII) were noted in 6 patients (13.3%). Median follow up time was 29months (range, 3 – 96months). The 3-year OS was 66% and the 3-year PFS rate was 24.8%. On multivariate analysis, number of metastatic lever lesion (≤4) and R0 status of liver were independent prognostic factors for OS (p=0.034, p=0.013).

Conclusions/Discussion: Upfront chemotherapy and SCRT with delayed surgery are an effective alternative treatment for LARC with liver metastasis, in that it can control both systemic and local disease despite of the long duration. This study has shown that this treatment modality is comparable to other treatments for get R0 resection in locally advanced rectal cancer and liver metastasis.

COMPARISON OF NEOADJUVANT SHORT-COURSE RADIOTHERAPY WITH PROLONGED INTERVAL TO SURGERY VERSUS LONG-COURSE CHEMORADIATION FOR LOCALLY ADVANCED RECTAL ADENOCARCINOMA.

QS307

H. AlQattan, N. Alhassan, N. Kopek, P. Charlebois, B. Stein, A. Liberman, S. Faria, L. Lee
Montreal, QC, Canada

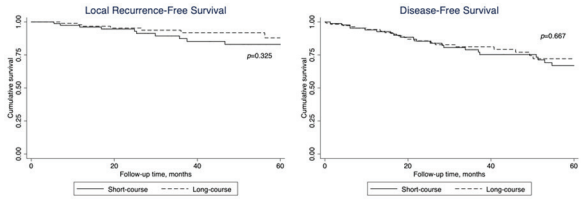
Purpose/Background: Neoadjuvant radiotherapy reduces local recurrence for rectal cancer, but the optimal protocol remains controversial. Short-course (SC) radiotherapy with prolonged interval is an emerging option. We aimed to compare outcomes between neoadjuvant SC and long-course (LC) chemoradiation for locally advanced rectal cancer.

Methods/Interventions: All patients with primary non-metastatic locally advanced rectal adenocarcinoma (cT3-4, cN+) receiving neoadjuvant (chemo)radiotherapy and total mesorectal excision (TME) at a single centre from 2009-2018 were reviewed. Patients were divided into SC (25 Gy total in 5 fractions with 8 week or longer interval to surgery) or LC (45 Gy or more in 25 or more fractions with concurrent chemotherapy with 8 week or longer interval to surgery). The main outcome measures were resection quality (defined as TME grade), anastomotic leak, and recurrence-free survival. Subgroup analyses for patients with preoperative threatened or involved circumferential resection margin (CRM) were performed.

Results/Outcome(s): A total of 212 patients were included (97 SC, 115 LC). Mean follow-up time was 37.4 months (SD28.3) and overall local recurrence rate was 8%. Mean interval to surgery was similar between groups (LC 14.7 weeks (SD14.3) vs. SC 12.2 weeks (SD13.5), $p=0.195$). Tumor height, abdominoperineal excision and adjuvant chemotherapy rates were similar, but LC had more patients with preoperative involved CRM (49% vs. 30%,

p<0.001). Resection quality (CRM involvement: LC 4% vs. SC 9%, p=0.180 and incomplete TME grade: LC 13% vs. SC 11%, p=0.683) and leak rates (LC 13% vs. SC 13%, p=0.935) were similar between groups. Cumulative 5-year local recurrence-free (LC 88% vs. SC 83%, p=0.325) and overall disease-free (72% vs. 67%, p=667) survival were similar (Figure). In patients with preoperative involved CRM, both local recurrence-free (p=0.809) and disease-free (p=0.863) survival were comparable between LC and SC groups.

Conclusions/Discussion: Neoadjuvant SC radiotherapy with prolonged interval to surgery may be a viable option for locally advanced rectal adenocarcinoma, especially if the preoperative CRM is not involved. Future studies should investigate cost implications and patient treatment preferences for neoadjuvant SC radiotherapy.



DOES TOTAL NEOADJUVANT CHEMORADIOTHERAPY IMPROVE PATHOLOGIC DOWNSTAGING COMPARED TO STANDARD PREOPERATIVE CHEMORADIOTHERAPY IN LOCALLY ADVANCE RECTAL CANCER?

QS308

K. Kelly-Schuette, M. Khan, M. Luchtefeld, J. Ogilvie
Grand Rapids, MI

Purpose/Background: Metastatic disease remains the leading cause of death in rectal cancer patients and there is increasing interest in treating patients upfront with systemic therapy as opposed to waiting until after the primary lesion has been treated with radiation and surgery. In 2017 our multispecialty tumor board began treating locally advanced rectal cancers with total neoadjuvant chemoradiotherapy (TNT) consisting of 6 months of FOLFOX followed by long-course radiation therapy. Our aim was to compare the traditional neoadjuvant chemoradiotherapy (TRAD) with TNT for surgical and oncologic outcomes at a community-based center.

Methods/Interventions: This is a retrospective review of consecutive patients undergoing treatment for rectal cancer between January 2015 to December 2018. All patients treated with TNT were compared to a cohort of TRAD treated patients. We collected demographic and staging data with a primary endpoint of pathologic response after surgery.

Results/Outcome(s): A total of 321 patients with rectal cancer were identified within the institutional cancer registry. Patients presenting with metastatic disease, who received no neoadjuvant therapy, or no surgery were excluded. This included 6/29 from the TNT group that had a "watch and wait" surveillance approach, leaving 23 patients for final analysis. In comparison the TRAD group had 4/59 (21% vs. 7%, p=0.15) excluded for "watch and wait". There were no statistically significant differences between groups in terms of demographics. Surgically, groups had similar rates of robotic resections (56% vs. 50%, p=0.99), conversion rates (4% vs. 5%, p=0.82), diverting ileostomy formation (65% vs. 78%, p=0.23) and postoperative complications (61% vs 45%, p=0.21). Time to ileostomy reversal was less in the TNT group (2.7 vs. 5.5 months, p<0.001). Pretreatment MRI favored more advanced T and N staging in the TNT group(T2/T3/T4; 0/65/35% vs 20/64/16%, p=0.03 and N0/N1/N2; 4/35/61% vs. 22/50/28%, p=0.02). There was no difference in final pathologic staging between groups (T0/T1-2/T3-4; 9/26/65% vs 13/36/51%, p=0.51 and N0/N1/N2-3; 43/39/17% vs. 62/31/7%, p=0.23). The complete pathologic response rate was 8.7% in TNT group and 10.9 % in TRAD group(p=0.33). Recurrence rates between groups were not different (26% vs 24%, p=0.82) and median follow-up for both groups was 25 months.

Conclusions/Discussion: Despite the inherent limitations of this retrospective study, our findings suggest that among those who underwent surgery after TNT or TRAD for locally advance rectal cancer there were similar complete pathologic response rates, although more patients in the TNT group were initially managed with "watch and wait". Both groups had comparable perioperative and short-term oncologic outcomes, while TNT patients had less time with an ileostomy. Ultimately, longer follow-up will be necessary to adequately compare disease free survival.

Staging Characteristics	TNT %(n)	TRAD %(n)
Pre-treatment MRI T Staging		
T2	0	20 (11)
T3	65.2(15)	63.6 (35)
T4	34.8 (8)	16.4 (9)
Pre-Treatment MRI N Staging		
N0	4.4 (1)	21.8 (12)
N1	34.8 (8)	49.1 (27)
N2	60.9 (14)	27.3 (15)
R0 Resection	82.6 (19)	94.6 (52)
Pathologic Staging		
CR	8.7 (2)	10.9 (6)
I/II	34.8 (8)	50.9 (28)
III/IV	56.6 (13)	38.2 (21)

TREATMENT FOR POSTOPERATIVE CRM-POSITIVE RECTAL CANCER - CHEMOTHERAPY OR RADIOTHERAPY?

QS309

E. Chen, Z. Song
Hangzhou, China

Purpose/Background: The most benefit of therapeutic methods for postoperative CRM-positive rectal cancer remains unclear. This population-based propensity matching study aimed to compare long-term oncological outcomes of postoperative CRM-positive rectal cancer with or without additional radiotherapy or/and chemotherapy.

Methods/Interventions: A total of 709 Patients diagnosed with postoperative CRM-positive rectal cancer were included between 2010 and 2015. Survival curves were plotted using the Kaplan–Meier method. Overall survival (OS) and Cancer-specific survival (CSS) were compared using adjusted hazard ratios (HRs) based on stratification analysis of the postoperative therapeutic method. A nomogram analysis was used to find relevant factors that influence the long-term oncological outcomes.

Results/Outcome(s): After the propensity score matching procedure, patients with postoperative CRM-positive rectal cancer have significant worse OS and CSS than those with CRM-negative (Both P<0.001). Multivariate analysis for survival outcomes in those patients indicates that post-chemotherapy (OS, P <0.001; CSS, P<0.001) but not radiotherapy (OS, P <0.260; CSS, P<0.227) is enough beneficial to improving survival outcomes. Moreover, stratification multivariate analysis suggests that a similar discovery is made to support the results whatever in Stage II/III or in Stage IV. The nomogram analysis the same as the multivariate analysis shows that post-chemotherapy but not radiotherapy plays a major role in the long-term oncological outcomes.

Conclusions/Discussion: There is no evidence that postoperative CRM-positive rectal cancer patients benefit from additional radiotherapy in the term of long oncological outcomes. These findings supported the clinical application of chemotherapy but not additional postoperative radiotherapy for postoperative CRM-positive in rectal cancer patients.

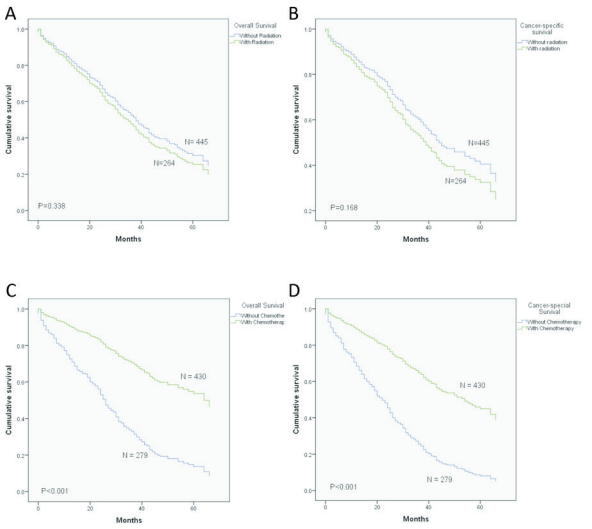


Figure 1: The adjusted survival analysis showed that chemotherapy but not radiotherapy improved survival both in OS and CSS.

IMPACT OF BMI ON RECTAL CANCER RESECTION CONVERSION RATES FOR LAPAROSCOPIC AND ROBOTIC SURGERY: ANALYSIS OF MULTI-CENTER NSQIP DATABASE.

QS310

V. Lyuksemburg, J. Abou Hanna, E. Stroumpi, Y. Wang, S. Tsoraides
Peoria, IL

Purpose/Background: Obesity contributes to increased surgical difficulty, especially in patients with rectal cancer. Intraoperative complications can lead to increased operative morbidity, which is associated with worse oncologic outcomes. Minimally invasive surgery (MIS) for rectal cancer is a subject of ongoing debate, however the potential benefits are not. While MIS is becoming more widely employed for rectal cancer surgery, there remains high rates of conversion to open laparotomy. Overall conversion rates of 15-29% in colorectal surgery have been demonstrated in multiple series, particularly with laparoscopic surgery in obese patients. The goal of this study is to delineate the impact of BMI on conversion rates with laparoscopic and robotic surgery for rectal cancer.

Methods/Interventions: Individuals who underwent resection for rectal cancer were identified from January 1, 2006 to December 31, 2017, using the American College of Surgeons National Surgical Quality Improvement Project (ACS-NSQIP) database. Only patients with malignant neoplasms of the rectum (ICD diagnosis code 154.1) were included. Patients were stratified into five body mass index (BMI) categories: underweight (<18.5 kg/m^2), normal (18.5-24.9 kg/m^2), overweight (25-29.9 kg/m^2), obese I (30-34.9 kg/m^2), obese II (35-39.9 kg/m^2), and obese III (>40 kg/m^2). Primary outcome was unplanned conversion from MIS (laparoscopic and robotic) to open surgery.

Results/Outcome(s): A total of 8158 patients underwent MIS resection for rectal cancer between 2006 to 2017, of which 5690 (69.7%) were laparoscopic and 2468 (30.3%) were robotic. Breakdown of weight group for laparoscopic and robotic surgery, respectively, included: 134 (2.4%) and 45 (1.8%) underweight, 1744 (30.7%) and 762 (30.9%) normal, 2033 (35.7%) and 843 (34.2%) overweight, 1111 (19.5%) and 500 (20.3%) obese I, 425 (7.5%) and 210 (8.5%) obese II, as well as 243 (4.3%) and 108 (4.4%) obese III. Unplanned conversion rates were higher with increasing BMI for both procedures (**Table 1**). Rates of conversion to open procedure were higher in the laparoscopic group for normal weight (9.4 vs. 2.9%), overweight (11.6 vs. 4.4%), obese I (15.7 vs. 6.2%), and obese II (20.7 vs.10%) ($p<0.001$), but not statistically significant for underweight ($p=0.064$) and obese III ($p=0.132$). Hypertension, diabetes mellitus, and dyspnea with moderate exertion increased with BMI ($p<0.001$) as expected.

Conclusions/Discussion: NSQIP data reveals that robotic rectal cancer surgery results in lower rates of conversion to open surgery for most normal weight and obese patients compared to the laparoscopic approach. Moreover, majority of patients undergoing MIS rectal cancer resection are either overweight or obese, with just under one third being of normal weight. As majority of MIS resections are performed with laparoscopic approach, this data should be taken into consideration when planning rectal cancer resection.

		Laparoscopic	Robotic	p-value
Underweight (<18.5 kg/m²)	Total	134	45	
	Unplanned Conversion to Open (%)	20 (14.9)	2 (4.4)	0.064
Normal (18.5-24.9 kg/m²)	Total	1744	762	
	Unplanned Conversion to Open (%)	164 (9.4)	22 (2.9)	**<0.001**
Overweight (25-29.9 kg/m²)	Total	2033	843	
	Unplanned Conversion to Open (%)	235 (11.6)	37 (4.4)	**<0.001**
Obese I (30-34.9 kg/m²)	Total	1111	500	
	Unplanned Conversion to Open (%)	174 (15.7)	31 (6.2)	**<0.001**
Obese II (35-39.9 kg/m²)	Total	425	210	
	Unplanned Conversion to Open (%)	88 (20.7)	21 (10)	**<0.001**
Obese III (>40 kg/m²)	Total	243	108	
	Unplanned Conversion to Open (%)	68 (28)	22 (20.4)	0.132

Conversion Rates from Minimally Invasive to Laparotomy by Obesity Class

THE EFFECT OF BODY MASS INDEX (BMI) ON THE CREATION OF AN END-COLOSTOMY IN RECTAL CANCER PATIENTS.

QS311

A. Grimes, K. Stewart, T. Garwe, Z. Sarwar, S. Carter, K. Booth, G. Dunn, L. Fischer
Oklahoma City, OK

Purpose/Background: With the increasing prevalence of obesity, there has also been a parallel increase in the incidence of colon and rectal cancer. There is a paucity of literature describing the association of body mass index (BMI) and end-colostomy creation versus primary anastomosis in patients undergoing proctectomy for rectal cancer. The primary objective of this study was to evaluate whether BMI is associated with the formation of an end-colostomy in rectal cancer patients to better identify patients unlikely to undergo primary anastomosis and improve peri-operative counseling

Methods/Interventions: This is a retrospective study of patients with rectal cancer from 2012-2018 who underwent a proctectomy with either primary anastomosis or creation of an end-colostomy. Data were collected from the National Surgical Quality Improvement Project (NSQIP). Patients included had an ICD 9 or ICD 10 diagnosis code of rectal or rectosigmoid malignancy and underwent a transabdominal or minimally invasive proctectomy based on appropriate CPT codes. Abdominoperineal resection was excluded. Multivariable logistic regression analysis was used to assess whether BMI is associated with creation of an end-colostomy after adjustment for multiple covariate factors.

Results/Outcome(s): 17,864 patients were identified as having proctectomy procedures for rectal or rectosigmoid malignancy. Among these, 16,446 (92.1%) underwent primary anastomosis and 1,418 (7.9%) underwent the creation of an end-colostomy. In comparing BMI to surgical procedure type, an overweight BMI (25-29.9) had the largest number of patients, but was least likely to have an end-colostomy (Reference Group). Patients with severe obesity (BMI 50+) had an adjusted odds ratio for undergoing an end-colostomy of 2.7 (95% CI 1.5-4.7) when compared to the reference group (Table 1). Other factors associated with an increased risk of end-colostomy formation were BMI of < 18.5, emergency procedures, partial or totally dependent functional status, having >10% weight loss, and having disseminated cancer.

Conclusions/Discussion: Using a large, national dataset we identified factors associated with increased odds of end-colostomy among patients undergoing proctectomy for a rectal malignancy. Patients with severe obesity (BMI 50+) have an increased odds of an end-colostomy likely due to the technical difficulties of creating a tension-free primary anastomosis. Patients who have a BMI of 50+ should be counseled regarding the likelihood

of an end-colostomy and may benefit from consideration of medical weight management or weight-loss surgery in conjunction with ongoing cancer treatment.

Table 1. Independent Predictors of End-Ostomy Among Rectal Surgery Patients

Effect	Odds Ratio, (95% CI)	p-value
BMI Categories		
BMI 25-29.9	*Reference*	
BMI<18.5	2.8 (2.1 - 3.7)	**<0.0001**
BMI 18.5-24.9	1.3 (1.1 – 1.5)	**0.0005**
BMI 30-39.9	1.2 (1.1 – 1.4)	**0.0081**
BMI 40-49.9	1.3 (1.0 – 1.8)	0.0759
BMI 50 +	2.7 (1.5 – 4.7)	**0.0007**
Age 65 or older	2.1 (1.9 – 2.4)	**<0.0001**
Emergency Procedure	18.5 (14.0 – 24.5)	**<0.0001**
Partial or Total Functional Dependence	4.2 (3.2 – 5.5)	**<0.0001**
Disseminated Cancer	2.8 (2.5 -3.3)	**<0.0001**
>10% Weight Loss 6 Months Prior	2.6 (2.2 – 3.2)	**<0.0001**

AUC 0.73 (95% CI 0.71-0.74), Hosmer-Lemeshow GOF p-value, 0.06

UTILITY OF SARCOPENIA, AS ASSESSED ON COMPUTED TOMOGRAPHY, AS A PREDICTIVE FACTOR FOR CURATIVE RECTAL CANCER RESECTION OUTCOMES: AN AUSTRALIAN COHORT.

QS312

V. Chai, A. Cocco, M. Chia, M. Bhamidipaty, B. D'Souza
Melbourne, VIC, Australia

Purpose/Background: The presence of cachexia and sarcopenia have been shown to correlate to poorer short and long term surgical and oncological outcomes. Dedicated body composition scans are not a part of routine investigation of rectal cancer while computed tomography (CT) derived body composition is a readily available substitute. We hypothesised that sarcopenia, as assessed on routine pre-operative CT, can be used as a readily available predictive factor for outcomes in patients undergoing curative resection for colorectal cancer.

Methods/Interventions: The study population included all consecutive cases of curative rectal cancer resection at a single tertiary referral centre between 2014-2019. Patients who had previous or concurrent malignancy, metastatic disease or irretrievable pre-operative CT scans were excluded. Data was collected from the perioperative period as well as within a 30 day and 1-year follow-up timeframe. Skeletal muscle area was assessed on pre-operative CT images at the third lumbar vertebra level and standardised for individual height to determine skeletal muscle index (SMI). Sarcopenia was defined by SMI cut-offs established by Prado et al. Patient characteristics, staging criteria and perioperative data was collected, including measures of perioperative risk. Associations were determined by univariate analysis using Pearson's Chi-square and by multivariate analysis using binary logistic regression with prespecified models accounting for age, gender, admission type, CCI score, cancer stage, albumin, operative access type, BMI and anatomical resection site. Primary outcomes assessed included any post-operative complication, severe complications assessed by Clavien-Dindo score (CD) >2, anastomotic leak and both disease-free and overall survival.

Results/Outcome(s): A total of 67 patients underwent rectal cancer resection between 2014-2019 and met inclusion criteria. Mean SMI was 41.0 cm2/m2 for males and 35.0 cm2/m2 for females, with 61/67 (91%) sarcopenic. Sarcopenia was significantly associated with postoperative complications (OR 3.95, p=0.047) with a numerical trend towards severe complications (0% vs 21.3%), cardiac complications (0% vs 19.6%) and requirement for transfusion (0% vs 16.4%). In the prespecified binary logistic regression model decreased SMI was found to be predictive of experiencing a post-operative complication (OR=0.89, P=0.016). For each unit decrease in SMI, patients were 11.4% more likely to experience a post-operative complication. There were no associations with anastomotic leak or disease-free survival at 1 year.

Conclusions/Discussion: The presence of pre-operative sarcopenia and lower muscle mass is independently associated with greater perioperative morbidity. CT measures of sarcopenia may provide an easily accessible predictive tool for curative rectal cancer resection outcomes and aid in addressing this modifiable patient factor.

QS312

Variable	Odds ratio (95%CI)	P value
Skeletal muscle index	0.87 (0.80-0.98)	0.016
Age	1.02 (0.97-1.08)	0.362
Gender	2.80 (0.31-25.22)	0.358
BMI	0.98 (0.85-1.13)	0.763
Elective vs emergency admission	0.15 (0.01-1.72)	0.126
CCI score	0.98 (0.73-1.31)	0.890
Preoperative albumin	1.06 (0.91-1.24)	0.454
Cancer Stage	0.52 (0.14-1.93)	0.324
Laparoscopic vs open procedure	0.72 (0.07-7.07)	0.776

Binary Logistic Regression Model of prespecified demographic, oncological, operative and perioperative variables vs post-operative complications

A COMPARISON OF PATIENT-REPORTED QUALITY OF LIFE AND FUNCTIONAL OUTCOMES AFTER LAPAROSCOPIC VERSUS TRANSANAL TOTAL MESORECTAL EXCISION FOR RECTAL CANCER.

QS313

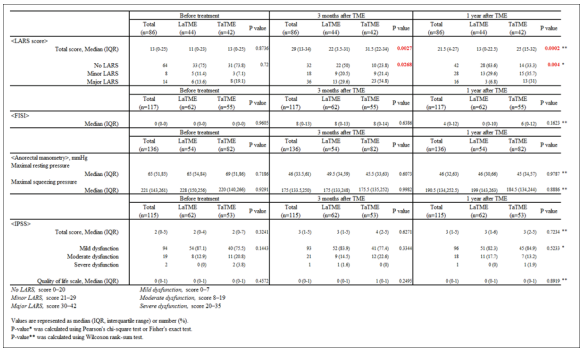
R. Ha, J. Oh, D. Sohn
Goyang-si, Korea (the Republic of)

Purpose/Background: Transanal total mesorectal excision (TaTME) has been proposed to overcome the technical difficulties of low rectal cancer surgery. A wide range of symptoms affecting quality of life (QoL) can occur after rectal cancer surgery, however, few studies evaluated QoL and functional outcomes after TaTME. This study focused on QoL and functional outcomes, including bowel and anorectal function and urogenital function, after TaTME compared to laparoscopic TME (LaTME).

Methods/Interventions: The study was based on the propensity score matched 202 patient pairs who underwent rectal cancer surgery between January 2014 and December 2017 in National Cancer Center, Korea. Covariates included age, tumor distance from the anal verge, primary tumor size, neoadjuvant chemoradiotherapy and lateral lymph node dissection. QoL and functional outcomes were assessed using anorectal manometry and the questionnaires, including European Organization for Research and Treatment of Cancer (EORTC) QLQ-C30 and QLQ-CR38, Low Anterior Resection Syndrome (LARS) score, Fecal Incontinence Severity Index (FISI), International Prostate Symptom Score (IPSS) for all the patients and the 5-item version of the International Index of Erectile Function questionnaire (IIEF-5) for male patients. We included patients with all the assessments before treatment and at 3 months and 1 year after TME for each evaluation. We excluded those who failed to reverse a stoma from the analysis of bowel and anorectal function.

Results/Outcome(s): Both groups were comparable in terms of age, sex, BMI, ASA score, tumor distance from the anal verge, tumor size, tumor stage and median follow-up. Only a diverting ileostomy was created significantly more in TaTME (83.2% vs. 74.8% in LaTME, p=0.038). The results of at least 86 patients were available at all 3 times for each evaluation except IIEF-5. The EORTC QLQ-C30 and QLQ-CR38 questionnaires showed comparable outcomes in terms of QoL between the groups before treatment and at 3 months and 1 year. Despite comparable results of FISI and anorectal manometry between the groups before treatment and at 3 months and 1 year, more patients suffered from major LARS in TaTME at 3 months (54.8% vs. 29.6% in LaTME, p=0.0268) and 1 year (31% vs. 6.8% in LaTME, p=0.004). More patients experienced moderate or severe urinary dysfunction in LaTME at 1 year (17.7% vs. 15.1% in TaTME, p=0.5233), not reaching statistical significance. Only 1.9% of male patients reporting sexual activity, IIEF-5 could not be analyzed.

Conclusions/Discussion: TaTME showed comparable overall QoL and anorectal and urinary function compared to LaTME. TaTME might be associated with worse LARS. Large prospective studies with long-term follow-up are required to clarify the functional outcomes of TaTME.



	Before treatment				3 months after TME				1 year after TME			
	Total (n=86)	LaTME (n=44)	TaTME (n=42)	P value	Total (n=86)	LaTME (n=44)	TaTME (n=42)	P value	Total (n=86)	LaTME (n=44)	TaTME (n=42)	P value
<LARS score>												
Total score, Median (IQR)	13 (9-23)	11 (9-20)	15 (9-25)	0.0736	29 (13-34)	22 (13-31)	31.5 (22-34)	0.0027*	21.5 (9-27)	13 (9-22.5)	25 (15-32)	0.0092 **
No LARS	64	33 (75)	31 (73.8)	0.72	32	21 (50)	10 (23.8)	0.0268	42	28 (63.6)	14 (33.3)	0.004 *
Minor LARS	9	5 (11.4)	3 (7.1)		18	9 (20.5)	9 (21.4)		18	11 (25.0)	15 (35.7)	
Major LARS	14	6 (13.6)	8 (19.1)		36	13 (29.6)	23 (54.8)		16	5 (11.4)	13 (31)	
	Before treatment				3 months after TME				1 year after TME			
	Total (n=117)	LaTME (n=62)	TaTME (n=55)	P value	Total (n=117)	LaTME (n=62)	TaTME (n=55)	P value	Total (n=117)	LaTME (n=62)	TaTME (n=55)	P value
<FISI>												
Median (IQR)	0 (0-3)	0 (0-4)	0 (0-3)	0.9693	0 (0-13)	0 (0-13)	0 (0-14)	0.8386	4 (0-12)	0 (0-10)	6 (0-12)	0.1823 **
	Before treatment				3 months after TME				1 year after TME			
	Total (n=136)	LaTME (n=54)	TaTME (n=82)	P value	Total (n=136)	LaTME (n=54)	TaTME (n=82)	P value	Total (n=136)	LaTME (n=54)	TaTME (n=82)	P value
<Anorectal manometry>, mmHg												
Maximal resting pressure												
Median (IQR)	65 (51.85)	65 (54.84)	69 (51.88)	0.7184	68 (53.5,81)	69.5 (54,79)	67.5 (53,83)	0.8071	68 (52,83)	66 (50,68)	67 (54,77)	0.9787 **
Maximal squeezing pressure												
Median (IQR)	221 (163,261)	238 (170,258)	220 (140,266)	0.9291	171 (131.5,250)	175 (131,248)	173.5 (135,252)	0.9982	180.5 (134,252.5)	199 (143,260)	184.5 (134,244)	0.8886 **
	Before treatment				3 months after TME				1 year after TME			
	Total (n=115)	LaTME (n=62)	TaTME (n=53)	P value	Total (n=115)	LaTME (n=62)	TaTME (n=53)	P value	Total (n=115)	LaTME (n=62)	TaTME (n=53)	P value
<IPSS>												
Total score, Median (IQR)	3 (0-5)	2 (0-4)	2 (0-7)	0.3241	3 (1-5)	3 (1-5)	4 (2-5)	0.8271	3 (1-5)	3 (1-6)	3 (2-5)	0.7234 **
Mild dysfunction	94	54 (87.1)	40 (75.5)	0.1443	93	52 (83.9)	41 (77.4)	0.3344	96	51 (82.3)	45 (84.9)	0.5233 *
Moderate dysfunction	19	8 (12.9)	11 (20.8)		21	9 (14.5)	12 (22.6)		18	11 (17.7)	7 (13.2)	
Severe dysfunction	2	0 (0)	2 (3.8)		1	1 (1.6)	0 (0)		1	0 (0)	1 (1.9)	
Quality of life scale, Median (IQR)	0 (0-1)	0 (0-1)	0 (0-1)	0.4572	0 (0-1)	0 (0-1)	1 (0-1)	0.2495	0 (0-1)	0 (0-1)	0 (0-1)	0.8919 **

No LARS, score 0-20 *Mild dysfunction*, score 0-7
Minor LARS, score 21-29 *Moderate dysfunction*, score 8-19
Major LARS, score 30-42 *Severe dysfunction*, score 20-35

Values are represented as median (IQR, interquartile range) or number (%).
P-value* was calculated using Pearson's chi-square test or Fisher's exact test.
P-value** was calculated using Wilcoxon rank-sum test.

IMPACT OF THE TYPE OF SURGERY AND PREOPERATIVE CHEMORADIOTHERAPY ON BOWEL FUNCTION AFTER SPHINCTER-PRESERVING SURGERY FOR RECTAL CANCER: A SINGLE-CENTER LONGITUDINAL OBSERVATIONAL STUDY.

QS314

A. Sakr[2], J. Kang[1], S. Yang[1], Y. Han[1], M. Cho[1], H. Hur[1], B. Min[1], K. Lee[1], N. Kim[1]
[1]*Seoul, Korea (the Republic of);* [2]*Mansoura, Egypt*

Purpose/Background: With advances in preoperative chemoradiation (pCRT), rates of sphincter preserving surgeries (SPS) have been increased in patients with rectal cancer. However, in many patients, postoperative bowel dysfunction negatively affects the quality of life. This study aimed to investigate the changes in bowel function with follow up time and to analyze the predictors of bowel dysfunction after SPS for rectal cancer according to type of surgery and preoperative chemoradiation therapy.

Methods/Interventions: Retrospective longitudinal study, including 345 rectal cancer patients from December 2010 to March 2019, who underwent SPS. Bowel function was assessed with the Memorial Sloan Kettering Cancer Center Bowel Function Instrument (MSKCC BFI) and Wexner score every 6 months after restoration of bowel continuity. All the assessments were conducted face-to-face by specialized nurse. Patients who were assessed at least twice were included. Patients were categorized into 2 groups: radiation and non- radiation group.

Results/Outcome(s): The radiation group included 241 patients, while those who didn't receive pCRT were 104 patients. Radiation group patients had more covering ileostomy, their tumors were nearer to the anal verge than non-radiation group patients (P<0.001). While, the non-radiation group patients received low anterior resection (LAR), and stapled anastomosis more than radiation group

(P=0.001). Concerning the bowel function, when we classified patients according to surgical technique (LAR vs ULAR±ISR); bowel dysfunction and fecal incontinence (FI) were noted within the 1st one year follow up in the ULAR±ISR group in comparison to the LAR group. After two years of follow up, another significant bowel dysfunction and FI were found in the ULAR±ISR group because of receiving more pCRT and this was confirmed when we compared the radiation and non- radiation groups. The radiation group showed more tendency to urgency, soilage and higher Wexner score. When we conducted univariate and multivariate analysis for risk factors associated with early bowel dysfunction (MSKCC score), we found that old age and ULAR±ISR technique with protective ileostomy were the risk factors. Whereas, pCRT, male gender, were risk factors for delayed FI (Wexner score).

Conclusions/Discussion: The impact of surgery (ULAR±ISR) on bowel function was noticed during early postoperative follow up period(1st 1 year). After 1year, bowel function tends to be more stabilized. However, receiving pCRT is significantly associated with delayed FI (>2years). Hence, careful selection and discussion with patients is mandatory.

URINARY CATHETER MANAGEMENT AFTER COLOVESICAL FISTULA REPAIR: A SURVEY OF US COLORECTAL SURGEONS.

QS320

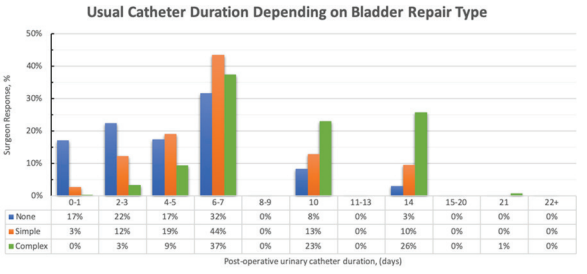
D. Meyer, S. Hill, P. Monahan, A. Resnick, J. Davids, J. Maykel, P. Sturrock, K. Alavi
Worcester, MA

Purpose/Background: Bladder management varies following colovesical fistula (CVF) repair including the role for intra-operative and post-operative bladder leak testing and duration of postoperative bladder decompression. Only limited data exists and none report catheter removal before seven days post-operatively. We sought to better understand surgical practice patterns.

Methods/Interventions: An online survey was emailed to 1,380 board certified members of the American Society of Colon and Rectal Surgeons. Questions were related to the intra- and post-operative setting. Bladder repairs were classified as none, simple (single-layer) or complex (multiple-layers). Frequency of testing was defined as routine (>90% of cases), selective (10-90%), and rare (<10%). Early catheter removal was defined by removal in 3 days or less post-operatively.

Results/Outcome(s): There was a 23.4% (n = 323) surgeon response rate. Responses were evenly distributed between practice setting (academic vs. non-academic), years in practice (0-10, 11-20, vs. 20+ years) and region (Northeast, Midwest, South, West). Surgeons performed CVF repair at a median of 6 (IQR 5-10) procedures annually. Ureteral stents were routinely utilized by 24%, selectively by 44%, and rarely by 32% of surgeons. Intra-operative bladder leak testing was performed routinely by 13%, selectively by 25%, and rarely by 62% of surgeons. The mean (SD) catheter duration was different by bladder repair type: 5 (3) days for no bladder repair, 7 (3) for simple single-layer repair, and 9 (4) for complex multiple-layer repair, p<0.001. A post-operative bladder leak test was performed prior to catheter removal routinely by 44%, selectively by 30%, and rarely by 26% of surgeons. When pre-removal leak test is performed, 66% use fluoroscopic cystogram and 28% use CT cystogram. The proportion of surgeons who perform early catheter removal differed by type of bladder repair: 40% for no repair, 15% for simple single-layer repair, and 4% for complex multiple-layer repair, p<0.001. Stratified by bladder repair type, catheter duration and early removal did not vary by practice setting, years in practice, region, or use of pre-removal bladder leak test.

Conclusions/Discussion: This survey suggests that current bladder management following CVF repair depends on the type of bladder repair performed. Many surgeons remove the urinary catheter in 3 days or less, particularly in cases of none or simple bladder repair, but safety of early catheter removal has never been studied. We are using these data to design a prospective study to optimally manage urinary catheters following CVF repair, focusing on early catheter removal and the utility of leak testing.



IMPACT OF MEDICAID EXPANSION ON SIGMOIDECTOMY FOR PATIENTS WITH DIVERTICULITIS.

QS321

M. Lin[1], J. Hsieh[2], S. Chao[3]
[1]*Buffalo, NY;* [2]*Ames, IA;* [3]*Flushing, NY*

Purpose/Background: Recent healthcare reform with adoption of Medicaid expansion by many states in 2014 attempted to increase access to health services. To our knowledge, no studies have evaluated the impact of this expansion for patient outcomes as it pertains to diverticulitis. Sigmoidectomy is a surgical intervention for select cases of diverticulitis. We sought to determine how expanded health insurance coverage impacts surgical intervention for diverticulitis.

Methods/Interventions: We used the 2012-2016 National Inpatient Sample (NIS) database for this study, which represents data from 2 years prior to and 3 years after Medicaid expansion. We identified patients with diverticulitis with ICD-9-CM (2008-2015Q3) and ICD-10-CM (2015Q4-2016) diagnosis codes. Inclusion criteria were patients between ages 18-65, who had Medicaid or private insurance as the primary form of payment, and had received a sigmoidectomy during the same admission. Univariate analysis was performed to compare the Medicaid patients to the private insurance patients on 12 factors: age, sex, elective admission, Medicaid expansion, Medicaid adoption rate, race, income quartile, and 5 other medical factors. A total of 5 patient outcomes were measured with both univariate and multivariate analysis (logistic and linear regression).

Results/Outcome(s): From the NIS database, we identified 19,544 patients that met the selection criteria. We observed a significant increase ($p<0.05$) in the number of sigmoidectomies performed on Medicaid patients for the divisions that had either medium or high adoption of Medicaid expansion (Figure 1). All the patient factors examined were significantly different between the two insurance types, and thus were included in the multivariate analysis regression models. Logistic regression showed that private insurance group had lower rates for severe sepsis (aOR = 0.52, p-value < 0.001), septic shock (aOR = 0.57, p-value < 0.001), and in-hospital mortality (aOR = 0.52, p-value = 0.002) compared to the Medicaid group. Medicaid expansion also had a significant impact for rate of severe sepsis (aOR = 0.85, p = 0.049) and septic shock (aOR = 1.25, p = 0.012). Length of stay decreased with private insurance (-2 days, p < 0.001), Medicaid expansion (-1 day, p < 0.001), and medium or high Medicaid expansion adoption (-1 day, p = 0.002 or 0.001, respectively). Despite a decrease in the length of stay, there was increased cost associated with Medicaid expansion ($1,145, p < 0.001) and medium and high Medicaid expansion adoption ($3,225 and $4,571, p < 0.001, respectively).

Conclusions/Discussion: Our study showed that Medicaid expansion had significant impacts on the number of sigmoidectomies performed and the outcomes of surgical intervention for patients with diverticulitis. Hospitals in divisions that had low adoption rate of the Medicaid expansion did not follow the same trends as the hospitals in divisions that had medium and high adoption rate.

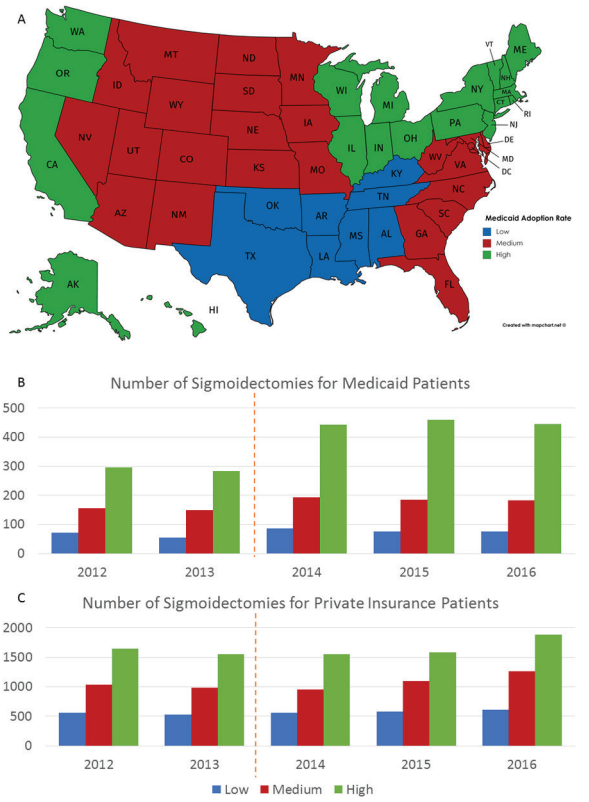


Figure 1. Number of sigmoidectomies performed during 2012-2016 for patients with diverticulitis. A) Adoption rates for divisions of the United States: low adoption (0-33% of states in division, blue), medium adoption (34-66%, red), and high adoption (67-100%, green). B) Patients with Medicaid as the primary form of payment. C) Patients with private insurance as the primary form of payment. The red dotted line indicates the adoption of Medicaid expansion. Significant increase ($p<0.05$) in cases was observed for both medium and high adoption divisions for the Medicaid patients after the expansion.

IMPACT OF THE ASCRS 2014 GUIDELINES FOR TREATMENT OF DIVERTICULITIS IN THE MANAGEMENT OF NON-EMERGENT SURGERY FOR DIVERTICULAR DISEASE: AN ACS NSQIP ANALYSIS.

QS322

A. Ore, B. Allar, A. Fabrizio, T. Cataldo, E. Messaris
Boston, MA

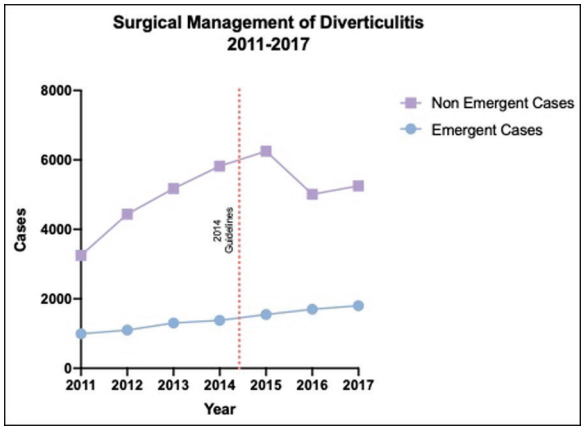
Purpose/Background: Due to rise in prevalence of diverticular disease, in 2014, the ASCRS developed practice parameters in order to improve and ensure high quality patient care. Non-emergent management of acute diverticulitis has evolved. Indications, timing and type of surgery have changed along with a better understanding of its pathophysiology. The aim of our study is to evaluate the impact of the 2014 guidelines on treatment of non-emergent sigmoid diverticulitis.

Methods/Interventions: A total of 5,302,529 patients were analyzed using the ACS NSQIP participant user files from 2011- 2017. Patients included in our analysis were

selected by ICD9/ICD10 respectively and categorized by year of procedure. Inclusion criteria included colectomy/colostomy procedures performed, excluding patients diagnosed with complicated diverticular disease, classified as emergent procedures, with a diagnosis of shock, disseminated malignancy or performed by other specialties. Our primary outcome was to analyze the trend in surgical intervention for non-emergent diverticulitis, along with assessing the impact of recommendations on surgical indications and technical considerations suggested (bowel preparation, ureteral stent use, surgery in patients less than 50 years of age).

Results/Outcome(s): 35,197 patients underwent non-emergent surgery for diverticular disease between 2011-2017 and 9,825 underwent emergent surgery (Figure 1). In 2011, 3,251 (9.2%) non-emergent procedures were performed, rising to 5,819 (16.5%)by 2014 and reaching 6,245 by 2015 (17.7%). We see a decrease in the number of non-emergent procedures to 14.2% and 14.9% in the following years (2016-2017). Rate of non-emergent surgery for patient under 50 years old also decreased significantly after 2014 (26.8% to 24.2%, $p<0.01$). Implementation of minimally invasive surgery (MIS) increased significantly throughout the years from 70% in 2011 reaching 80.7% in 2017. There was a decrease in reoperation rates from 4.1 to 3.5% along with a decrease in length of stay (4 days to 3 days, $p<0.01$). When analyzing the targeted colectomy data, we see a steady increase in the adoption of laparoscopic surgery along with the rising trend of robotic surgery, as well as a statistically significant increase in the use of mechanical and antibiotic bowel preparation.

Conclusions/Discussion: Publication of the 2014 ASCRS guidelines for management of diverticular disease has changed the management of diverticular disease in the non-emergent setting. There is a statistically significant impact of society guidelines in clinical practice, which encompasses a change in the indications for surgery, increased adoption of bowel preparation, and an increase in the use of minimally invasive techniques such as laparoscopic and robotic surgery.



Surgical Management of Diverticulitis 2011-2017

THE IMPACT OF SURGERY ON PATIENTS WITH DIVERTICULITIS: INVESTIGATING THE ROLE OF PATIENT-REPORTED OUTCOMES.

QS323

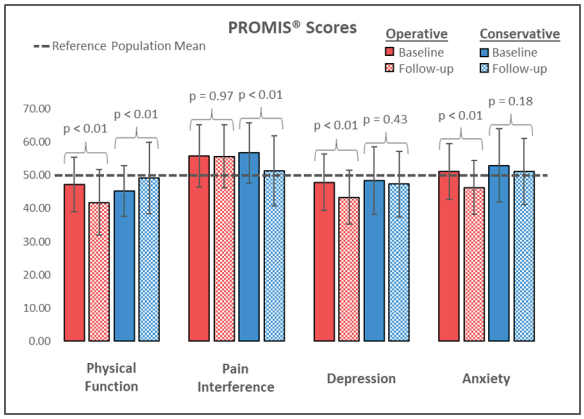
K. Rosen, S. Hsu, F. Fleming, C. Cellini, G. Poles, R. Salloum, J. Speranza, L. Temple
Rochester, NY

Purpose/Background: ASCRS Practice Parameters recommend individualizing recommendations for elective resection after uncomplicated diverticulitis by weighing the impact of diverticulitis on quality of life against medical comorbidities. Patient-reported outcomes (PROs) could be an important factor in decision-making, although PRO data are limited amongst patients with diverticulitis.

Methods/Interventions: Patients with diverticulitis who presented to the outpatient colorectal clinic during 2/2016-9/2019 and completed validated PROMIS measures [Physical Function (PF), Pain Interference (PI), Anxiety, and Depression] at two time points were included. Clinical characteristics were extracted from the electronic health record. Appropriate statistical analyses were performed to evaluate differences between treatments and trends over time.

Results/Outcome(s): Amongst the cohort of 80 patients (29 M, 51 F), there were no demographic differences between patients treated surgically (n=51, Md age 57: 16 M, 35 F) versus non-surgically (n=29: Md age 53; 13 M, 16 F). The majority of patients had recurrent diverticulitis (89%), 48% had been hospitalized, and 9% had a recent percutaneous drainage; a significantly higher proportion of non-surgical patients were hospitalized (66% vs 37% for surgical patients). The median follow-up for patients treated surgically was longer than for patients who did not undergo surgery [105 (57-168) vs 56 (36-86) days]. At presentation to the outpatient clinic, patients had similar PROMIS scores across all domains regardless of decision to proceed with surgery. Patients who proceeded with surgery experienced a significant decline in PF but improved in depression and anxiety after surgery [29 (16-62) days post-operatively]. Amongst patients who did not have surgery, PI and PF improved although there was no improvement in anxiety or depression.

Conclusions/Discussion: Initial PROMIS scores did not appear to differ between those who did or did not undergo surgery. Patients who had surgery appeared to have improved mood after undergoing surgery. Longer follow-up may be required to understand the impact of surgery on physical function and pain interference compared to patients who elect not to have surgery. Further work is required to determine how to incorporate PROs into decision-making and toward understanding the impact of surgery on patients' long-term quality of life.



DELAY TO INTERVENTION FOR COMPLICATED DIVERTICULITIS IS ASSOCIATED WITH HIGHER INPATIENT MORTALITY.

QS324

N. Sell, R. Goldstone, T. Francone, L. Bordeianou, C. Cauley, D. Berger, H. Kunitake, R. Ricciardi
Boston, MA

Purpose/Background: Patients with diverticular disease complicated by abscess and/or perforation represent the most severely afflicted and therefore have the highest mortality and poorest outcomes. This study aimed to investigate what patient and operative factors are associated with poor outcomes from complicated diverticular disease.

Methods/Interventions: We analyzed the National Inpatient Sample (NIS) to identify inpatient discharges for diverticulitis in the United States (U.S) from 1/1/1988 through 9/30/2015. Next, we specifically identified patients with perforation and/or intestinal abscess based on ICD-9 codes. Multivariable models were then constructed to examine patient demographic and operative covariates associated with an inpatient mortality from complicated disease.

Results/Outcome(s): During this period, a total of 1,054,596 patients were discharged with diverticulitis from sampled U.S. hospitals. From this cohort, 10.1% had an abscess and 1.2% had a perforation associated with diverticular disease. Inpatient mortality of diverticulitis patients with a perforation was 9.2% compared to 1.5% in those without a perforation (p<0.001). Perforated patients who underwent surgery had an inpatient mortality of 10% vs. 7.5% mortality amongst perforated patients who did not undergo an operation (p<0.001). Only 8.3% of perforated patients who underwent a procedure on the day of admission died during the hospitalization compared to 14.1% of patients who died if intervened upon day 3 or later (p<0.001). Perforated patients who underwent a procedure and died waited an average of 7.3 days until their first procedure compared to patients who survived (average 4.4 days; p<0.001). Similarly, patients with an abscess who underwent a procedure and died during the hospitalization waited an average of 7.6 days until their first procedure compared to 3.8 days for those who underwent an operation and survived (p<0.001). Logistic regression of patients with an abscess that had surgery revealed a 50% increased mortality risk for procedural interventions that were delayed more than one day after admission (OR 1.50, CI 1.32-1.70; p<0.001). Additionally, patients with a perforation that underwent surgery had a 21% increased mortality risk for each day after admission that a procedure was delayed (OR 1.21, CI 1.01-1.45; p=0.04). Mortality risk was also increased for patients with either abscess or perforation who underwent surgery if they were female, age ≥65, higher comorbidity, had colostomy formation, or had a post-procedural complication (Table).

Conclusions/Discussion: Perforated diverticular disease with or without an abscess has substantial associated inpatient mortality compared to uncomplicated diverticulitis. This risk may be amplified by a delay to procedural intervention during the index admission. Reasons for procedural delays in patients with complicated diverticular disease should be investigated to reduce unnecessary mortality risk.

Table. Odds of Inpatient Mortality for Patients with Complicated Diverticulitis who underwent an Operation

Variable	Odds Ratio	95% CI	*P*-value
Female	1.24	1.11-1.39	**<0.001**
Age ≥65	4.44	3.90-5.06	**<0.001**
Charlson Comorbidity Index			
0	Reference		
1-2	1.94	1.73-2.18	**<0.001**
3-4	2.34	1.99-2.75	**<0.001**
≥5	3.83	3.15-4.67	**<0.001**
Operation Type			
Right Colectomy	Reference		
Transverse Colectomy	1.00	0.60-1.67	0.991
Left Colectomy	0.66	0.50-0.86	**0.003**
Sigmoid Colectomy	0.45	0.35-0.58	**<0.001**
Low Anterior Resection	0.27	0.17-0.42	**<0.001**
Hartmann's Procedure	0.78	0.49-1.25	0.304
Total Colectomy	2.83	1.96-4.08	**<0.001**
Other Resection	0.65	0.35-1.23	0.190
Colostomy Creation	2.15	1.91-2.43	**<0.001**
Days from Admission to Procedure			
≤ 1 day	Reference		
> 1 day	1.27	1.15-1.41	**<0.001**
Postoperative Complications			
Sepsis	3.10	2.76-3.49	**<0.001**
Hemorrhage	0.99	0.71-1.37	0.941
Wound Disruption	1.45	1.11-1.90	**0.007**
Postoperative Infection	1.23	1.00-1.50	**0.045**
DVT/PE	1.60	1.22-2.10	**0.001**
Acute Renal Failure	3.99	3.56-4.47	**<0.001**

CI, confidence interval; DVT, deep venous thrombosis; PE, pulmonary embolism

PLAYING THE LONG GAME: TREATMENT SATISFACTION IN MANAGEMENT OF RECURRENT DIVERTICULITIS.

QS325

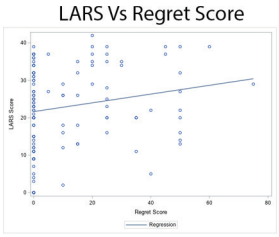
E. Wolf Horrell, M. Ford, T. Geiger, R. Muldoon, M. Feng, D. Beck, A. Hawkins
Nashville, TN

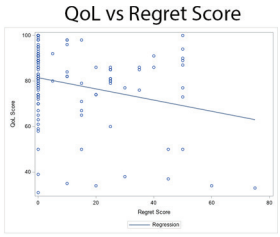
Purpose/Background: Recurrent diverticulitis is a common pathology with significant morbidity. The decision to pursue surgical resection is complex and mainly centers around improvement in quality of life. However, there is a profound lack of data assessing long term patient satisfaction and function following elective management of diverticulitis. The goal of this study was to evaluate decision regret and bowel dysfunction in patients undergoing elective treatment of diverticulitis. We hypothesize that surgery will be associated with decreased decision regret and improved quality of life.

Methods/Interventions: We conducted a retrospective study of all patients diagnosed with diverticulitis evaluated in the colorectal surgery clinic from 2014-2019. A web-based survey was administered which assessed demographic information, decision regret (modified Brehaut Regret scale, range 0–100), overall quality of life (sub scale of the EQ5D, range 0-100), and bowel function (Low Anterior Resection Syndrome (LARS) score – categorized as no, minor or severe dysfunction). Patient were categorized by the decision to undergo observation (Obs) or surgery (Surg).

Results/Outcome(s): 677 patients met inclusion criteria and 116 completed the survey (17% response rate). The median age was 60 and 57% were female. 37% of patients underwent surgical intervention following the initial consultation. At a median follow up of 36 months, 9% of patients reported decision regret, 57% reported improved quality of life and 57% reported minor (25%) or severe (37%) bowel dysfunction. Surgical intervention was significantly associated with improvement in quality of life (Obs: 48% vs Surg: 72%; p=0.039), but not decision regret (Obs: 10% vs Surg: 7%; p=0.74) or bowel dysfunction (Obs: 51% vs Surg: 67%; p=0.07). Neither bowel dysfunction nor current QoL was significantly associated with decision regret (Figure).

Conclusions/Discussion: In this extensive survey of patient undergoing surgical evaluation of diverticulitis, we find improved QOL with surgery, and overall surprisingly high rates of bowel dysfunction and minimal decision regret. Either or surgery or observation can result in high QOL and minimal decision regret despite poorer than expected functional scores. This data highlights the importance of tailoring surgical decision making in patients with recurrent diverticulitis.





PATIENT PREFERENCES AND PERCEPTIONS REGARDING SURGERY FOR RECURRENT UNCOMPLICATED DIVERTICULITIS: A CROSS-SECTIONAL SURVEY STUDY.

QS326

N. Oiknine, R. Garfinkle, S. Sabboobeh, D. Marinescu, N. Morin, C. Vasilevsky, M. Boutros
Montreal, QC, Canada

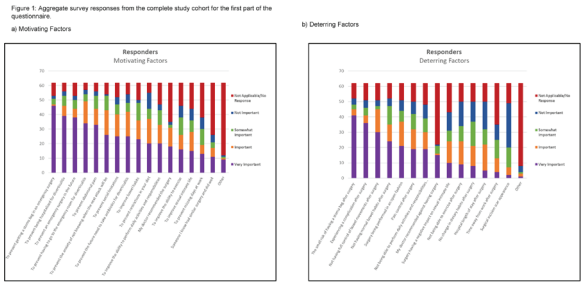
Purpose/Background: Current guidelines indicate that the decision for elective colectomy for recurrent uncomplicated diverticulitis should be individualized. The objective of this study was to understand patient preferences and priorities regarding elective colectomy for recurrent diverticulitis.

Methods/Interventions: After Institutional Review Board approval, all patients with recurrent uncomplicated diverticulitis (at least two documented episodes) treated at a tertiary-care center between 2010-2018 were approached to participate. Patients treated with operative and expectant management were included. A bipartite questionnaire was used. Part-1) A 34-item investigator-generated questionnaire about subjective preferences and priorities for elective colectomy. All items were ranked using a 4-point scale ranging from "not important" to "very important" with a fifth option of "not applicable/no response". Part-2) The Diverticulitis Quality of Life (DV-QOL) instrument, which comprised of 17 diverticulitis-related quality of life items covering 4 condition-specific domains (physical symptoms, concerns, emotions, and behavioural changes). Responses were normalized on 10 to obtain overall scores.

Results/Outcome(s): Of 164 eligible participants contacted, 62 completed the questionnaires (response rate: 37.8%). Of these, 25 (40.3%) patients underwent colectomy. The mean age was 59.6 years (±11.3) and 45.2% were male. Patients reported that the most influential *motivating factors* were "to prevent getting a stoma/bag in an emergency surgery", "to prevent being hospitalized for diverticulitis" and "to prevent an emergency surgery in the future". The most important *deterring factors* were "the small risk of having a stoma/bag after surgery", "experiencing a complication after surgery" and "not having full control of bowel movements after surgery" (Figure 1). Comparing patients who underwent elective colectomy to expectant management, the top three *motivating* and *deterring factors* were the same for both subgroups. The

mean global DV-QOL score was 3.37 (± 3.13), and DV-QOL was similar among patients who underwent colectomy vs. expectant management (3.27 vs. 3.43, $p=0.85$). Patients who reported one of these top three motivating or deterring factors had significantly worse global DV-QOL scores (3.69 vs 2.01, p=0.03), and scored worse in the domains of emotions (3.60 vs. 1.04, $p=0.004$) and behavioral changes (3.32 vs. 0.33, $p<0.001$).

Conclusions/Discussion: Patients with recurrent uncomplicated diverticulitis favor surgery largely due to their desire to avoid major sequelae, including a stoma. Patients with these common perceptions and preferences experience worse DV-QOL. Patient counseling regarding the risk of stoma during a recurrent episode of diverticulitis may better inform patients when considering elective surgery.



LOSS OF INDEPENCE IN GERIATRIC PATIENTS FOLLOWING SURGERY FOR DIVERTICULAR DISEASE.

QS327

A. Gabre-Kidan, S. Gearhart, S. Fang, C. Atallah, J. Efron, B. Safar
Baltimore, MD

Purpose/Background: As the population continues to age, increasing numbers of patients over the age of 65 are presenting for surgical evaluation. While the traditional metrics of surgical success such as length of stay and mortality are important to consider, there are outcomes relevant to our geriatric patients that may offer better insight in to their recovery. The aim of this study is to examine the impact of surgical intervention for diverticular disease on loss of independence in the geriatric population.

Methods/Interventions: This study included data on patients over the age of 65 who underwent surgery for diverticular disease from 2017-2018 and were included in the geriatric pilot within NSQIP. Patients were identified using ICD-10 codes for diverticular disease and CPT codes for surgeries to address diverticular disease. Loss of independence was defined as a change from "independent" on admission to "partially dependent" or "totally dependent" on discharge and/or at 30 days. Univariable and multivariable analyses were performed to examine the predictors of loss of independence at discharge.

Results/Outcome(s): A total of 459 patients over the age of 65 underwent procedures for diverticular disease. 15 patients (3.2 %) had a history of cognitive decline with 19 (4.1%) patients requiring a surrogate to sign consents. 107 patients (22.9%) used a mobility aid preoperatively and 36 patients (7.7%) had a history of falls within the last year. 20% of cases were emergent. Post operatively, 10% of patients experienced delirium, 4.1% had sepsis and 4.7% required reoperation. 412 patients were independent at admission and 108 (26.2%) experienced a loss of independence (p<.001). Data on independence at 30 days post discharge was only available for 62 patients at which time 20 patients (62.5%) continued to experience loss of independence (p<.001). On univariable analysis, fall history and the use of a mobility aid preoperatively were independent risk factors for loss of independence at discharge (OR 4.6, CI 2.1-10.1, p<.001; OR 6.0, CI:3.7-9.7, p<.001) as were postoperative delirium, (OR 11.9, CI 5.5-25.7, p<.0001) reoperation (OR 4.2, CI 1.6-11.1, p=.001) and postoperative sepsis (OR 8.2, CI 2.6-25.7, p<.0001). On multivariable analysis, use of a mobility aid preoperatively (OR 4.5, 95% CI: 2.5-8.1, p<.0001), postoperative delirium (OR 6.5, CI: 2.5-16.6, p<.0001), reoperation (OR 3.4, CI: 1.0-11.1, p=.045) and postoperative sepsis (OR 8.25, CI: 1.7-39.65, p=.008) remained significant predictors.

Conclusions/Discussion: Approximately 1/4 of patients over the age of 65 requiring surgery for diverticular disease will experience a loss of independence with postoperative sepsis and postoperative delirium conferring the greatest risk. Focusing on loss of independence as an endpoint for future studies may help better counsel our geriatric patients as to the potential impact on their quality of life after surgery.

PATIENT AND PHYSICIAN PREFERENCES FOR ANTIBIOTICS IN ACUTE UNCOMPLICATED DIVERTICULITIS: A MODIFIED DELPHI CONSENSUS PROCESS TO GENERATE NON-INFERIORITY MARGINS.

QS328

R. Garfinkle, S. Sabboobeh, M. Demian, A. Barkun, N. Morin, A. Liberman, C. Vasilevsky, M. Boutros
Montreal, QC, Canada

Purpose/Background: Despite existing evidence, the omission of antibiotics in the management of acute uncomplicated diverticulitis (AUD) has not gained widespread acceptance. The purpose of this study was to incorporate the input of patients and physicians on the avoidance of antibiotics in AUD to generate clinically relevant non-inferiority margins (NIMs) for three outcomes.

Methods/Interventions: This was an Institutional Review Board-approved mixed methods study, which included in-person interviews and surveys with patients and a modified Delphi process with physicians.

The primary objective was to generate NIMs for three important diverticulitis outcomes: 1) time to reach full recovery; 2) persistent (or ongoing) diverticulitis; 3) progression to complicated diverticulitis. Patient participants were recruited from a single university-affiliated institution, and were shown a 7-minute informational video. Their willingness to accept a worse outcome after treatment for AUD to avoid antibiotics was assessed using a continuous risk scale. Evidence summaries for each outcome were disseminated to Delphi participants (Colorectal Surgeons, Acute Care Surgeons, Gastroenterologists from the US and Canada). Data from the patient population were shared with physician participants after Round 1 of the Delphi process so that physicians could take patient opinions into consideration for their Round 2 responses. A minimum of 50 physician and 50 patient participants were recruited to provide a precision of ±15% around any estimate. Consensus was defined as an interquartile range <2.5.

Results/Outcome(s): Fifty patients participated in this study. In order to avoid antibiotics, patients were willing to accept up to 5.0 (IQR 3.0-7.0) days longer to reach full recovery, up to an absolute increase of 4.0% (4.0-6.0) in the risk of developing persistent diverticulitis, and up to an absolute increase of 2.0% (0-3.8) in the risk of progressing to complicated diverticulitis. A total of 55 physicians across 18 states/provinces participated in the Delphi (Round 1 response rate =94.8%; Round 2 response rate =100%). Consensus NIMs were generated for persistent diverticulitis (4.0%, 4.0-5.0) and progression to complicated diverticulitis (3.0%, 2.0-3.0), but not for time to reach full recovery (5.0 days, 3.5-7.0) **(Fig 1)**. Most physician participants did not believe that antibiotics were required in all cases of AUD (76.4%); however, almost all still believed that a North American trial is still needed (98.2%). The principal physician concerns with a non-antibiotic strategy were negative patient outcomes (70.9%) and absence of North American data (60.0%).

Conclusions/Discussion: NIMs were generated for three important outcomes after treatment of AUD in the context of a non-antibiotic strategy. These NIMs can help physicians better interpret the existing data and can guide future trial design.

Figure 1 – Non-inferiority margins generated for each outcome within a non-antibiotic treatment strategy, from the Delphi process (Rounds 1 and 2) and patient population

Outcome	Estimate *with* antibiotics*	Delphi Round 1 (n=55) Mean (±SD)	Delphi Round 1 (n=55) Median (Q1-Q3)	Patient Population (n=50) Mean (±SD)	Patient Population (n=50) Median (Q1-Q3)
Time to reach full recovery (days)	12.0	4.2 (2.7)	3.5 (2.3-6.0)	6.7 (4.4)	5.0 (3.0-7.0)
Risk of persistent diverticulitis (%)	6.0	4.4 (2.1)	4.0 (3.0-6.0)	7.1 (6.6)	4.0 (4.0-6.0)
Risk of progressing to complicated diverticulitis (%)	3.0	3.2 (1.9)	3.0 (2.0-5.0)	3.7 (4.6)	2.0 (0-3.8)

⬇

Outcome	Estimate *with* antibiotics*	Delphi Round 2 (n=55) Mean (±SD)	Delphi Round 2 (n=55) Median (Q1-Q3)
Time to reach full recovery (days)	12.0	4.9 (1.8)	5.0 (3.5-7.0)
Risk of persistent diverticulitis (%)	6.0	4.3 (1.1)	4.0 (4.0-5.0)
Risk of progressing to complicated diverticulitis (%)	3.0	3.1 (1.3)	3.0 (2.0-3.0)

*estimates for each outcome *with* antibiotics were obtained from rapid meta-analyses performed as part of the evidence summaries

HOW DOES OBESITY CHANGE THE RISK PROFILE FOR URGENT/EMERGENT COLORECTAL RESECTIONS?

QS329

D. Choi, M. Chang, S. Hendren, A. Hassan, M. Battaglia, R. Cleary
Ann Arbor, MI

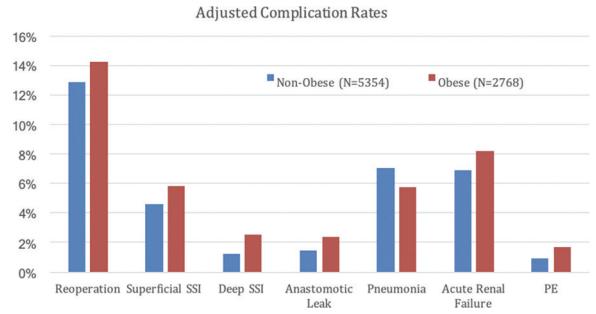
Purpose/Background: The rate of obesity in America is projected to reach 50% by 2030. This risk factor may be modifiable in elective colorectal surgery, but there is no opportunity for weight loss when patients present with urgent/emergent colorectal conditions. We know that obese patients have increased rates of cardiac, thromboembolic, and infectious complications after elective colorectal surgery, but outcomes for obese patients in the urgent/emergent setting are not well understood. In the context of rapidly increasing obesity rates, the goal of this study was to understand the outcomes of obese patients who undergo urgent/emergent colorectal surgery.

Methods/Interventions: This is a retrospective cohort study of 30-day outcomes for urgent/emergent colorectal resections in the Michigan Surgical Quality Collaborative (1/2009 to 12/2018). Patients with BMI ≥30 were defined as obese. Propensity score weighting (using 20 risk factors) was used to derive adjusted rates for overall morbidity, mortality, and specific complications. For comparing outcomes between obese/non-obese groups, p-values were calculated using weighted regressions including several variables that differed after propensity weighting: sex, diabetes, sleep apnea, disseminated cancer, and smoking.

Results/Outcome(s): The study population included 2768 obese and 5354 non-obese patients who had urgent/emergent colorectal surgery. BMI ≥30 was significantly associated with higher adjusted overall complication rate (36.79% vs 34.16%, p=0.04), superficial (5.82% vs 4.59%, p=0.021) and deep (2.51% vs 1.26%, p<0.001) surgical site infections (SSI, 5.82% vs 4.59%, p=0.021), anastomotic leaks (2.35% vs 1.49%, p=0.013), acute renal failure (8.21% vs 6.86%, p=0.047), and pulmonary embolism

(1.71% vs 0.92%, p=0.011). Obese patients actually had a lower risk of pneumonia (5.65% vs 7.07%, p=0.04). Morbidity and mortality rates were highest in patients with class III obesity (BMI >40).

Conclusions/Discussion: Obesity is associated with an increased risk of specific complications after urgent/emergent colorectal surgery. With the growing proportion of obese patients treated in the urgent/emergent setting, surgeons can expect to see more surgical site infections, anastomotic leaks, acute kidney injuries, and pulmonary emboli. Research about how to optimize perioperative care for obese patients is needed, including pharmacokinetics of antibiotic administration and thromboembolism prevention.



ORAL ANTIBIOTICS WITHOUT MECHANICAL BOWEL PREPARATION PRIOR TO EMERGENCY COLECTOMY REDUCES THE RISK OF ORGAN SPACE SURGICAL SITE INFECTIONS: AN ACS-NSQIP PROPENSITY SCORE MATCHED STUDY.

QS330

E. Salama, F. Alrashid, C. Vasilevsky, G. Ghitulescu, J. Faria, N. Morin, M. Boutros
Montreal, QC, Canada

Purpose/Background: Pre-operative administration of oral antibiotic bowel preparation (OABP) alone has been shown to reduce surgical site infections (SSIs), leak, ileus and major morbidity in patients who undergo elective colectomy. However, it is unclear if these benefits extend to emergency resections. This study compares peri-operative morbidity in patients who received OABP to those who did not in the emergency setting.

Methods/Interventions: After institutional review board approval, the American College of Surgeons National Surgical Quality Improvement Program Colectomy-Specific database was queried for all patients who underwent emergency colectomy between 2012-2018. Patients who received mechanical bowel preparation were excluded, as were those likely unable to ingest OABP (i.e. patients ventilated, obstructed, in septic shock, or moribund). Outcomes of interest were surgical site infection (SSI), leak, postoperative ileus, and NSQIP major morbidity (defined as any of the following: organ space or deep SSI, wound dehiscence, sepsis, septic shock, reintubation, reoperation, myocardial infarction, cardiac arrest, acute renal failure, pneumonia, deep vein thrombosis, or urinary tract infection). A 1:1optimal propensity score matching was performed with potential confounders selected a priori including age, ASA class, smoking, diabetes, chronic obstructive pulmonary disease, weight loss greater than 10%, immunosuppression, chemotherapy, anemia, preop sepsis, indication for surgery, emergency indication, surgical approach, type of resection (ileocolic, subtotal, or other partial colectomy), stoma creation, and wound class. Logistic regression was then performed.

Results/Outcome(s): Of 15,988 patients who met the inclusion criteria, 592 received OABP prior to emergency colorectal resection. Prior to matching, those who did not receive OABP were more likely to have higher ASA class, diabetes, hypertension, pre-operative sepsis, open procedures and dirty wound class. Post-operatively, there were no differences in SSIs or leak, however higher NSQIP major morbidity and ileus were found in the no preparation group. After matching, 1184 patients remained with 592 in each arm. Pre-operative characteristics were balanced on univariate analysis (Table 1). Post-operatively, those who received OABP had decreased organ space SSI (8.9% vs. 14.9%, p = 0.006), but no differences were found in overall SSI (16.9% vs 19.6%, p=0.494), leak (2.5% vs 3.4%, p = 0.493), ileus (26.2% vs 29.9%, p = 0.174), or NSQIP major morbidity (40.5% vs. 42.7%, p = 0.479). On multivariate logistic regression including propensity score, the reduction in organ space SSI with OABP persisted (OR 0.60, 95%CI 0.417-0.852).

Conclusions/Discussion: Administration of OABP alone prior to emergency colectomy reduces the risk of organ space SSI and should be considered when possible.

Table 1 – Pre-operative characteristics following propensity score matching

	No Preparation	OABP	p-value
Observances (n)	592	592	
Age	60.1	59.0	0.256
Sex (male)	312 (52.7%)	282 (47.6%)	0.092
BMI	28.4	28.7	0.507
ASA			0.480
1-2	193 (32.6%)	193 (32.6%)	
3	278 (47.0%)	262 (44.3%)	
4	121 (20.4%)	137 (23.1%)	
Smoking	118 (19.9%)	115 (19.4%)	0.884
Dyspnea	33 (5.6%)	49 (8.3%)	0.086
COPD	58 (9.8%)	60 (10.1%)	0.923
HTN	251 (42.4%)	255 (43.1%)	0.860
CHF	11 (1.9%)	20 (3.4%)	0.145
Diabetes	71 (12.0%)	66 (11.1%)	0.716
Renal Failure	8 (1.4%)	11 (1.9%)	0.644
Weight loss	43 (7.3%)	45 (7.6%)	0.912
Anemia	362 (61.1%)	372 (62.8%)	0.590
Disseminated cancer	39 (6.6%)	37 (6.3%)	0.906
Ascites	10 (1.7%)	13 (2.2%)	0.674
Immunosuppressed	107 (18.1%)	114 (19.3%)	0.655
Chemotherapy	42 (7.1%)	36 (6.1%)	0.558
Bleeding disorder	56 (9.5%)	52 (8.8%)	0.762
Pre-operative Sepsis	323 (54.6%)	309 (52.2%)	0.449
Pre-operative Transfusion	29 (4.9%)	37 (6.3%)	0.375
Primary Indication			0.882
Bleeding	6 (1.0%)	10 (1.7%)	
Colonic Neoplasm	44 (7.4%)	45 (7.6%)	
Diverticulitis	283 (47.8%)	271 (45.8%)	
Enterocolitis	22 (3.7%)	21 (3.5%)	
IBD	57 (9.6%)	60 (10.1%)	
Volvulus	6 (1.0%)	10 (1.7%)	
Other	174 (29.4%)	175 (29.6%)	
Emergent Indication			0.145
Bleeding	30 (5.1%)	39 (6.6%)	
Perforation	436 (73.6%)	401 (67.7%)	
Toxic Colitis	35 (5.9%)	47 (7.9%)	
Other	91 (15.4%)	105 (17.7%)	
Type of resection			0.4595
Ileocolic	78 (13.2%)	91 (15.4%)	
Left Partial	450 (76.0%)	432 (73.0%)	
Subtotal	64 (10.8%)	69 (11.7%)	
Approach			0.6765
Open	455 (76.9%)	462 (78.0%)	
MIS	137 (23.1%)	128 (21.6%)	
Stoma			0.764
Yes	309 (52.2%)	297 (50.2%)	
Unknown	63 (10.6%)	68 (11.5%)	
Wound classification			0.191
2	101 (17.1%)	125 (21.1%)	
3	109 (18.4%)	109 (18.4%)	
4	371 (62.7%)	358 (60.5%)	

EFFICACY OF NEGATIVE PRESSURE WOUND THERAPY FOLLOWED BY DELAYED PRIMARY CLOSURE FOR THE ABDOMINAL WOUND IN PATIENTS WITH LOWER GASTROINTESTINAL PERFORATION: MULTICENTER PROSPECTIVE STUDY.

QS331

K. Ohta[1], K. Danno[2], H. Ota[3], T. Matsumura[4], T. Komori[5], S. Okamura[6], M. Okano[7], A. Ogawa[5], H. Tamagawa[5], K. Sakata[8], S. Noura[9], M. Uemura[6], C. Matsuda[6], T. Mizushima[6], M. Ikenaga[1], T. Yamada[1], M. Mori[10], Y. Doki[6]

[1]Higashiosaka, Japan; [2]Minoh, Japan; [3]Ikeda, Japan; [4]Sakai, Japan; [5]Osaka, Japan; [6]Suita, Japan; [7]Kaizuka, Japan; [8]Habikino, Japan; [9]Toyonaka, Japan; [10]Fukuoka, Japan

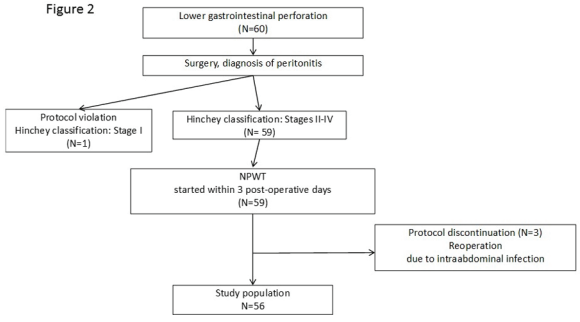
Purpose/Background: A high frequency of surgical site infection (SSI) will occur after surgery for acute peritonitis, which is a considerable source of postoperative complications. Negative pressure wound therapy (NPWT) is commonly applied after the occurrence of SSI following digestive surgery, but the efficacy of NPWT and its application for severely contaminated wounds during surgery have not yet been established. We aimed this study to evaluate the efficacy of NPWT utilized until delayed primary closure (DPC) assessing by the rate of infection in patients with lower gastrointestinal perforation (jejunum, ileum, appendix, colon and rectum).

Methods/Interventions: This prospective multicenter cohort study included patients who underwent abdominal surgery for a lower gastrointestinal perforation from February 2016 to May 2017. We implemented NPWT after surgery and attempted DPC for all patients. Prospective data from eight institutions were recorded. The extent of peritonitis was categorized according to the Hinchey classification, and patients in Hinchey stage I were excluded.

Results/Outcome(s): Fifty-six patients underwent NPWT after surgery and attempted DPC. Five of the patients had SSIs with NPWT and failed to move on to DPC (9%). Fifty-one patients had DPC, 44 of which had no infection (91%), but 7 patients developed SSIs after DPC (13.7%). The SSI rates for Hinchey stage II, III, and IV were 0, 22.6%, and 35.7%, respectively. Median (range) time to wound healing was 15 (10-36), 19 (11-99), and 19 (10-53) days, respectively. There were no significant differences between the stages.

Conclusions/Discussion: NPWT followed by DPC achieved a low infection rate, representing a promising alternative to traditional DPC alone. This procedure has a potential to contribute to improving the SSI rate corresponding to Hinchey level, even in a lower gastrointestinal perforation.

Figure 2



SURGICAL INTERVENTION FOR MECHANICAL LARGE BOWEL OBSTRUCTION AT A TERTIARY HOSPITAL: WHICH PATIENTS RECEIVE A STOMA AND HOW OFTEN ARE THEY REVERSED?

QS332

R. Capona, T. Hassab, I. Sapci, A. Aiello, S. Holubar, A. Lightner, S. Steele, M. Valente
Cleveland, OH

Purpose/Background: The surgical management of large bowel obstruction (LBO) is heterogeneous and influenced by multiple variables such as patient stability, etiology and intraoperative findings. The aim of this study was to analyze and compare the various surgical interventions and outcomes of patients necessitating surgery for mechanical LBO.

Methods/Interventions: Patients who presented with a mechanical LBO between 2000 to 2017 were retrospectively queried from the electronic medical record. Diagnosis of volvulus, pseudo-obstruction, anastomotic stricture, and hernia were excluded. Main outcomes measures included intraoperative findings, operative management, post-operative outcomes and stoma closure rates. Univariate analysis was performed to compare patient demographics and surgical management and outcomes.

Results/Outcome(s): A total of 133 patients were included with a mean age of 65 years (range, 31-100), and 57% were female. Most were left sided 82% (n=109) versus right sided 18% (n=24). The most common cause of LBO was colorectal cancer (CRC) in 44%, extrinsic malignant compression in 29%, and diverticular stricture in 18 %. 110/133 patients (82.7%) underwent operative intervention (Table 1). There were no differences in demographic variables between the operations performed for LBO. The most common operation performed was fecal diversion without resection (n=51; 46.4%). In this group, the most frequent etiology of obstruction was extrinsic compression (n=26/51; 51%) followed by CRC (n=17/51; 33%). This group had significantly more stage 4 carcinoma (n= 35/51; 69%, P =0.001) as well as carcinomatosis at the time of surgery (24/51; 47%, p<0.001). This group also had the lowest stoma closure rate (n=9; 17.6%), and significantly higher Charlson Morbidity index (p=0.012). In total, 85.5% of the operated patients underwent some type of fecal diversion, of these, 27.6% had stoma reversal at a median time of 6 months (range, 0.75-27). Patients that had a resection and anastomosis with diverting loop ileostomy (DLI) were most likely to undergo stoma reversal (61.5%, p=0.005) and had the lowest number of patients with stage 4 carcinoma (n=3; 23%). Overall 30-day post-operative complication rate was 21.8% and mortality rate was 11%. Patients with an intraoperative finding of proximal bowel ischemia (9%) were found to have the highest rate of surgical site infection rates.

Conclusions/Discussion: In this single institution analysis, the management of mechanical LBO entails high operative and stoma rates for patients with stage 4 carcinoma,

QS332

	Diversion Only	Resection + Anastomosis + Diversion	Resection + End Ileostomy	Resection + End Colostomy	Resection + Anastomosis	p-value
Number (% total)	51 (46.3)	13 (11.8)	15 (13.6)	15 (13.6)	16 (14.5)	
Age	64.4±15.5	66.9±12.1	61.6±13.2	68.7±13.7	67.1±14.8	0.66
Gender - Female (%)	27 (53)	9 (69)	12 (80)	6 (40)	8 (50)	0.169
BMI	25.8 [23.2,29.7]	23.3 [20.7,30]	27.1 [21.6,29.3]	27 [25,29.8]	26.1 [23,34.7]	0.727
Stoma Closure (%)	9 (17.6)	8 (61.5)	3 (20)	6 (40)	N/A	0.009
Median CCI	8 [6.0,9.0]	6 [4.0,6.0]	4 [3.0,8.0]	6 [3.0,8.0]	5.5 [4.0,8.0]	0.012
Location Right/Left	6/35	1/12	2/13	0/15	9/7	
Etiology (%)						<0.001
- Colorectal cancer	17 (33)	5 (38)	7 (47)	9 (60)	11 (69)	
- Extrinsic compression	26 (51)	1 (8)	2 (13)	1 (7)	1 (6)	
- Diverticular disease	5 (10)	6 (46)	2 (13	4 (26)	4 (25)	
- Other	3 (6)	1 (8)	4 (27)	1 (7)	0	
Stage IV cancer (%)	35 (69)	3 (23)	5 (33)	5 (33)	4 (25)	0.001
Surgical Complications (%)						
- Deep Incisional SSI	0	1 (8)	3 (20)	0	0	0.005
- Organ Space SSI	2 (4)	2 (15)	3 (20)	0	1(6.3)	0.10
- Postop Sepsis	2 (4)	1 (8)	1 (7)	1 (6.3)	0	0.58
- Anastomotic Leak	N/A	1 (8)	N/A	N/A	0	0.13
Mortality (%)	7 (13.7)	1 (7.7)	2 (13.3)	2 (13.3)	1(6.3)	0.8

CCI: Charlson Comorbidity Index. SSI: Surgical Site Infection

with less than 30% of patients undergoing eventual stoma closure. Resection and anastomosis plus DLI had the highest chance of stoma reversal potentially due to less advanced disease.

INTRAVENOUS FLUID HYDRATION SHOULD BE GIVEN TO ALL PATIENTS WITH NEWLY CREATED ILEOSTOMIES.

QS333

D. Borsuk[2], A. Studniarek[1], S. Marecik[2], J. Park[2], K. Kochar[2]
[1]*Chicago, IL;* [2]*Park Ridge, IL*

Purpose/Background: Newly created ileostomies often result in patient readmission or emergency department (ED) presentation due to dehydration secondary to high ostomy output. Implementation of standardized, mandatory post-discharge home intravenous fluid (IVF) hydration protocol can potentially avoid this problem.

Methods/Interventions: This is a retrospective review comparing all patients who underwent ileostomy creation during a period of sporadic at home IVF hydration (February 2011 to December 2013) to patients who underwent standardized, mandatory post-discharge home IVF hydration (March 2016 to December 2018). All patients after March 2016 were discharged with the standardized at home IVF hydration protocol.

Results/Outcome(s): A total of 241 patients were included in the retrospective review. 119 patients were in the 'sporadic' group and 122 patients were in the 'protocol' group. Length of stay was significantly shorter in the 'protocol' group by 3.3 days ($p < 0.0001$). Surgical approach differed significantly among both groups, with 15% less patients undergoing open procedures and 4.9% more patients undergoing hand-assisted laparoscopic procedures ($p = 0.0018$). Patient demographics were otherwise comparable among the two groups. Prior to protocol implementation, only 23.5% (28/119) of patients were sent home with IVF hydration. Following implementation, all patients were successfully sent home with the mandatory IVF hydration. 15.1% of patients (18/119) experienced dehydration in the "sporadic" group compared to 7.4% of patients (9/122) who experienced dehydration in the "protocol" group ($p = 0.0283$). Following protocol implementation, the number of patients readmitted due to dehydration on or prior to postoperative day 30 fell from 13 patients (10.9%) to 4 (3.3%) patients ($p = 0.01$). Patients in the "protocol" group who were readmitted for dehydration were either non-compliant with the prescribed at home IVF hydration (2 patients), experienced issues with their midline catheter (1 patient), or had concomitant ileus (1 patient).

Conclusions/Discussion: Standardized, mandatory at home IVF hydration following ileostomy creation leads to a significant reduction in postoperative incidence of dehydration and dehydration-associated readmissions in these patients. We believe this protocol should be followed for all patients with newly created ileostomies as long as adequate home health nursing support and active post-discharge surveillance is available to the patient.

DOES LOOP ILEOSTOMY IMPROVE SURVIVAL IN FULMINANT CLOSTRIDIUM DIFFICILE COLITIS AS COMPARED TO TOTAL ABDOMINAL COLECTOMY? A META-ANALYSIS.

QS334

D. Felsenreich[1], M. Gachbayov[2], A. Rojas[2], R. Bergamaschi[2]
[1]*Vienna, Austria;* [2]*Valhalla, NY*

Purpose/Background: Emergency surgery is often required for a fulminant progression of Clostridium difficile colitis (CDC). Total abdominal colectomy (TAC) was the treatment of choice before 2011, although with high morbidity and mortality. However, more recent reports advocated that loop ileostomy (LI) with an antibacterial intra- and postoperative washout of the colon may improve survival. The aim of this meta-analysis was to evaluate whether LI was associated with better survival as compared to its TAC conterpart.

Methods/Interventions: Studies comparing TAC to LI for CDC were identified by a systematic search of the following databases: Pubmed, Cochrane Library, MEDLINE (Ovid), and CINAHL. Newcastle-Ottawa scale was used for quality assessment. Primary outcome was short-term mortality. Secondary endpoint was ostomy reversal rate. Mantel-Haenszel method with random-effects model and odds ratio and 95% confidence interval (OR (95%CI)) as an effect measure was employed for meta-analysis. Numbers needed to treat (NNT) was calculated to assess clinical relevance of statistical findings.

Results/Outcome(s): Five observational studies (3 cohort and 2 database analysis studies) totaling 3683 patients were included. The overall quality was determined to be moderate. Short-term mortality rate was 31.3% following TAC and 26.2% following LI. This difference was neither statistically nor clinically significant [OR (95%CI) = 0.73 (0.45, 1.20); p=0.22; NNT=20]. Statistical among-study heterogeneity was moderate (I^2=55%; Tau^2=0.15). Ostomy reversal rate was both statistically and clinically significantly lower following TAC as compared to LI [25% vs. 80%; OR (95%CI) = 12.71 (3.35, 48.24); p=0002; NNT=2] with low heterogeneity (I^2=0%). Publication bias risk was found to be low (Egger's p=0.83).

Conclusions/Discussion: This meta-analysis found LI for fulminant CDC to be a valid alternative to TAC, although with no survival improvement. Two LI procedures would prevent one permanent ileostomy. Randomize control trials are required to confirm these findings.

ADDING NARROW-BAND IMAGING TO CHROMOENDOSCOPY FOR THE EVALUATION OF TUMOR RESPONSE TO NEOADJUVANT THERAPY IN RECTAL CANCER.

QS340

T. Konishi, M. Ishioka, A. Chino, S. Nagayama, T. Akiyoshi, T. Yamaguchi, T. Nagasaki, Y. Fukunaga, J. Fujisaki
Tokyo, Japan

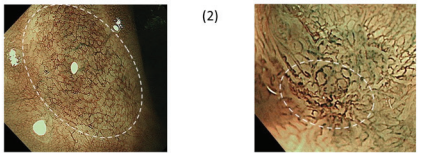
Purpose/Background: Endoscopic assessment plays a pivotal role in the diagnosis of clinical complete response (cCR) after neoadjuvant therapy and subsequent decision making for watch and wait strategy in rectal cancer. We previously reported excellent diagnostic accuracy of chromoendoscopy compared to conventional white-light endoscopy in the diagnosis of cCR. Recently, narrow-band imaging (NBI) endoscopy has been widely used for colorectal cancer diagnosis due to technical simplicity and better inter-rater agreement. This study aimed to evaluate the benefits of adding NBI endoscopy to chromoendoscopy in predicting pathological complete response (pCR) in the surgical specimen.

Methods/Interventions: This was an ad hoc study of a prospective phase II trial at a single comprehensive cancer center. Patients with high-risk stage II-III low rectal cancer received neoadjuvant modified FOLFOX6 plus bevacizumab followed by chemoradiotherapy and surgery. Tumor response after neoadjuvant therapy was prospectively evaluated using conventional white light endoscopy plus chromoendoscopy then followed by using NBI based on a predefined diagnostic protocol (Figure). Diagnostic accuracy of the endoscopic CR or near-CR for predicting pCR and inter-rater agreement of the diagnosis between an expert and trainee were compared between the assessment using conventional white light endoscopy plus chromoendoscopy and the assessment adding NBI.

Results/Outcome(s): A total of 61 patients were eligible for the study, and 19 had a pCR (31.1%). The median interval between endoscopic evaluation and surgery was 3 days. Although the addition of NBI correctly converted the diagnosis in 3 patients, overall diagnostic improvement in predicting pCR was limited (conventional chromoendoscopy vs adding NBI: accuracy, 70.5% vs 75.4%; sensitivity, 63.2% vs 73.7%; specificity, 73.8% vs 76.2%; positive predictive value, 52.2% vs 58.3%; and negative predictive value, 81.6% vs 86.5%). A kappa value for the inter-rater agreement improved from 0.599 (moderate agreement) to 0.756 (substantial agreement) by adding NBI.

Conclusions/Discussion: Despite the limited improvement in diagnostic accuracy, adding NBI to chromoendoscopy improved inter-rater agreement between the expert and non-expert endoscopists. This shows that NBI provides accurate endoscopic assessment of tumor response to neoadjuvant therapy even in non-experts, making it beneficial for less experienced endoscopists or surgeons. As this study is limited by a small sample size and a single center cohort, a larger multicenter randomized study is warranted to evaluate benefits of NBI for universal standardization of the diagnosis of cCR.

		Endoscopic CR	Endoscopic near-complete response	Endoscopic incomplete response
Chromo-endoscopy	- Ulcer	Closed ulcer		Open ulcer
		Flat / Linear scar	irregular surface	
	- Protruded nodule	No		Yes
	- Wall extension	Normal	Decreased	Poor
NBI	- Surface pattern	Regular / Round	Obscure	Unstructured
	- Vessel pattern	Regular circulated/Lacy[1]	Lack of uniformity	Caliber change/ Irregularity[2]



Endoscopic evaluation criteria with narrow-band imaging. (1) The circled area shows isolated vessel pattern characterized by orderly network of thin-caliber vessels, indicating endoscopic complete response. (2) The circled area shows neoplastic vessel pattern characterized by lack of uniformity, blind ending, branching, and curtailed irregularity, indicating endoscopic incomplete response.

ADJUVANT CHEMOTHERAPY IS ASSOCIATED WITH IMPROVED SURVIVAL IN CLINICAL STAGE II RECTAL CANCER PATIENTS TREATED WITH CHEMORADIATION AND TOTAL MESORECTAL EXCISION IRRESPECTIVE OF 'HIGH' RISK PATHOLOGIC FEATURES.

QS341

A. Sabesan, B. Powers, S. Felder
Tampa, FL

Purpose/Background: The oncologic benefit of adjuvant chemotherapy (AC) is unclear for patients with clinical Stage II (T3N0/T4N0) rectal adenocarcinoma (LARC) receiving neoadjuvant chemoradiation (CRT) and total mesorectal excision (TME). AC benefit is extrapolated from pathologic Stage II *colon* cancer trials, where histologic features are applied to stratify 'high' vs lower risk patients. Our aim was to determine the impact of AC on OS in clinical Stage II LARC patients and assess the impact of 'high' risk histologic features.

Methods/Interventions: The National Cancer Database (NCDB) was queried to identify clinical Stage II LARC (T3/4N0) patients receiving CRT followed by curative-intent TME. Patients with pathologic T/N upstaging were excluded. Statistical analyses used Chi-squared and Wilcoxon-Mann-Whitney U tests for frequency associations and the Kaplan-Meier survival function and Cox proportional hazards models for survival analyses.

Results/Outcome(s): A total of 3781 patients were included, 1620 (43%) patients received AC. Median OS was not reached for patients receiving AC and was 139 months for patients not receiving AC (log-rank, $P<0.001$). After adjusting for confounders, AC predicted decreased mortality when compared to patients not receiving AC

(HR, 0.58; 95% CI 0.47-0.71). Increased pathologic T downstaging (cT3 to ypT2/T1/T0; cT4 to ypT3/T2/T1/T0) after CRT strongly predicted decreased mortality (HR, 0.68; 95% CI 0.48-0.95). Variables predicting increased mortality were: examination of <12 lymph nodes (HR, 1.42; 95% CI 1.18 - 1.72), lymphovascular invasion (HR, 1.44; 95% CI 1.04–2.00), perineural invasion (HR, 1.73; 95% CI 1.28-2.34), R1 margin (HR, 1.74; 95% CI 1.10-2.76), and male sex (HR, 1.46; 95% CI 1.20-1.78). Charlson comorbidity index (CCI) was the greatest predictor of increased hazard of death (CCI 3, HR, 3.06; 95% CI 1.83–5.01).

Conclusions/Discussion: For clinical Stage II LARC patients receiving CRT and TME, AC was associated with improved OS, even when adjusted for pathologic features considered 'high' risk. These results suggest fit patients with clinical Stage II may benefit from AC irrespective of pathologic features. Unexpectedly, the majority of patients did not receive AC, despite current guideline recommendations. Poor co-morbidity status (CCI >1 (4% of cohort)) alone unlikely accounted for this finding. Additional studies capturing cancer-specific survival are needed to allow individualized AC strategies utilizing patient-specific pathologic features following neoadjuvant CRT and TME.

A STRUCTURED PRE-SURGERY PRE-HABILITATION FOR ELDERLY PATIENTS UNDERGOING ELECTIVE SURGERY SIGNIFICANTLY IMPROVES SURGICAL OUTCOMES AND REDUCES COST.

QS342

F. Koh, W. Tan, L. Ho, D. Yen, K. G, S. Sivarajah, F. Foo, M. Chew
Singapore, Singapore

Purpose/Background: With increasing global life expectancy, many developed countries have acknowledged the problem of an aging population. This silver tsunami inevitably results in an increased in the number of major surgeries done for the elderly. As age is a non-modifiable risk factor for increased morbidity and mortality, it is therefore important for peri-operative optimization of modifiable risk factors in the aging surgical patient population. The aim of this study is to examine the effectiveness of a structured pre-habilitative programme for elderly colorectal cancer patients in improving post-operative surgical outcomes.

Methods/Interventions: An interventional cohort study was performed with a retrospectively collected control group. "Programme for Enhanced Elderly Recovery @ SKH" (PEERS) was initiated in February 2017 for patients 70 years-old and older who were due to undergo major colectomies. These patients were put through a 1-2 month-long programme before surgery which included a geriatric assessment, nutritional supplementation by dieticians and resistance training regimes by physiotherapists. The surgical outcomes of this cohort were compared with that of patients from a similar age group who did not undergo PEERS in the preceding 1.5 years before PEERS was introduced (non-PEERS). All surgeries were performed by the same group of attending/consultant-level surgeons

Results/Outcome(s): Forty-one patients were recruited from a single tertiary institution to undergo PEERS with a median age of 77 (70-93) years-old. Baseline characteristics between the PEERS and non-PEERS groups were similar. Patients in PEERS tend to have less 30-days morbidity (Clavien-Dindo Grade 1 and above) (34.1% vs 47.8%, $p<0.05$). Both groups had similar 30-days overall mortality rates (0% vs 0%, $p=1.00$). Most importantly, the duration of hospitalization is significantly shorter in the PEERS group compared to the non-PEERS group (9.8 vs 19.1 days, $p<0.05$). All the patients in the PEERS group were discharged home, with only 6 (14.6%) patients requiring a short duration of rehabilitation in a subacute care unit. With the median reduction of 9.3 days of hospital stay, in the local (Singapore) context, this represents a median cost saving of US$4,079.54 (Hospital cost averaged US$438.66 per day in Singapore). However, when this reduction in hospitalization is extrapolated to the USA, a median cost saving of US$36,725.70 (Hospital cost averaged US$3,949.00 per day in USA).

Conclusions/Discussion: With a standardized pre-habilitation programme for elderly patients before elective colectomies, morbidity and duration of hospitalization can be reduced. Most of them also eventually returned home and back to their baseline function earlier. These translate to a significant reduction in healthcare costs for elderly patients, who often require more resources for their full return to function.

WHAT DIFFERENCE IN SURGICAL SITE INFECTION RATES ARE PATIENTS UNDERGOING ELECTIVE COLORECTAL SURGERY WILLING TO ACCEPT TO AVOID A MECHANICAL BOWEL PREPARATION? ESTABLISHING A PATIENT DERIVED CLINICAL EFFECTIVENESS MARGIN FOR FUTURE TRIALS.

QS343

S. Gu, A. Jhaveri, S. Acuna, A. Pooni, S. Schmocker, M. Brar, E. Kennedy
Toronto, ON, Canada

Purpose/Background: The use of preoperative bowel preparation has been shown to reduce the risks of developing surgical site infections (SSI). Current ASCRS guidelines recommend mechanical bowel preparation and oral antibiotics (MBP+OA) the day before surgery. However, recent large administrative database studies have questioned the role of MBP in the above regimen. Our group has received funding to evaluate this by comparing MBP

and OA relative to OA alone in a clinical trial. The objective of this study is to elicit patient preferences for MBP+OA relative to OA alone which will establish a patient derived clinical effectiveness margin to ensure adequate power for the trial so that the results will be meaningful to both patients and physicians.

Methods/Interventions: We conducted a cross-sectional survey of patients using a standardized, in-person interview. The probability trade-off technique was used to elicit participant preferences for the maximally acceptable increase in SSI with OA relative to MBP+OA. Patients over the age of 18 who were attending colorectal surgery clinic at a tertiary center academic hospital and who have previously had a MBP were approached for participation. At the start of the interview, the protocol, risks and benefits for MBP+OA and OA alone were described. Initially, each participant was asked to indicate which treatment they would prefer if the risk of SSI was 7% for both options. If the participant initially preferred OA alone, then the risk of SSI was systematically increased by 1% increments until the participant switched their preference to MBP+OA. This switch point represented the maximal increase in the risk of SSI that the participant would accept to avoid a MBP. A sample size of 50 subjects was required to ensure a 95% CI with a precision of 15% for any given switch point.

Results/Outcome(s): A total of 56 patients were invited to participate and 50 completed the interview. All participants chose OA when the SSI risk was 7% for both OA and MBP+OA. The most common reason for this choice was the inconvenience and the process of the MBP. The distribution of the participants' switch points ranged from 8%-25% with a mean of 11.4% (SD 3.88). The mean was similar when comparing participants who had experienced an SSI (11% vs 11.6% p=0.55) or a complication from a MBP (9.9% vs 11.7%, p=0.23) against those who did not.

Conclusions/Discussion: The results of this study suggest that patients on average are willing to accept a 4% absolute increase in the risk of SSI to avoid an MBP. This data is important because it represents a patient derived clinical effectiveness margin. This effectiveness margin can be used to ensure that future trials comparing MBP+OA relative to OA are adequately powered and that the results will be meaningful to both patients and physicians.

DECREASING ILEOSTOMY READMISSIONS IN A RURAL HEALTHCARE SETTING: A QUALITY IMPROVEMENT INITIATIVE.

QS344

M. Eid, P. Gray, J. Goldwag, S. Ivatury
West Lebanon, NH

Purpose/Background: Readmission after ileostomy creation continues to a be major cause of morbidity with rates ranging from 15-30% due to dehydration and obstruction. Rural environments pose an added risk of readmission due to larger travel distances and lack of consistent home health services. Prior work has demonstrated that outpatient IV hydration has helped reduce readmission, but this is not a feasible solution in many rural healthcare systems. Here we describe our efforts to reduce readmission rates in a rural academic medical center.

Methods/Interventions: 30-day readmissions after ileostomy creation from an academic colorectal surgery service were retrospectively queried from July 2017 to December 2017 to establish base-line readmission rates. Themes of possible quality improvement implementation steps were identified through an iterative process. These themes included lack of continuity in housestaff, standardized oral rehydration protocols, and nursing education. Patients undergoing ileostomy creation for both elective benign and malignant disease were followed prospectively with quality improvement initiatives implemented in 6-month intervals as conventional Plan-Do-Study-Act (PDSA) cycles (12/2017-5/2019). The primary outcome was 30-day readmission.

Results/Outcome(s): Roughly equal rates of ileostomies were created within each timepoint, consistent with a tertiary care colorectal practice. The pre-implementation readmission rate was 27%. Over the course of the entire quality improvement initiative, re-admission rates decreased by almost 50% (27% to 13%). PDSA cycle 1, which involved the integration of a service-specific physician assistant to the team allowing for greater continuity of care, had the most dramatic effect and decreased rates by 25% (27 to 21%). Standardization of an oral rehydration therapy and the implementation of a patient-directed intake/output sheet during PDSA cycle 2 resulted in further improvement in readmission rates (21% to 15%). Finally, implementation of nurse and PA-driven patient education on fiber supplementation resulted in an additional modest decrease in readmissions (15% to 13%) (Figure 1).

Conclusions/Discussion: Implementation of initiatives targeting enhanced team continuity, the standardization of rehydration therapies, and improved patient education decreased readmission rates in patients with new ileostomies. Rural centers, where outpatient resources are not as readily available or accessible, stand to benefit the most from these types of targeted interventions in order to decrease readmission rates.

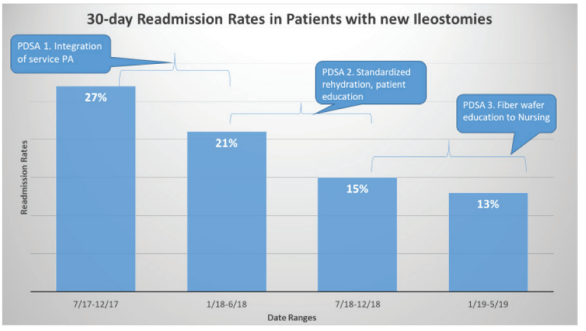


Figure 1, The effect of PDSA Cycles on 30-day readmission rates in patients with new ileostomies over a two-year period.

THE FACT INHIBITOR CBL0137 AUGMENTS THE CYTOTOXIC EFFECTS OF RADIATION IN RECTAL CANCER.

QS345

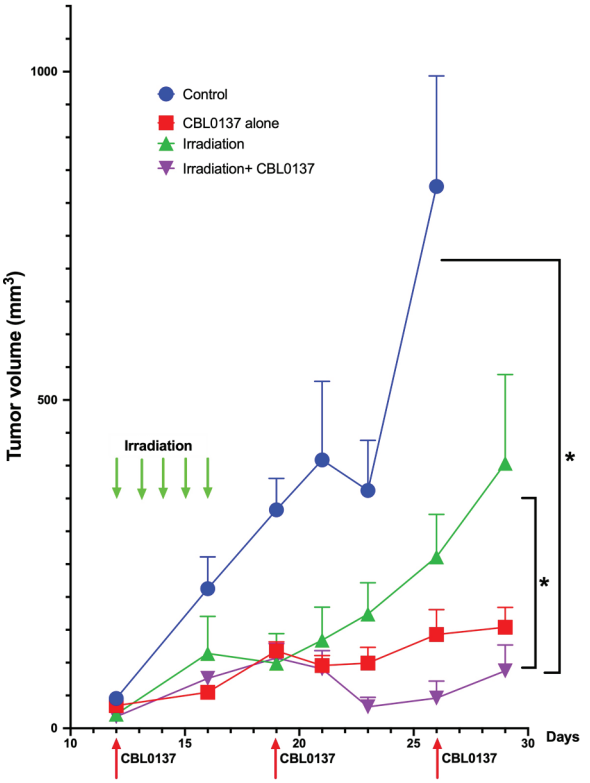
D. Liska, S. Xiang, S. Ferrandon, S. De, J. DeVecchio, A. Adams, G. Stark, M. Kalady
Cleveland, OH

Purpose/Background: The standard of care for locally advanced rectal cancer includes neoadjuvant chemotherapy and radiation (XRT) followed by surgical resection. Response to neoadjuvant therapy has been shown to be an important predictor of long-term survival. Furthermore, patients with a complete response can, selectively, be offered organ preservation and thereby avoid surgery. However, response to irradiation is highly variable, and only 25% of patients achieve a complete pathologic response. The curaxin compound, CBL0137 (CBL), has been shown in preclinical studies to synergize with cytotoxic drugs by inhibiting the histone chaperone FACT (facilitates chromatin transcription), and thereby disturbing DNA-histone interactions. We hypothesize that CBL increases the efficacy of XRT by augmenting radiation-related DNA damage.

Methods/Interventions: Rectal cancer cells (HRT18, ATCC) response to radiation *in vitro* was evaluated with clonogenic assays. Cells were treated overnight with CBL 1 mM or vehicle and then exposed to increasing dosages of gamma radiation. Colonies (> 50 cells) were counted 10 days following treatment. For *in vivo* experiments, rectal cancer xenografts were established subcutaneously in the flanks of NSG mice. Once the tumors were palpable, mice were randomized to treatment with vehicle control, CBL alone, XRT (5 x 1 Gy) alone, or the combination of CBL and XRT. Tumor volumes were measured every 3 days and compared between groups. The effects of CBL and XRT on DNA damage were assessed using comet assays and gH2AX expression. Activation of DNA damage repair proteins was assessed using western blots.

Results/Outcome(s): CBL inhibited colony formation and sensitized rectal cancer cells to radiation in a dose dependent fashion *in vitro*. The combination of 1 mM CBL and 6 Gy of radiation led to near complete inhibition of colony formation. Rectal cancer xenograft growth was only partially inhibited by fractionated XRT totaling 5 Gy. CBL treatment inhibited tumor growth and significantly enhanced the effects of radiation *in vivo* (Figure 1). CBL augments the DNA damages induced by radiation as evidenced by significantly increased DNA tail moment on comet assays (169.3±92.0 vs 12.1±7.1; $p < 0.001$) and expression of γH2AX (15 ± 2.5 vs. 5 ± 2.5; $p < 0.001$). The CBL-dependent increase in DNA damage results in augmented activation of DNA damage repair with increased levels of phospho-ATM and phospho-DNA-PKcs.

Conclusions/Discussion: CBL0137 inhibits rectal cancer growth and augments the effects of radiation *in vitro* and *in vivo* by enhancing radiation related DNA damage. These findings reveal a novel therapeutic regimen with the potential to boost the effects of neoadjuvant therapy in rectal cancer and thereby improve outcomes and increase the number of patients eligible for organ preservation.



CBL inhibits tumor growth and augments the effects of radiation *in vivo* (*, $p < 0.001$).

COLORECTAL CANCER ONCOGENE PTPRF INTERACTS WITH THE WNT LRP6 SIGNALOSOME THROUGH THE CLATHRIN ENDOCYTOSIS PATHWAY.

QS346

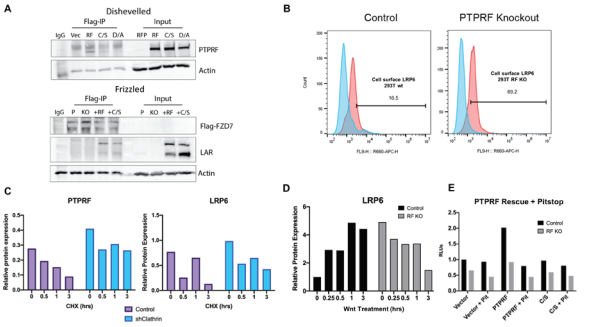
T. Gan, A. Stevens, X. Xiong, B. Evers, T. Gao
Lexington, KY

Purpose/Background: The dysregulation of the Wnt signaling pathway is a major contributor to the development of colorectal cancer (CRC). We previously identified a membrane bound receptor type protein tyrosine phosphatase, PTPRF, to be a novel oncogene in CRC. PTPRF suppression decreases CRC growth *in vitro* and *in vivo*. We identified an interaction between PTPRF and Wnt co-receptor LRP6. The complex LRP6 signalosome is activated via endocytosis. In this study, we evaluated the role of PTPRF in the formation of LRP6 signalosome through the clathrin endocytosis pathway.

Methods/Interventions: We utilized human CRC cell lines (HCT116 and patient-derived Pt130) to generate PTPRF and clathrin knockdown with lentivirus directed RNA interference. Additionally, PTPRF knockout (RF KO) 293T cells were generated using CRISPR-Cas9. [1] The PTPRF interaction with components of the LRP6 signalosome was evaluated with co-immunoprecipitation (co-IP) of flag-tagged PTPRF wildtype and phosphatase mutants (C/S or D/A). [2] Membrane LRP6 expression was analyzed using flow cytometry as a marker for LRP6 endocytosis in RF KO cells. [3] PTPRF and LRP6 protein degradation was determined in clathrin knockdown cells with cycloheximide treatment using western blot. [4] To evaluate the effect of Wnt activation on LRP6 internalization, RF KO cells were treated with Wnt over time and quantified using Western blot. [5] Lastly, PTPRF was re-expressed in RF KO cells to determine the functional contribution of endocytosis in Wnt signaling. Cells were treated with Pitstop (20μM), an inhibitor of clathrin endocytosis, and the activation of Wnt signaling was measured using TOPFlash luciferase assay and Wnt target gene expression.

Results/Outcome(s): [1] Co-IP demonstrated that PTPRF interacts with components of the LRP6 signalosome including Disheveled, Frizzled and AP2. [2] Higher levels of endogenous LRP6 were localized to the plasma membrane in RF KO cells, suggesting reduced endocytosis of LRP6 with decreased PTPRF expression. [3] The degradation of both PTPRF and LRP6 was attenuated in clathrin knockdown cells, indicating that clathrin-mediated endocytosis is required for internalization and degradation of PTPRF and LRP6. [4] The time course of Wnt-stimulated changes in LRP6 expression was altered in RF KO cells suggesting a role of PTPRF in modulating the formation and trafficking of LRP6 signalosome upon Wnt activation. [5] Inhibition of clathrin-mediated endocytosis prevented Wnt-induced activation of TOPFlash reporters and Wnt target gene expression. Overexpression of PTPRF in RF KO cells rescues the ability of cells to respond to Wnt.

Conclusions/Discussion: PTPRF interacts with the Wnt signaling pathway through the LRP6 signalosome. The clathrin-dependent endocytosis pathway is required for PTPRF to activate Wnt signaling. Future studies are needed to identify the PTPRF subtrate ultimately required for the development of a targeted therapy.



PTPRF Regulates the LRP6 Signalosome through the Clathrin Endocytosis Pathway. (A) Co-immunoprecipitation of flag-tagged PTPRF and phosphatase mutants (C/S or D/A) were conducted with Dishevelled and Frizzled demonstrating interaction with LRP6 signalosome. **(B)** Flow cytometry of membrane bound LRP6 in PTPRF knockout (RF KO) cells illustrate decreased LRP6 endocytosis with decreased PTPRF expression. **(C)** PTPRF and LRP6 protein degradation were evaluated with cycloheximide (CHX) treatment in clathrin knockdown cells indicating clathrin endocytosis is needed for both LRP6 and PTPRF internalization. **(D)** Wnt activation of RF KO cells over time demonstrate decreased LRP6 expression. **(E)** TOPFlash luciferase assay with control and RF KO cells with and without Pitstop (20 μM) treatment demonstrating inhibition of Wnt signaling with clathrin inhibition, but rescue of Wnt signaling in RF KO cells was achieved with PTPRF overexpression.

DETECTION OF MICROSATELLITE INSTABILITY DETECTION FROM PLASMA IN COLORECTAL CANCER PATIENTS.

QS347

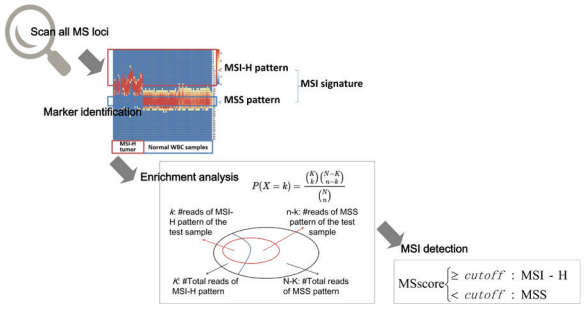
S. He[1], Z. Cai[2], Z. Wang[1], J. Zhou[1], X. Zhu[1], M. Zheng[2], H. Zhang[3], J. Sun[2]
[1]Suzhou, China; [2]Shanghai, China; [3]Guangzhou, China

Purpose/Background: Microsatellite instability (MSI), detected in 15% of colorectal cancer (CRC) patients, is a hypermutable phenotype caused by deficiency in DNA mismatch repair (MMR) system. Multiple studies have reported the predictive value of MSI status for chemotherapy and immunotherapy in CRC patients. Currently, MSI detection is limited to tissue samples with sufficient tumor content. Detection of MSI from blood samples has been explored but confounded by low sensitivity due to the trace amount of circulating tumor DNA (ctDNA) present. In this study, we developed a next generation sequencing (NGS) read-count based algorithm-bMSISEA (blood MSI signature enriched analysis) to detect MSI from blood samples in CRC patients.

Methods/Interventions: Matched tumor and adjacent normal tissues were obtained from 50 MSI-H CRC patients to establish a microsatellite pattern for MSI-H patients. White blood cells (WBCs) from 100 CRC patients were used to establish a microsatellite pattern for MSS. Plasma samples were obtained from 87 CRC patients with known MSI status assessed by immunohistochemistry (IHC) (43 MSI-H and 44MSS) to validate the algorithm.

Results/Outcome(s): To establish features for MSI-H and MSS tumors, 51 microsatellite loci covered by ColonCore panel with mononucleotide repeats longer than 10bp were scanned using paired tumor and adjacent normal tissues and 8 loci with significant differential read length distribution were identified. Next we performed MSI signature enrichment analysis using WBCs to establish a microsatellite signature for MSS tumors. For each locus, the numbers of total reads supporting either MSI-H (denoted as K in the equation) or MSS (N-K, where N refers to the total number of reads supporting either MSI-H or MSS at a specific locus) were counted. The MSI signature enrichment analysis was performed, the enrichment level of each locus was reflected by H value, and The final microsatellite status was reflected by MS score. A MS score of 15 was derived to differentiate MSS and MSI-H tumors. Both simulation data and data generated using clinical samples revealed more than 98% sensitivity and 100% specificity with ctDNA percentage greater than 1%. This method is still reliable if the ctDNA percentage drops to 0.4%, yielding sensitivity of 94.1% and specificity of 100%.

Conclusions/Discussion: We developed a sensitive algorithm which can reliably detect MSI status with ctDNA fraction greater than 0.4% with sensitivity of 94.1% and specificity of 100%.



CD4/CD8 RATIO AS A MARKER FOR INCREASED RISK OF HIGH-GRADE ANAL DYSPLASIA AND ANAL CANCER IN VETERANS LIVING WITH HIV: A REGIONAL RETROSPECTIVE COHORT STUDY.

QS348

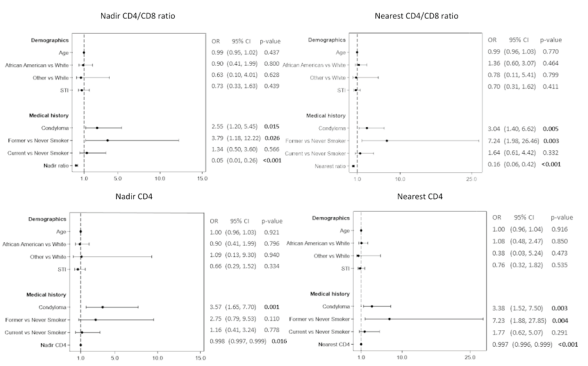
C. Geltzeiler, Y. Xu, E. Carchman, E. Lawson, C. Heise, R. Striker, C. Voils
Madison, WI

Purpose/Background: People living with HIV(PLWH) are at risk for anal dysplasia and anal cancer. The Department of Veterans Affairs(VA) cares for the largest population of PLWH of any healthcare system in the US. We have previously shown an association between low CD4/CD8 ratio and advanced anal disease (high-grade anal dysplasia(HG) and anal cancer) within a single non-VA academic institution. The objective of this study was to determine if low CD4/CD8 ratio is associated with advanced anal disease in a much larger regional population of HIV-positive veterans.

Methods/Interventions: Retrospective cohort study of HIV-positive veterans within Veterans Integrated Service Network(VISN) 12 (comprised of eight medical centers in the Great Lakes area). We included patients cared for between 2001-2019 and divided them into cohorts with advanced disease (HG or anal cancer) or non-advanced disease (low-grade dysplasia(LG), atypical squamous cells of undetermined significance(ASCUS) or negative for dysplasia) on biopsy or cytology. We compared lowest (nadir) CD4/CD8 ratio and nearest CD4/CD8 ratio to diagnosis in each cohort. Logistic regression modeling was utilized to estimate adjusted odds of advanced disease. Modeling was performed with CD4/CD8 ratio as well as CD4 alone.

Results/Outcome(s): A total of 202 PLWH were included, 119 with non-advanced disease (29 LG, 22 ASCUS, 67 negative) and 83 with advanced disease (33 cancer, 50 HG). The two groups were similar in age, race, sex and presence of other sexually transmitted diseases(STI). The advanced disease patients were more likely to have a history of condyloma (58% v.39%, p=0.007). Those with advanced disease were also more likely to be current smokers (49% v. 47%) or former smokers (25% v. 10%) than those with non-advanced disease, p=0.007. Mean nadir ratio and mean nearest ratio were lower in patients with advanced disease v. those without (0.24 v.0.44 (p<0.001) and 0.50 v. 0.79(p<0.001)), respectively. When adjusting for age, sex, race, history of STI, condyloma and smoking status, increase in nadir ratio or nearest ratio of one unit conferred decreased risk of advanced disease (OR of 0.05(95% CI 0.01, 0.26, p<0.001)) and (OR 0.16 (95% CI 0.06, 0.42, p<0.001)), respectively. An increase in nadir CD4 or nearest CD4 also conferred decreased risk of advanced disease, (OR of 0.998 and 0.991, respectively). **Figure 1**

Conclusions/Discussion: Low CD4/CD8 ratio is associated with an increased risk of HG anal dysplasia and cancer in veterans with HIV infection after adjusting for known risks factors of anal cancer. Low CD4/CD8 ratio, especially nadir ratio, is more closely associated to advanced anal disease than CD4 levels alone. These data suggest that CD4/CD8 ratio may be useful for identifying PLWH who are at higher risk of advanced disease and could be a marker to help tailor burdensome screening and surveillance strategies.



CAREFUL EXAMINATION OF VENOUS INVASION AND SUBSEQUENT CHEMOTHERAPY IMPROVES ONCOLOGIC OUTCOMES IN STAGE IIA COLON CANCER: A SCENARIO OF VENOUS INVASION-CHEMOTHERAPY-SURVIVAL.

QS349

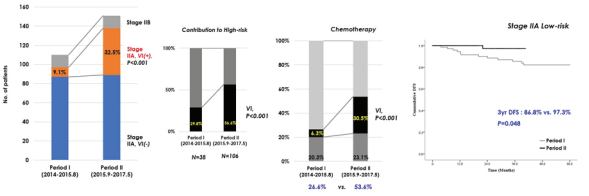
H. Kim, G. Choi, J. Park, S. Park, A. Seo
Daegu, Korea (the Republic of)

Purpose/Background: Colon cancer patients of stage III or stage II with high risk features are recommended to have adjuvant chemotherapy. Pathological evaluation of metastatic lymph nodes is well established, but, venous invasion (VI) has been often underreported. Therefore, we have recently adopted an elastin stain to enhance VI detection rate. We hypothesized that if VI is a valuable prognostic factor and chemotherapy effectively controls unnoticed micrometastasis, stage IIA patients in the study period could be benefited while VI was not completely examined during the time prior to elastin stain in which some of patients might miss the chance to adjuvant chemotherapy. Contrarily, for stage III, as all patients are indicated to adjuvant chemotherapy anyways, regardless of status of VI, the survival of these patients should not be different. We aimed to compare the oncological outcomes in two different periods before and after adopting elastin staining for detecting VI.

Methods/Interventions: This study reviewed patients who underwent curative resection for colon cancer in two different periods; Period 1(HE stain only) was from 2014 to August 2015 and Period 2(elastin stain) was from September 2015 to May 2017. Chemotherapy was provided to the colon cancer patients with stage high-risk stage II and stage III.

Results/Outcome(s): 327 patients in the Period 1 and 418 patients in Period 2 were evaluated. Over the periods, VI detection rate increased from 9.2% to 36.7% in stage II and 20.2% to 60.7% in stage III, respectively (P<0.001). As a result, stage II patients with high-risk features increased from 29.8% to 56.6% (P<0.001) so that chemotherapy was more frequently administered in Period 2 than Period 1, 52.6% vs. 26.6% (P<0.001). Also, 3-year disease-free survival (DFS) showed a trend of improvement, 86% vs. 92.4% (P=0.081). Especially, for patients with low-risk stage II, 3-year DFS was significantly improved in Period 2 (86.8% vs. 97.3%, P=0.048) although it was similar for patients with high-risk stage II (P=0.704). In stage III patients, the use of chemotherapy was similar between the two periods although the VI detection rate increased (P=0.338) and 3-year DFS did not show any difference between the two periods (P=0.720).

Conclusions/Discussion: In this study, we tried to prove whether our scenario of "VI-chemotherapy-survival connection" is a possible truth or not. Elastin staining provided an improved VI detection contributing to better identification of high-risk stage II patients and subsequently to improved survival by increased use of chemotherapy as we hypothesized. To our best knowledge, this is the first study to suggest that careful evaluation of VI is important not only to predict prognosis of disease, but also to extend indication of chemotherapy and most importantly to improve the survival of patients with stage IIA colon cancer.



Association of venous invasion-chemotherapy-survival

COMPARISON OF SIMULTANEOUS AND DELAYED RESECTION FOR RESECTABLE SYNCHRONOUS COLORECTAL LIVER METASTASIS: A META-ANALYSIS.

QS350

G. Maranon, M. Carino, O. Siozon, A. Burog, M. Cabel, H. Monroy, A. Abella, R. Azores, O. Ocampo
Quezon City, Philippines

Purpose/Background: Liver metastasis from colorectal cancer remain a substantial clinical problem. Among newly diagnosed colorectal cancers, approximately 20 percent of patients have metastatic disease at the time of diagnosis and may be eligible for surgery with curative intent. The sequence of surgical treatment of a primary colorectal cancer and liver metastases remains a contentious issue. The traditional surgical approach has been a delayed resection whereby the primary colon or rectal tumor is resected first followed by liver surgery at a later stage. Recently, there is a rise in trend favoring simultaneous resections whereby the primary lesion and liver resection are performed concurrently. This meta-analysis was conducted to compare the clinical outcomes of patients who underwent simultaneous resection of primary colorectal cancer and liver metastasis with patients who underwent a delayed procedure.

Methods/Interventions: We performed an electronic systematic search of literature from January 2000 until December 2017. The retrieved articles were subjected to appraisal using the standard criteria for validity and applicability and the Newcastle-Ottawa Scale (NOS) was utilized for assessing the quality of non-randomised studies in meta-analyses. The inclusion criteria was set by the investigators. The primary outcomes analyzed were 3-year survival and 5-year survival. The secondary outcomes were over-all morbidity, post-operative mortality, length of hospital stay, operative time, blood loss, bile leak, anastomotic leak.

Results/Outcome(s): Twenty-three cohorts with a total of 27,357 patients were included in this study. Of these, 2,205 patients underwent simultaneous resection and 25,512 underwent delayed resection. Age, sex, and localization of the primary tumor were similar in the 2 groups. Mean size and number of the hepatic metastases were greater in the delayed group (3.32cm vs 3.97cm; p=0.01). Over-all morbidity (31.89% vs 25.65%, p=0.97), post-operative mortality (3.03% vs 2.21%; p=0.31), operative time (mean difference=36.91, p=0.23), length of hospital stay (mean difference=1.43, p=0.49), blood loss (mean difference=25.44, p=0.85), bile leak (OR=1.3,p=0.22) and anastomotic leak (OR=0.81,p=0.56) were comparable between simultaneous and delayed group respectively. The 3-year and 5-year survival rates were 50.23% and 37.83% in the simultaneous and 55.33% and 44.22% in the delayed groups respectively.

Conclusions/Discussion: This study demonstrates that simultaneous resection of primary colorectal cancer and liver metastasis has similar long-term survival rates to a delayed approach. Both surgical approaches also showed similar short-term outcomes in terms of over-all morbidity, post-operative mortality, bile leak, anastomotic leak, blood loss, operative time, and length of hospital stay. Comparable results may be attributed to careful patient selection and surgical expertise in oncologic liver surgery.

OMISSION OF ADJUVANT CHEMOTHERAPY IN RECTAL CANCER PATIENTS WITH PATHOLOGIC COMPLETE RESPONSE: A NATIONAL CALL TO ACTION.

QS351

M. Morris, L. Winer, T. Lee, S. Shah, J. Rafferty, I. Paquette
Cincinnati, OH

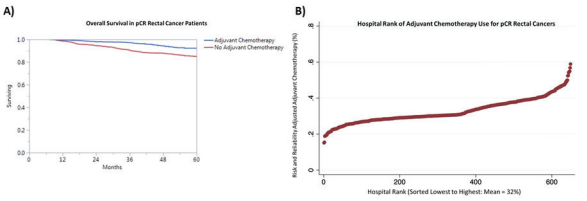
Purpose/Background: An increasing number of patients achieve a pathologic complete response (pCR) after neoadjuvant chemotherapy and radiation for locally advanced rectal cancer. Consensus guidelines continue to recommend the use of adjuvant chemotherapy following oncologic resection in these patients. We hypothesized that there is significant variation in compliance across the nation.

Methods/Interventions: The National Cancer Database (NCDB) was queried from 2004-2016 for all patients with locally advanced rectal cancer who underwent neoadjuvant chemotherapy and radiation followed by oncologic resection with a complete pathologic response (ypT0N0). Kaplan-Meier and Cox-proportional hazards models for overall survival from date of cancer diagnosis to date of last follow-up or death were performed. Hierarchical logistic regression models were used to create risk and reliability adjusted rates of adjuvant chemotherapy utilization in patients with pathologic complete response for each hospital, adjusting for all pertinent patient and tumor factors available. Low and high chemotherapy utilizer hospitals were defined as the bottom and top 10% of hospitals, respectively.

Results/Outcome(s): A total of 2,421 patients from 662 different hospitals were identified who had a pCR on the final pathology report. Five-year overall survival was improved in patients with pCR who received adjuvant chemotherapy (92%) compared to those who did not (85%, p<0.01). (Figure 1a) On multivariate modeling, the use of adjuvant chemotherapy (HR 0.60, 95% CI 0.44-0.82, p<0.01) and female gender (HR 0.66, 95% CI 0.51-0.86, p<0.01) were associated with improved overall survival. Older age, (HR 1.04, 95% CI 1.02-2.05, p<0.01), higher Charlson-Deyo comorbidity score (3 or more, HR 2.85, 95% CI 1.60-5.07, p<0.01), and clinical stage T4 (HR 2.63, 95% CI 1.44-4.79, p<0.01) were associated with decreased overall survival. The median overall risk and reliability adjusted adjuvant chemotherapy utilization rate in patients with a pCR was 32% (Figure 1b). The high chemotherapy utilizer hospitals were more likely to be academic centers (54.9%) compared to low chemotherapy utilizer hospitals (45.9%, p<0.01) and less likely to be integrated network cancer programs (7.6% vs 23.7%, p<0.01). There were no differences in hospital surgical volumes between high and low chemotherapy utilizer hospitals.

Conclusions/Discussion: Adjuvant chemotherapy confers a survival benefit in patients with pathologic complete response following neoadjuvant chemoradiation in rectal cancer. However, the majority of these patients continue to forgo adjuvant chemotherapy. There is significant variability in utilization of this algorithm nationally, with the majority of higher utilizing hospitals being academic centers. National efforts should be made to standardize adjuvant chemotherapy utilization following neoadjuvant chemoradiation in centers treating patients with pCR rectal cancer.

Figure 1



DOWNSTAGING AFTER PREOPERATIVE CHEMORADIATION FOR LOCALLY-ADVANCED RECTAL CANCER IS ASSOCIATED WITH BETTER SURVIVAL THAN PATHOLOGIC STAGE 0-1 DISEASE TREATED WITH UPFRONT SURGERY.

QS352

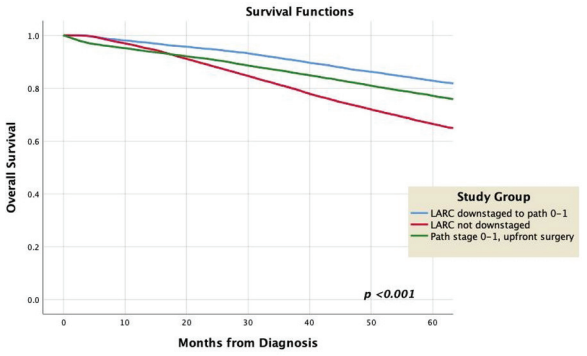
A. Artinyan[1], N. Seiser[1], I. Stettler[1], W. Shen[1], R. Zhu[1], M. Shirinian[2], J. Cohen[1], Y. Nasseri[1]
[1]*Los Angeles, CA;* [2]*Glendale, CA*

Purpose/Background: Patients with locally-advanced rectal cancer (LARC) with significant response to preoperative radiotherapy/chemoradiotherapy have significantly better survival compared to non-responders. It is not known, however, how well responders fare relative to patients with true pathologic 0-1 disease undergoing upfront surgery. We hypothesized that LARC downstaged to pathologic stage 0-1 disease has better survival compared to true pathologic stage 0-1 tumors.

Methods/Interventions: The NCDB (2004-2016) was queried for all patients with non-metastatic rectal cancer who had undergone radical resection. Three distinct study groups were identifed: 1) clinical stage 2-3 disease downstaged to pathologic stage 0-1 disease after preoperative radiotherapy, 2) clinical stage 2-3 disease not downstaged after radiotherapy, and 3) true pathologic 0-1 tumors treated with upfront surgery. Demographic, clinical and pathologic factors were compared. Overall survival was compared using Kaplan-Meier and multivariate Cox-regression analyses.

Results/Outcome(s): 59,884 patients were identified. The mean age of the population was 61.6 ±12.7 years and 61% of the population was male. Of the 40,130 patients (67%) with LARC treated with preoperative radiation, 31.5% (12,670) had significant downstaging (group 1) while 27,460 had no significant downstaging (group 2). 19,754 (33%) had pathologic 0-1 disease treated with upfront resection (group 3). 96% of patients in groups 1 and 2 received chemotherapy prior to surgery, indicating a predominant long-course chemoradiation strategy. Group 3 patients were significantly older than groups 1 and 2 (65.2 ± 0.09 vs. 60.5 ± 0.11 and 59.6 ± 0.07 years, respectively). Group 1 patients had the lowest rate of LVI (4.2% vs. 22.7% and 9.7% in groups 2 and 3, respectively). Non-downstaged (group 2) patients had the highest rate of margin positivity (8.5% vs. 1.9% and 1.1% for groups 1 and 3, respectively) (all p<0.001). On Kaplan-Meier analysis, downstaged patients (group 1) had significantly better overall survival compared to both non-downstaged and true pathologic stage 0-1 patients (median OS 156 vs. 99 and 136 months for groups 2 and 3, respectively, p<0.001). On multivariate analysis, downstaged patients had significantly better survival (HR 0.88, p<0.001) compared to true pathologic 0-1 patients, while non-downstaged patients fared significantly worse (HR 1.78, p<0.001).

Conclusions/Discussion: LARC downstaged after preoperative radiotherapy/chemoradiotherapy has significantly better survival compared to true pathologic stage 0-1 disease treated with upfront surgery. Response to chemoradiotherapy likely identifies a subset of patients with particularly good prognosis. Our results also suggest that multidisciplinary therapy may be superior to surgery alone, even for early stage patients.



SHORT AND LONG-TERM OUTCOMES FOLLOWING SURGICAL RESECTION OF PRESACRAL TUMORS: A SINGLE CENTER SERIES OF 133 PATIENTS.

QS353

P. Davis[1], E. Dozois[1], R. Pride[1], K. Mathis[1], D. Larson[1], A. Merchea[2], S. Kelley[1]
[1]*Rochester, MN;* [2]*Jacksonville, FL*

Purpose/Background: A diverse group of benign and malignant tumors can arise in the presacral space. Presacral tumors are rare and few centers have experience treating them. Given this, limited data exists on outcomes following surgery. The aim of this study was to review the short and long-term outcomes following surgery for presacral tumors in a large series of patients treated at a single institution.

Methods/Interventions: Patients who underwent resection of a presacral tumor between 2000 and 2018 were retrospectively analyzed. Demographic data, clinical presentation, imaging, operative approach, pathologic features, and short and long-term outcomes were reviewed. Sacral tumors including chordomas were excluded.

Results/Outcome(s): A total of 133 patients (99 female) with a median age of 45 years (range, 14-81) were identified. Of those, 87 were symptomatic at presentation and 46 were discovered incidentally. Primary resection was performed in 95 patients and 38 had secondary resections for persistent or recurrent disease. The most common pathologic subtypes included tailgut cyst (n=50), schwannoma (n=24), and teratoma (n=15). Resection was done for benign disease in 110 patients, and 23 for malignant lesions. A combined anterior-posterior approach was used in 14 patients, a posterior-only approach in 43, and an abdominal-only approach in 76. R0 resection was

achieved in 96%. Median postoperative hospital stay was 3 days (range, 0-21). 30-day mortality and morbidity were 0.8% and 34.6%, respectively (Table 1). Late complications occurred in 12.8% (Table 1). Morbidity in patients with malignant vs. benign lesions was 73.9% vs. 35.1%, p<.001. Median follow-up after surgery was 26 months (range, 0-214). Recurrence occurred in 15 patients and was more common in patients with malignancy (26% vs. 8.1%, p=.016). Median 2-year survival for patients with malignancy was 75%.

Conclusions/Discussion: In this large single institution series, surgery for both benign and malignant tumors could be performed with a low mortality and morbidity. Recurrence rates in benign tumors were low. Despite a high R0 resection rate, malignant lesions had a high recurrence rate.

Operative Morbidity and Mortality	
	n
Early Complications	
Urinary retention	12
Ileus	9
Urinary tract infection	8
Pelvic abscess/seroma	6
Superficial SSI	5
Lower extremity neuropathy	2
Wound dehiscence	2
Acute kidney injury	2
Wound seroma	1
Hematoma	1
C. diff infection	1
Small bowel obstruction	1
Rectal leak	1
Acute heart failure	1
Intraoperative cardiac arrest, death	1
Total	53*
Late Complications	
Lower extremity neuropathy	5
Chronic pain	4
Post-coccygectomy pain	2
Erectile dysfunction	2
Anastomotic leak	1
Pelvic hematoma	1
Pelvic abscess	1
Perineal hernia	1
Urethral fistula	1
Ventral hernia	1
Lymphocele	1
Total	20†

*53 total events in 46 patients

†20 total events in 17 patients

THE IMPACT OF IMATINIB ON OUTCOMES AND PROGNOSTIC FACTORS FOR COLORECTAL GASTROINTESTINAL STROMAL TUMORS.

QS354

S. Yang, S. Holubar, A. Lightner, S. Steele, M. Kalady, E. Gorgun, D. Liska
Cleveland, OH

Purpose/Background: Gastrointestinal stromal tumors (GIST) are rare and only about 5% originate in the colon and rectum. The prognosis of colorectal GIST (CR GIST) is worse compared to GIST arising from other sites. Imatinib (IM) has become the standard treatment for advanced GIST and has also shown some benefit in the neoadjuvant setting. Due to their rarity, the impact of IM on outcomes and prognostic factors in CR GIST is still unknown. The aim of the present study is to evaluate prognostic factors and the impact of IM therapy on oncological outcomes in patients with CR GIST.

Methods/Interventions: All patients with non-metastatic CR GIST who were treated surgically at our institution between 2002 and 2018 were enrolled in this retrospective study. Data regarding clinical, pathological, and treatment information were obtained from a prospectively maintained database. After 2007 (when IM was first used for CR GIST at our institution), patients identified as Miettinen high risk or with sphincter involvement were selected to receive IM perioperatively. The Kaplan-Meier method was used to analyze DFS and OS, and Cox regression analysis was performed to identify prognostic factors for survival.

Results/Outcome(s): A total of 56 patients (46.4% male) with a median age of 63 (28-81) years were included in the study. Median follow-up time was 67 months (12-180). Sixteen (28.6%) patients received IM perioperatively, 7 (12.5%) as neoadjuvant treatment, 15 (26.8%) as adjuvant treatment and 6 (10.7%) before and after surgery. Patients with or without IM treatment were similar with regards to follow-up time, age, gender, tumor location (colon vs. rectum) and rectal tumor distance to the anal verge. Despite patients receiving IM having larger tumors and greater proportion of high risk tumors (median 4 vs. 2 cm; $p<0.001$, 100 vs. 32.5%; $p<0.001$), they had similar 5-year OS and DFS as patients without IM treatment (90.0 vs. 84.7% ; p=0.907, 71.6 vs. 66.6%; p=0.989). Among the 29 high-risk patients, IM treated group (n=16) had significantly improved 5- year DFS (71 vs 8%; $p=0.004$), but not 5- year OS (90 vs. 61%; $p=0.202$). None of the high-risk patients who received perioperative IM (n=16) required a permanent stoma (0 vs. 6; $p=0.002$). On univariate analysis, perioperative IM, adjuvant IM, and R0 resection were significantly associated with DFS (Table 1). Multivariate analysis showed that perioperative IM and R0 resection were associated with improved DFS

(HR 6.414; 95% CI 1.061-38.776, $p=0.043$; HR 13.629, 95% CI 2.542-73.073, $p=0.002$). However, univariate and multivariate analyses revealed no significant prognostic factors for OS.

Conclusions/Discussion: In this largest, single-institution, series of CR GIST, the use of perioperative imatinib was associated with improved DFS and sphincter preservation, but not OS. Appropriate perioperative IM treatment and margin negative tumor resection are critical for optimal oncologic outcomes for CR GIST.

FINANCIAL DIFFICULTY AND HEALTH-RELATED QUALITY OF LIFE IN RECTAL CANCER PATIENTS FROM A CLINICAL PROSPECTIVE DATABASE.

QS360

R. Batra, M. Fuglestad, K. Samson, I. Crum, Z. Torgersen, M. Shashidharan, C. Ternent
Omaha, NE

Purpose/Background: Knowledge of the impact of therapy for rectal adenocarcinoma on quality of life and financial hardship is limited. This study evaluated the effects of therapy for rectal cancer on Health-Related quality of life (HRQoL) including measures of financial hardship. We hypothesized that patients undergoing treatment for rectal cancer have reduced HRQoL and increased financial distress that varies by time, age and treatments.

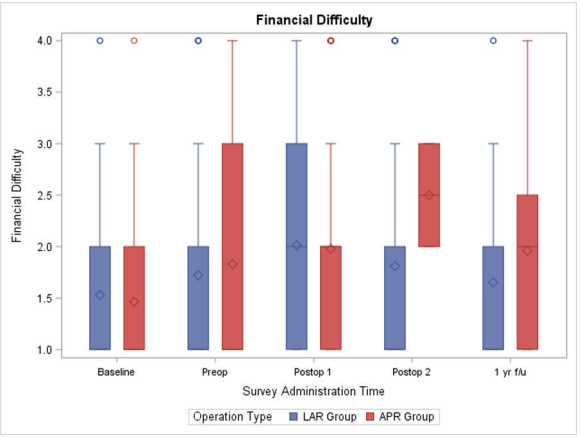
Methods/Interventions: A local prospective rectal cancer database including surgical/oncologic outcomes and HRQoL 2009-2019 was analyzed. All patients completed the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire-Core30 (EORTC QLQ-C30) preoperatively and at postoperative visits up to one year. Cohorts included patients undergoing low anterior resection (LAR), abdominoperineal resection (APR), or no surgical intervention (NSI). Differences in question responses between time periods were assessed using ordinal logistic regression. Pairwise comparisons consisted of all comparisons to baseline and pairwise comparisons of adjacent time points. P-values of comparisons were Bonferroni adjusted.

Results/Outcome(s): 255 patients were included (LAR=143, APR=68, NSI=44). Mean age was 61 years and 65% were men. Median follow up was 13.1 months. First postoperative visit daily activity (ADL) related QoL measures were significantly decreased in the overall surgical cohort compared to baseline ($p<.001$) with worse overall health and limitation with hobbies, social activities, and family life compared to baseline ($p<0.001$ for all). Rectal resection patients reported greater financial difficulty compared to baseline ($p<.001$) on the first postoperative visit, however this returned to baseline (Figure 1). Patients under age 65 experienced more financial hardship (OR 1.63, $p = 0.08$) compared to those over 65. APR patients were more likely to report difficulty in ADLs compared to LAR patients (OR 1.69, $p = .04$). No significant difference in financial hardship was noted between LAR and APR groups ($p = 0.51$). Patients undergoing APR reported lower health scores compared to LAR (OR 0.55, $p = .01$). NSI patients reported no significant difference in the limitation of daily activities, enjoying hobbies, social activities, financial difficulty, or overall health.

QS354 Table 1 Univariate and multivariate (stepwise variable selection) Cox regression analyses for DFS and OS

	DFS			OS		
Variable	HR	95%CI	P value	HR	95%CI	P value
			Univariate			
Age (>60 year)	1.530	0.528-4.435	0.433	0.615	0.123-3.081	0.554
Gender (male)	1.284	0.444-3.713	0.644	0.688	0.164-2.886	0.609
Tumor location	1.693	0.740-3.872	0.212	1.380	0.420-4.531	0.596
Postoperative complications Clavien-Dindo (3/4)	1.887	0.437-8,139	0.395	10.294	0.869-122.006	0.065
Tumor size (>5cm)	0.626	0.232-1.687	0.355	0.384	0.094-1.569	0.183
Tumor mitosis (>5/50 HPF)	1.122	0.406-3.097	0.825	1.371	0.458-6.404	0.424
R0 resection	8.115	2.933-22.454	<0.001	2.001	0.747-5.358	0.167
Any perioperative IM	4.513	1.445-14.098	0.01	2.705	0.545-13.424	0.223
Any neoadjuvant IM	0.657	0.182-2.238	0.523	0.380	0.072-2.005	0.254
Any adjuvant IM	3.472	1.116-10.801	0.032	2.118	0.425-10.552	0.360
Neoadjvant+adjuvant IM	0.657	0.182-2.380	0.523	0.380	0.072-2.005	0.254
			Multivariate			
R0 resection	13.629	2.542-73.073	0.002	2.073	0.339-12.668	0.430
Any perioperative IM	6.414	1.061-38.776	0.043	4.507	0.238-5.352	0.879

Conclusions/Discussion: This analysis demonstrated that APR and LAR patients had reduced HRQoL with limitations of daily activities, hobbies, social life, increased financial distress and overall reduced health. Financial difficulties parallel quality of life in patients under age 65, but not in the over 65 group, implying that working age poses a greater risk for financial distress in the rectal cancer population. These data highlight the importance of appropriate perioperative counseling regarding the HRQoL and the potential financial burden of multimodality therapy and surgery for rectal cancer.



Rectal resection patients reported greater financial difficulty compared to baseline (p <.001) on the first postoperative visit (APR and LAR patients combined). No significant difference in financial hardship was noted between LAR and APR groups (p = 0.51).

CATASTROPHIC HEALTH EXPENDITURE RISK FOR SURGICAL ONCOLOGIC EMERGENCIES AMONG UNINSURED GASTROINTESTINAL CANCER PATIENTS.

QS361

S. Murthy[1], J. Scott[2], A. Loehrer[3], C. Zogg[4]
[1]East Lansing, MI; [2]Ann Arbor, MI; [3]Lebanon, NH; [4]New Haven, CT

Purpose/Background: National costs for cancer reached $87.5 billion in 2012. Despite efforts to curb costs and ensure timely access to care (*e.g.* increased screening efforts, passage of the Patient Protection and Affordable Care Act [ACA] in 2010), cancer patients present with costly emergencies that require urgent surgical care. The aim of this study was to assess the risk of catastrophic health expenditure (CHE) among uninsured gastrointestinal (GI) cancer patients presenting with oncologic emergencies requiring urgent surgical care. Secondary aims assessed changes in insurance coverage and CHE risk pre- and post-passage of the ACA.

Methods/Interventions: State-specific 2011-2015 inpatient claims from 5 Medicaid expansion (Colorado, Illinois, Minnesota, New Jersey, and New Mexico) and 4 non-expansion (Florida, Nebraska, North Carolina, and Texas) states identified adults (18-64 years) admitted with colorectal, gastric, esophageal, liver, or pancreatic cancer who underwent surgical intervention for perforation, hemorrhage, or obstruction. To evaluate CHE (defined by the WHO as hospital charges ≥40% of annual post-subsistence income), we used US census data and reported total hospital charges (2018 USD) to estimate post-subsistence incomes and risk of CHE. Quasi-experimental difference-in-difference models assessed changes in insurance coverage and CHE risk before-and-after ACA implementation in Medicaid expansion-vs-non-expansion states.

Results/Outcome(s): A total of 612 uninsured adults (10,851 patients overall) were included. Across income quartiles, CHE risk for uninsured patients was high, ranging from 97.8% (95%CI: 96.4-99.1%) to 92.3% (91.0-93.6%) (Table). Following ACA implementation, the percentage of uninsured cancer patients significantly declined in both Medicaid expansion (-1.4 percentage-points, p=0.029) and non-expansion (-2.9 percentage-points, p<0.001) states. While there were not significant differences between states in the extent of the decline (p=0.094), the mechanism behind the decline differed, pointing toward significant increases in Medicaid (5.1%) within expansion states and private-insurance (7.7%) within non-expansion states. Each corresponded to a 1.3 percentage-point (26.5% relative decline) and 2.8 percentage-point (37.0%) decrease in CHE within the adult cancer population as a whole due to a decline in uninsured patients.

Conclusions/Discussion: Cancer care is financially devastating, especially for uninsured patients. The results of this study show that the risk of CHE exists for uninsured patients of all incomes. Passage of the ACA reduced uninsured rates and risk of CHE through increases in private insurance coverage in non-expansion states or expansion of government programs in Medicaid expansion states. Additional efforts to reduce the number of uninsured are expected to have a meaningful impact on financial well-being.

Uninsured adults aged 18-64y, state-specific data from 2011-2015 in 2018 USD (expansion and non-expansion)

		Number of patients	% with CHE	95% Posterior Credibility Interval	
Overall (N=612)					
	Income quartile 1 (lowest)	225	97.8%	96.4%	99.1%
	Income quartile 2	177	96.0%	94.9%	97.2%
	Income quartile 3	132	93.2%	91.9%	95.5%
	Income quartile 4 (highest)	78	92.3%	91.0%	93.6%
Hemorrhage (N=48)					
	Income quartile 1 (lowest)	15	100.0%	100.0%	100.0%
	Income quartile 2	18	96.7%	94.4%	100.0%
	Income quartile 3	< 10	--	--	--
	Income quartile 4 (highest)	< 10	--	--	--
Perforation (N=126)					
	Income quartile 1 (lowest)	51	100.0%	100.0%	100.0%
	Income quartile 2	30	100.0%	100.0%	100.0%
	Income quartile 3	45	97.8%	95.6%	100.0%
	Income quartile 4 (highest)	0	--	--	--
Intestinal obstruction (N=123)					
	Income quartile 1 (lowest)	51	100.0%	100.0%	100.0%
	Income quartile 2	42	99.0%	97.6%	100.0%
	Income quartile 3	15	96.3%	84.9%	100.0%
	Income quartile 4 (highest)	15	85.3%	73.3%	100.0%
Bile duct obstruction (N=336)					
	Income quartile 1 (lowest)	111	96.4%	94.6%	97.3%
	Income quartile 2	93	95.3%	93.5%	97.8%
	Income quartile 3	75	89.9%	88.0%	92.0%
	Income quartile 4 (highest)	57	87.8%	86.0%	90.6%

Means and Bayesian posterior distributions of 10,000 simulation runs through the income-quartile specific gamma models
Results for quartiles with < 10 patients omitted due to HCUP reporting requirements
Data limited to patients with a cancer diagnosis, one (or more) of the indicated emergent issues, and a corresponding procedure code

ANALYSIS OF THE COSTS OF READMISSION FOR COMPLICATIONS RELATED TO DIVERTING LOOP ILEOSTOMY AFTER LOW ANTERIOR RESECTION FOR CANCER.

QS362

E. Cousin-Peterson, H. Janjua, T. Barry, P. Kuo, J. Marcet, J. Williams
Tampa, FL

Purpose/Background: Diverting Loop Ileostomy (DLI) continues to be utilized with Low Anterior Resection (LAR), especially following neoadjuvant radiation for rectal adenocarcinoma. While data has shown DLI does not prevent anastomotic leaks, it is thought to reduce the sequelae of a leak. The objective of this study was to evaluate the rate of complications associated with DLI after LAR for cancer, as well as the cost of readmissions related to DLI complications.

Methods/Interventions: Using the Healthcare Cost and Utilization Project-State Inpatient Databases from 4 states between 2009 and 2014, patients with an initial primary diagnosis of rectal, rectosigmoid, or sigmoid cancer that underwent LAR with DLI were analyzed. Readmissions within 90 days of discharge were evaluated, and stratified into three groups: 0-30 (30-day), 31-60 (60-day), and 61-90 (90-day) readmissions. Primary diagnoses were used to further analyze the reason for each readmission and sub-classified into groups based on cause, including but not limited to, infectious complications, direct stoma complications, renal/dehydration/electrolyte disorders, and obstruction/ileus. Individual readmission costs and overall costs of each readmission group were calculated and summarized.

Results/Outcome(s): During the 6-year period, 7,043 patients underwent LAR with DLI for cancer, of which 3,016 patients were readmitted at least one time within 90 days of discharge. All cause readmission rates were 17.45%, 10.84%, and 9.93% at 30, 60, and 90 days respectively. The overall median cost of all readmissions was $8,187 with an average cost of $12,370 (std dev $16,130). Infections and wound complications attributed to 28.6% of the primary diagnoses for 30-day readmissions with a total cost of $7.444M. Dehydration/renal/electrolyte disorders represented 24.6% of 30- day readmissions ($6.399M) and ileostomy complications 7.2% ($1.867M). For the 60-day and 90-day groups, ileostomy complications and dehydration/renal/electrolyte disorders represented over 50% of the primary diagnoses with a total cost of $15.439M and $9.752M respectively.

Conclusions/Discussion: While the use of Diverting Loop Ileostomy is thought to improve patient care by reducing patient risk, it is associated with a substantial rate of readmission over a 90-day period. This comes at a considerable cost to patients and the healthcare system. Further studies need to be undertaken to explore other more cost-effective options, or better predict who may benefit from foregoing DLI for rectal cancer.

IS NEWER ALWAYS BETTER?: A COST AND UTILIZATION ANALYSIS COMPARING LAPAROSCOPIC & ROBOTIC RIGHT HEMICOLECTOMY.

QS363

M. Hopkins, A. Hawkins, M. Soda, V. Tiwari, M. Ford, R. Muldoon, D. Beck, T. Geiger
Nashville, TN

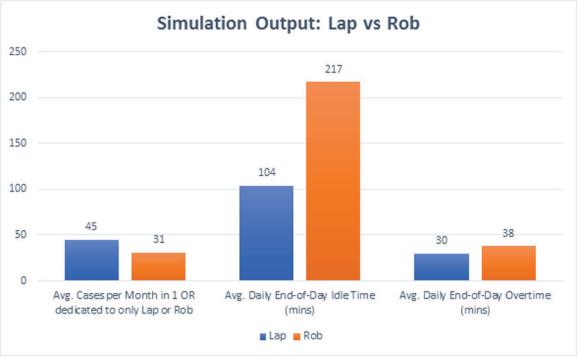
Purpose/Background: As proponents expand the list of colorectal procedures suitable for a robotic approach to right hemicolectomy, attention beyond short term outcomes is needed. An integral piece of the value calculation is cost- not only in supplies, but operative room (OR) utilization. We aim to compare short term outcomes, cost and OR utilization between robotic and laparoscopic approaches for right hemicolectomy. We hypothesize that a robot approach will have increased costs but improved short term outcomes.

Methods/Interventions: We performed a retrospective observational study of all patients undergoing minimally invasive right colectomy from 11/17- 8/19. Patients undergoing concurrent surgery were excluded. The primary exposure was surgical approach- laparoscopic (LAP) or robotic (ROB). The primary outcome compared was technical variable direct cost of the procedure. Secondary outcomes included total cost, supply cost, operative time, length of stay (LOS), and 30-day post-operative outcomes. Cost were compared using the Median test with Yates's continuity correction. We then conducted a simulation of a single OR dedicated to just LAP or ROB cases. We assumed a 10-hour block with flexibility to allow scheduling of cases up to 11-hours running 1000 iterations of 5 simulation runs. Simulation was performed in MS-Excel using @Risk add-in from Palisade Corporation.

Results/Outcome(s): 80 patients were included in the analysis. 63 (78.8%) underwent LAP and 17 (21.2%) underwent ROB. All ROB patients underwent intracorporeal anastomosis while most LAP patients underwent an extracorporeal anastomosis. The median technical variable direct cost was 24% greater in the ROB group ($p<0.001$). Similarly, median total cost (26%; $p<0.001$) and median supply costs (162%; $p<0.001$) were greater in the robotic cohort. Robotic approach was associated with longer median operative time (LAP: 118 min vs ROB: 203 min; $p<0.001$). Neither mean LOS (LAP: 3.67d vs ROB: 3.62d; $p=0.62$), readmission (LAP: 4% vs ROB: 7%; $p=0.54$), surgical site infection (LAP: 8% vs ROB: 7%; $p=1.00$) nor anastomotic leak (LAP: 0% vs ROB: 7%; $p=0.25$) were significantly different. In a simulation of OR utilization, 45 cases of LAP per OR per month can be done in a 10-hour block as opposed to 31 ROB cases. The end-of-day (EOD) idle time in ROB ORs would be higher (217 mins vs 104 mins), which can potentially be used for some other cases.

Conclusions/Discussion: In this detailed cost analysis, we find a 24% increase in technical variable direct

cost and a 162% increase in supply cost for robotic right hemicolectomy with no significant difference in LOS or post-operative outcomes. Robotic cases were associated with increased operative case time which can negatively impact overall case volume and timely access for patients in capacity constrained ORs. Without improvements in cost or operating room efficiency, a robotic approach for right hemicolectomy is difficult to justify.



OR Utilization Simulation

HAS ROBOTIC UTILIZATION INCREASED MINIMALLY INVASIVE COLORECTAL SURGERY RATES? SURGEON-LEVEL EVIDENCE FROM NEW YORK STATE.

QS364

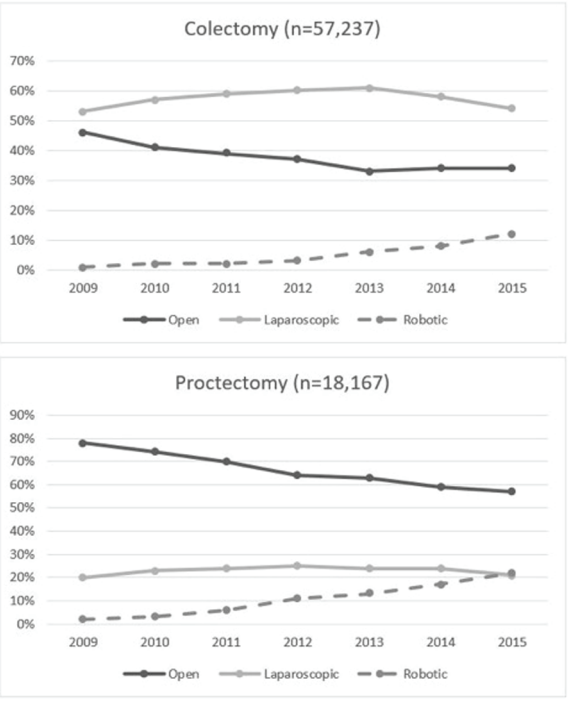
C. Justiniano, A. Becerra, Z. Xu, C. Aquina, L. Temple, F. Fleming
Rochester, NY

Purpose/Background: While colorectal robotic utilization has increased, it is unclear whether this has led to an overall increase in minimally invasive surgery (MIS) with a robotic approach being adopted in lieu of open, or if an intra-MIS migration from laparoscopic to robotic surgery has occurred. This study aims to evaluate whether adoption of robotic surgery has led to an increase in the rate of colorectal MIS.

Methods/Interventions: This New York state population-based study included elective colectomy and proctectomy patients from 2009-2015 using the Statewide Planning and Research Cooperative System (SPARCS). Surgeons were categorized as adopters or non-adopters of robotic surgery over time based on annual increase (or lack thereof) in their proportional use of robotic surgery. The rates of each approach were compared among robotic adopters and non-adopters over time. Multinomial regression was used to evaluate the odds of surgical approach across the study period.

Results/Outcome(s): 72,813 resections (colectomy: 57,237; proctectomy: 18,167) were included. In comparing 2009 and 2015, there was a significant increase in MIS resections (47% vs 61%, p<0.0001). For colectomy, the overall MIS rate increased from 54% to 66% (p<0.0001), the laparoscopic rate remained stable (53% in 2009 vs 54% in 2015), and the robotic rate increased from 1% to 12%. For proctectomy, the overall MIS rate increased from 22% to 43%, the laparoscopic rate remained stable (20% in 2009 vs 21% in 2015), and the robotic rate increased from 2% to 22% (Figure). Over the study period, 2,487 surgeons performed colectomies. Among robotic adopters (156 surgeons), the robotic rate increased from 2% to 29%, while the laparoscopic rate decreased from 67% to 44% and the open rate decreased from 31% to 27%. Overall, adopters performed MIS colectomy 73% of the time in 2015 as compared to 69% in 2009. Over the study period, 1,131 surgeons performed proctectomies. Among robotic adopters (97 surgeons), the robotic rate increased from 3% to 42%, while the laparoscopic rate decreased from 25% to 15% and the open rate decreased from 73% to 44%. Overall, adopters performed MIS proctectomy 56% of the time in 2015 as compared to 27% of the time in 2009. For non-adopters, laparoscopic rates increased for colectomy and proctectomy. After adjusting for patient, surgeon and hospital factors, as compared to open, the odds of robotic surgery (Odds Ratio (OR): 1.57, 95% Confidence Interval (CI): 1.49, 1.66) and laparoscopic surgery (OR: 2.04, CI 1.93, 2.15) increased from years 2009-12 to 2013-15.

Conclusions/Discussion: The rate of MIS for colorectal resections has significantly increased from 2009 to 2015. The increase in MIS appears to be secondary to increased robotic utilization with a concurrent decrease in both open and laparoscopic approaches among robotic adopters as well as increased laparoscopic utilization among non-adopters of robotic surgery.



PREOPERATIVE LOADING WITH COMPLEX CARBOHYDRATE GEL (MALTODEXTRIN) AS PART OF AN ENHANCED RECOVERY PROTOCOL IS SAFE IN DIABETICS UNDERGOING ELECTIVE COLORECTAL SURGERY.

QS365

I. Gaytan Fuentes, C. Cordova-Cassia, G. Cataldo, D. Wong, A. Storino, E. Messaris, A. Fabrizio, T. Cataldo
Boston, MA

Purpose/Background: Carbohydrate loading (CHO) has been shown to attenuate perioperative catabolic response, reduce insulin resistance, prevent hyperglycemia and muscle catabolism in non–diabetic elective colorectal procedures. Currently, there is scarce evidence evaluating the role of complex carbohydrate loading on glucose levels in diabetic patients. Using a complex carbohydrate gel, maltodextrin, we aimed to assess the effect of CHO on perioperative glycemic levels compared to standard overnight fasting amongst diabetic patients undergoing elective colorectal procedures. In addition, we reviewed the effect of CHO on perioperative complications associated with glycemic control.

Methods/Interventions: A retrospective review of elective colectomies and proctectomies performed from January 2010 through December 2018 at Beth Israel Deaconess Medical Center in adult diabetic patients was performed. Beginning in January 2014 and as part of our ERAS program, we began providing our patients with maltodextrin among other complex carbohydrates, in the form of a gel (GU ®). Patients were divided into two cohorts by the date of carbohydrate gel implementation at our institution. We defined a glucose derangement composite outcome based on 2 variables: perioperative glucose levels of >180 mg/dl and a perioperative need for insulin administration. Positivity in either of the variables yielded the patient positive for the outcome. Perioperative Insulin dosage, perioperative glucose levels, and 30-day clinical outcomes were included in the final analysis. Descriptive statistics were used.

Results/Outcome(s): There was no statistically significant difference in the preoperative glucose derangement (OR 0.84, 95% CI 0.41 – 1.74, p = 0.65), postoperative glucose derangement (OR 1.31, 95% CI 0.71 – 2.44, p = 0.39) or overall glucose derangement (OR 1.28, 95% CI 0.67 – 2.41, p = 0.45) outcome in the maltodextrin-treated cohort, when compared to the overnight fasting group. There was a lower superficial site infection rate among the maltodextrin group when compared to the fasting group (3% vs 11% respectively, p = 0.05). Rates of deep surgical site infection were also lower in the Maltodextrin-treated group (0% vs 5%, p = 0.01). Length of stay was not significantly different among both groups (5.03 ± 5.09, 95% CI 4.27 – 5.86 vs 5.03 ± 3.7, 95% CI 4.2 – 5.87). Interestingly in our study, ileus cases showed an increased incidence within the Maltodextrin cohort (10% vs 1% p = 0.014).

Conclusions/Discussion: The study demonstrates that the use of the complex carbohydrate loading, maltodextrin, has no significant negative impact when compared to overnight fasting in terms of glucose derangement. These findings should prompt further investigation in a larger sample with a prospective design.

Basic Demographics	Groups	
	Maltodextrin-Treated (n=159)	Overnight Fasting (n=80)
AGE [mean ± SD]	65 ± 11.08	67.06 ± 11.7
GENDER [n (%)]		
Male	81 (50)	40 (52)
Female	79 (49)	36 (47)
BMI		
Underweight	1 (0.6)	3 (3.7)
Healthy Weight	24 (15)	13 (16)
Overweight	63 (39)	24 (30)
Class I Obese	35 (22)	19 (24)
Class II Obese	23 (14)	9 (11)
Class III Obese	4 (8)	12 (15)
RACE [n (%)]		
African American	22 (14)	13 (16)
White	102 (64)	57 (71)
Asian	10 (6)	3 (4)
Unknown	23 (14)	7 (9)
Native Hawaian/Other	1 (0.6)	0
DM STATUS [n (%)]		
NIDDM	109 (68)	51 (63)
IDDM	50 (31)	29 (36)
ASA [n (%)]		
I	39 (24)	20 (25)
II	109 (68)	55 (69)
III	11 (7)	5 (6)
SURGICAL APPROACH [n (%)]		
Open Colectomy	30 (19)	35 (44)
Lap Colectomy	114 (71)	34 (42)
Open Proctectomy	7 (4)	7 (9)
Lap Proctectomy	8 (5)	4 (5)
DIAGNOSIS [n (%)]		
Benign	49 (31)	23 (29)
Infllammatory	12 (8)	8 (10)
Malignant (Cancer)	97 (61)	48 (60)
STEROID USE [n (%)]		
No	139 (87)	75 (94)
Yes	20 (12)	5 (6)
HBA1C [mean ± SD]	7.1 ± 1.12	6.8 ± 2.04
CCI Score [n (%)]		
0	1 (0.6)	0
1	4 (2.5)	2 (2.5)
2	9 (5.6)	7 (9)
3	16 (10)	10 (12.5)
4	33 (21)	19 (24)
5	29 (18)	12 (15)
6	28 (18)	10 (12.5)
7	12 (7)	10 (12.5)
8	16 (10)	3 (4)
9	7 (4)	3 (4)
10	1 (0.6)	2 (2.5)
11	3 (2)	1 (1.25)
14	0	1 (1.25)
OR TIME [mean ± SD]	236 ± 65	238 ± 59
COMPLICATIONS [n (%)]		
SSSI	6 (4)	8 (10)
DSSI	0 (0)	4 (5)

IMPACT OF ENHANCED RECOVERY PATHWAYS AND EARLY CATHETER REMOVAL ON POST-OPERATIVE URINARY RETENTION.

QS366

V. Tam, W. Lutfi, K. Morgan, R. Vasan, R. Scaife, B. Mahler, D. Medich, J. Celebrezze, A. Watson, J. Holder-Murray
Pittsburgh, PA

Purpose/Background: Post-operative urinary retention (POUR) is a common complication after colorectal surgery, especially after pelvic operations. Prolonged indwelling Foley catheter drainage is associated with catheter-associated urinary tract infections (CAUTI), decreased mobility, increased discomfort, and prolonged length of hospital stay. Enhanced recovery pathways (ERP) typically include early catheter removal but may place patients at risk for POUR. The purpose of this study was to determine whether an ERP with routine early Foley removal is associated with higher rates of POUR.

Methods/Interventions: This is an observational retrospective analysis of patients undergoing colon and rectal surgery at a single institution between 4/2014 and 11/2017. In 7/2015, ERP were instituted, which dictates Foley catheter removal on post-operative day (POD) 1. Patients were stratified into non-ERP and ERP cohorts and post-operative outcomes were compared. The primary outcome was POUR, defined as the need for straight catheterization, Foley reinsertion, or initiation of alpha-1a antagonists. Multivariable logistic regression modelling adjusting for pre-operative and intra-operative variables was performed to identify predictors of POUR.

Results/Outcome(s): Of 284 patients studied, 149 (53%) were male with mean age 57 (SD 16). ERP was applied to 161 (57%) while the remaining 123 (43%) recovered under standard of care. Rectal operations were performed in 37% and 35% of ERP and non-ERP patients ($p=0.77$), and the laparoscopic approach in 64% and 72% ($p=0.18$), respectively. Mean duration of indwelling Foleys was 1.5 days for ERP and 3.8 days for non-ERP patients ($p=0.001$). ERP patients experienced higher rates of straight catheterization (22% vs 12%, $p=0.027$), Foley reinsertion (14% vs 7%, $p=0.07$), and initiation of alpha antagonists (12% vs 5%, $p=0.04$) than non-ERP patients. There were insignificant differences in complications between the two groups, specifically no differences in CAUTI, ileus, wound infections or anastomotic leaks. On multivariate analysis, pelvic dissection, open approach, and positive intra-operative fluid balance were not associated with POUR. Significant independent predictors of POUR were age (OR 1.04, $p<0.001$) and male gender (OR 2.91, $p=0.001$). ERP was independently associated with two-fold increased odds of POUR (OR 2.1, $p=0.017$).

Conclusions/Discussion: ERP following colorectal surgery that include routine Foley catheter removal on POD 1 is associated with increased rates of POUR; however, this does not lead to increased rates of CAUTI or other post-operative complications. Amongst elderly males, clinical discretion on indwelling catheter duration is advocated over routine early removal to reduce rates of re-catheterization.

FIV-O, A NOVEL ADHERENCE SCORING SYSTEM DESIGNED TO EVALUATE ENHANCED RECOVERY PROTOCOLS IN COLORECTAL SURGERY.

QS367

M. Ghobrial, F. Dehkordi-Vakil, M. Jafari, M. Stamos, M. Brady, S. Mills, A. Pigazzi, J. Carmichael
Irvine, CA

Purpose/Background: The purpose of this study was to design and validate a measurement tool to predict the impact of enhanced recovery protocols (ERPs) on inpatient length of stay. The FIV-O score is based on three core enhanced recovery protocol principles: **F**eed early, **IV** fluid and **O**pioid restriction (FIV-O). ERPs have gained increasing popularity in recent years due to improved patient outcomes and significantly reduced length of stay after elective intestinal surgery. A typical ERP involves adoption of a bundle of measures to improve outcomes; however, there is no clarity on which of these measures most significantly benefits patient recovery. Our hypothesis is that early feeding, intravenous fluid restriction and opioid reduction are the three most important components of an ERP.

Methods/Interventions: A structured literature search was conducted using PubMed to identify all randomized controlled trials (RCT) regarding enhanced recovery in elective colon and rectal surgery from 1990 to January 2019. These studies were classified by type of surgery (laparoscopic or open), as this is an important independent indicator of length of hospital stay. The patient cohorts in each RCT were scored based on timing of early feeding (score 1-5), timing of discontinuation of IV fluids (score 1-3), and degree of non-narcotic pain management (score 1-3). The sum of the scores assigned for the three components was considered the "total adherence score". Spearman correlations and regression models were used to determine the relationship between each of the variables, total adherence score, and inpatient length of stay for each cohort.

Results/Outcome(s): A total of 17 RCTs had adequate information regarding their ERP to be included in the study. Overall, 577 lap patients and 655 open patients were included in this analysis. Spearman correlation between total adherence score and median length of hospital stay was statistically significant ($P < 0.05$) in both laparoscopic and open surgery. Regression model results indicate that total adherence score is a significant (-0.50; p-value = .0066)

predictor of median length of hospital stay. For every one unit increase in the adherence score, the median length of hospital stay decreases by half a day (on average). Among the three component scores, pain management has the greatest effect on reducing the median length of hospital stay (-2.65; p-value = .0199), followed by early discontinuation of IV fluid (-2.02; p-value = .0003) and early feeding (-0.594; p-value = .054).

Conclusions/Discussion: The FIV-O total adherence score serves as a reliable tool to assess the quality of ERPs based on the inclusion of three core postoperative treatment components. We conclude that adherence to all three measures are important to decreasing length of stay both in laparoscopic and open surgery. Using the FIV-O score we found that pain management had the most significant effect on shortening length of stay.

RISK FACTORS FOR PROLONGED (>5 DAYS) LENGTH OF STAY AFTER COLORECTAL CANCER SURGERY IN SENIOR ADULTS: ANALYSIS OF 244 CONSECUTIVE ELECTIVE PATIENTS.

QS368

G. Taffurelli, I. Montroni, F. Ghignone, D. Zattoni, A. Garutti, P. Tramelli, G. Ugolini
Faenza, Italy

Purpose/Background: The vast majority of surgical colorectal cancer (CRC) patients are senior adults who are at higher risk for complications and re-admission after surgery. This study aims to evaluate preoperative frailty and surgical factors related to prolonged length of stay early after elective colorectal cancer surgery in patients older than 70 years.

Methods/Interventions: Retrospective data on patients aged ≥70 year operated on elective setting for CRC between January 2017 and October 2019 were retrieved from a prospectively maintained database and analyzed. Frailty was assessed by preoperative living situation (dependent or independent, LS), age-adjusted Charlson Comorbidity Index (CACI), Flemish Triage Risk Screening Test (fTRST), ADL, Timed Up & Go test (TUG), ECOG, Nutritional Risk Screening (NRS) and ASA score. Primary end-point was identification of factors related to an early and durable discharge, defined as going home within postoperative day 5 without readmission within 30 days.

Results/Outcome(s): 244 consecutive patients where included (128 males and 116 females). Mean age was 79.7 years old (70-93). Seventy-five patients (30.7%) had rectal cancer and 169 (69.3) colon cancer. Majority of the patients were preoperatively independent (84.9%), had CACI ≥6 (81.1%) and ASA > 2 (59.4%). fTRST ≥2 was detected in 34%, ADL <5 in 13.5% and 9.8% had TUG >20 seconds. ECOG >1 was scored by 21.7% and 37.7% had NRS score 1. Vast majority of patients had curative (95.9%) and laparoscopic (92.2%) surgery and all were included in an enhanced recovery protocol. Twenty-nine (11.9%) patients had an ileostomy and 32 (13.1%) an end colostomy; 183 (75%) had primary anastomosis. Overall complication rate was 43.4%, even if CD III/IV were 5.7% and anastomotic leak rate was 4.5%. Mortality, readmission and reoperation rate were respectively 2%, 11% and 4.1%. One-hundred and fifty patients (62.5%) out of 230 were discharged within postoperative day 5 and were not readmitted, while 80 of them (32.8%) had a longer length of stay. Significant risk factors for prolonged stay and readmission were: dependent LS (p=0.031), fTRST ≥2 (p=0.001), ADL <5 (p=0.017), TUG >20 (p=0.012), ECOG>1 (p=0.017), ASA >2 (p<0.001), rectal cancer (p=0.004), presence of ileostomy (p<0.001) and colostomy (P=0.034). On Multivariate analysis, fTRST>2 (p=0.033; OR 2.1), ASA >2 (p=0.005; OR 3.1) and ileostomy creation (p<0.001; OR 11.6) were correlated to prolonged length of stay.

Conclusions/Discussion: Early, durable discharge after CRC surgery is possible in senior adults. Preoperative frailty assessment is crucial for identification of those at higher risk of prolonged hospital stay. Moreover, ileostomy (vs colostomy) creation needs to be carefully evaluated because of its detrimental effects on postoperative course.

KETAMINE INTOLERANCE IN ENHANCED RECOVERY AFTER SURGERY PATIENTS UNDERGOING COLORECTAL OPERATIONS.

QS369

S. Stringfield, P. Daher-Tobia, A. Khan, L. Dosselman, A. Fichera, W. Peters, K. Wells
Dallas, TX

Purpose/Background: Enhanced Recovery after Surgery (ERAS) programs decrease length of stay, postoperative complications, hospital readmission, and cost. A key element of these protocols is the narcotic-sparing effect of multimodal analgesia, including the use of intravenous ketamine. Ketamine has been shown to reduce pain scores, opioid consumption, and postoperative nausea. Side effects include hallucinations, sedation, and diplopia, and can limit its use. The purpose of this study is to determine the incidence of side effects resulting in early discontinuation of ketamine, and its impact on narcotic use and short term outcomes.

Methods/Interventions: Patients were identified from a prospectively maintained database of colorectal surgery patients on the ERAS program and enrolled in a pharmacogenetics study. All operations were performed September 2017-August 2019 by colorectal surgeons at our institution. Ketamine was introduced as part of the multimodal analgesia protocol in February 2018. Patients

that did not receive ketamine after February 2018 were excluded. Additional data regarding ketamine duration, dose, and tolerance was obtained from the medical record.

Results/Outcome(s): A total of 180 patients were included. Of those patients, 57 were prior to ketamine introduction and 123 were after ketamine introduction. Thirty-four patients (28% of those treated with ketamine) developed documented side effects that required early discontinuation of ketamine, largely in the form of dizziness or diplopia (Table 1). Between ketamine tolerant and intolerant groups, there was no difference in age (51.7y v 56.8y, p=0.098), ASA class (p=0.6), open surgery (48% vs 47%, p=0.9), malignancy (54% v 38%, p=0.12), or opioid tolerance (11% v 12%, p=0.9). Ketamine intolerant patients were more likely to be female (68% v 48%, p=0.054). There was a statistically significant difference in Oral Morphine Equivalent (OME) use in the first 24 hours postoperatively, with lowest use in ketamine intolerant patients (73.3) compared to ketamine tolerant patients (94.4) and those that did not receive ketamine (113.8, p=0.0002). However, overall OMEs from admission to discharge was not statistically different when comparing those treated with ketamine and those that did not receive ketamine, regardless of tolerance (tolerant 168.5, intolerant 151.5, no ketamine 204.2, p=0.3). Length of stay was similar between groups (tolerant 4.3 days, intolerant 4.2, no ketamine 3.6, p=0.27).

Conclusions/Discussion: In our series, 28% of patients required early discontinuation of ketamine due to side effects. There were no significant differences in patient demographics between the groups. Ketamine offers reduction in early OME use, regardless of whether it is tolerated. However, ketamine does not significantly impact overall narcotic use or length of stay. Larger prospective studies are needed to assess the benefit of ketamine as part of an ERAS program.

QS369 Reported ketamine side effects requiring discontinuation of the medication

Side Effect	N	% of pts treated with ketamine
Dizzines	11	8.9%
Diplopia	10	8.1%
Hallucinations	6	4.9%
Nausea	4	3.2%
Dissociation	2	1.6%
Hypotension	2	1.6%
Somnolence	1	0.8%
Unknown	4	3.2%

EFFECT OF EARLY RECOVERY AFTER SURGERY (ERAS) PATHWAY ON OUTPATIENT OPIATE PRESCRIPTIONS.

QS370

A. Wu, E. Lee
Albany, NY

Purpose/Background: To determine whether there is a difference in outpatient opiate usage and prescribing patterns in colorectal patients on the early recovery after surgery (ERAS) pathway.

Methods/Interventions: This was a retrospective review of colorectal patients at a single tertiary US institution. Pre-ERAS and ERAS data from a single tertiary care center was reviewed. Opiate prescriptions were captured from the time of discharge and one month after surgery. Complication rates were compared between the two groups. All data was analyzed using Chi-square and Fisher's exact tests.

Results/Outcome(s): 1,290 patients met criteria for review. 31 were excluded due to death prior to discharge from the hospital or incomplete records (29 from the pre-ERAS group and 2 from the ERAS arm). There was no statistical difference in age, types of surgical procedures or pre-operative opiate usage between the pre-ERAS and ERAS groups. The pre-ERAS group had significantly more complications than the ERAS group (25% vs 20%, p=0.016). The ERAS group was prescribed significantly fewer opioids than the pre-ERAS group on discharge (29 vs 86%, p<0.0001), but not at 1 month after surgery (15% vs 25%, p<0.0001). At 3 months and 9 months the ERAS patients again had more narcotic prescriptions than the pre-ERAS group (21% vs 5%, p<0.0001 and 18% vs 4%, p<0.0001, respectively). Patients who had complications received the same number of prescriptions at discharge between the two groups (23.8% vs 19.2%, p=0.1) but 1 month post-operatively the ERAS group had fewer prescriptions (18.2% vs 29.8%, p=0.04).

Conclusions/Discussion: ERAS patients had significantly fewer prescriptions for opiates upon discharge than pre-ERAS patients but more narcotic prescriptions at 1, 3 and 9 months after surgery. Patients in both arms who experienced surgical complications had comparable numbers of narcotic prescriptions on discharge, but at one month after surgery the ERAS group had fewer narcotic prescriptions.

FORMALIZED MULTIMODAL (NON-NARCOTIC) PATIENT PRESCRIBING RESULTS IN SIGNIFICANTLY DECREASED OPIOID USE AFTER ANORECTAL SURGERY.

QS371

D. Yoon, C. Wickham, K. Mirza, E. Noren, S. Lee, K. Cologne, G. Ault
Los Angeles, CA

Purpose/Background: The use of multimodal pain medications have been advocated to decrease postoperative opioid requirement while maintaining satisfactory pain control. Its efficacy in anorectal procedures, which has traditionally been known as painful procedures, has not been studied. Our study aim was to evaluate the impact of outpatient multimodal pain medication use in decreasing postoperative opioid requirement following anorectal procedures.

Methods/Interventions: Patients undergoing elective outpatient anorectal procedures at an academic, county safety-net hospital were enrolled from August 2018 to November 2019. Patients were divided into three groups based on their use of non-opioid medications: opioid only (group A), opioid plus encouraged over the counter non-opioid use (group B), and opioid plus formally prescribed non-opioid with structured education (group C). The education consisted of instructions on appropriate use of opioids and a multimodal non-opioid pain medication regimen consisting of three times daily acetaminophen, ibuprofen, and gabapentin. A telephone survey was conducted one week postoperatively. Demographic, procedure and postoperative data was collected. A $P<0.05$ was considered statistically significant.

Results/Outcome(s): A total of 236 patients were enrolled. The telephone response rate was 72% (n=170). 76, 36, and 58 patients were enrolled in groups A, B, and C, respectively. Compliance with taking at least two non-opioids medications varied across the groups (A 0% vs B 31% vs C 83%, $P<0.001$). Compared to group B, group C had a higher compliance rate of taking acetaminophen (88% vs 37%, $P<0.001$) and gabapentin (75% vs 3%, $P<0.001$), but not for ibuprofen (80% vs 86%, $P=0.514$). Only 25.9% (n=15) of group C patients took all three non-opioid medications three times daily as instructed. Despite suboptimal compliance, group C had the lowest total postoperative morphine milligram equivalent requirement (A 63.0 vs B 44.7 vs C 21.2, $P<0.001$), lowest percentage of patients taking opioids by postoperative day 7 (A 61% vs B 44% vs C 12%, $P<0.001$) and low percentage of patients requiring additional opioid (A 1% vs B 11% vs C 2%, $P=0.048$). There was no difference in overall patient reported pain control satisfaction.

Conclusions/Discussion: Utilization of a multimodal pain medication regimen decreases postoperative opioid requirement. Providing prescriptions for over-the-counter non-opioid medications may also improve compliance by facilitating access to non-opioid medications, especially in a county patient population.

ONE SIZE DOES NOT FIT ALL: FACTORS ASSOCIATED WITH OPIOID REFILLS FOLLOWING MAJOR INPATIENT COLORECTAL SURGERY.

QS372

C. Hartwig, T. Aiken, P. Skelton, D. Livingston-Rosanoff, E. Staudt, D. Lemaster, B. Hanlon, E. Lawson
Madison, WI

Purpose/Background: In response to the opioid crisis, surgeons and providers are striving to reduce postoperative opioid prescribing to prevent new opioid dependence and diversion of excess opioids into the community for abuse. Unintended consequences of sending patients home with fewer opioids include the potential for inadequate pain management and increased refill requests. The objective of our study was to identify patient demographic and clinical factors associated with requesting an opioid refill after discharge for patients that underwent a major inpatient colorectal surgical procedure.

Methods/Interventions: We conducted a retrospective analysis of an existing prospectively collected database of patients who underwent major inpatient colorectal surgery between 3/2018-5/2019 at an academic medical center. Patients who required a refill within 30 days of discharge were identified and compared to those who did not require a refill. Inpatient opioid usage and opioid prescriptions at discharge were converted to morphine milligram equivalents (MME). Multivariable logistic regression was performed for opioid refill status adjusting for clinically relevant patient demographic and clinical factors.

Results/Outcome(s): A total of 613 patients were included in the analysis. An opioid refill within 30 days of discharge was requested by 73 patients (11.9%). Baseline characteristics were similar between the groups, though patients requesting a refill were younger (51.4 vs 55.8 years, $p<0.01$) and had higher rates of preoperative opioid use (54.9% vs 25.0%, $p<0.01$). Patients requiring a refill had higher opioid usage in the first 24 hours post-surgery (135.4 vs 61.7 MME, $p<0.01$) and final 24 hours prior to discharge (74.8 vs 25.3 MME, $p<0.01$). In addition, patients requesting a refill received a higher opioid prescription at discharge then patients who did not request a refill (210.7 vs 172.7 MME, $p<0.01$). If opioid usage following discharge is anticipated to remain similar to the final 24 hours prior to discharge, patients requesting a refill were discharged with a prescription covering proportionally fewer opioid analgesic days then patients who did not request a refill (4.2 vs 7.3 days, $p<0.01$). There was no significant difference between groups in terms of regional anesthesia use,

laparoscopic approach, or indication for surgery. On multivariable regression, only preoperative opioid usage and greater opioid use in the final 24 hours prior to discharge were significant predictors of refill requirements (Table 1).

Conclusions/Discussion: We found that preoperative opioid use and greater opioid use in the final 24 hours prior to discharge were significantly associated with patients requesting an opioid refill following major inpatient colorectal surgery. Despite high inpatient opioid pain requirements, patients requiring a refill were discharged with proportionally fewer opioids.

Table 1: Multivariable logistic regression for factors associated with opioid refills following major inpatient colorectal surgery

	No refill	Refill	p-value
Prior opioid use, OR (95% CI)	Ref	2.9 (1.6-5.3)*	<0.01
Opioid use in final 24 hours (per 10 MME)	Ref	+6.0%^	0.03

OR, odds ratio; CI, confidence interval; Ref, Reference category; MME, morphine milligram equivalent. Regression controls for age, sex, cancer history, IBD history, pre-op opioid and benzodiazepine use, diagnosis, procedure, laparoscopic vs open, regional anesthesia type, inpatient opioid use, and inpatient pain scores

*Patients with preoperative opioid use had a 2.9 times increased odds of needing a refill within 30 days of discharge.
^For every additional 10 MME (6.7 mg oxycodone) used in the final 24 hours before discharge, there was a 6% increase in the odds of needing a refill within 30 days of discharge.

DO ROUTINE POSTOPERATIVE DAY ONE LABS AFTER PROCTECTOMY PROVIDE CLINICAL INSIGHT OR SIMPLY REASSURANCE?

QS373

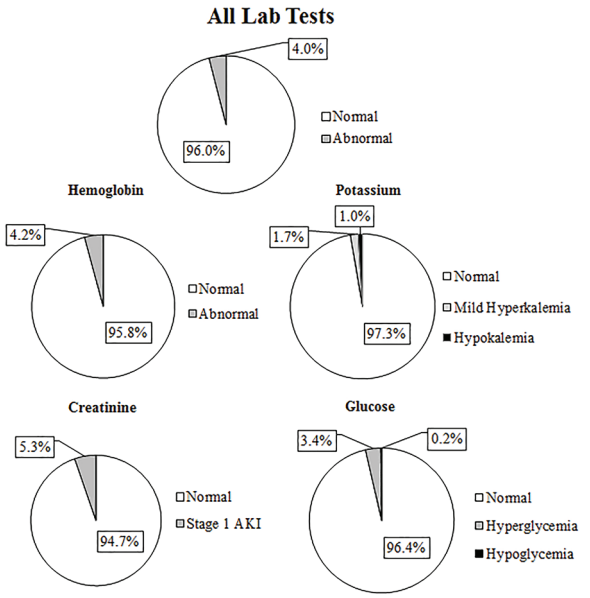
N. McKenna, A. Glasgow, K. Behm, E. Habermann, R. Cima
Rochester, MN

Purpose/Background: Enhanced recovery pathways (ERPs) after colorectal surgery commonly include routine postoperative day (POD) 1 blood work. The ERP at our institution includes a complete blood count, potassium, creatinine, and glucose lab draw on POD 1. It is unknown whether these protocolized lab tests provide clinical insight after proctectomy, so we sought to determine how often these labs were abnormal and what their associated cost was.

Methods/Interventions: Patients undergoing abdominoperineal resection or total proctocolectomy between January 1, 2015 and December 31, 2017 within the division of colon and rectal surgery at our institution were identified. Hemoglobin, potassium, creatinine, and glucose values obtained before 0800 on POD 1 were reviewed. Lab-specific exclusion criteria included patients with a preoperative hemoglobin <8 g/dL or who received a blood transfusion during surgery for the hemoglobin analysis, a diagnosis of chronic kidney disease for the potassium and creatinine analysis, and a diagnosis of diabetes for the glucose analysis as POD 1 labs would typically be indicated in these patients. Abnormal postoperative labs were defined as a hemoglobin ≤8 g/dL, a potassium <3.5 mmol/L (hypokalemia), between 5.5-5.9 mmol/L (mild hyperkalemia), or ≥6 mmol/L (severe hyperkalemia), a creatinine increase of 0.3 g/dL or ≥ 1.5X the preoperative value (acute kidney injury [AKI] based on the Kidney Disease Global Initiative Group definition), and a glucose <70 (hypoglycemia) or >180 mg/dL (hyperglycemia). Costs were calculated based on the 2017 Medicare fee schedule; actual costs to institutions and patients may vary. Univariate comparisons were performed to compare characteristics associated with abnormal labs.

Results/Outcome(s): Of 630 total patients, 590 met inclusion criteria for hemoglobin, 602 met inclusion criteria for potassium and creatinine, and 530 met inclusion criteria for glucose. All eligible patients had routine POD 1 labs drawn. Only 4% (n=25) of patients had a POD 1 hemoglobin ≤8 g/dL. These patients had lower preoperative hemoglobin values and higher estimated blood loss (both $p<0.0001$). Potassium abnormalities were present in 3% of patients (n=16 total; 6 hypokalemia, 10 mild hyperkalemia, 0 severe hyperkalemia). An AKI was diagnosed in 5% (n=32) patients and was associated with older age and increasing operative duration (both $p<0.05$). Lastly, glucose was abnormal in 4% (n=19) of patients. In total, of 2,322 lab values, only 4% revealed abnormal results (FIGURE). The total aggregate cost of routine POD 1 labs was over $17,000 in the study period.

Conclusions/Discussion: Routine POD 1 labs after proctectomy were rarely abnormal, and therefore seem to serve more as a measure of reassurance than a clinically valuable tool. Protocolized labs after proctectomy have now been replaced with labs ordered based on clinical criteria.



Percent of abnormal labs overall and by specific laboratory test.

WEARABLE TECHNOLOGY IN PREDICTING READMISSION FOLLOWING COLORECTAL SURGERY.

QS374

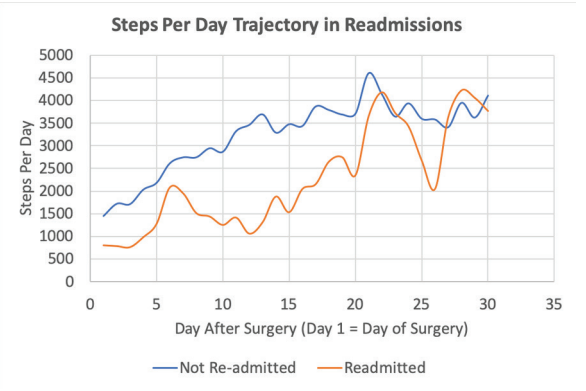
W. Kane, T. Hassinger, A. Charles, S. Hoang, C. Friel, R. Thiele, T. Hedrick
Charlottesville, VA

Purpose/Background: Readmission rates following colorectal surgery range between 8 to 17%, frequently exceeding that of other surgical procedures. Reasons for readmission following colorectal surgery are multifactorial and are notoriously difficult to predict on an individual basis. The proliferation of wearable technology in the last decade presents a novel opportunity for postoperative monitoring. We hypothesize that wearable technology could be utilized to predict readmission following colorectal surgery.

Methods/Interventions: Patients undergoing major elective colorectal surgery were recruited and consented in the preoperative surgical clinic, and trained to use a wearable fitness device (FitBit Charge 2). Patients were instructed to wear the device for 30 days prior to surgery, during their inpatient stay, and for 30 days following surgery. The primary outcome of interest was 30-day hospital readmission. Data was extracted and univariate analyses were performed to compare patient demographics, operative factors, and step count data between readmitted and non-readmitted patients.

Results/Outcome(s): 112 patients were consented to the study; of these, 18 were excluded (5 canceled surgery, 1 withdrew, 12 experienced technical problems with the FitBit) leaving 94 patients available for analysis. 16 (17.0%) patients were readmitted within 30 days following the index operation. There were no differences in preoperative baseline step count between patients who did and did not require readmission, as readmitted patients took a median of 4,291 steps/day while those who were not readmitted took 4,208 steps/day ($p=0.58$). However, analysis of step count on the day before the patient's discharge revealed a significant association between step count and readmission. Patients who subsequently required readmission were significantly less active on the day prior to discharge (424 steps/day) from the index hospitalization than those that did not require readmission (1,378 steps/day, $p=0.003$) and were also significantly less active compared to their baseline activity level on the day prior to discharge (19% of baseline steps/day) from the index hospitalization than those that did not require readmission (42% of baseline steps/day, $p=0.01$). Additionally, the trajectory of postoperative steps per day demonstrates a significant association between step count in the postoperative period and readmission (Figure 1).

Conclusions/Discussion: Postoperative step count was associated with 30-day hospital readmission following elective colorectal surgery. Wearable technology presents a novel opportunity for postoperative monitoring and may guide surgeons in assessing readiness for discharge following colorectal surgery.



NODE-BY-NODE EVALUATION MATCHING MRI, INTRAOPERATIVE IMAGING AND PATHOLOGY DURING LATERAL PELVIC NODE DISSECTION IN LOCALLY ADVANCED RECTAL CANCER.

QS380

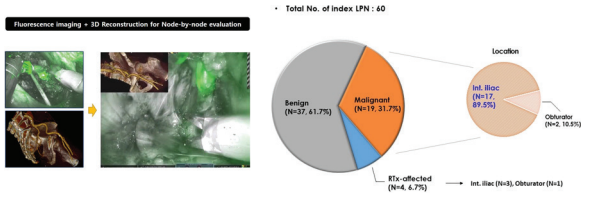
H. Kim, G. Choi, S. Cho, A. Seo
Daegu, Korea (the Republic of)

Purpose/Background: Lateral pelvic lymph node dissection (LPND), beyond the total mesorectal excision (TME) plane, is selectively suggested for treating suspected lymph node metastasis in the pelvic side-wall in patients with rectal cancer who underwent preoperative chemoradiotherapy (CRT). However, there are still controversies about the indication. This study aimed to identify *index* LPN, defined as suspected LPN metastasis, under dual-image, fluorescence and 3D reconstruction-image guidance during operation and to perform thorough pathologic examination in a node-by-node setting to help to make an indication guideline for LPND.

Methods/Interventions: Rectal cancer patients who were anticipated to undergo LPND after preoperative CRT were prospectively enrolled. Index LPN was defined as a short-axis diameter of ≥5 mm with speculated or indistinct borders, or a mottled heterogenic pattern on MRI. For fluorescence imaging, ICG at a dose of 2.5mg was injected around the tumor preoperatively. For 3D reconstruction images, each patient had an axial CT scan with contrast (0.6mm slice thickness) before operation. These images were then manipulated using OsiriX (Pixmeo, Geneva, Switzerland). Index LPNs and essential structures in the pelvic sidewall, such as obturator nerve, were reconstructed with abdominal arteries from 3D volume rendering. During operation, we matched the ICG-bearing LPN with 3D lymphovascular reconstruction image. Each LPN was evaluated by hematoxylin and eosin staining and immunohistochemistry using anti-cytokeratin antibody AE1/AE3 were used to detect micrometastasis.

Results/Outcome(s): Thirty-two patients who underwent TME with LPND after preoperative CRT were evaluated. For these patients, 44 each pelvic sidewall dissection was performed and 60 *index* LPNs were identified. Pathologic LPN metastasis was confirmed in 14 patients (43.8%), 18 dissected sidewalls (40.9%), and 19 *index* LPNs (31.7%), including 2 micrometastasis. All metastatic LPNs were identified among *index* LPNs and for 4 dissected sidewall (22.2%), malignant LPN was identified in remained LPN which was not detected on MRI. Most malignant index LPN was located in the internal iliac area (89.5). Six of the 19 metastatic LPNs (31.6%) were <7 mm on pretreatment MRI, and 7 (36.8%) were <5 mm on the post-treatment MRI.

Conclusions/Discussion: Index LPNs were completely dissected by using the dual image-guidance LPND technique, including fluorescence and 3D lymphovascular reconstruction. Radical LPND was suggested form the results that additional malignant LPN was identified, which was not detected on MRI. In addition, it should be cautious to decide the cut-off value to identify the malignant LPN on MRI findings.



Index pelvic node metastatic rate after node-by-node evaluation using dual image-guidance pelvic node dissection

LATERAL LYMPH NODE AND ITS ASSOCIATION WITH RECURRENCE IN RECTAL CANCER TREATED WITH NEOADJUVANT CHEMORADIOTHERAPY.

QS381

Y. Kim, J. Jang, I. Park, S. Park, J. Kim, J. Lee, C. Kim, Y. Yoon, S. Lim, J. Park, C. Yu, J. Kim
Seoul, Korea (the Republic of)

Purpose/Background: Enlarged lateral nodes before and after preoperative chemoradiotherapy (PCRT) has been reported to be related with higher lateral local recurrence rates. For better local recurrence control, lateral lymph node dissection combined with total mesorectal excision has been suggested for selective patients. Therefore, thorough understanding of the relation between lateral node and recurrence is required.

Methods/Interventions: From 2008 to 2012, patients who received resection following preoperative chemoradiotherapy (PCRT) for rectal cancer were included. MRIs pre/post PCRT of all patients were re-evaluated and data regarding recurrence were collected for analysis. Short axis of nodes 7mm or greater before PCRT and 5mm or greater after PCRT was the size criteria for enlarged nodes.

Results/Outcome(s): Of the total 813 patients, 34 patients (4.2%) experienced local recurrence, 17 (2.1%) lateral recurrence, and 182 (22.4%) distant recurrence. Patients with LN short axis larger than 7mm before PCRT was significantly related to worse local recurrence-free survival (RFS), lateral RFS, and distant RFS (p<0.001, 0.001, and 0.004 respectively). Size shrinkage after PCRT to below 5mm showed better distant RFS but was not statistically significant (p=0.115). Lateral pelvic lymph node sampling (LPLNS) was not beneficial in lowering recurrence rates with a mean RFS of 69.3 months in patients who received LPLNS and 94.9 months in patients who did not receive LPLNS. Lateral recurrence presented in the same area of the enlarged nodes identified before PCRT in 4 (66.7%) patients.

Conclusions/Discussion: LN short axis of 7mm or greater before PCRT is related to higher recurrence risk in local, lateral, and distant areas. Once the patient is assessed with nodes larger than 7mm, response to PCRT is not a guarantee for better outcome. Although node sampling shows no benefits, the role of full lateral node dissection needs to be verified.

QS381 Lateral node and recurrence-free survival by site

	Pre PCRT (n=813)			Post PCRT (n=813)			Pre PCRT SA ≥ 7mm (n=70)		
RFS by site	SA < 7mm (n=743)	SA ≥ 7mm (n=70)	p	SA < 5mm (n=753)	SA ≥ 5mm (n=60)	p	Post PCRT SA < 5mm (n=21)	Post PCRT SA ≥ 5mm (n=49)	p
Local, mo.	100.4	86.1	<0.001	100	84.8	<0.001	77.4	82	0.340
Lateral, mo.	101.5	88.1	0.001	100.9	89.3	0.005	77.4	84.9	0.472
Distant, mo.	89.8	77.5	0.004	89.8	75.8	0.003	75.4	70.4	0.115

PROGNOSTIC IMPACT OF LYMPH NODE YIELD IN PATIENTS WITH LOCALLY ADVANCED RECTAL CANCER AFTER NEOADJUVANT CHEMORADIOTHERAPY.

QS382

L. Bustamante-Lopez, C. Nahas, G. Cotti, C. Sparapan Marques, U. Ribeiro Junior, A. Rocco Imperiale, I. Cecconello, S. Nahas
Sao Paulo, Brazil

Purpose/Background: Prognostic Impact of Lymph Node Yield in Patients With Locally Advanced Rectal Cancer After Neoadjuvant Chemoradiotherapy Prognostic Impact of Lymph Node Yield in Patients With Locally Advanced Rectal Cancer After Neoadjuvant Chemoradiotherapy The standard of care for patients with locally advanced rectal cancer is neoadjuvant chemoradiotherapy (NCRT) followed by total mesorectal excision (TME). According to the International Union Against Cancer and the American Joint Committee on Cancer, a minimum of 12 lymph nodes (LN) should be obtained from surgical specimen in order to stage colorectal cancer appropriately. The number of LN in the specimen of patients with rectal cancer after NCRT not always reaches the Minimum number of 12, despite adequate surgery. The literature already recognized the best tumor regression grade (TRG) as the most important factor associated with the decrease in the number of LN. Objective: The aim of this study was to examine the prognostic significance of the number of LN in locally advanced rectal cancer patients after NCRT and TME.

Methods/Interventions: This was a prospective single cancer center study. Low and mid locally advanced rectal cancer underwent NCRT followed by TME with curative intent between 2012 and 2015. Chemotherapy consisted of 5-FU and leucovorin IV. Total dose of pelvic radiation was 5040 Gys. All patients were staged and restaged by digital rectal examination, proctoscopy, colonoscopy, CT of abdomen and chest, and MRI of the pelvis. Patients were categorized into two groups according to Pathological response (Complete or Incomplete) Groups were compared with respect to the number of LN retrieved from the specimen: less than 12 LN and 12 LN or more, and oncologic outcomes: overall-survival (OS), cancer-specific-mortality (CSM), cancer-free-survival (CFS), and recurrences (R).

Results/Outcome(s): A total of 280 patients were included in this study. Mean age of 61.2 years old. Pathological complete response was the only variable to independently affect the number of LN obtained. The mean number of LN was 20.1. Pathological complete response was obtaining in 47 (16.8%) patients, of this 25.5 % of this patients had fewer than 12 LN. After 5 years of follow-up, only one patient on each group had recurrence, (8.3% with less than 12 LN and 2.9% with 12 or more LN). When compare with patients with pathological incomplete response the Recurrence rate was 33.3 % in patients with less than 12 LN and 27.1 % with 12 or more LN. Our results showed that 5-year OS, CFS and recurrence were considerably better in patients with pathological complete response independent if the minimum of 12 LN or more were retrieved or not. Table 1.

Conclusions/Discussion: Pathologic complete response after chemoradiotherapy is associated with less than 12 lymph nodes harvested. Pathological Complete Response was also associated with better survival and less recurrence rates. Thus, the number of lymph nodes should not be used as a surrogate for oncologic adequacy of resection in patients with Pathologic Complete Response.

PROGNOSTIC IMPACT OF EXTRANODAL EXTENSION IN RECTAL CANCER PATIENTS UNDERGOING RADICAL RESECTION FOLLOWING PREOPERATIVE CHEMORADIOTHERAPY.

QS383

Y. Kim, C. Kim, J. Lee, Y. Yoon, I. Park, S. Lim, C. Yu, J. Kim
Seoul, Korea (the Republic of)

Purpose/Background: Extranodal extension (ENE) of nodal metastasis has emerged as an important prognostic factor in many malignancies, including rectal cancer. However, its significance in patients with rectal cancer receiving preoperative chemoradiotherapy (PCRT) has not been extensively investigated. Thus, the aim of this study is to assess ENE and its prognostic impact in a large series of consecutive rectal cancer patients with lymph node metastasis following PCRT and curative resection.

Methods/Interventions: Between January 2000 and December 2014, a total of 1925 patients with rectal cancer underwent surgical resection following PCRT. Medical records of 436 patients with node positivity were reviewed retrospectively.

QS382 5 year's Overall Survival, Cancer Free Survival and Recurrence for patients with Locally advanced rectal cancer after NCRT and TME

Pathologic Response	< 12 LN			12 LN or more		
	OS	CFS	Recurrence	OS	CFS	Recurrence
Complete	84.1%	90%	8.3%	93.8%	97%	2.9%
Incomplete	59.3%	59%	33.3%	72.3%	65.9%	27.1%

Overall Survival (OS). Cancer Free Survival (CFS). Lymph nodes (LN)

Results/Outcome(s): Of the 436 patients, 112 (25.7%) presented with ENE. ENE was observed more frequently in those with advanced tumor stage (higher T, N, and ypStage). Five-year disease-free survival (DFS) was lower in patients with ENE-positive tumors than those with ENE-negative tumors (36.2% *vs.* 52.3%, $P = 0.002$). Similarly, five-year overall survival (OS) was lower in patients with ENE-positive tumors than those with ENE-negative tumors (60.7% *vs.* 71.9%, $P < 0.001$). Multivariate analysis showed that the presence of ENE was an independent poor prognostic factor for DFS and OS.

Conclusions/Discussion: The presence of ENE in patients with rectal cancer undergoing PCRT is a negative prognostic factor, reflecting poor long-term survival.

PATHOLOGICAL EXTRA MURAL VASCULAR INVASION IS ASSOCIATED WITH DISTANT METASTASES BUT NOT LOCAL RECURRENCE OR SURVIVAL IN A LARGE COHORT OF STAGE II-III RECTAL CANCER PATIENTS TREATED WITHOUT PREOPERATIVE CHEMO-RADIOTHERAPY.

QS384

M. Jitsumura, K. Chandrakumaran, R. Smyth, A. Venkatasubramaniam, S. Arnold, B. Moran, F. Di Fabio
Basingstoke, United Kingdom

Purpose/Background: The prognostic effect of pathological extramural vascular invasion (pEMVI) in rectal cancer is controversial. Neoadjuvant chemo-radiotherapy (nCRT) is recommended in stage II-III rectal cancer in patients with MRI predicted threatened or involved circumferential resection margin (CRM). It is unclear if nCRT benefits stage II-III patients without margins at risk, though many advocate nCRT more liberally, especially if EMVI is seen at MRI. We analysed the impact of pEMVI in a cohort of rectal cancer patients who did not have nCRT.

Methods/Interventions: We retrospectively analysed a single-centre cohort of 328 consecutive patients with stage I-III rectal cancer undergoing surgery in 2005-2017. The use of nCRT was only for MRI predicted threatened or involved CRM or radiological evidence of involved pelvic sidewall nodes. We analysed the association of pEMVI status with local recurrence, distant metastases and overall survival.

Results/Outcome(s): Overall 328 patients (female/male: 121/207; median age: 66 years) underwent surgery. In total 244 (74%) were pEMVI negative and 84 (26%) pEMVI positive. pEMVI was present in 0/102 stage I, 20/95 (21%) stage II and 64/131 (49%) stage III. Including only Stage II-III (n=226) patients in the analysis, a total of 45 (20%) had nCRT. Overall 197/226 (87%) underwent anterior resection and 29 (13%) abdominoperineal excision. Postoperative chemotherapy was given to 129 (57%). On multivariate Cox-regression analysis, pEMVI positivity was associated with distant metastases (hazard ratio 2.1, C.I. 1.1-4.2; p=0.034) but not local recurrence or overall survival. In patients with MRI predicted CRM clear, not receiving nCRT, the 3- and 5-year rate of distant metastases was 5% and 5% in pEMVI negative and 16% and 21% in pEMVI positive respectively (p=0.024). In the patients undergoing nCRT the 3- and 5-year rate of distant metastases was 14% and 23% in ypEMVI negative and 35% and 46% in ypEMVI positive respectively (p=0.401). The 5-year local recurrence rate in patients with MRI predicted CRM clear, not receiving nCRT, was 4.8% in pEMVI negative and 8.5% in pEMVI positive (p=0.82), and the 5-year survival rate was a mean of 115 months in pEMVI negative and 110 months in pEMVI positive (p=0.94).

Conclusions/Discussion: Pathological EMVI is associated with distant metastases but not local recurrence or survival. Stage II-III rectal cancer patients with MRI-predicted-CRM-negative and MRI-predicted-EMVI-positive tumours may be best treated by neoadjuvant chemotherapy without radiotherapy in future clinic trials, to reduce distant metastases avoiding the functional consequences of radiotherapy.

MUCINOUS AND SIGNET RING CELL CARCINOMA PRESENTATION, TREATMENT AND OUTCOMES DIFFER FROM NON-MUCIN PRODUCING ADENOCARCINOMA.

QS385

A. Ofshteyn, K. Bingmer, J. Bliggenstorfer, E. Steinhagen, S. Stein
Cleveland, OH

Purpose/Background: While treatment for non-mucinous adenocarcinoma (NMC) of the rectum has been standardized, data is more sparse on mucinous (MC) and signet ring cell carcinoma (SRCC). Prior studies suggest that these mucin-producing subtypes have significant effect on clinical presentation and patient outcomes. We hypothesized that patients diagnosed with mucin-producing subtypes present at later stages of disease, are managed differently, and experience worse outcomes.

Methods/Interventions: The National Cancer Database was queried for patients with rectal cancer aged 18 years old and older diagnosed between 2004 and 2016. Demographic, socioeconomic, clinical, and facility factors were used to evaluate differences in patient presentation, treatment and outcomes on bivariate and multivariate analyses, using Chi square, t-testing, adjusted logistic regression and Kaplan-Meyer survival analysis as appropriate. Primary outcomes included stage at diagnosis, adherence to NCCN-guideline recommended clinical management for rectal adenocarcinoma and adjusted overall survival. Secondary outcomes included margin positivity, length of stay and readmission.

QS385 Table 1: Bivariate analyses comparing non-mucinous adenocarcinoma (NMC), mucinous adenocarcinoma (MC) and signet ring cell adenocarcinoma (SRCC) in terms of clinical factors, treatment and outcomes.

Variable description	Variable detail	NMC n=207,430	MC n=11,343	SRCC n=2,125	p value SRCC vs. NMC	p value MC vs. NMC	p value SRCC vs. MC
Clinical Stage	In Situ	5,192(3.53%)	62(0.84%)	10(0.66%)	<0.001	<0.001	<0.001
	Stage I	29,004(19.72%)	1,109(15.02%)	143(9.4%)			
	Stage II	39,970(27.18%)	2,329(31.55%)	392(25.76%)			
	Stage III	42,682(29.02%)	2,561(34.69%)	534(35.09%)			
	Stage IV	30,209(20.54%)	1,322(17.91%)	443(29.11%)			
Grade	Well-differentiated	16,063(9.4%)	1,142(12.3%)	10(0.61%)	<0.001	<0.001	<0.001
	Moderately differentiated	131,404(76.92%)	5,984(64.45%)	87(5.34%)			
	Poorly differentiated	21,564(12.62%)	1,936(20.85%)	1,379(84.6%)			
	Undifferentiated; anaplastic	1,800(1.05%)	222(2.39%)	154(9.45%)			
Tumor size	<1cm	10,808(8.04%)	367(4.35%)	58(4.95%)	<0.001	<0.001	<0.001
	1-2cm	18,437(13.71%)	857(10.17%)	82(7%)			
	2-3cm	25,314(18.82%)	1,364(16.18%)	162(13.83%)			
	3-4cm	24,466(18.19%)	1,467(17.4%)	168(14.35%)			
	>4cm	55,446(41.23%)	4,374(51.89%)	701(59.86%)			
Margin positivity	Negative margins	137,795(97.56%)	7,970(94.43%)	871(86.84%)	<0.001	<0.001	<0.001
	Positive margins	3,448(2.44%)	470(5.57%)	132(13.16%)			
Formal resection performed (stage II and III only)	No formal resection	20,051(24.26%)	713(14.58%)	333(35.96%)	<0.001	<0.001	<0.001
	Received formal resection	62,601(75.74%)	4,177(85.42%)	593(64.04%)			
Received appropriate neoadjuvant radiation (stage II and III only)	Did not receive neo-adjuvant radiation	29,159(35.28%)	1,535(31.39%)	447(48.27%)	<0.001	<0.001	<0.001
	Received neoadju-vant radiation	53,493(64.72%)	3,355(68.61%)	479(51.73%)			
Received appropriate neoadjuvant chemotherapy (stage II and III only)	Did not receive neoadjuvant chemotherapy	26,239(34.9%)	1,324(31.07%)	382(47.45%)	<0.001	<0.001	<0.001
	Received neoadju-vant chemotherapy	48,768(65.02%)	2,938(68.93%)	423(52.55%)			
Timing between radiation and surgery (stage II and III only)	Less than 6 weeks	6,756(8.17%)	462(9.45%)	55(5.94%)	<0.001	<0.001	<0.001
	6-8 weeks	14,727(17.82%)	884(18.08%)	114(12.31%)			
	8-12 weeks	16,607(20.09%)	889(18.18%)	156(16.85%)			
	More than 12 weeks	44,562(53.92%)	2,655(54.29%)	601(64.9%)			
Length of stay	days, Mean ± SD	6.79 ± 8.33	7.89 ± 8.46	8.36 ± 9.35	<0.001	<0.001	0.0845
Readmission within 30 days (after definitive resection and for Stage II and III only)	No readmission	55,848(91.99%)	3,682(90.82%)	517(89.45%)	0.025	0.008	0.287
	Readmission	4,862(8.01%)	372(9.18%)	61(10.55%)			

Significant differences also seen on bivariate analyses of gender, age, race/ethnicity, primary insurance, income, high school graduation, living area density (metropolitan, urban, rural), hospital region, facility type and Charlson-Deyo comorbidity score. Bivariate differences demonstrated in Table 1 were confirmed on subgroup multivariate analyses controlling for these demographic, clinical and facility characteristics.

Results/Outcome(s): Analysis included a total of 220,898 patients; 207,430(93.9%) with NMC, 11,343(5.1%) MC and 2,125(0.96%) SRCC. Compared with NMC, on bivariate analysis, MC and SRCC presented at a later stage (MC OR 1.29, p<0.001; SRCC 1.29, p<0.001) as well as higher grade and larger tumor size (Table 1). Adherence to NCCN-guideline recommended treatment was evaluated for locally advanced rectal cancer alone (stage II and III), and was significantly reduced for MC and SRCC when compared to NMC, with decreased rates of definitive resection as well as appropriate neoadjuvant radiation, chemotherapy and timing of surgery (Table 1). Rates of positive margins were increased for MC and SRCC (NMC 2.44, MC 5.57, SRCC 13.16, all p<0.001), as well as longer length of stay (6.8 NMC vs. 7.9MC and 8.4 SRC days, p<0.001). These results persisted in multivariate subgroup analyses adjusted for demographic, clinical and hospital factors. Adjusted overall survival was significantly worse for MC (HR 1.25, p<0.001) and SRCC (HR 1.76, p<0.001), compared to NMC.

Conclusions/Discussion: Mucin-producing subtypes of adenocarcinoma present at a later stage with worse tumor characteristics, and have a higher risk of margin positivity, longer length of stay, readmission and worse survival. SRCC and NMC were less likely to receive appropriate definitive resection and neoadjuvant chemoradiation. Further studies should focus on evaluating whether specific guidelines for the care for mucinous and signet ring cell adenocarcinoma would improve survival, and determining whether tumor biology or differences in care are driving worse outcomes for this subset of patients.

SURVIVAL DIFFERENCES BETWEEN T1 AND T2 TUMORS IN PATIENTS WITH RESECETED STAGE I RECTAL CANCER: TIME FOR A SUBCLASSIFICATION? ANALYSIS OF 16,612 PATIENTS FROM THE SEER DATABASE.

QS386

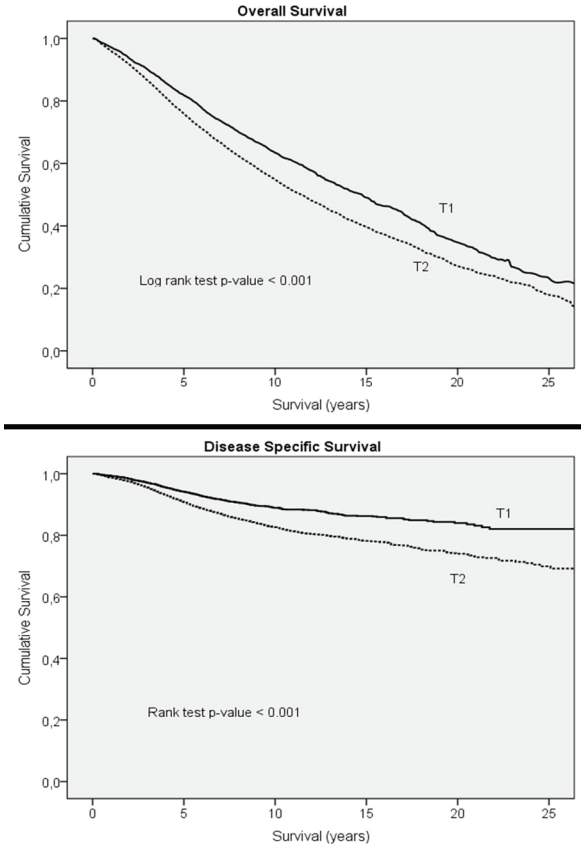
P. Goffredo[1], N. Allievi[2], P. Zhou[1], A. Masson[1], M. Pisano[2], E. Poiasina[2], A. Lucianetti[2], I. Hassan[1]
[1]*Iowa City, IA;* [2]*Bergamo, Italy*

Purpose/Background: The primary purpose of a tumor staging system is to provide a basis to prognosticate tumors and treat them accordingly. The American Joint Committee on Cancer (AJCC) categorizes non metastatic node negative colorectal cancers invading the submucosa (T1) and muscolaris propria (T2) as stage I tumors (T1-2N0M0) with no further subclassification. However, modifications in the staging system that result in the identification of higher risk patient categories can lead to individualized treatment regimens. Unlike in early stage colon cancer where a segmental resection is considered standard treatment, local excision can be an option in selected T1 rectal cancers. We hypothesized that T1 and T2 rectal cancers have a significantly different prognosis, warranting a subclassification in stage Ia and Ib respectively, in order to effectively compare different treatment strategies. The aim of the current study was to compare overall survival (OS) and Disease-Specific Survival (DSS) in node negative T1 vs. T2 rectal cancer patients who underwent proctectomy.

Methods/Interventions: The Surveillance, Epidemiology and End Result (SEER) was queried to identify adult patients with Stage I rectal cancer managed with proctectomy between 1989 and 2015. Chi-square and Student's t-test were used to compare categorical and continuous variable. The Kaplan-Meier method was used to define OS and DSS and Cox proportional hazard regression was used to identify factors associated with outcome.

Results/Outcome(s): A total of 16,612 patients were included: 36% had a T1 and 64% a T2 primary tumor. Overall, mean age was 65.5±12.5 years and 59% of patients were male. Age, gender, ethnicity and insurance status were equally distributed between the two groups. Tumor size was significantly larger for T2 tumors (36 ± 17 vs 24 ± 18 mm, p <0.001). When compared to those with T1 tumors, patients with T2 cancers demonstrated decreased survival rates (Figure 1): 5- and 10- year OS was 76% and 54% versus 82% and 63%, respectively (p <0.001); while DSS at 5- and 10-years was 91% and 82% vs 94% and 89%, respectively (p <0.001). On multivariable analysis, factors indipendently associated with decreased OS and DSS were: increasing age at diagnosis, male sex, increasing tumor size (3% increase in overall mortality and 10% increase in disease-related mortality for every additional centimeter), T2 primary tumor (HR 1.16 and 1.45, p <0.001) and African-American ethnicity (HR 1.39 and 1.65, p <0.001).

Conclusions/Discussion: In this large population-based cohort, patients with T2N0 tumors demonstrated a decreased OS and DSS, as compared to those with T1N0 tumors. This survival difference may justify a revision of the AJCC classification for Stage I rectal cancer with the introduction of a Stage Ia (T1N0M0) and Ib (T2N0M0) subclassification.



CLINICAL FACTORS ASSOCIATED WITH PATHOLOGIC COMPLETE RESPONSE AFTER TOTAL NEOADJUVANT THERAPY FOR RECTAL CANCER.

QS387

V. Mironova, H. Pantel
New Haven, CT

Purpose/Background: The traditional treatment for patients with locally advanced rectal adenocarcinoma is neoadjuvant chemoradiotherapy followed by total mesorectal excision and adjuvant systemic chemotherapy. Recently there has been promising results with total neoadjuvant therapy, giving both chemoradiotherapy and systemic cytotoxic chemotherapy preoperatively. Many of these patients are noted to have no residual disease in their pathologic specimen at the time of surgery. As such there has been interest in avoiding total mesorectal excision altogether as up to 1/3 will have no disease at the time of surgery. This non operative approach after total neoadjuvant therapy paired with intense surveillance has been deemed "watch and wait". It is likely that patients who are most likely to succeed with this approach are those with no residual disease. The purpose of this study is to identify preoperative clinical factors associated with a pathologic complete response after total neoadjuvant therapy. We hope that by identifying factors strongly associated with no residual disease after total neoadjuvant therapy this can aid in selecting who is most appropriate for a watch and wait strategy.

Methods/Interventions: The National Cancer Database was retrospectively reviewed from 2006 to 2016 for patients with adenocarcinoma of the rectum clinical stage 1 through 3 who received total neoadjuvant therapy in the form of both radiation therapy and multiagent chemotherapy prior to surgery. These patients were dichotomized into those with complete pathologic response (pT0,pN0) and those with residual disease (pT>0,pN>0). Variables which could be identified preoperatively were used in a univariate logistic regression model to identify variables which were incorporated into a multivariate model to determine association with a pathologic complete response.

Results/Outcome(s): A total of 19,141 patients with non metastatic adenocarcinoma of the rectum who received total neoadjuvant therapy prior to surgery comprised the study population. The rate of pathologic complete response observed in this group was 28%. Preoperative identifiable factors associated with a pathologic complete response were older age, smaller tumor size, lower clinical T stage, normal carcinoembryonic antigen, and lower carcinoembryonic antigen when elevated.

Conclusions/Discussion: The clinically identifiable factors of a smaller primary tumor and normal carcinoembryonic antigen are associated with a pathologic complete response after total neoadjuvant therapy for rectal cancer. These factors may provide some aid in clinical decision making about further treatment after neoadjuvant therapy, possibly in helping deciding who is likely to have no residual disease and may be a good candidate for a watch and wait strategy.

PREDICTING RADIOTHERAPY RESPONSE: AN IMPROVEMENT IN ASSESSMENT OF RESPONSE TO PREOPERATIVE CHEMORADIOTHERAPY FOR RECTAL CANCER USING MRI AND MULTIGENE-BASED BIOMARKER.

QS388

Y. Kim, I. Park, E. Cho, S. Park, S. Lim, C. Yu, J. Kim, S. Hong
Seoul, Korea (the Republic of)

Purpose/Background: As organ-preserving strategies are being increasingly employed for rectal cancer patients after PCRT, there is a sharp increase in need for better post-treatment assessment of response to PCRT. As helpful as it may be, singular use of magnetic resonance image (MRI) in the absence of a biomarker may incomprehensive in assessment. We developed a new set of assessment that employs a multigene biomarker for rectal

cancer, which, in combination with MRI, resulted in better prediction of response to PCRT.

Methods/Interventions: We included 184 patients who received PCRT followed by radical resection and categorized them as either good responders (pathologic total or near-total regression) or poor responders (all other patients). Three experienced board-certified radiologists assessed MRI images and MR-based tumor grading system (mrTRG) was measured. Score of tumor biology was calculated using a multigene panel of 8 genes (the NanoString nCounter gene expression assay). A new set of scores, the Combined Response Prediction Value (cRPV), was calculated by adding the mrTRG grade and the calculated score from each multigene assay. The predictive probability of cRPV was measured using area under the receiver operating characteristic curve (AUC).

Results/Outcome(s): Combined Response Prediction Value (cRPV) was able to predict good responders (those with pathologic total and near-total regression, AUC: 0.869). The cPRV's accuracy in predicting pathologic total regression was 38.2% in mrTRG1 patients, and 35% in mrTRG2. The accuracy of mrTRG in predicting good responders (pathologic total/near total regression) was 71.7% (142 of 198), and that of cRPV was 84.3% (167 of 198). Sensitivity and negative predictive value were significantly higher for cRPV when compared with mrTRG (66% vs. 90.1%, 64.2% vs. 85.7%). Among 112 diagnosed as having achieved pathologic total/near-total regression, 38 patients (35.8%) were diagnosed as poor responders with mrTRG, while cRPV diagnosed only 11 of them as poor responders.

Conclusions/Discussion: Combined Response Prediction Value (cRPV), a more comprehensive assessment of degree of response to PCRT, was achieved by results of mrTRG and multigene panel biomarker. The new assessment score showed improved accuracy in assessing post-PCRT status in rectal cancer patients. It increased detection rate of good responders and would increase chance for organ-preserving treatment after PCRT.

QS388 Comparison of Diagnostic Accuracy for Treatment Response between mrTRG and cRPV

	mrTRG	cRPV
Accuracy	71.7%	84.3%
Sensitivity	66%	90.1%
Specificity	79%	76.7%
Positive predictive value	80%	83.4%
Negative predictive value	64.2%	85.7%

ADJUVANT THERAPY FOR PATIENTS ACHIEVING PCR FOLLOWING NEOADJUVANT THERAPY AND RADICAL EXCISION MAY BE OVERKILL.

QS389

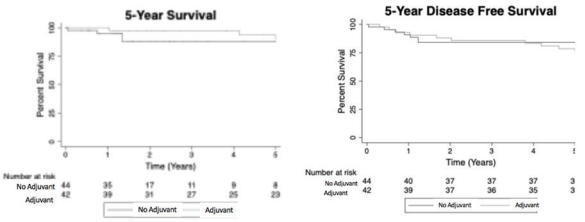
K. Hrebinko[1], K. Reitz[1], A. Gamboa[2], G. Balch[2], A. Hawkins[3], S. Regenbogen[4], M. Silviera[5], J. Holder-Murray[1]
[1]Pittsburgh, PA; [2]Atlanta, GA; [3]Nashville, TN; [4]Ann Arbor, MI; [5]St. Louis, MO

Purpose/Background: The benefit of adjuvant chemotherapy (AC) for patients with rectal cancer who achieve a pathologic complete response (pCR) following standard neoadjuvant therapy and mesorectal excision is not well established. By nature of achieving pCR, these tumors demonstrate favorable response to cytotoxic chemoradiotherapy. We therefore hypothesize that the addition of AC in patients who achieve pCR will not result in survival benefit as the eradication of micrometastases that may contribute to recurrence and mortality were likely treated with neoadjuvant therapy.

Methods/Interventions: Using the multi-institutional US Rectal Cancer Consortium Database (2007-2017), patients with a pCR who underwent mesorectal excision and standard neoadjuvant chemoradiotherapy for locally advanced non-metastatic rectal cancer were identified. Baseline patient, tumor, and operative characteristics were compared between those who received or did not receive AC using fisher's exact, rank-sum, chi-squared, and two-sample t-tests. The primary outcome was 5-year disease-free survival (DFS). Secondary outcomes included 5-year overall survival (OS) and 5-year recurrence rate (RR).

Results/Outcome(s): 419 patients had locally advanced rectal cancer and underwent neoadjuvant therapy, of which 86 (20.5%) had a pCR. 44 patients received AC and 42 did not. Baseline characteristics including age (AC: 59.6 vs. no AC: 59.3 years, p=0.91), male gender (AC: 69.0% vs. no AC: 66.0%, p=0.39), BMI (p=0.77), current smoking status (AC: 24.0% vs. no AC: 21.0%, p=0.70), private insurance status (AC: 56.0% vs. no AC: 63.0%, p=0.62) and ASA class (AC: 2.4 vs. no AC: 2.5, p=0.12) were similar between groups. Preoperative clinical stage as assessed by available endorectal ultrasound, pelvic MRI, and CT data was similar between groups (p=0.55). There was no difference in 5-year DFS (AC: N=32 [76.2%] vs. no AC: N=37 [84.1%], p=0.42) or 5-year OS (AC: N=36 [87.8%] vs. no AC N=34 [87.2%], p=0.21) between groups (Figure 1). Of those with pCR, there were 10/86 recurrences and an overall 5 year RR of 12.0%. There was no difference in the 5-year RR between groups (AC: N=7 [16.7%] vs. no AC: N=3 [6.8%], p=0.18).

Conclusions/Discussion: There is no DFS, OS, or RR benefit of AC in patients who achieve pCR following standard neoadjuvant therapy and mesorectal excision in this multi-institutional cohort. Further studies are needed to determine if patients with pCR benefit from the use of AC.



5-year overall and disease free survival for patients with pCR who received or did not receive adjuvant chemotherapy following mesorectal excision and neoadjuvant therapy.

LONG-TERM OUTCOMES OF ORGAN PRESERVATION IN RECTAL CANCER PATIENTS WITH CLINICAL COMPLETE RESPONSE AND NEAR CLINICAL COMPLETE RESPONSE FOLLOWING NEOADJUVANT THERAPY: DATA FROM A SINGLE CENTER.

QS390

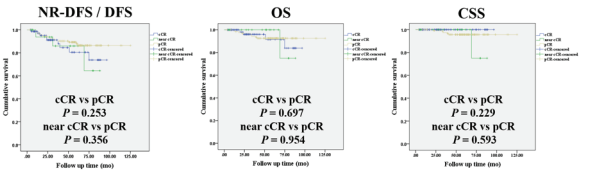
Y. Zhao, L. Wang, A. Wu
Beijing, China

Purpose/Background: The aim of this study was to investigate the long-term outcomes of organ preservation (OP) method with watch-and-wait strategy (W&W) or local excision (LE) in rectal cancer patients with clinical complete response (cCR) or near clinical complete response (near-cCR) after neoadjuvant chemoradiotherapy (nCRT).

Methods/Interventions: Clinical data of two group of rectal cancer patients were retrospectively analyzed and compared between 2011 and 2019. The organ preservation (OP) group includes 73 patients who had a cCR after nCRT and 20 patients who had a near-cCR after nCRT. W&W or LE was offered if response assessment with digital rectal examination, endoscopy and MRI showed a cCR or near cCR. The ypCR (yield pathological complete response) group includes 125 patients who underwent nCRT and total mesorectal excision (TME) and eventually proved to be ypCR. Primary outcomes included overall survival (OS), non-regrowth disease-free survival (NR-DFS) and cancer specific survival (CSS). The secondary outcomes included 3-year organ preservation rate (OPR), 3-year sphincter preservation rate (SPR), 3-year local regrowth rate and 3-year metastasis rate. Survival analysis was performed with Kaplan-Meier curves (Log-rank method).

Results/Outcome(s): In OP group, a total of 93 patients were included, with median follow-up of 32.8 months, of whom 9 patients underwent local excision (8 ypCR, 1 ypT2), 84 patients accepted watch and wait policy. At 5 year, OS was 91.5% (95%CI, 86.3%-96.7%) in cCR group, 100% in near-cCR group and 92.5% (CI 90.1%-96.3%) in ypCR group; NR-DFS was 80.5% (95%CI, 73.8%-87.2%) in cCR group and 85.9% (76.3%-95.2%) in near-cCR group, DFS was 87.9% (95%CI, 83.8%-91.0%) in ypCR group. At 3 year, OPR and SPR were 82.9% and 93.6%, respectively. In OP group, 3-year local regrowth rate were 27.6% (13/47, median regrowth time of 13.0 months) and 16 of 18 local regrowth were salvaged by surgery (88.9%). At 3 year, 10.6% patients in OP group and 6.4% in ypCR group had metastasis. There was no significant difference of CSS (cCR vs ypCR, $P = 0.229$; near cCR vs ypCR, $P = 0.593$) and OS (cCR vs ypCR, $P = 0.697$; near cCR vs ypCR, $P = 0.954$) between OP group and ypCR group. Compared with 5-year DFS of ypCR group, no significant difference was found in 5-year NR-DFS of OP group (cCR vs ypCR, $P = 0.253$; near cCR vs ypCR, $P = 0.356$).

Conclusions/Discussion: Compared with ypCR patients, organ preservation method including LE and W&W in cCR and near-cCR patients appears to achieve high organ preservation rate and similar long term outcomes.



		NR-DFS	95% CI		OS	95% CI		CSS	95% CI
cCR (n=73)	5 yr NR-DFS	80.5%	73.8%-87.2%	5 yr OS	91.50%	86.3%-96.7%	5 yr CSS	100%	-
	3 yr NR-DFS	91.1%	87.3%-94.9%	3 yr OS	96.10%	93.4%-99.4%	3 yr CSS	100%	-
near-cCR (n=20)	5 yr NR-DFS	85.9%	76.3%-95.2%	5 yr OS	100%	-	5 yr CSS	100%	-
	3 yr NR-DFS	85.9%	76.3%-95.2%	3 yr OS	100%	-	3 yr CSS	100%	-
ypCR (n=125)	5 yr DFS	87.9%	83.8%-91.0%	5 yr OS	92.50%	90.1%-94.9%	5 yr CSS	95.70%	93.8%-97.6%
	3 yr DFS	91.0%	88.4%-93.6%	3 yr OS	94.20%	92.1%-96.3%	3 yr CSS	97.40%	95.9%-98.9%

Figure 1. Non-regrowth disease free survival (NR-DFS), overall survival (OS) and cancer-specific survival (CSS) of organ preservation group and yield pathological complete response group.

TIMING AND DETECTION OF LOCAL REGROWTHS DURING WATCH-AND-WAIT FOR PATIENTS WITH A COMPLETE RESPONSE AFTER NEOADJUVANT THERAPY IN RECTAL CANCER: IMPLICATIONS FOR FOLLOW-UP.

QS391

G. Beets[1], H. Haak[1], J. Zmuc[2], D. Lambregts[1], R. Beets-Tan[1], J. Melenhorst[3], M. Maas[1]
[1]Amsterdam, Netherlands; [2]Ljubljana, Slovenia; [3]Maastricht, Netherlands

Purpose/Background: To give an overview of the method and timing of local regrowth (LR) detection during follow-up (FU) of patients in a watch-and-wait (W&W) approach for a complete response (CR) after chemoradiation (CRT) in rectal cancer and improve the FU strategy.

Methods/Interventions: Patients with rectal cancer with a CR after CRT (diagnosed by digital rectal examination, endoscopy and MRI) were included in a W&W-program between 2004-2018. Patients were followed with frequent endoscopy and MRI 3-monthly during the first year and 6-monthly thereafter. Timing and location of LR and modality of detection were collected. Results were compared to the literature.

Results/Outcome(s): 304 patients were analysed (median FU 40 (2-158) months). 50/304 (16%) developed a LR (43 luminal; 3 nodal; 4 luminal and nodal). In 98% of patients, LR was detected ≤2 years (≤6 months (n=4), 6-12 months (n=26), 12-24 months (n=19)). Main modality of detection were MRI and endoscopy (n=30: 28 luminal; 2 nodal), followed by endoscopy-only (n=14) and MRI-only (n=6: 3 nodal; 2 luminal; 1 luminal and nodal). Review of the literature included 13 studies (n=428) and revealed comparable results: LR was mostly luminal and longest interval to LR was a median of 30 months (range 6-64).

Conclusions/Discussion: Almost all LRs occur within 24 months and 88% is detected on endoscopy, only 12% on MRI-only. However, MRI remains essential in detecting nodal involvement. The FU schedule after 2 years can be simplified, for instance by yearly instead of 6-monthly intervals and omitting MRI. New prospective studies have to verify the safety of these schedules.

OUTCOMES OF PATIENTS WITH LOCAL REGROWTH AFTER NONOPERATIVE MANAGEMENT OF RECTAL CANCER AFTER NEOADJUVANT CHEMORADIOTHERAPY.

QS392

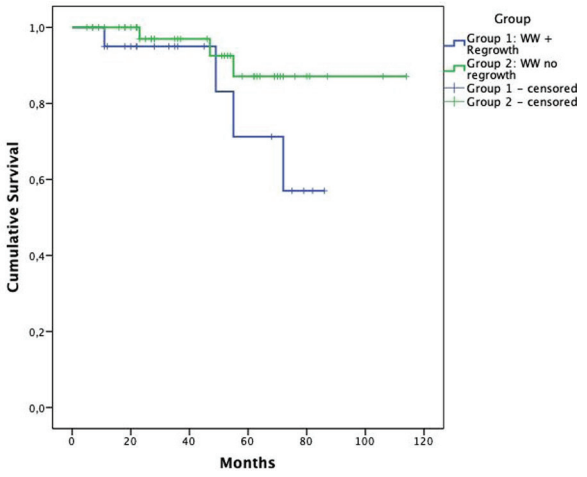
G. Cotti, R. Pandini, O. Braghiroli, C. Nahas, C. Sparapan Marques, A. Rocco Imperiale, L. Bustamante-Lopez, U. Ribeiro, B. Salvajoli, P. Hoff, S. Nahas
São Paulo, Brazil

Purpose/Background: There is an increasing acceptance of a "watch and wait" (WW) strategy in patients with rectal cancer treated with neoadjuvant chemoradiotherapy (nCRT). Nonetheless, a significant proportion of patients may experience a local regrowth, and the long-term oncological outcomes of these patients is not totally known. The purpose of this study was to analyze the outcome of patients submitted to a watch and wait strategy that developed a local regrowth, and to compare these results with the remaining patients of the WW strategy.

Methods/Interventions: Retrospective review of patients with rectal cancer treated with nCRT in a single institution between 2008 and 2019. Patients who were found at restage to have a complete or near complete clinical response, and refused surgical intervention, underwent a watch and wait strategy (with or without a full thickness local excision) and developed local regrowth (group I, N = 20) were compared to the remaining patients of the WW strategy (group II, N = 47).

Results/Outcome(s): There were 67 patients, mean age 63.0 (SD 10.8) years and 49.3% were females. Local regrowth occurred in 29.9% of the patients treated with a WW strategy. Mean distance to anal verge was 4.0cm (SD 2.6) in Group I vs 3.7 cm (SD 2.2) in Group II. Mean follow-up was 46.1 months (SD 12.8). Patients presented with comparable initial staging, lateral pelvic lymph-node metastasis (5.0 vs 6.7%), and extramural venous invasion (15.0 vs 15.6%), but group I patients had a statistically non-significant higher incidence of mesorectal fascia involvement (35.0 vs 13.3%, p 0.089). Regrowth occurred at mean 14.3 months after nCRT (SD 8.2), half of them within the first 12 months. All Group I patients underwent a salvage surgery, mostly (75%) a sphincter-sparing procedure. Overall survival was 80.0 vs 93.6%, with no statistical difference in survival analysis (p = 0.126, log-rank test).

Conclusions/Discussion: Local regrowth is a frequent event after a WW policy (29,9%), however patients could undergo salvage surgical treatment with a 75% rate of sphincter preservation. Overall survival of patients who developed a local regrowth showed no statistical difference from patients managed with a WW strategy that did not experience a local regrowth



SYSTEMATIC REVIEW AND ANALYSIS OF HARM OF PATIENTS WITH RECTAL CANCER UNDERGOING WATCH AND WAIT FOLLOWING TOTAL NEOADJUVANT THERAPY.

QS393

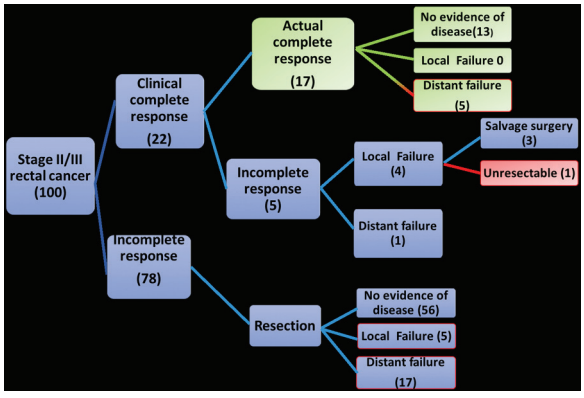
R. Pedraza, D. Herzig, K. Lu
Portland, OR

Purpose/Background: Organ preservation approach ("watch and wait") has emerged as a safe alternative for the management of rectal cancer in selected patients; however, the risk of recurrent (or persistent) poses a potential harm to patients. We sought to perform a systematic review of the literature to estimate rates of regrowth, salvage surgery and distant failure and then use those estimates to analyze the potential harm from a watch-and-wait strategy.

Methods/Interventions: We conducted a systematic review of peer-reviewed publications utilizing the Medline search engine of studies (in English or Spanish) that included patients with locally advanced rectal cancer who underwent TNT, as well as studies reporting outcomes from non-operative management. Studies with 5 subjects or fewer were excluded. A pooled data analysis was performed of the selected studies, and the rates of pCR, local failure after watch and wait, systemic failure after watch and wait, and salvage therapy for local failure were obtained. These estimates were then used to provide an analysis of harm.

Results/Outcome(s): From the studies analyzed, we identified a cCR rate of 22% after neoadjuvant therapy in patients undergoing watch and wait approach with a local failure of 19.2% (95%CI 18.0%-21.2%). Among those patients with local failure, the salvage therapy rate was 80.1%. When analyzing studies evaluating TNT followed by resection, we identified a pCR rate of 20.8% (95% CI 18.2-23.4%) with a risk for systemic recurrence of 22.1% (95% CI 19.4-24.8%) and a local recurrence of 6%. Based on these data, Figure 1 represents the analysis of harm. Starting with 100 stage II or III rectal cancer, using hypothetical proportion distribution of possible outcomes of patients with rectal cancer undergoing a watch and wait strategy following TNT, harm from an unresectable local regrowth would occur in 1 patient.

Conclusions/Discussion: Based on a systematic review of currently available studies, a watch and wait approach following TNT for rectal cancer results in adequate outcomes with only 1% of patients presenting with rectal cancer at risk of developing unresectable local failure.



FLEXIBLE SIGMOIDOSCOPY IS THE KEY MODALITY TO DETECT REGROWTHS DURING A WATCH-AND-WAIT STRATEGY FOR RECTAL CANCER: ENDOSCOPIC FINDINGS AND LESSONS LEARNED FROM OVER 140 PROCEDURES.

QS394

K. Watson, I. Gardner, V. Tsikitis, D. Herzig
Portland, OR

Purpose/Background: Multimodality treatment of rectal cancer and the shift to "total neoadjuvant therapy" have led to an increased proportion of complete or near complete clinical and pathological responses. As a result, there is increasing interest in delaying rectal resection in these patients, a treatment plan termed either "organ preservation" or "watch-and-wait." The optimal surveillance strategy to detect regrowths in these patients is evolving. Here we report lessons learned during the initial experience in a high-volume tertiary care center with an active watch-and wait program.

Methods/Interventions: We conducted a single-center retrospective review of our patients treated with the watch-and-wait strategy following a complete or near-complete response to total neoadjuvant therapy for rectal cancer. Patients who refused a recommended operation after an incomplete response were excluded. Surveillance was performed with serial concurrent magnetic resonance imaging (MRI), flexible sigmoidoscopy, digital rectal exam (DRE) and carcinoembryonic antigen (CEA) every 3 months for two years, then every 6 months for two years, then annually.

Results/Outcome(s): A total of 27 patients with median age 57 years (range 33-80 years) treated with total neoadjuvant therapy and eligible for watchful waiting were followed over a median of 15 months (range 1-46 months), including 140 endoscopic procedures, 152 MRIs and 71 computed tomography (CT) scans. Tumor regrowth was identified in a total of 3 patients (11%), all by flexible sigmoidoscopy at a median interval of 8 months (range 3-16 months). There were abnormal findings on MRI in 1 patient and on DRE in 1 patient, but not sufficient to be reported as regrowth. CT and CEA did not detect local regrowth in any patient, although CT identified 1 patient with metastatic disease at 16 months. Salvage surgery was possible in all patients with local regrowth, with tumor size in the resected specimen ranging from 2 to 10 mm in size. Of the regrowths detected by flexible sigmoidoscopy, only 1 was appreciated on antegrade endoscopic exam, whereas all three were identified using retroflexion or extended examination using near focus or desufflation to examine the wall compliance.

Conclusions/Discussion: High definition video flexible sigmoidoscopy is the single most component of organ preservation surveillance to detect early local tumor regrowth. Because retroflexion is critical for detection of regrowths, rigid proctoscopy may not be adequate. Small regrowths

can be detected with a careful examination for characteristic findings of nodularity, which can be obscured by over insufflation of the rectum.

Watson, K
Figure 1

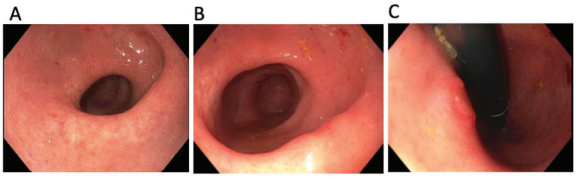


Figure 1: Endoscopic findings of recurrent local disease in a 56-year-old man 9 months following completion of total neoadjuvant therapy. DRE was equivocal and MRI was negative. Antegrade evaluation demonstrated a stable scar (A). Using partial insufflation (B) as well as retroflexion (C), the regrowth was identified.
DRE = Digital rectal exam.
MRI = Magnetic resonance imaging.

THE IMPACT OF SURGICAL APPROACH ON MARGINS AND COMPLICATION RATES FOR TOTAL MESORECTAL EXCISION.

QS400

A. Post, P. Rodrigues Armijo, S. Langenfeld, J. Leinicke
Omaha, NE

Purpose/Background: One important limitation of randomized trials for rectal cancer is that the surgeons involved in the studies are often world experts in laparoscopic proctectomy. It is unclear if the outcomes demonstrated in these studies are being reproduced outside the confines of clinical trials. The purpose of this study was to compare margin status and complication rates between minimally invasive and open proctectomy for rectal cancer.

Methods/Interventions: The 2016-2017 ACS-NSQIP proctectomy-targeted database was queried for adult patients undergoing low anterior resection (LAR) or abdominoperineal resection (APR) for a primary diagnosis of rectal cancer. Patients undergoing redo surgery for rectal cancer recurrence and those undergoing secondary procedures other than proctectomy were excluded. Outcomes evaluated included circumferential radial margin (CRM), distal resection margin (DRM), surgical site infection (SSI), 30-day all complications, 30-day mortality, 30-day readmission, and length of stay (LOS). Patients were divided according to surgical approach; the first group was OPEN approach and the second was minimally invasive surgery (MIS), which included both laparoscopic and robotic cases. Statistical analysis was performed using PC SAS version 9.4, with $\alpha=0.05$.

Results/Outcome(s): A total of 1236 patients were included (LAR: N=508, APR: N=728). Our preliminary data showed the majority of patients were male (LAR: 63%, APR: 64%), Caucasian (LAR: 73%, APR: 72%), mean age (LAR: 58, SD=12 years; APR: 64, SD=13 years; Table 1). For patients undergoing LAR, there was no significant difference in rates of positive CRM (OPEN 3%, MIS 4%, p=0.371) or DRM (OPEN: 2%, MIS: 1%, p=0.7317). For patients who underwent APR, rates of positive CRM were significantly higher in the MIS group (10% vs 6%, p=0.024). Overall complication rates were higher for MIS approaches to both LAR (36% vs 22%, p=0.029) and APR (25% vs 16%, p=<0.001

Conclusions/Discussion: In the real world, MIS approaches to proctectomy are associated with increased complications and higher rates of margin positivity. Future analysis will evaluate the impact of specific type of MIS approach (laparoscopic vs robotic) and perform a multivariate analysis to account for confounders.

Table 1

	Low Anterior Resection			Abdominoperineal resection		
	Open N=349	MIS N=159	*p*	Open N=410	MIS N=318	*p*
	N (%) or Median [IQR]	N (%) or Median [IQR]		N (%) or Median [IQR]	N (%) or Median [IQR]	
Sex (male)	219 (63%)	99 (62%)	0.916	261 (64%)	206 (65%)	0.754
Race (Caucasian)	259 (74%)	111 (70%)	0.301	298 (73%)	227 (71%)	0.698
Pre-Stage 1 2 3 4	11 (3%) 145 (42%) 180 (52%) 13 (4%)	5 (3%) 61 (38%) 76 (48%) 17 (11%)	0.023	12 (3%) 150 (37%) 234 (57%) 14 (3%)	5 (2%) 149 (47%) 141 (44%) 23 (7%)	0.001
Age	58 [51, 65]	62 [46, 71]	0.114	59 [53, 66]	73 [61, 79]	<.001
BMI	28.00 [24.48, 31.74]	26.68 [23.16, 30.54]	0.023	27.81 [23.83, 31.69]	27.16 [23.36, 31.88]	0.374
Positive Radial Margin	10 (3%)	7 (4%)	0.372	23 (6%)	32 (10%)	0.024
Positive Distal Margin	8 (2%)	2 (1%)	0.732	7 (2%)	6 (2%)	0.856
SSI	26 (7%)	15 (9%)	0.446	50 (12%)	49 (15%)	0.210
30-day Reoperation	9 (3%)	7 (4%)	0.275	21 (5%)	27 (8%)	0.069
30-day Readmission	49 (14%)	23 (14%)	0.899	48 (12%)	49 (15%)	0.145
30-day Mortality	0	0	--	0 (0%)	2 (1%)	0.191
30-day Complications	57 (16%)	39 (25%)	0.029	89 (22%)	115 (36%)	<.001

MIS Minimally Invasive Surgery, IQR Interquartile Range, *p* p-value,
BMI Body Mass Index, *SSI* Surgical Site Infection

EFFECTS OF SURGICAL APPROACH IN SHORT AND LONG-TERM OUTCOMES IN EARLY STAGE RECTAL CANCER.

QS401

W. Kethman, K. Bingmer, A. Ofshteyn, R. Charles, S. Stein, D. Dietz, E. Steinhagen
Cleveland, OH

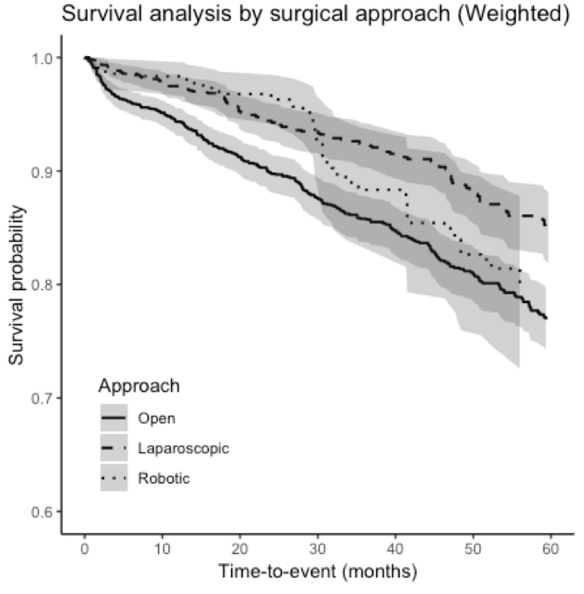
Purpose/Background: Randomized control trials have demonstrated non-inferiority of minimally invasive surgery for rectal cancer, but data is lacking regarding outcomes using a national database. The primary aim of this study was to evaluate the likelihood of successful oncologic resection by operative approach in a homogenous, early stage rectal cancer cohort.

Methods/Interventions: The National Cancer Database was queried for patients who underwent an open, laparoscopic, or robotic proctectomy for early clinical stage rectal adenocarcinoma (cT1-2N0M0) from 2010-2015, excluding those who received inappropriate neoadjuvant or adjuvant

locoregional therapy. Oncologic resection success was defined by margin negativity and adequate lymph node yield. Short and long-term mortality and morbidity were compared using propensity score-weighted logistic and linear regression models. Survival analysis was performed by propensity score-weighted Kaplan-Meier statistic.

Results/Outcome(s): Among 3,386 rectal cancer resections, 1,660 (49%) were performed open, 1,239 (37%) laparoscopic, and 487 (14%) robotic. After propensity score-weighting, there were no significant differences among the cohorts for pre-operative variables, including age, sex, ethnicity, insurance status, Charlson-Deyo score, clinical staging, tumor grade, and facility rectal cancer resection volume. Laparoscopic and robotic approaches were not associated with decreased likelihood of oncologic success (OR_{adj}=1.1, 95% C.I. 0.88-1.3 and OR_{adj}=1.3, 95% C.I. 0.94-1.7). Open approach (7.7±0.2 days) was associated with a longer length of stay (laparoscopic - 6.2±0.2 days, robotic – 5.9±0.3, p <0.01), however, there was no difference in readmission (OR_{adj}=1.1, 95% C.I. 0.81-1.5 and OR_{adj}=1.3, 95% C.I. 0.86-1.9). Laparoscopic and robotic approaches were associated with lower 90-day mortality (OR_{adj}=0.43, 95% C.I. 0.25-0.72 and OR_{adj}=0.44, 95% C.I. 0.2-0.95). Weighted overall survival analysis by approach was performed for the 2,849 (84%) patients whose pathologic stage did not worsen or improve after resection (Figure 1).

Conclusions/Discussion: For patients with early stage rectal cancer treated with proctectomy, this study demonstrates short-term advantages for minimally invasive approaches. These benefits persist in the long-term for laparoscopic, but not robotic approaches. Further investigation is necessary to understand patient-specific factors that drive short and long-term outcomes for open approach.



Weighted KM-survival analysis (with 95% C.I.) of pathologic early stage disease by surgical approach.

TaTME AFTER NEOADJUVANT RADIOCHEMOTHERAPY FOR LOCALLY ADVANCED EXTRAPERITONEAL RECTAL CANCER: LONG-TERM FUNCTIONAL OUTCOMES, QUALITY OF LIFE AND MANOMETRIC FINDINGS.

QS402

V. De Simone, R. Persiani, A. Biondi, D. D'Ugo, F. Litta, A. Parello, M. Goglia, C. Ratto
Rome, Italy

Purpose/Background: In an integrated strategy to treat rectal cancers, transanal total mesorectal excision (TaTME) is considered a valuable procedure. The aim of this prospective study was to evaluate the long term functional outcomes (in terms of quality of life [QoL], fecal incontinence, and anorectal manometry [ARM] features), when neoadjuvant radiochemotherapy (RCT) was associated to TaTME in treating locally advanced extraperitoneal rectal cancer.

Methods/Interventions: Between February 2016 and April 2019, 33 consecutive patients with mid-low rectal cancer undergoing TaTME were enrolled in the present study. Patients with locally advanced rectal cancer were treated by RCT and TaTME (group 1); patients with earlier rectal cancer were treated by TaTME only (group 2). The preoperative and postoperative evaluation included collection of: Cleveland Clinic Fecal Incontinence Score (CCFIS), Low Anterior Resection Syndrome Score (LARS), anorectal manometry (ARM), and quality of life questionnaires (SF36 and FIQL). The two groups were compared.

Results/Outcome(s): Nineteen patients were assigned to group 1 and fourteen to group 2. Mean follow up after stoma closure was 22 months (range 12-38 months). In all patients a primary anastomosis was performed (22 end-to-end, 10 side-to-end colo-rectal anastomosis, 1 end-to-end colo- anal anastomosis). In group 1, mean CCFIS was 0.6±1.2 preoperatively, and 3.7±4.4 postoperatively; in group 2, mean CCFIS was 0.7±1.9 preoperatively and 1.2±1.5 postoperatively (p=0.038). According to LARS score, mean preoperative and postoperative values in group 1 were 2.3±4.4 and 11.8±9.6, respectively, while in group 2 were 2.6±4.8 and 8.7±10.7, respectively (p=n.s.). Mean values of ARM parameters at pre- vs. postoperative evaluation were: mean resting pressure, group 1: 41.8±23.8 vs. 30.6±14.9 mmHg; group 2: 39.7±17.9 vs. 34.4 ±18.0 mmHg (p =n.s.); maximum resting pressure, group 1: 92.1±40.3 vs. 77.6±41.7 mmHg; group 2: 81.7±33.2 vs. 76.5±33.8 mmHg (p =n.s.); maximum squeeze pressure, group 1: 179.7±81.5 vs. 194.8±83.7 mmHg; group 2: 171.2±82.6 vs. 185.9±98.5 mmHg (p =ns). Concerning QoL, there was no significant difference in SF36 and FIQL questionnaire between the two groups.

Conclusions/Discussion: Data from this study seems to suggest that TaTME after RCT caused an additional risk of fecal incontinence, but patients' QoL was not negatively

affected. Preoperative irradiation could influence negatively the fecal evacuation after 1 year from surgery. However, the addition of RCT seems to only slightly decrease the manometric parameters (including mean and maximum resting pressures), without any significant difference when compared with TaTME alone.

TRANSANAL TOTAL MESORECTAL EXCISION (TaTME) FOR RECTAL CANCER: ONCOLOGIC AND CLINICAL OUTCOMES OF 140 CONSECUTIVE PATIENTS AT A SINGLE INSTITUTION.

QS403

E. Abboud, M. Uwah, J. Wright, M. Albert, J. Kelly, T. deBeche-Adams, G. Nassif, J. Monson
Orlando, FL

Purpose/Background: Local recurrence (LR) rates following taTME have been hotly debated with at least one national moratorium against its use. This study, using the largest single center experience in the United States, evaluates early oncologic and clinical outcomes.

Methods/Interventions: We extracted data from a prospective database for 140 consecutive patients who underwent resections for rectal cancers with taTME from 3/2012 to 10/2019. The primary outcome observed was cancer recurrence. Data were also analyzed for patient demographics, tumor characteristics, cancer stage, quality of TME specimen, and postoperative complications.

Results/Outcome(s): Of 140 rectal cancer patients, 71.4% were male. Mean age was 59.5 years and BMI 27.6kg/m^2. 14.3% were clinical stage 1; 25% stage 2; 59.3% stage 3; and 1.4% stage 4. 80.7% received neoadjuvant chemoradiation. 93% underwent LAR, 4% APR, and 3% proctocolectomy. 89.3% were performed via laparoscopy, 7.9% robotic, and 2.8% open. The conversion rate from minimally invasive to open was 3.6%. The mean tumor distance from anal verge (measured by MRI) was 5.32cm (range 0-13cm). Pre-treatment MRI circumferential margin (CRM) involvement was 27.1%, and postop CRM involvement 6.4%. TME grade was complete or nearly complete in 96.4% of cases, and mean lymph node harvest was 19.3. Distal resection margins were negative in 97.9%. The overall recurrence rate was 23.6% (33 patients); 4 LR, 25 distant (lung & liver), and 4 both distant and LR. The majority that recurred had stage 2 (33.3%) or 3 (48.5%) disease. Of the 8 that recurred locally, 37.5% had stage 1, 12.5% stage 2, and 50% stage 3 disease. Of the 25 that had a complete response to neoadjuvant therapy, 3 recurred (12%); 1 distant, and 2 with both distant and LR. The median time to recurrence was 13 months (range 4-41 months). 100% of LR had low tumors (within 6cm of the anal verge). In those that recurred, mean preop CRM involvement was 39%, postop CRM involvement 18.2%, and mean tumor height 4.57cm (compared to 23%, 2.8%, and 5.55cm in those that did not recur, respectively). The overall recurrence rate was 20.2% for tumors of the lower rectum and 14.3% for the mid rectum. Distal resection margins were negative in 90.9%. Median follow up was 16 months, with a survival of 98.6%. Only 1 patient died within 30 days (sepsis, multiorgan failure). Average postop length of stay was 6.2 days. 11.4% had an anastomotic leak.

Conclusions/Discussion: In this series, we have not seen high rates of local cancer recurrence following taTME. Indeed, in a group of high-risk patients with low and locally advanced tumors, the LR rate appears similar to those achieved with traditional operative technique. It also appears to be a safe and effective approach with an acceptable morbidity profile. A moratorium against taTME is not justified. Larger studies with long-term follow-up are required to support these conclusions.

THE RATE OF LOCAL RECURRENCE FOLLOWING TRANSANAL TOTAL MESORECTAL EXCISION FOR RECTAL CANCER: A SYSTEMATIC REVIEW AND META-ANALYSIS.

QS404

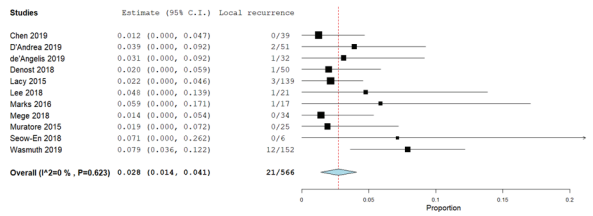
H. Wasmuth[1], M. Gachbayov[2], A. Rojas[2], D. Felsenreich[2], R. Bergamaschi[2]
[1]*Trondheim, Norway;* [2]*New York, NY*

Purpose/Background: Although transanal total mesorectal excision (taTME) was grabbing the headlines in the surgical literature of the last decade, recent Norwegian moratorium challenged the status quo reporting more frequent early multifocal local recurrences. The aim of this systematic review was to evaluate local recurrence rate following taTME in reports published to date.

Methods/Interventions: The Pubmed and MEDLINE (via Ovid) databases were systematically searched. Any descriptive or comparative studies reporting the rates of local cancer recurrence at the median of more than 10 months following taTME were included. Local recurrence was defined as any recurrence located in the pelvic surgery site (anastomosis and/or lymph nodes). Untransformed proportion method of one-arm meta-analysis was utilized for statistical analysis. Untransformed percent proportion with 95% confidence interval (UP (95%CI)) was used to express pooled outcomes.

Results/Outcome(s): Eleven studies totaling 574 patients were included (1 prospective randomized trial, 8 prospective cohort studies, and 2 retrospective cohort studies). The pooled rate of local cancer recurrence was 2.8% (1.4%, 4.1%) at the average of 25.5 months following taTME with low statistical among-study heterogeneity (I^2=0%) (Figure 1). Clinical heterogeneity across the included studies was determined to be substantial. Figure 1. Pooled local recurrence rate: forest plot.

Conclusions/Discussion: This systematic review found the rate of local recurrence following taTME for rectal cancer to be 2.8%. However, clinical heterogeneity across the studies was substantial raising concerns of selection and publication biases.



CAN ROBOTIC SURGERY OVERCOME THE LIMITATIONS OF LAPAROSCOPIC SURGERY FOR RECTAL CANCER? ANALYSIS OF 533 ROBOTIC RECTAL RESECTIONS.

QS405

O. Peacock, T. Limvorapitak, M. Tillman, B. Bednarski, C. Messick, Y. You, G. Chang
Houston, TX

Purpose/Background: Minimally invasive surgery for rectal cancer is technically demanding. It has been associated with a lower rate of successful resection based on circumferential resection margin involvement and/or incomplete total mesorectal excision (TME), particularly in obese male patients with bulky or distally located tumors. Robotic surgery addresses some of the limitations of laparoscopy, but there is still limited data regarding the outcomes. The aim of this study was to evaluate the outcomes of robotic TME at a single NCI designated cancer center.

Methods/Interventions: Retrospective analysis of a prospective database of consecutive patients undergoing total or tumour-specific mesorectal excision for rectal cancer between April 2009 and August 2019. Main outcomes were short-term peri-operative and oncologic outcomes. Major morbidity was defined as Clavien-Dindo≥3.

Results/Outcome(s): A total of 533 patients underwent robotic protectomy during the study period. The mean age was 54 (SD+/-12.5) years and there were 200 (37.5%) females. The median BMI was 27.2 kg/m^2 (IQR 23.6-30.7). The median tumor distance from the anal verge was 7cm (IQR 4-10). Neoadjuvant therapy was performed in 365 (68.5%) patients. The types of procedures performed were: 365 (68.4%) low and ultra-low anterior resections, 73 (13.7%) handsewn colo-anal anastomoses, 85 (15.9%) abdominoperineal resections, 7 (1.3%) total proctocolectomies, 4 (0.8%) total pelvic exenterations and 2 (0.4%) Hartmann's procedures. Beyond TME surgery was performed in 106 (19.9%) patients. The rate of conversion to open surgery was 3.0% (n=16), median total operating time was 339 minutes (IQR 284-418), median estimated blood loss was 100ml (IQR 50-200) and the median length of hospital stay was 5 days (IQR 4-6). The major morbidity rate was 7.9% (n=42), including 20 patients with an anastomotic leak (3.8%). The median lymph node harvest was 25 (IQR 19-33) and the incomplete TME rate was 0.8% (n=3). The overall positive circumferential (<2mm) and distal resection margins were 2.4% (n=13) and 0.4% (n=2) respectively.

Conclusions/Discussion: The robotic approach to rectal cancer is associated with a low conversion to open surgery rate, a low rate of circumferential resection margin positivity and a low rate of incomplete TME despite a high rate of beyond TME resections. The robotic approach may therefore address the challenges posed by minimally invasive surgery for rectal cancer.

A NATIONAL ANALYSIS OF SURVIVAL OUTCOMES IN THE LAPAROSCOPIC VERSUS OPEN VERSUS ROBOTIC SURGICAL TREATMENT OF STAGE II-III INVASIVE RECTAL ADENOCARCINOMA.

QS406

M. Al-Hamad Daubs, J. Farewell, G. Calfee, C. St. Hill, D. Kirgan, O. Bardakcioglu
Las Vegas, NV

Purpose/Background: The completeness of total mesorectal excision in the treatment of locally advanced stage II and III rectal cancer dictates the likelihood of local recurrence and therefore is an indication of adequate surgical excision. Studies have shown that laparoscopic resection failed to meet non-inferiority criteria when compared to open resection due to a higher rate of positive radial margin. We sought to evaluate survival outcomes in this patient population to determine if this purported higher ration of margin positivity impacted long-term oncologic survival.

Methods/Interventions: Using the National Cancer Database, we identified 8,955 cases of locally advanced Stage II-III invasive rectal adenocarcinoma from 2010-2015 who received neoadjuvant chemoradiation and underwent Anterior resection (2,145) or Abdominoperineal resesction (6,810). Within this group of patients 4,287 (61.7%) underwent open surgical resection, 1,641 (23.6%) underwent laparoscopic resection and 1,024 (14.7%) underwent robotic resection. Kaplan-Meier and Cox and logistic regression were used to compare overall survival and surgical treatment patterns several demographic and clinical strata.

Results/Outcome(s): Overall survival in the open cohort was 65.1 months (95% CI, 64.1-66.2) vs. 66.8 months (95% CI,65.1-68.5) for laparoscopic vs. 65.6 months (95% CI, 65.3-67.1) for robotic (p<0.01). Cox regression showed statistically significant improvement in survival (p<0.05) in patients based on age; female gender; treatment at academic/research hospitals; private

insurance; laparoscopic approach; and patients who received chemoradiation. The odds of a patient undergoing minimally invasive resection versus open resection were 2.095 times higher at a comprehensive community cancer program (p<0.001), 2.051 times higher at an academic/research program (p<0.001) and 1.662 times higher at an integrated network cancer program (p=0.001) compare to community program; 1.5 times higher in patients with private insurance and Medicare (p<0.001) compared to uninsured; 1.245 times higher in patients making $35K-45.9K and 1.329 times higher in patients making 46K+ compared to patients making less than $30K (p< 0.05); and 1.363 times higher in patients getting radiation than patients not receiving radiation therapy (p<0.05).

Conclusions/Discussion: Despite concerns that laparoscopic resection has higher rates of positive radial margins, patients receiving laparoscopic and robotic resection had improved survival in patients with stage II and III rectal cancer compared to open resection. It appears that it is not only the surgical approach but also facility type affects survival. This supports the ongoing trend of developing rectal cancer treatment centers of excellence.

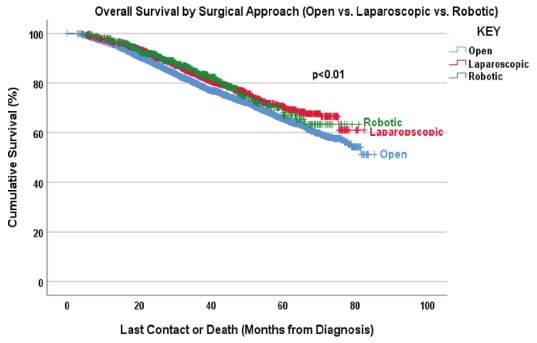


Figure 1. Kaplan-Meier curves for patients receiving open, laparoscopic or robotic surgical resection of rectal adenocarcinoma. Overall survival in the open cohort was 65.1 months (95% CI, 64.1-66.2) vs. 66.8 months (95% CI, 65.1-68.5) for laparoscopic vs. 65.6 months (95% CI, 65.3-67.1) for robotic.

LEARNING CURVE FOR SINGLE PORT ROBOT ASSISTED RECTAL CANCER SURGERY.

QS407

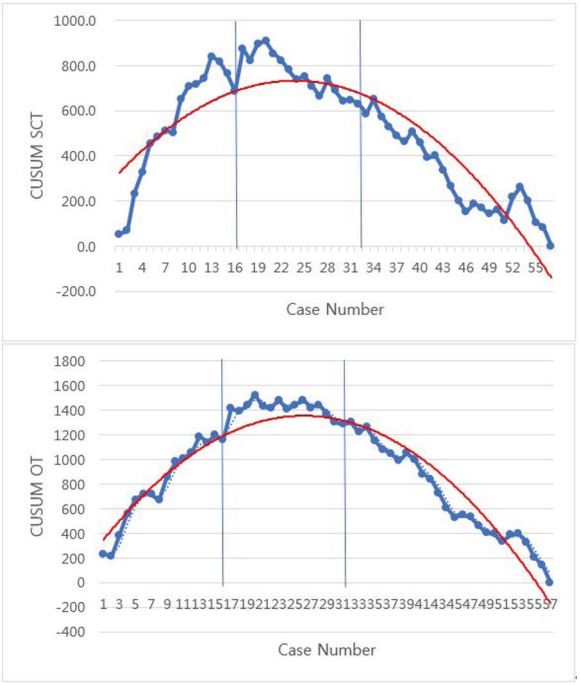
S. Yun, W. Lee, H. Kim, M. Choi, J. Huh, Y. Park, Y. Cho, J. Shin
Seoul, Korea (the Republic of)

Purpose/Background: Single port Robot(SPR) assisted Laparoscopic surgery is emerging as a new technique and important surgical approach for colorectal cancer surgery. We analyzed the learning curve of SPR assisted rectal cancer surgery and determine the incidence of laparoscopic assists and complication rates during this phase.

Methods/Interventions: From April 2019 to October 2019, 57 consecutive SPR rectal cancer surgery cases performed by the same surgeon. Surgical method for rectal cancer included low anterior resection (LAR), ultra-low anterior resection (uLAR), intersphincteric resection (ISR), and abdominoperineal resection (APR). In patients with a difficult robot approach from abdomen, robot assisted transanal total mesorectal excision (TaTME) was performed in parallel. Total operation time (OT), docking time (DT) and surgeon consol time (SCT) measured during surgery were used as parameters of the learning curve. The learning curve was evaluated using the cumulative sum (CUSUM). This study was reviewed and approved by the institutional review board.

Results/Outcome(s): A total of 57 patients (male = 34) (59.6%) were treated for rectal cancer, which included 34 LAR (59.6%), 14 uLAR (24.6%), 7 ISR (12.3%), and 2 APR (3.5%). Among these, 11 patients were performed with robotic TaTME. The mean age of the patients was 57.4 ± 10.1 years, mean BMI was 24.5 ± 3.5 kg/m2 and the median value of the American society of anesthesiologists (ASA) was 2. The mean value of total OT was 241.8 ± 91.7 minutes, the mean value of DT was 20.6 ± 19.1 minutes, and the mean value of SCT was 135.9 ± 66.7. The average hospital stay for patients was 9.4 days. There was a statistically significant difference in total OT, SCT, DT and laparoscopic hybrid cases when the three phases were compared. The learning curves for OT, DT and SCT were analyzed. The learning curve was divided into phase 1 (initial 16 case), phase 2 (second 16 case), and phase 3 (subsequent 25 case). The peak was seen in the 21st case on the CUSUM graph. The longest OT of each phase was the phase 2. Complication was most frequent in the phase 2(9 patients). But complications of Clavian-Dindo grade(CD) IIIb were occurred on phase 3. The most common complications were complicated fluid collection and urinary retention (7 patients each). CD grade IIIb had one stomy revision by stoma obstruction and one irrigation and loop ileostomy due to anastomosite leakage. Due to the difficulty of the surgery, laparoscopic assisted surgery was mostly appeared in the phase 1.

Conclusions/Discussion: The learning curve for SPR rectal cancer operation is completed after 21 cases. OT, SCT, and DT decreased as the number of cases increased. Laparoscopic hybrid technique showed a decreasing pattern after phase 1. Complications were mostly occurred on phase 2. Severe complications are occurred on phase 3.



Cumulative sum polynomial graph for surgeons consol time and operation time. On the graph, two blue line indicate start point of each phase. Red line indicate second order polynomial graph with equation, blue point line indicate moving average method for the time.

ROLAAR TRIAL COMPARISON TO SINGLE INSTITUTION RECTAL CANCER ROBOTIC RESECTION OUTCOMES.

QS408

C. Martinez, J. Marcet, G. Chedister, J. Williams, R. Bennett, B. Choi, T. Tran
Tampa, FL

Purpose/Background: Robotic-assisted surgery for rectal adenocarcinoma has dramatically increased in popularity over the last several years. Since the publication of the ROLAAR randomized clinical trial in 2017, we have seen a continued rise in the utilization of robotic surgery for rectal cancer. The ROLAAR study was a multi-institution study whose primary outcome assessment was the rate of conversion to open between laparoscopic and robotic surgery for rectal cancer. This institution has utilized robotic assisted surgery for rectal cancer for over 10 years. This study is a comparison of a single-institution (SI) robotic surgery experience to the ROLAAR robotic arm results

Methods/Interventions: SI retrospective cohort analysis from the University of South Florida assessing patients undergoing DaVinci robotic-assisted resection for rectal cancer between 5/2011-12/2018. The primary and secondary end points identified in the ROLAAR trial were directly compared. The primary outcome was conversion to open laparotomy. Secondary outcomes were circumferential radial margin, TME quality, intra-and post-operative complications and length of stay. Patients with T4 tumors requiring enbloc resection of adjacent organs, synchronous cancer requiring multi-segment resection, and non-resectable disease were excluded

Results/Outcome(s): After exclusions, 128 of 164 patients were analyzed. The mean age was 59 which was younger compared to the ROLAAR robotic arm (59.1 vs 64.4, p<0.001). The SI conversion to open rate was significantly lower (2.3% vs 8.1%, p=0.036). There was no difference in intra-operative damage to adjacent structure (3.9% vs 4.7%, p=0.73), hemorrhage (3.9% vs 1.7%, p 0.28) or anastomotic complication (4.7% vs 3.0%, p=0.39). There was no difference in circumferential radial margin (4.0% vs 5.1%, p=0.626) and quality of complete TME (79.7% vs 75.4%, p=0.08). Lymph node harvest was lower in the SI group (16.1 vs 23.2, p<0.0001). There was no difference in the overall 30d post-operative complication rate and mortality rate (36.7% vs 33.1%, p=0.48 and 0.8% vs 0.8%, p=1.0), respectively. Meanwhile the 30d SSI rate was lower in the SI group, 3.1% vs 8.9% (p=0.037) as was LOS (6.8D vs 8.0D, p=0.024). Overall 30d-6mos complication rate was not different (18.7 vs 14.4, p=0.27)

Conclusions/Discussion: This study continues to support the use of robotic assisted surgery for rectal adenocarcinoma. The conversion to open rate in this study was significantly less compared to the multi-center RCT ROLAAR study. Surgical pathology outcomes were similar. Although the lymph node harvest in this study was less, it was within the standard of care for adequate staging and there was a higher percentage of patients in this study who received neoadjuvant chemoradiation which may have affected the lymph node harvest. The use of robotic assisted surgery for rectal cancer remains a field of ongoing investigation but continues to demonstrate promising outcomes for rectal cancer.

ONCOLOGIC OUTCOMES FOR COMPLETION TME PROCTECTOMY AFTER TEM COMPARED TO UPFRONT TME SURGERY.

QS409

S. Avoine, S. Drolet, A. Bouchard, P. Bouchard, R. Gregoire, F. Letarte, C. Thibault
Lac-Beauport, QC, Canada

Purpose/Background: Transanal Endoscopic Microsurgery (TEM) is a safe and effective procedure for the local excision of low-grade rectal tumors. However, completion Total Mesorectal Excision (cTME) is sometime indicated when adverse pathological features are present on final pathology. The aim of our study was to evaluate the impact of prior TEM for patients requiring a cTME compared to patients having a primary Total Mesorectal Excision (pTME) according to oncologic outcomes.

Methods/Interventions: All patients who had a laparoscopic cTME (within 6 months) following TEM excision

between January 2012 and October 2018 were identified through medical records. Forty-six patients were included in the cTME group. These patients were matched with a historical cohort (laparoscopic pTME from 2004 to 2014) using sex, age, BMI and tumor distance from the anal margin with a ratio of 1:6. Standardized retrospective chart review was performed including patient demographics, TEM pathology, type of surgery, final pathology, postoperative morbidity and oncological outcomes. Statistics were achieved using Student t-test, Wilcoxon Mann Whitney Test and Exact Pearson Chi Square Test.

Results/Outcome(s): There were 52,2% male patients in both groups. The distance from the anal margin was 7,48 cm (±3,17) and 6,49 cm (±3,67) in the cTEM and pTME groups respectively (p = 0.0911). Abdominoperineal resection (APR) was performed in 28,3% (13/46) in cTME and 15,6% (43/275) in pTME (p = 0.0559). There was no difference according to blood losses, operative time or complications between the groups. The median length of stay was five days in the cTME group compared to 6 days in the pTME group (p = 0.0314). Finally, there was no conversion to laparotomy in the cTEM group compared to 22 cases (8%) in the pTME group. The distal margin was negative in 100% for cTME and in 98,5% for pTME (p = 0.6333). The Circumferential Resection Margin (CRM) was negative in 95,7% for cTME and 94,5% for pTME (p = 1.000). The mesorectum pathologic grading was complete or near-complete in 84,8% of patients in the cTME group compared to 90,5% in the pTME group (p = 0.2868). The average lymph node count was 24,84 (±12,98) and 16,65 (±9,36) in the cTME and pTME groups respectively.

Conclusions/Discussion: Completion TME after TEM is safe. Patients having cTME are slightly more at risk of having an APR compared to pTME. There was no difference in short term oncologic outcomes (CRM, distal margin and quality of mesorectum) compared to the pTME cohort. Finally, having a previous TEM procedure for an early rectal tumor does not adversely affect the short-term oncologic outcomes in cTME.

FISTULOUS COMPLICATIONS FOLLOWING SURGERY FOR LOW RECTAL CANCER.

QS410

S. M R
Mumbai, India

Purpose/Background: Rectovaginal fistula (RVF) following surgery for low rectal cancer ranges from 5-10%. Risk factors for the development of a fistula include type of surgery, anastomotic dehiscence and leak, preoperative radiation therapy, advanced cancer, resection for cancer.

Methods/Interventions: This is a retrospective analysis of a prospectively maintained database of operated cases of low rectal cancer in a tertiary care center. The incidence of rectovaginal fistula(RVF) was estimated and the factors influencing it's incidence were analyzed. Univariate analysis was done for age, type of surgery.

Results/Outcome(s): 1006 female patients with primary rectal carcinoma were operated between January 2013 and June 2019. Of these 103 patients developed RVF (10.2%) in the post-operative period. Median age of patients with RVF was 47 years and those without RVF was 50 years (p value=0.09). 88.9% of the patients with RVF received neoadjuvant chemoradiation. Cytoreductive surgery (CRS) with HIPEC (31.1%) and followed by Interspinchteric resection (26.2%) were the most common procedure following which RVF was noted. V-Y plasty was done in 31 patients out of which 6 patients developed RVF (19%). Superficial Surgical site Infection (SSI) was seen in 58 patients out of which 5 patients developed in 5 patients (8.6%). On univariate analysis CRS with HIPEC (p value=0.000) and pT3/T4 (p value=0.002) were found to be statistically significant factors affecting the incidence of RVF. Further, on multivariate analysis, both the factors were found to be significant for predicting RVF (CRS + HIPEC –HR 14, CI: 7.8 – 25.3; p value=0.000 and pT3/T4 HR 2.9, CI: 1.1 – 7.4; p value=0.022).

Conclusions/Discussion: Rectovaginal fistulas developed significantly more commonly in patients undergoing CRS with HIPEC and also in patients with pT3/T4 disease. Local flap and wound infection did not result in increased fistula rates. The incidence of RVF is slightly higher in our study as compared to historical data. This may be attributed to the new era of neoadjuvant chemoradiation.

EXTRALEVATOR APR FOR RECTAL ADENOCARCINOMA: DOES POSITIONING AFFECT PERINEAL WOUND COMPLICATIONS AND ONCOLOGIC OUTCOMES?

QS411

F. Zhang, P. Bauer, W. Chapman, M. Silviera, M. Mutch, S. Hunt
St. Louis, MO

Purpose/Background: The extralevator abdominal perineal resection (APR) was designed to improve the circumferential resection margin and lower intra-operative perforation rates. Subsequent studies suggested lower local recurrence rates in the extralevator approach, traditionally described in the prone jackknife position (PJ). Despite improved local recurrence rates, studies have also described longer operative times, longer length of stay (LOS), and higher complication rates after APR in PJ as compared to lithotomy position. This study aims to compare perioperative and oncologic outcomes between APR performed in either position.

Methods/Interventions: This single-center restrospective cohort study included patients who underwent APR for rectal adenocarcinoma between January 2010

and February 2019 in either PJ or lithotomy positions. Exclusions included metastatic disease, multivisceral resection, and intersphincteric dissection. Patient characteristics and outcomes were gathered from institutional National Surgical Quality Improvement Project data. Severity of complications was graded according to the Clavien-Dindo scale. Multivariable logistic regression of perineal wound complications was performed. Disease-free survival was analyzed with Kaplan-Meier analysis.

Results/Outcome(s): Of 148 eligible patients, 52 patients (35%) underwent APR in the lithotomy position and 96 patients (65%) were in PJ position. Background and comorbidities were largely similar between cohorts. Clinical stage, tumor height, and neoadjuvant therapy did not differ significantly between groups. The rate of any peri-operative complication was higher in the lithotomy group (75.0% vs. 46.9%, p=0.001) but the rate of severe complications was similar (28.9% vs. 20.8%, p=0.27). Perineal wound complications (infection, dehiscence, fistula/chronic sinus, and hernia) were more common in the lithotomy cohort (44.2% vs. 25.0%, p=0.02), and lithotomy was associated with a nearly threefold increased risk of perineal wound complications on multivariate analysis (OR 2.92, 95% CI 1.27 – 6.71). Operative time was comparable between groups, but LOS was longer in the lithotomy group (6.5 days vs 5 days, p=0.01). The rate of complete total mesorectal excision was higher in the PJ group (94.8% vs. 78.9%, p=0.003), but at a median follow-up of approximately three years, there was no significant difference in local recurrence (6.3% PJ vs. 7.7%, p=0.27) or disease-free survival (78.0% PJ vs. 76.1%, p=0.88).

Conclusions/Discussion: APR in the PJ position is associated with fewer perineal wound complications and fewer overall complications than APR in lithotomy. In addition, it is associated with similar operative times and shorter LOS. Oncologic outcomes were similar between groups. This study suggests that, when feasible, prone jackknife is the preferred approach for APR of rectal adenocarcinoma.

OPEN VS. MINIMALLY-INVASIVE ABDOMINOPERINEAL RESECTION FOR RECTAL CANCER: A NATIONAL CANCER DATABASE STUDY.

QS412

P. Kandagatla, A. Tang, R. Shah, C. Reickert, A. Stefanou
Detroit, MI

Purpose/Background: The use of minimally-invasive surgical approach for the treatment of rectal cancer is increasing. This is especially true for robotic procedures. There are, however, limited data examining outcomes, both short and long-term, of minimally-invasive abdominoperineal resection (APR) for rectal adenocarcinoma. The objective of our study was to compare outcomes between open and minimally-invasive APR procedures.

Methods/Interventions: We queried the National Cancer Database (NCDB) for patients diagnosed with rectal cancer that underwent an APR from the years 2010 – 2015. Patients were grouped based on the surgical approach of either a minimally-invasive (MI) or open procedure. An MI approach included both laparoscopic and robotic procedures. After identifying the demographic and clinicopathologic variables, the two groups were then matched using propensity-score analysis to create two cohorts. Post-operative outcomes including 30-day readmission, 30-day and 90-day mortality were compared. Cox proportional hazard models were used to assess the association between surgical approach and mortality.

Results/Outcome(s): A total of 71,260 patients were included in the study. The mean age of all patients was 63.4 (SD 12.0) years and 29, 595 (41.5%) were female. Of these patients, 35,998 (50.5%) underwent an MI approach, and 35,262 (49.5%) patients underwent an open approach. After propensity matching, there were 29,025 patients in both groups. When comparing the two groups, we found there to be a significantly higher 30-day readmission rate among the open approach group (1,662 [5.7%] vs 1,873 [6.5%], $p < 0.001$). We also found there to be higher 30-day (310 [1.1%] vs 505 [1.7%], $p < 0.001$) and 90-day (675 [2.3%] vs 919 [3.2%], $p < 0.001$) mortality rates among patients with an open APR. After adjusting for several covariates including race, insurance, comorbidities, stage, and chemoradiation, an MI approach was associated with better overall survival (HR: 0.79 [0.76 - 0.81], $p < 0.0001$).

Conclusions/Discussion: We found that an MI approach to an APR was associated with lower readmission, mortality (30-day and 90-day), and better overall survival. Though comorbidities and insurance status were similar among the matched cohorts, there may still be an element of patient-selection that may not necessarily be captured by the variables of the NCDB database. Further prospective research is warranted.

MODIFIED VERTICAL RECTUS ABDOMINIS MUSCLE FLAP REDUCES PERINEAL WOUND COMPLICATIONS AFTER EXTRALEVATOR ABDOMINOPERINEAL EXCISION OF THE RECTUM.

QS413

R. Campanati, B. Hanan, K. Buzatti, A. André, M. Profeta da Luz, R. Gomes da Silva
Belo Horizonte, Brazil

Purpose/Background: Perineal wound morbidity is the most frequent complication after extralevator abdominoperineal excision (ELAPE) of the rectum, occurring in up to 66% of cases, mainly surgical site infection, delayed

wound healing and perineal hernia. Muscle flaps and mesh repairs are the most recommended techniques for pelvic reconstruction after such operation. The modified vertical rectus abdominis muscle flap (mVRAM) is one of the many flaps proposed and differs from the classical VRAM since it is comprised of only the rectus abdominis muscle, without the need to resect the adjoined rectus sheath, subcutaneous tissue and skin. This work aims to compare the results of the use of mVRAM for pelvic closure after ELAPE with other reconstruction methods.

Methods/Interventions: A retrospective analysis was conducted in a prospectively maintained database of patients submitted to an ELAPE for adenocarcinoma of the rectum in a single tertiary cancer center from 2013 to 2018. The different pelvic reconstruction methods were analyzed regarding early (<30 days) and late wound complications (>30 days). Primary outcome was total perineal wound morbidity incidence and secondary outcomes were early and late perineal wound complications rates, operative time and length of stay.

Results/Outcome(s): Forty-four patients were submitted to an ELAPE procedure for rectal adenocarcinoma in the given period, 32 as a primary operation and another 12 as a salvage surgery, with a mean age of 59 years, the majority being female (n=23; 52.3%) and submitted to neoadjuvant chemoradiotherapy (n=42; 95.5%). The median operative time was 300 min (165 – 480 min), a mean length of stay of 9.5 days (2 – 47 days) and a median follow-up period of 39 months. Total postoperative complications rate was 54.5% (n=24), most frequently being Clavien-Dindo grade I/II (n=14; 31.8%) and a total perineal wound complication rate of 52.3% (n=23). The mVRAM was utilized in 34.1% (n=15) of cases and was associated with a lower total (14.2% *vs* 73.0%; p=0.001) and early perineal wound complication rate (14.2% *vs* 59.2%; p=0.006) and a shorter mean length of stay (7.3 days *vs*10.6 days; p=0.045), with no difference on late perineal wound complication incidence (0% *vs* 18.5%; p=0.086) and mean operative time (312 min *vs* 283 min; p=0.789) in comparison to other methods. There was an abdominal bulge in one patient submitted to a mVRAM flap reconstruction, without signs of incisional hernia after physical exam and computerized tomography.

Conclusions/Discussion: The mVRAM flap reconstruction after ELAPE is an adequate method for pelvic closure that results in a lower perineal wound complication rate and length of stay, no difference on operative time and minimal donor site morbidity and, thus, must be considered as a feasible technique to reduce postoperative morbidity.

DOES RESPONSE TO UPFRONT FOLFOX PREDICT EVENTUAL CLINICAL AND PATHOLOGICAL RESPONSE AFTER COMPLETION OF TOTAL NEOADJUVANT THERAPY FOR PATIENTS DIAGNOSED WITH RECTAL CANCER? OBSERVATIONS FROM A PHASE II CLINICAL TRIAL.

QS414

A. Abdalla, A. Aref, A. Alame, M. Barawi, D. Ma, S. Szpunar, Z. Kafri
Grosse Pointe Woods, MI

Purpose/Background: There has been an increasing interest in utilizing total neoadjuvant therapy (TNT) to treat patients diagnosed with moderately advanced rectal cancer. The rationale for using TNT is to achieve higher rates of tumor downstaging and to address micrometastases by earlier administration of systemic chemotherapy. We hypothesized that the clinical response to induction chemotherapy can be used as in-vivo assessment of the eventual clinical and pathological response after completion of TNT. We now report the relationship between response to neoadjuvant FOLFOX and response to CRT in patients with locally advanced rectal cancer (LARC) treated in our phase II clinical trial. To the best of our knowledge, this relationship has not been reported before.

Methods/Interventions: This is a single-arm prospective phase II clinical trial approved by the Ascension St. John Institutional Review Board. All participants signed a written informed consent before inclusion in the trial. Patients with T2-T3/N0-N+ histopathology-proven rectal invasive adenocarcinoma were enrolled. All patients received six cycles of FOLFOX (infusional fluorouracil, leucovorin, and oxaliplatin) which was administered every two weeks. After a three-week recovery period, patients then received conventional CRT with 5FU or capecitabine. All patients received MRIs and endorectal ultrasounds (ERUS) at baseline, after completing the FOLFOX 3-months regimen and after finishing conventional CRT. Patients underwent either full-thickness local excision (LE) or total mesorectal resection depending on their tumor response to neoadjuvant therapy. The time interval between completion of radiation therapy was seven weeks but later increased to 12 weeks based on data showing a benefit from a longer waiting interval between surgery and radiation.

Results/Outcome(s): A total of 13 patients were enrolled in the study. Based on pelvic MRI, rectal exam and flexible endoscopy seven patients (54%) had complete clinical response (CCR) after neoadjuvant FOLOFX. All seven patients who achieved CCR after neoadjuvant chemotherapy continued to have a CCR after CRT. Six out of the seven patients (86%) who had a CCR had a complete pathological response (CPR). Out of the six patients who did not have CCR to FOLFOX only one patient (17%) had complete pathological response after

CRT and surgical excision. The Spearman correlation coefficient between response to FOLFOX and CPR is 0.55 with a p-value of 0.05.

Conclusions/Discussion: Our data suggest that the clinical response to induction FOLFOX can predict the eventual clinical and pathological response after completion of TNT. This observation can help in adjusting the treatment intensity of the subsequent chemoradiation phase to optimize treatment strategy. This observation needs to be validated in a larger data set.

IMPACT OF MEDICAID EXPANSION ON COLON RESECTION FOR PATIENTS WITH COLON CANCER.

QS420

M. Lin[1], J. Hsieh[2], S. Chao[3]
[1]*Buffalo, NY;* [2]*Ames, IA;* [3]*Flushing, NY*

Purpose/Background: Recent healthcare reform with adoption of Medicaid expansion by many states in 2014 attempted to increase access to health services. To our knowledge, no studies have evaluated the impact of this expansion for patient outcomes as it pertains to colon resection in colon cancer. We sought to determine how expanded health insurance coverage impacts surgical intervention for colon cancer.

Methods/Interventions: We used the 2012-2016 National Inpatient Sample (NIS) database for this study, which represents data from 2 years prior to and 3 years after Medicaid expansion. We identified patients with colon cancer with ICD-9-CM (2008-2015Q3) and ICD-10-CM (2015Q4-2016) diagnosis codes. Inclusion criteria were patients between ages 18-65, who had Medicaid or private insurance as the primary form of payment, and had received a colon resection during the same admission. Univariate analysis was performed to compare the Medicaid patients to the private insurance patients on 16 factors: age, sex, elective admission, Medicaid expansion, Medicaid adoption rate, race, income quartile, and 9 other medical factors. A total of 5 patient outcomes were measure with both univariate and multivariate analysis (logistic and linear regression).

Results/Outcome(s): From the NIS database, we identified 13,410 patients that met the selection criteria. We observed an increasing trend in the number of colon resections performed on Medicaid patients for the divisions that had a high adoption of Medicaid expansion (Figure 1). All the patient factors except for sex were significantly different between the two insurance types, and thus were included in the multivariate analysis regression models. Logistic regressions showed that private insurance group has lower rates for severe sepsis (aOR = 0.64, p-value = 0.002), septic shock (aOR = 0.70, p-value = 0.021), and in-hospital mortality (aOR = 0.53, p-value = 0.002) compared to the Medicaid group. Medicaid expansion also had a significant impact for rate of severe sepsis (aOR = 0.77, p = 0.042) and in-hospital mortality (aOR = 0.62, p = 0.012). Length of stay decreased with private insurance (-2 days, p < 0.001), Medicaid expansion (-2 day, p < 0.001), and medium Medicaid expansion adoption (-1 day, p = 0.003). Despite a decrease in the length of stay, there was increased cost associated with medium and high Medicaid expansion adoption ($3,216 and $6,488, p < 0.001, respectively).

Conclusions/Discussion: Our study showed that Medicaid expansion had impacts on the number of colon resections performed and the outcomes from surgical intervention for patients with colon cancer. Hospitals in divisions that had low adoption rate of the Medicaid expansion did not follow the same trends as the hospitals in divisions that had medium and high adoption rate.

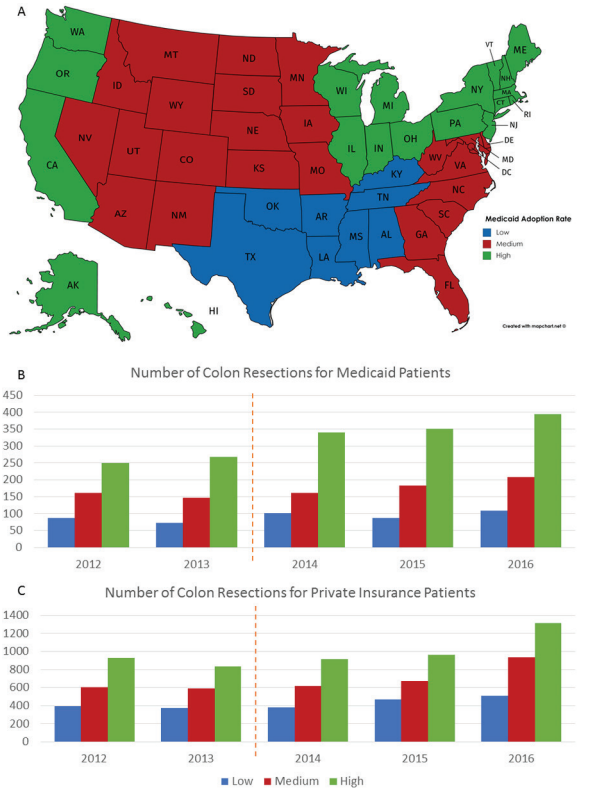


Figure 1. Number of colon resections performed during 2012-2016 for patients with colon cancer. A) Adoption rates for divisions of the United States: low adoption (0-33% of states in division, blue), medium adoption (34-66%, red), and high adoption (67-100%, green). B) Patients with Medicaid as the primary form of payment. C) Patients with private insurance as the primary form of payment. The red dotted line indicates the adoption of Medicaid expansion. An increasing trend of cases was observed for the high adoption divisions for the Medicaid patients after the expansion.

ROBOTIC VERSUS LAPAROSCOPIC COLORECTAL SURGERY: A COMPARISON OF ONCOLOGIC OUTCOMES.

QS421

A. Akhtar, I. Bernescu
Elkridge, United States Minor Outlying Islands

Purpose/Background: With increasing availability and surgical experience, robotic surgeries are being utilized more frequently for colorectal cancers. However, data regarding outcomes of robotic surgeries is based on institutional experiences. This study compares oncological outcomes of robotic versus laparoscopic surgery for colorectal cancer from a national population database.

Methods/Interventions: Retrospective analysis of the National Cancer Database (NCDB) by the Commission on Cancer (CoC) was performed to identify colorectal cancer patients who underwent laparoscopic and robotic surgery between 2004 and 2015. Oncological outcomes were compared between laparoscopic and robotic surgery groups.

Results/Outcome(s): A total of 232,348 patients underwent minimally invasive colorectal cancer surgery (laparoscopic 90%, and robotic 10%) between 2004 and 2015. Females comprised 44% of laparoscopic colorectal procedures and 48% robotic procedures. Eighty three percent of patients were white and 12% were African-Americans. Among patients undergoing laparoscopic surgery 77% had colon cancer, and among patients undergoing robotic surgery 57% had colon cancer. Rate of conversion to open was 12% in laparoscopic surgery and 8% in robotic surgery ($p<0.005$). Pathological margins were negative in 90% of patients who had laparoscopic surgery versus 95% of patients with robotic surgery ($P<0.005$). Ninety percent of laparoscopic surgery patients and 85% of robotic surgery patients had 12 or more lymph nodes harvested ($P<0.005$). Thirty-day mortality after laparoscopic and robotic colorectal cancer surgery was 2.0% and 1.2%, respectively while 90-day mortality was 3.4% and 2.3%, respectively ($p<0.005$). Adjuvant chemotherapy was started within 60 days in 16.3% of laparoscopic surgery group and 31% of robotic surgery group (48%) ($P<0.005$).

Conclusions/Discussion: Our data suggests that robotic colorectal cancer surgery is associated with higher rate of negative margins, lower rate of post-operative mortality and early recovery to start adjuvant chemotherapy. However, lymph node harvestiation was suboptimal in our population and needs further study. With increasing experience, it is plausible that lymph node hervestation should improve among patients undergoing robotic surgery.

WHAT'S THE MAGIC NUMBER? IMPACT OF TIME TO INITIATION OF TREATMENT FOR RECTAL CANCER.

QS422

G. Edwards[1], A. Gamboa[2], S. Abdel-misih[3], G. Balch[2], J. Holder-Murray[4], S. Regenbogen[5], M. Silviera[6], A. Hawkins[1]
[1]*Nashville, TN;* [2]*Atlanta, GA;* [3]*Stony Brook, NY;* [4]*Pittsburgh, PA;* [5]*Ann Arbor, MI;* [6]*St. Louis, MO*

Purpose/Background: National guidelines, including the National Accreditation Program for Rectal Cancer, recommend initiation of treatment within 60 days of diagnosis. However, the effect of this timeliness upon progression-free survival (PFS) and overall survival (OS) is unknown. We hypothesize that initiation of treatment within 60 days of diagnosis will result in improved PFS and OS.

Methods/Interventions: Using the US Rectal Cancer Consortium, we performed a multicenter, retrospective cohort study of patients with Stage II-III rectal cancer who underwent radical resection. Patients were excluded if they had clinical stage I or IV disease based on pre-treatment imaging, unavailable clinical staging information, R1/R2 resection, or experienced death or recurrence within 30 day post-operatively. The primary exposure was initiation of treatment, as defined as either resection or initiation of chemotherapy or chemoradiotherapy, within 60 days of diagnosis. The primary outcome, PFS, and secondary outcome, OS, were calculated from the date of resection. We performed adjusted survival analyses using Cox Proportional Hazard models. An a priori power analysis concluded that a cohort of 466 was needed to have 80% power to detect a HR of 0.77 at $p=0.05$.

Results/Outcome(s): 788 patients met inclusion criteria and were included in the analysis. For their initial treatment course, 719 patients (91.2%) received neoadjuvant chemoradiation, 18 (2.3%) received neoadjuvant chemotherapy only without radiation, and 51 (6.5%) proceeded directly to resection. Median time to initiation of treatment was 36 days (IQR 25, 49). Treatment was initiated within 60 days of diagnosis in 79.2% of patients. In multivariable logistic regression, insurance status, comorbidities, race, and age were not significantly associated with delay in treatment. However, significant treatment delay beyond 60 days was observed among patients who underwent upfront resection (OR 0.17, 95% CI 0.1, 0.3) and neoadjuvant chemotherapy alone (OR 0.39, 95% CI 0.2, 0.6) when compared to neoadjuvant chemoradiation. Within five years, 15.5% of patients experienced recurrent disease and 12.1% died. In survival analyses, neither PFS nor OS were significantly associated with timely initiation of therapy (HR 1.49, 95% CI 0.82-2.7 and HR 0.89, 95% CI 0.5-1.6, respectively; Figure 1). In an adjusted model which accounted for treatment sequence, stage, age, comorbidities, and receipt of

adjuvant chemotherapy, this lack of association persisted for both PFS (HR 2.1, 95% CI 0.9-4.6) and OS (HR 0.9, 95% CI 0.5-1.8).

Conclusions/Discussion: In this large, multicenter study, we found no difference in important oncologic outcome metrics, as defined by PFS and OS, with timely initiation of treatment. This calls into question using initiation of treatment within 60 days as a national accreditation standard for rectal cancer programs.

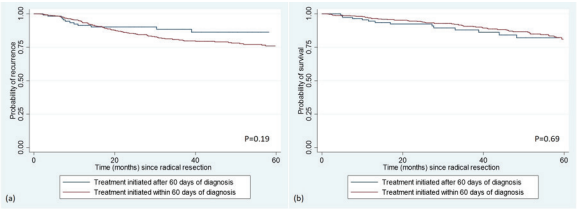


Figure 1: Kaplan-Meier curves for probability of (a) recurrence and (b) all-cause survival based on time to initiation of treatment from date of diagnosis.

THE IMPACT OF MODIFIABLE LIFESTYLE FACTORS ON 90-DAY POSTOPERATIVE COMPLICATION RATE OF ELECTIVE SURGERY IN COLORECTAL CANCER PATIENTS.

QS423

L. Loogman[1], L. de Nes[2], T. Heil[1], F. van Duijnhoven[3], E. Kampman[3], H. de Wilt[1]
[1]Nijmegen, Netherlands; [2]Beugen, Netherlands; [3]Wageningen, Netherlands

Purpose/Background: Previous research has shown an association between patients' preoperative lifestyle factors and the number and severity of postoperative complications. The aim of this study was to determine the distribution and the associations of modifiable preoperative lifestyle factors with negative postoperative outcomes in patients undergoing elective surgery for colorectal cancer (CRC).

Methods/Interventions: 1564 patients with newly diagnosed primary stage I-IV CRC between 2010 and 2018 included in a prospective observational study (COLON) were analyzed. At diagnosis, data about smoking habits, diet, weight and physical activity were collected using questionnaires and merged with data regarding postoperative complications from the nationwide database of the Dutch ColoRectal Audit. Multivariable logistic regression models were used to identify risks of postoperative complications.

Results/Outcome(s): The median age of the included patients was 66 years, 64% were male and 87.2% were classified as American Society of Anesthesiologists (ASA) I or II. Postoperative 90-day complications occurred in 28.5% of the patients. Complications were more often seen in patients who smoke (p=0.007), in males (p<.000) and in patients 70 years or older (p=0.003). Patients who experienced a complication had a substantially prolonged hospital stay (12 vs. 5 days p<.000). Factors independently associated with higher 90-day postoperative complication rates in multivariable analyses were ASA Classification ≥ III (adjusted odds ratio [OR], 2.96; 95% confidence interval [CI], 1.69-5.19 p<.000) and rectal tumors (adjusted OR, 1.81; 95%CI, 1.28-2.55 p=0.001). Modifiable lifestyle factors including body mass index (BMI), smoking habits, alcohol consumption and physical activity had no association with postoperative complications (all p-values>0.05).

Conclusions/Discussion: This study shows no association between modifiable preoperative lifestyle factors and postoperative complications 90 days after CRC surgery in a relatively healthy study population. Prehabilitation that aims to positively influence preoperative lifestyle factors might be beneficial for a select group, but additional research is required to identify characteristics of these patients.

A SYSTEMATIC REVIEW OF RESTAGING COMPUTED TOMOGRAPHY (CT) SCANS AFTER NEOADJUVANT TREATMENT FOR RECTAL CANCER.

QS424

H. Adamson, S. Hammond, M. Ward, R. Helewa, D. Hochman, B. Yip, J. Park
Winnipeg, MB, Canada

Purpose/Background: Neoadjuvant radiation (most often with chemotherapy) prior to surgical resection remains the current standard of care for patients with locally advanced rectal cancers. While current practice guidelines are clear on initial work-up of rectal cancer, there is little guidance on the practice of restaging computed tomography (CT) post-neoadjuvant treatment and prior to surgery. The development of new metastasis after neoadjuvant treatment potentially could influence patient management. We systematically reviewed studies evaluating re-staging CT post-neoadjuvant therapy in rectal cancer patients. Specific outcomes of interest were: 1. CT identification of development or progression of metastatic (M1) disease, and 2. whether changes in management occurred because of findings on re-staging CT.

Methods/Interventions: We searched MEDLINE, Embase, Cochrane, and Google Scholar databases. Inclusion criteria were locally advanced rectal cancer patients undergoing neoadjuvant treatment who had CT scans performed before and after neoadjuvant treatment. Two reviewers independently assessed, screened, and extracted study level data. Where possible, we followed Preferred Reporting Items for Systematic and Meta-Analyses (PRISMA) guidelines.

Results/Outcome(s): The search yielded 1,672 articles for screening. After review and de-duplications, 8 studies met the inclusion criteria. All were retrospective analyses.

In one study, pre- and post-neoadjuvant CTs were ordered routinely; in 7 studies, post-treatment scans appear to be ordered on selected patients without explicit reporting on reasons for why some patients underwent re-staging CTs and some did not. All eight of the studies (N = 1,437 patients) reported on the development of M1 disease, where CT identified M1 disease development or progression in 5.6% (95% CI 4.4-6.8%) of cases. All eight of the studies (N = 1,447) reported on changes in management, with changes of management occurring in 6.1% (95% CI 4.9-7.3%) of cases.

Conclusions/Discussion: In reported studies on patients with locally advanced rectal cancers, new M1 disease or significant management changes can occur following post-neoadjuvant treatment restaging CT scans. The actual incidence is difficult to discern as for the most part only selected populations underwent restaging, which may not be representative of all treated patients. Larger, prospective data sets which include broader or more unselected populations may help provide more valid estimates, and possibly identify higher risk groups in whom routine re-restaging may be indicated.

NEOADJUVANT CHEMOTHERAPY FOR LOCALLY ADVANCED COLON CANCER: A SYSTEMATIC REVIEW AND META-ANALYSIS.

QS425

C. Cheong, K. Nistala, C. Ng, N. Syn, H. Chang, R. Sundar, C. Chong
Singapore, Singapore

Purpose/Background: Colon cancer represents a substantial disease burden in global health. There has been growing interest in the option of pre-operative chemotherapy in patients with operable colon cancer, however it is not widely practised as superior oncological outcomes are not yet apparent. To better evaluate the literature regarding the use of neoadjuvant therapy for non-metastatic colorectal cancer, a systematic review and meta-analysis was performed.

Methods/Interventions: A systematic review was performed in accordance to PRISMA guidelines. MEDLINE, Embase, Cochrane Library, CNKI and ClinicalTrials.gov were searched on 18/11/19. Studies comparing patients with locally advanced colon cancer undergoing neoadjuvant chemotherapy versus adjuvant chemotherapy were included if oncologic or perioperative outcomes were reported. Three reviewers in blinded pairs screened titles and abstracts, then independently reviewed remaining full texts to select articles for inclusion. Data extraction was performed independently. Risk of bias was assessed using the Cochrane Risk of Bias Tool and the Newcastle-Ottawa Scale. Hazard Ratios and 95% Confidence Intervals were estimated for oncologic outcomes, and Risk Ratios and 95% Confidence Intervals were estimated for perioperative complications. Sensitivity analysis to investigate the effect of randomisation was conducted.

Results/Outcome(s): 2461 articles were identified, 2077 records were screened and 51 texts were assessed for eligibility. 5 English articles and 2 Chinese articles were included in the meta-analysis. Patients who received neoadjuvant chemotherapy had better overall survival (HR=0.79, 95%CI 0.69-0.91) but did not have better disease-free survival (HR=0.83, 95%CI 0.54-1.26). Rates of abdominal infection (RR=1.48, 95% CI 0.67-3.29) and anastomotic leakage (RR=1.06, 95% CI 0.52-2.16) did not differ between groups. Studies reporting adverse effects found no statistical differences in occurrence rates between both groups. Sensitivity analysis did not change the trend in outcomes for overall survival or anastomotic leakage.

Conclusions/Discussion: This meta-analysis has shown an improved overall survival and no difference in post-operative complications with neoadjuvant chemotherapy treatment for non-metastatic locally advanced colon cancer. Despite the early body of evidence, with the advances made in standard and targeted therapy, there is a foreseeable trend of increased adoption of neoadjuvant chemotherapy for curable colon cancers in the next decade.

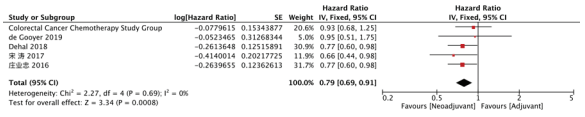


Figure 1: Overall Survival

PREOPERATIVE CHEMOTHERAPY IS ASSOCIATED WITH WORSE OVERALL SURVIVAL IN OPERABLE COLON CANCER.

QS426

A. Artinyan[1], N. Seiser[1], R. Zhu[1], I. Stettler[1], W. Shen[1], M. Shirinian[2], J. Cohen[1], Y. Nasseri[1]
[1]*Los Angeles, CA;* [2]*Glendale, CA*

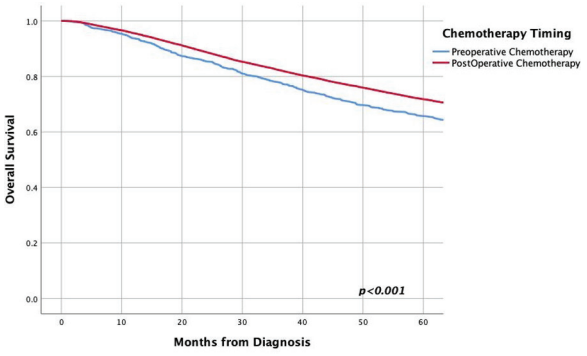
Purpose/Background: The FOxTROT trial suggested that preoperative chemotherapy may provide a potential benefit in patients with operable colon cancer. We examined the survival benefit of preoperative chemotherapy in patients with resected, non-metastatic colon cancer using a large nationwide cohort. We hypothesized that preoperative chemotherapy would provide a small survival benefit over postoperative chemotherapy.

Methods/Interventions: The NCDB database (2004-2016) was queried for all patients with non-metastatic colon adenocarcinoma, treated with radical resection and chemotherapy in whom clinical stage was known. Treatment groups were categorized into preoperative vs. post-operative chemotherapy. Demographic, clinical and pathologic factors were compared between treatment

groups. Because pretreatment EUS or MRI are not routinely performed for colon cancer, patients were broadly categorized into those with clinical localized disease (stages 1-2) and those with clinical nodal disease (stage 3). Overall survival was compared using the Kaplan Meier method stratified by clinical nodal status, and multivariate Cox-regression analysis controlling for confounding factors including age, comorbidity, clinical stage, and regional nodes examined.

Results/Outcome(s): 49,255 patients were identified. The mean age of the population was 62.6 ± 12.5 years. 24,738 patients (50.2%) had clinical nodal disease. 1509 patients (3.1%) received preoperative chemotherapy, while the remainder (96.9%) received postoperative chemotherapy. Patients receiving preoperative chemotherapy were younger (60.4 ± 0.31 vs. 62.7 ± 0.06 yrs, preop vs. postop, respectively), more likely to be male (61% vs. 50%), had less comorbidity (80% vs. 74% Charlson-Deyo 0), lower grade disease (83% vs. 75% Grade 1-2), less clinical stage 3 disease (42% vs. 51%), less pathologic stage 3 disease (37% vs. 76%) and lower mean lymph node harvest (17.8 ± 0.11 vs. 20.8 ± 0.04) (all p-values <0.05). On Kaplan Meier analysis, preoperative chemotherapy was associated with significantly worse overall survival (median OS 100 vs. 136 months, preop vs. postop, respectively, p<0.05). On stratified analysis, this difference was most pronounced in patients with clinical node negative disease. On multivariate analysis, preoperative chemotherapy was a significant independent predictor of worse overall survival (HR 1.5, p<0.001).

Conclusions/Discussion: Preoperative chemotherapy is associated with worse survival compared to postoperative chemotherapy in patients with operable colon cancer, particularly in clinically node negative disease. This finding may be secondary a delay in surgery in the preoperative therapy group, or due to more high-risk disease that cannot be accounted for by traditional risk factors. Prospective trials are necessary to evaluate the true benefit of preoperative chemotherapy in operable colon cancer.



ADJUVANT CHEMOTHERAPY IS ASSOCIATED WITH IMPROVED LONG-TERM SURVIVAL IN STAGE II COLON CANCER IN THE ABSENCE OF HIGH-RISK FACTORS: A PROPENSITY MATCHED ANALYSIS UTILIZING THE NATIONAL CANCER DATABASE.

QS427

A. Graham[1], S. Parascandola[3], S. Hota[2], A. Sparks[1], V. Obias[1]
[1]Washington, DC; [2]Norfolk, VA; [3]Bethesda, MD

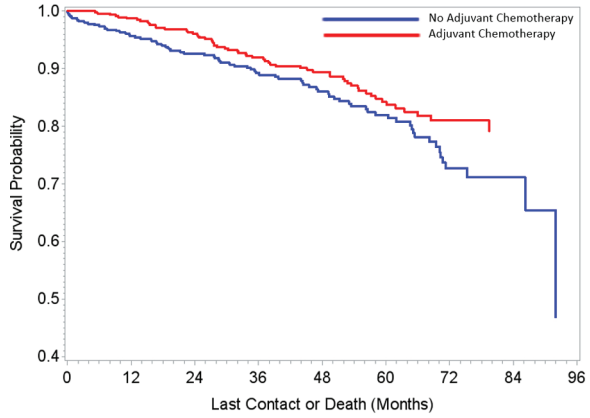
Purpose/Background: The management of Stage II colon cancer remains under debate. Currently, adjuvant chemotherapy (AC) is recommended for patients with Stage II colon cancer and high-risk features. However, it is unclear whether AC may benefit patients without these risk factors. The purpose of this study is to evaluate effect of AC on Stage II colon cancer in the absence of high-risk features.

Methods/Interventions: The National Cancer Database Colon data files from 2010-2016 were reviewed. All patients with T3N0M0 adenocarcinoma who underwent definitive surgical therapy were evaluated. Patients with PNI, LVI, positive tumor margins, positive tumor deposits, or LN harvest of <12 were excluded. The remaining sample was then divided into two groups based on AC status. From these two groups, a 1:1 nearest neighbor propensity score matching analysis was performed. The groups were adjusted for the potential confounding covariates including age, sex, race, Charleson score, site of primary cancer, tumor grade, tumor size, CEA level, microsatellite instability, KRAS mutation, time from diagnosis to definitive surgery, surgical approach, and surgery type. A hazard ratio was calculated and Kaplan-Meier curves were created. A subgroup analysis was then performed on patients >=65 and <65 years of age.

Results/Outcome(s): A total of 10,345 patients met initial criteria. 9781 did not receive AC, and 564 patients received AC. From these 2 groups, a total of 1086 patients were included in the 1:1 nearest neighbor PSM. The 1:1 nearest neighbor PSM +/- 1% caliper for allocation of adjuvant chemotherapy had a strong area under the curve of 0.813. The p-values of all potential confounding covariates were p>=0.3, indicating well balanced samples. In the PSM, patients who underwent AC had a 30% decreased mortality hazard relative to patients who did not undergo AC (Hazard Ratio=0.70, 95% CI=0.50-0.98, p=0.037). See Figure 1 for survival curves. On subgroup analysis, 35.7% were >=65, and 64.3% were <65 years old. Patients >=65 had an increased mortality hazard, independent of AC status (p<0.001). In the older subgroup, patients undergoing AC had a 44% decreased mortality hazard and this hazard ratio approached significance (HR =0.66, CI 0.43-1.01, p=0.0551). In contrast, the hazard ratio in the younger cohort did not approach significance (HR =0.71,

CI=0.40-1.24, p=0.2263) despite the larger sample size. This suggests that AC may have a larger effect in the older population.

Conclusions/Discussion: Addition of adjuvant chemotherapy to the treatment of Stage IIa colon cancers is associated with significant improvements in long-term survival in the absence of high-risk factors.



MICROPAPILLARY PATTERN IS AN INDEPENDENT PREDICTOR FOR POOR ONCOLOGIC OUTCOME IN STAGE I-III COLON CANCER.

QS428

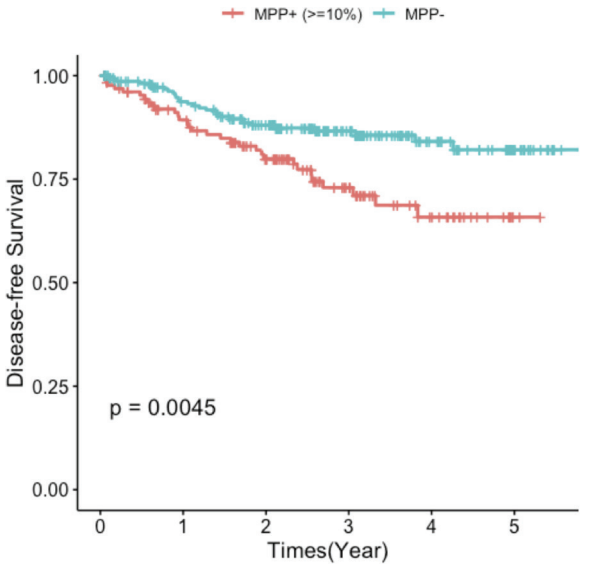
D. Pyo, Y. Cho, W. Lee, S. Yun, H. Kim, J. Huh, Y. Park, J. Shin
Seoul, Korea (the Republic of)

Purpose/Background: The presence of a micropapillary pattern (MPP) in adenocarcinoma is associated with poor prognosis in several malignancies such as lung cancer or breast cancer. However, its clinicopathologic significance and in colon cancer and optimal cutoff value for distinguishing the presence and absence of MPP have not been clearly validated. We evaluated MPP as a potential prognostic marker in colon cancer.

Methods/Interventions: A retrospective review of 2213 consecutive patients with stage I-III colon cancer undergoing curative resection from October 2013 to December 2017 at Samsung Medical Center was performed. The presence of MPP in more or equal than 0%, 5%, 10%, 30%, and 50% of tumor volume was considered as MPP+ to establish the optimal cutoff value, respectively. Multivariate cox regression for disease-free survival was performed. 1:2 propensity score matching with age, sex, body mass index, cell differentiation, pT stage, pN stage, lymphatic invasion, venous invasion, perineural invasion, microsatellite instability status, and tumor budding was done to balance the between the MPP+ and MPP- groups.

Results/Outcome(s): The number of MPP+ cases with the cutoff value of 0%, 5%, 10%, 30%, and 50% were 332 (15.0%), 199 (9.0%), 120 (5.4%), 44 (2.0%), 13 (0.6%), respectively. The median follow-up was 37.6 months. MPP+ was significantly correlated with higher pT stage, pN stage, lymphatic invasion, perineural invasion, tumor budding, and microsatellite stable in all cutoff values. On multivariate analysis, MPP+ with the cutoff value of 10% was shown the greatest hazard ratio among the other cutoff values for disease-free survival (HR 1.55, 1.02 – 2.34; p=0.04). After 1:2 matching of 120 cases with MPP+ with the cutoff value of 10% to 240 cases with MPP-, 3-year disease-free survival (DFS) was 72.9% and 86.6% in MPP+ and MPP-, respectively (p=0.005).

Conclusions/Discussion: The presence of MPP more or equal than 10% of tumor volume could serve as an independent prognostic marker of disease-free survival in stage I-III colon cancer.



Kaplan-Meier curve for disease-free survival analysis in 1:2 matched cohort between MPP+ (>=10%) and MPP- (<10%) in colon cancer

ADENOSQUAMOUS CARCINOMA: AN AGGRESSIVE HISTOLOGIC SUB-TYPE OF COLON CANCER WITH POOR PROGNOSIS.

QS429

Y. Nasseri[1], B. Cox[1], I. Stettler[1], W. Shen[1], R. Zhu[1], A. Artinyan[2], J. Cohen[1], A. Gangi[1]
[1]*Los Angeles, CA;* [2]*Glendale, CA*

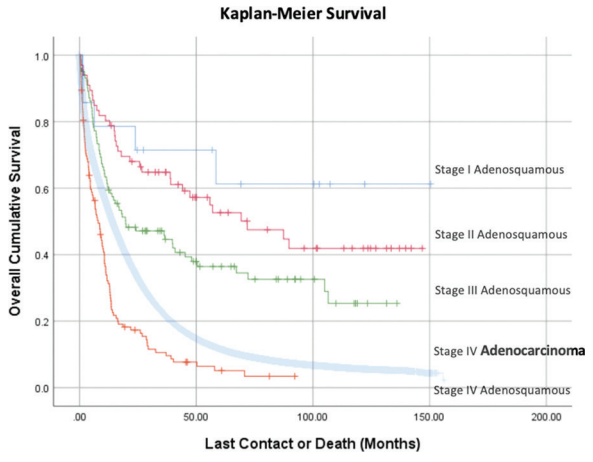
Purpose/Background: Previous studies have reported worse overall survival for patients with adenosquamous colon cancer compared to adenocarcinoma, but to date, none have analyzed a large national dataset.

Methods/Interventions: The National Cancer Database (NCDB) was queried from 2004-2016 to identify patients with invasive adenosquamous and adenocarcinoma of the colon. Patients AJCC Stage I-IV were included in our analysis. Kaplan-Meier survival analyses were performed to assess overall survival (OS) and patients were subsequently stratified to assess differences in gender, grade, and stage at

diagnosis. Differences in descriptive variables were evaluated using Independent T-Test and Chi-squared analyses.

Results/Outcome(s): Three hundred thirty-two adenosquamous carcinoma patients were identified and compared to a cohort of 496,950 adenocarcinoma patients. Both the adenocarcinoma and adenosquamous cohorts exhibited a slight female gender predominance (51.2% and 52.1%, respectively), although this difference was not significant (p=0.78). Adenocarcinoma patients were significantly older (68.6 years) than adenosquamous patients (64.4 years), p<0.001. Most adenosquamous lesions presented late with Stage IV (41.3%) and poorly differentiated (57.5%) disease compared to adenocarcinoma (22.4% stage IV and 17.7% poorly differentiated). Overall survival (OS) of the adenosquamous cohort was 13.9 months. Median OS for stage IV adenosquamous carcinoma was significantly shorter than for stage IV adenocarcinoma (8.0 vs 14.1 months, respectively, p<0.001)

Conclusions/Discussion: This is the largest known analysis of adenosquamous carcinoma of the colon. Our findings reiterate their aggressive nature by demonstrating that they most frequently present late (Stage IV), as poorly differentiated lesions, and have significantly worse overall survival compared to adenocarcinoma.



TUMOR BUDDING AND T CELL RESPONSE IN COLORECTAL CANCER: U.S. NATIONWIDE PROSPECTIVE COHORT STUDIES.

QS430

K. Fujiyoshi[1], J. Väyrynen[1], J. Borowsky[1], Y. Akagi[2], J. Lennerz[1], M. Giannakis[1], J. A Nowak[1], S. Ogino[1]
[1]*Boston, MA;* [2]*Kurume, Japan*

Purpose/Background: Adaptive immune response, represented by cytotoxic T cells (CTLs), plays a crucial role in suppressing tumor invasion and metastasis, and abundance of tumor-infiltrating CTLs are associated with favorable prognosis in colorectal cancer. Tumor budding is thought to be one of the initiating and enabling steps in the invasion and metastasis cascade. The International Tumor Budding Consensus Conference (ITBCC) underlined the importance of tumor budding as an independent prognostic factor in colorectal cancer and clarified the definition of tumor bud as a single tumor cell or a cluster of fewer than five tumor cells dissociated from the main tumor at the invasive front. We hypothesized that T cell densities in tumor might be inversely associated with the extent of tumor budding in colorectal cancer.

Methods/Interventions: Utilizing molecular pathological epidemiology database of 915 colon and rectal carcinoma cases in the Nurses' Health Study and the Health Professionals Follow-up Study, we characterized T-cell subsets by simultaneously measuring the expression of CD3, CD4, CD8, CD45RO, and FOXP3 in immune cells with multiplex immunofluorescence. Tumor budding at invasive front was quantified using the ITBCC criteria. Multivariable logistic regression analysis was conducted to assess the association of the densities of T-cell subsets (tertile ordinal categories) with the tumor budding count (quartile ordinal categories), controlling for potential confounders, including disease stage, tumor grade, *CDH1* and *CTNNB1* expression, MSI status, CIMP, LINE-1 methylation, and *KRAS*, *BRAF* and *PIK3CA* mutations. Multivariable Cox proportional hazards models were used for survival analysis in tumor budding grade, controlling for poorly differentiated clusters, T cell density, and other potential confounders.

Results/Outcome(s): $CD3^+CD8^+$ cell density (lowest vs. highest density category: multivariable odds ratio (OR) 0.58, 95% confidence interval (CI), 0.43-0.79; $P_{trend} < 0.001$) and $CD3^+CD8^+CD45RO^+$ cell density (lowest vs. highest density category: multivariable OR 0.50, 95% CI, 0.37-0.68; $P_{trend} < 0.001$) in tumor epithelial region were inversely associated with the extent of tumor budding. High tumor budding grade was independently associated with higher colorectal cancer-specific mortality (low vs. high grade: multivariable hazard ratio 2.22, 95% CI, 1.61-3.04; $P_{trend} < 0.001$).

Conclusions/Discussion: Densities of $CD3^+CD8^+$ and $CD3^+CD8^+CD45RO^+$ T cell in tumor epithelial region are inversely associated with tumor budding at invasive front, suggesting that cytotoxic anti-tumor immunity can suppress microinvasion and micrometastasis. Two large U.S. nationwide prospective cohorts study also represent an extensive validation of the prognostic value of ITBCC evaluation of tumor budding, independent of tumor molecular features and immune cell densities.

Table 1. Logistic Regression Analysis to Assess the Associations of T cell Densities (Predictor) with Tumor Budding at Invasive Front (Outcome)

	Univariable OR (95% CI)[a,b]	Multivariable OR (95% CI)[a,b]
Intraepithelial CD3⁺ cell density		
C1 (low)	1 (referent)	1 (referent)
C2 (intermediate)	0.69 (0.51-0.95)	0.73 (0.53-1.00)
C3 (high)	0.69 (0.50-0.94)	0.71 (0.52-0.98)
P_{trend}[c]	0.018	0.037
Intraepithelial CD3⁺CD8⁺ cell density		
C1 (low)	1 (referent)	1 (referent)
C2 (intermediate)	0.81 (0.59-1.10)	0.86 (0.63-1.18)
C3 (high)	0.52 (0.39-0.70)	0.58 (0.43-0.79)
P_{trend}[c]	< 0.001	< 0.001
Intraepithelial CD3⁺CD8⁺CD45RO⁺ cell density		
C1 (low)	1 (referent)	1 (referent)
C2 (intermediate)	0.73 (0.53-0.99)	0.81 (0.59-1.11)
C3 (high)	0.45 (0.34-0.61)	0.50 (0.37-0.68)
P_{trend}[c]	< 0.001	< 0.001

[a] IPW was applied to reduce a bias due to the availability of tumor tissue after cancer diagnosis (see "Statistical analysis" subsection for details).
[b] The multivariable ordinal logistic regression model initially included age, sex, year of diagnosis, family history of colorectal cancer, tumor location, tumor grade, AJCC disease stage, microsatellite instability, CpG island methylator phenotype, long-interspersed nucleotide element-1 methylation level, *KRAS*, *BRAF*, and *PIK3CA* mutations, *CDH1* expression, and *CTNNB1* expression. A backward elimination with a threshold *P* of 0.05 was used to select variables for the final model.
[c] P_{trend} was calculated by the linear trend across the ordinal categories of the intraepithelial T cell densities (quartile ordinal categories, as an ordinal predictor variable) in the IPW-adjusted ordinal logistic regression model for the number of tumor buds/0.785 mm² at invasive front (quartile ordinal categories, as an ordinal outcome variable).

THE USE OF TISSUE OXYGEN MEASUREMENTS COMPARED TO ICG IMAGING FOR THE ASSESSMENT OF INTRAOPERATIVE TISSUE VIABILITY OF HUMAN BOWEL: A MULTI-INSTITUTIONAL TRIAL.

QS431

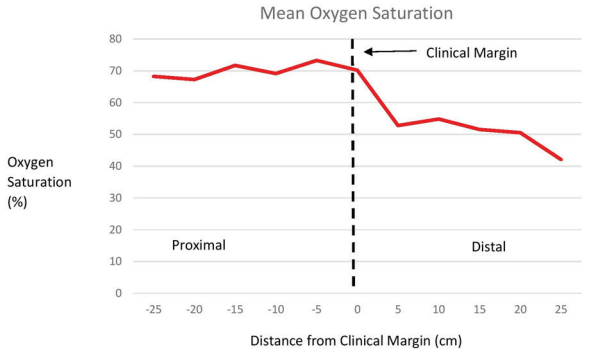
D. Sherwinter[1], R. Rhee[1], A. Mongui[1], P. Chandler[1], J. Agnew[2], A. Pihokken[2], P. Addison[2], N. Nguyen Tran[2], J. Martz[2]
[1]*Brooklyn, NY;* [2]*New York, NY*

Purpose/Background: Adequate tissue oxygenation and perfusion remain a fundamental aspect of safe bowel resection surgery. Near infrared (NIR) imaging using indocyanine green has proven itself superior to clinical evaluation alone in assessing bowel perfusion, but requires expensive equipment not readily available in many centers. We studied the IntraOx device (Vioptix Inc, Newark, CA USA), a handheld, real-time, oxygen saturation assessment tool, to evaluate how oxygen saturation (OS) compares with clinical and NIR assessment of bowel viability.

Methods/Interventions: Patients undergoing elective large bowel resection surgery for benign and malignant disease were included. After choosing a clinical margin and dividing the mesentery, OS values were collected at 4 points on the colon (12,3,6,9, O'clock positions) at 5cm intervals. An OS margin was assigned where a "drop-off" of saturation of ≥10 points was noted along the colon. NIR perfusion was then assessed using ICG imaged with the Spy-phi system (Stryker, Kalamazoo, MI, USA). Distance of the OS margin from the clinical and NIR margin was recorded. Intraoperative and postoperative data (4 weeks) were collected.

Results/Outcome(s): 13 consecutive patients undergoing colectomies were enrolled and data from 12 patients were analyzed. One screening failure resulted from an unexpected intraoperative finding of locally advanced disease. Participant's mean age was 59 and BMI was 25. Colectomies for malignant and benign disease was performed in 7 and 5 cases respectively. The difference in mean OS across the clinical margin was 17.36 which was statistically significant (P<.0001, 95% CI 11.79 – 22.93). In all cases, the margin identified by OS matched that identified by NIR perfusion assessment. At 4-week follow-up no significant complications were reported.

Conclusions/Discussion: The IntraOx device reliably identified a margin of significant saturation "drop-off" which correlated with the findings on NIR perfusion assessment. Although no conclusions can be reached regarding the prevention of anastomotic leaks, our data indicate that tissue oxygenation may represent an appropriate surrogate for bowel viability. In addition, the IntraOx device may be a more cost-effective solution for surgeons looking for adjunctive evaluation of bowel viability. More study is warranted in a larger group of patients to evaluate the impact of OS assessment in preventing anastomotic leak.



ALTERED FECAL SMALL RNA PROFILES IN COLORECTAL DISEASES REFLECT GUT MICROBIOME COMPOSITION IN STOOL SAMPLES.

QS432

G. Gallo[1], A. Realis Luc[2], G. Clerico[2], M. Trompetto[2]
[1]*Catanzaro, Italy;* [2]*Vercelli, Italy*

Purpose/Background: The characteristics of microbial small RNA transcription are largely unknown, while it is of primary importance for a better identification of molecules with functional activities in the gut niche under both healthy and disease conditions. In particular, host and gut microbiome interactions are mediated by proteins, metabolites, and small RNAs (sRNAs), including Homo sapiens microRNAs (hsa-miRNAs) or other human small noncoding RNAs (hsa-sncRNAs) In this study, we performed small RNA and shotgun sequencing on 95 stool specimens from patients with CRC or with adenomas and from healthy subjects in order to evaluate their combined use as a predictive tool for disease detection

Methods/Interventions: Samples were collected from patients recruited in a hospital-based study at the Clinica S. Rita in Vercelli, Italy. On the basis of colonoscopy

results, participants were classified into three categories: (i) healthy subjects (individuals with colonoscopy results negative for tumor, adenomas, and inflammatory bowel disease [IBD]); (ii) adenoma patients (individuals with a colorectal adenoma[s]); and (iii) colorectal cancer patients (individuals with newly diagnosed CRC). Naturally evacuated fecal samples were obtained from all patients previously instructed to self-collect the specimen at home before any bowel preparation for colonoscopy. The stool was collected in stool nucleic acid collection and transport tubes with RNA stabilizing solution and returned at the time of performing a colonoscopy in the endoscopy unit or at the time of blood sampling. Aliquots (200 ml) of the stool samples were stored at –80°C until RNA/DNA extraction.

Results/Outcome(s): A total of 95 subjects (35 CRC patients, 32 adenoma, and 28 controls) were included in the present study. We observed considerable overlap and a correlation between metagenomic and bsRNA quantitative taxonomic profiles obtained from the two approaches. We identified a combined predictive signature composed of 32 features from human and microbial small RNAs and DNA-based microbiome able to accurately classify CRC samples separately from healthy and adenoma samples (area under the curve [AUC]0.87).

Conclusions/Discussion: In the present study, we report evidence that host-microbiome dysbiosis in CRC can also be observed by examination of altered small RNA stool profiles. Integrated analyses of the microbiome and small RNAs in the human stool may provide insights for designing more-accurate tools for diagnostic purposes.

MULTITARGET STOOL DNA TESTING IN DETECTING COLORECTAL CANCER – DOES AGE MATTER?

QS433

A. Dinallo, C. Lee, S. Judeeba, J. Church
Cleveland, OH

Purpose/Background: Cologuard™, a multitarget stool DNA (MT-sDNA) test, was FDA approved for average risk colorectal cancer screening. Detection is based on an algorithm of results generated from fecal hemoglobin and genetic markers including *KRAS* mutations and DNA methylation. A positive result indicates an alteration in the genetic markers within the colon/rectum which could be caused by a cancer or precancer. While Cologuard™ has 92% sensitivity, the utility of this test may be limited in advanced age when DNA methylation normally increases. We sought to determine if advanced age increased the false positive rates of MT-sDNA thereby limiting its utility in certain age groups.

Methods/Interventions: Following IRB approval, a retrospective review of adult patients who underwent a colonoscopy for a positive Cologuard™ test was performed. Data collected at the time of colonoscopy included patient demographics (age, gender, history of polyps and / or colorectal cancer), family history of colorectal cancer, previous colonoscopies and their associated findings, and presence of polyps and / or neoplasm, morphology, size, pathology and treatment at the time of colonoscopy.

Results/Outcome(s): 544 patients had a positive Cologuard™; 86 were excluded for lack of follow up colonoscopy. Of the remaining 458 patients included in the analysis, the median age was 68 years (range, 50 – 86) and 205 (44.8%) were male. Fifty one (11.1%) patients had a personal history of polyps at their most recent colonoscopy. At the time of colonoscopy, polyps or neoplasms were present in 358 patients (78.2%); 256 patients (71.5%) had a right colon polyp, 203 patients (56.7%) had a left colon polyp and 113 patients (32.6%) had a rectal polyp. The positive predictive value (PPV) of Cologuard varied by patient age and lesion type (Table). The PPV for any lesion was 80% in patients <70 years of age compared to 56.5% in patients >79 years. Most advanced adenomas were found to be right sided (52.1% right, 33.7% left, 14.1% rectal). A total of 16 (3.5%) had a cancer at the time of colonoscopy in the right colon (n=4), left colon (n=7) and rectum (n=5). The PPV for cancer in patients <70 compared to >79 was 2.0% versus 8.7%.

Conclusions/Discussion: The PPV of Cologuard™ for any lesion decreases with increasing age. While a positive Cologuard™ test carries a low risk of cancer, especially in patients 80 and older, the high yield of advanced adenomas underscores the importance of follow up colonoscopy.

QS433

Age	N	PPV for any lesion	PPV for sessile serrated lesion	PPV for adenoma	PPV for advanced adenoma	PPV for cancer
< 70	255	80%	4.3%	62.4%	40.4%	2.0%
70 - 79	180	78.3%	3.3%	65.0%	29.4%	5.0%
> 79	23	56.5%	0%	47.8%	30.4%	8.7%

PPV = positive predictive value

NOVEL USE OF COLORECTAL ORGANOIDS FROM FAMILIAL ADENOMATOUS POLYPOSIS PATIENTS: A MODEL OF PERSONALIZED CHEMOPREVENTION.

QS434

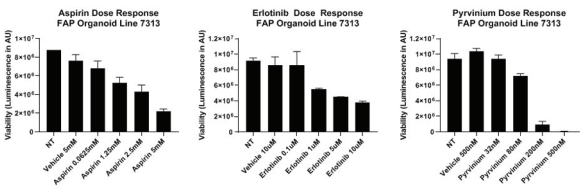
A. Adams, J. DeVecchio, S. Ferrandon, S. Xiang, D. Liska, M. Kalady
Location:NE6-212, OH

Purpose/Background: Patients with familial adenomatous polyposis (FAP) develop colorectal adenomas and without timely intervention will eventually develop cancer. There is no reliable *in vitro* system to study carcinogenesis or response to chemoprevention in this disease. We hypothesized that patient-derived FAP 3D-spheroid cultures (organoids) can function as a novel model to study FAP.

Methods/Interventions: Adenomatous polyp tissues were obtained from patients with FAP either during colonoscopy or from colectomy specimens. Tissues were minced and dissociated in collagenase I solution, resuspended in Matrigel beads, and grown in media containing Noggin, R-spondin, and Wnt-3a. Viability assays (CellTiter-Glo 3D) were used to analyze response to three chemoprevention agents: aspirin, erlotinib, and pyrvinium. Alterations in Wnt signaling (β-catenin) and survival pathways (ERK) were studied by Western blot after exposure to pyrvinium. Protein bands were quantified using ImageJ and normalized to 6 hours vehicle treatment.

Results/Outcome(s): 3D spheroid cultures were successfully established from FAP adenomatous tissue. Aspirin, erlotinib, and pyrvinium treatment decreased viability in a dose-dependent manner (Figure). Pyrvinium inhibited Wnt signaling as demonstrated by increased phosphorylation of β-catenin, which was an early event. In response to the decrease in Wnt signaling, we observed an early increase in ERK signaling, a survival pathway. However, at 24 hours, ERK signaling had decreased to below baseline levels, leading to decreased cell viability.

Conclusions/Discussion: We have established a consistent, reliable model to establish FAP adenoma organoid cultures that can be used to evaluate chemoprevention agents. Further studies to determine the relationship between patient response and *in vitro* cultures are underway as demonstration of a personalized model that might help direct individual chemoprevention drug choice.



SURGICAL INTERVENTION IN PATIENTS WITH RECURRENT UNCOMPLICATED DIVERTICULITIS: SHOULD ELECTIVE RESECTION BE OFFERED SOONER?

QS440

E. Price, C. Kutruff, M. Robinson, R. Carman
Harrisburg, PA

Purpose/Background: The decision to perform an elective sigmoid resection on patients who present with uncomplicated diverticulitis has been a point of controversy. There are currently no clear guidelines for when elective resection should be offered. The current guidelines recommend that the decision to perform elective sigmoid resection be individualized. The purpose of this study was to analyze patients with recurrent uncomplicated diverticulitis who progressed to surgical intervention since the new practice guidelines.

Methods/Interventions: Patients admitted with acute diverticular disease to a community healthcare system from October 2016 to May 2019 were retrospectively reviewed. Included were patients whose first episode of acute diverticulitis was considered uncomplicated documented by CT scan. Excluded were patients with diverticulosis without diverticulitis, a complicated first episode, not left sided or first episode unable to be identified. The patients who initially presented as uncomplicated acute diverticulitis were then analyzed to identify which progressed to complicated disease and/or required surgical intervention. Patient demographics, comorbidities, details of progression and surgical interventions were recorded.

Results/Outcome(s): 371 out of 1558 patients initially presented with acute uncomplicated diverticulitis. 16% (n=59/371) progressed to complicated disease. Fistulas (27.1%, n=16/59), frank perforations (16.9%, n=10/59), and pelvic abscesses requiring drain placement (16.9%, n=10/59) were the most common presentations. Of those who progressed, 47.5% (n=28/59) underwent elective surgery, 32.2% (n=19/59) emergent surgery, and 20.3% (n=12/59) no surgery. 50.8% (n=30/59) required 1 surgery, 20.3% (n=12/59) 2 surgeries, 8.5% (n=5/59) >2 surgeries, and 35.6% (n=21/59) required an ostomy. The average number of episodes until complicated disease was 2.5. The average time from the initial uncomplicated episode to presentation with complicated disease was 24 months. 8.9% (n=33/371) of patients with uncomplicated disease underwent elective sigmoid resection for recurrent episodes. The average age of this population was 56.9 years old with a 3:1 female to male ratio. Elective resection was performed after an average of 4.1 episodes of uncomplicated diverticulitis. All of these patients underwent 1 surgery with 93.9% (n=31/33) performed minimally invasive.

Conclusions/Discussion: The rate at which uncomplicated diverticulitis progresses to complicated disease remains unknown but is likely higher than previously

reported. Patients who progress to complicated disease endure higher morbidity, including multiple surgeries and increased need for ostomy creation. Patients with recurrent episodes of uncomplicated diverticulitis that elect to have surgical intervention after an average of four recurrences did not experience any increase in morbidity or mortality as supported by the current guidelines.

FACTORS ASSOCIATED WITH DECISION REGRET AMONG PATIENTS WITH DIVERTICULITIS DECIDING BETWEEN ELECTIVE COLECTOMY AND OBSERVATION.

QS441

J. Cohan, J. Esplin, F. Brecha, B. Orleans, L. Huang, E. Ozanne
Salt Lake City, UT

Purpose/Background: In the elective setting, patients with diverticulitis must decide between undergoing prophylactic colectomy or observation. We examined factors associated with patient decisional regret regarding this treatment decision.

Methods/Interventions: In this cross-sectional study of adult patients treated for diverticulitis at a single center between 2014-2019, participants completed validated instruments measuring decisional regret (Decision Regret Scale); decisional conflict (Decisional Conflict Scale and its subscales); shared decision making (9-Item Shared Decision Making Questionnaire); desired participation in decision making (Control Preference Scale); and gastrointestinal (GI)-specific quality of life (Gastrointestinal Quality of Life Index-10 item). Patients were excluded if they underwent urgent or emergent surgery. Spearman correlation was used to measure the association between decisional regret and decisional conflict, shared decision making, and quality of life. The Wilcoxon rank sum test was used to compare decision regret scores in patients who attained their desired level of participation in decision making with those who did not. To account for multiple comparisons, the Bonferroni correction was applied and statistical significance was set a priori at $p=0.006$.

Results/Outcome(s): Of 826 eligible patients, 117 completed the survey (14% response) a median of 25 months (IQR 15-38) from their last treatment discussion. 65 (56%) participants were women and the mean age was 60 (±12 years). Patients reported a median of 5 episodes of diverticulitis (IQR 3-8). With regards to the most severe episode, 46 (40%) required inpatient admission, 34 (30%) were discharged after evaluation in the emergency department, and 34 (30%) were managed in the outpatient setting. 16 (14%) participants underwent elective colectomy. Regarding the decision to pursue surgery or observation, 34 (29%) had significant decisional regret (score ≥25). As shown in the table, decisional regret was strongly correlated with decisional conflict and its subscales, including experiences of uncertainty, feeling informed, values clarity, decision making support, and effective decision making. Decisional regret was moderately inversely correlated with shared decision making and GI-related quality of life (see Table). Similarly, decision regret was higher in patients who did not attain their desired level of participation in decision making compared with those who did (median score 0 vs 20, $p=0.004$).

QS441 Table: Factors associated with decision regret (measured using the Decision Regret Scale) regarding the decision to pursue elective surgery or observation for diverticulitis.

Patient-Reported Measure	Instrument	Correlation Coefficient*	95% CI**	P-value
Decisional conflict	Decisional Conflict Scale	0.65	0.51 - 0.76	<0.001
Uncertainty	Decisional Conflict Subscale: Uncertainty	0.60	0.46 - 0.72	<0.001
Feeling informed	Decisional Conflict Subscale: Informed	0.62	0.47 - 0.74	<0.001
Values clarity	Decisional Conflict Subscale: Values Clarity	0.61	0.46 - 0.74	<0.001
Support during decision making	Decisional Conflict Subscale: Support	0.59	0.43 - 0.72	<0.001
Efficacy of decision	Decisional Conflict Subscale: Effective Decision	0.72	0.58 - 0.83	<0.001
Shared decision making	9-Item Shared Decision Making Questionnaire	-0.37	-0.54 - -0.20	<0.001
Quality of life	Gastrointestinal Quality of Life Index-10 Item	-0.41	-0.59 - -0.29	<0.001

CI: confidence interval; *Spearman correlation; **Bootstrap method with bias corrected interval

Conclusions/Discussion: A substantial proportion of patients experience decisional regret regarding treatment for diverticulitis. Decisional regret is associated with decisional conflict and is inversely associated with shared decision making. Future efforts to reduce decisional regret should be tailored to improve patient knowledge, values clarity, and shared decision making.

CONDITIONAL RECURRENCE-FREE SURVIVAL AFTER AN EPISODE OF DIVERTICULITIS MANAGED NONOPERATIVELY.

QS442

R. Garfinkle, T. Almalki, N. Morin, V. Pelsser, C. Reinhold, A. Liberman, C. Vasilevsky, M. Boutros
Montreal, QC, Canada

Purpose/Background: Recurrent diverticulitis is common following a first episode. However, the risk of recurrence may not be uniform throughout the follow-up period, and the significance of risk factors may vary over time. Conditional survival, as opposed to actuarial survival, accounts for time lived recurrence-free, and can provide a dynamic estimate of recurrence. The purpose of this study was to describe the conditional diverticulitis recurrence-free survival (Div-RFS) of patients after an index episode of diverticulitis managed nonoperatively, and to estimate the difference in conditional Div-RFS according to specific risk factors.

Methods/Interventions: This was an Institutional Review Board–approved multicenter retrospective cohort study of all patients managed nonoperatively for acute sigmoid diverticulitis at two university-affiliated hospitals from 2007-2017. All CT scans from the index episode of diverticulitis were reviewed by two blinded expert gastrointestinal radiologists. The primary outcome was diverticulitis recurrence, diagnosed by CT scan or on clinical grounds by a Colorectal Surgeon, at 60 days or later following the index episode. Actuarial and conditional Div-RFS were calculated throughout the first 10 years of follow-up. To study the varying impact of risk factors on recurrent diverticulitis over time, conditional Div-RFS was compared between categories of several binary covariates throughout the first five years of follow-up after the index episode.

Results/Outcome(s): In total, 991 patients were included for analysis. The overall recurrence rate was 32.5% (322/991), and the median follow-up was 2.3 (0.9-4.3) years. Actuarial and conditional Div-RFS are presented in **Table 1**. One, 2-, and 3-year actuarial Div-RFS was 81.1%, 71.5%, and 67.5%, respectively. Compared to the 1-year actuarial Div-RFS of 81.1%, the 1-year conditional Div-RFS increased with each additional year survived recurrence-free, reaching 96.0% after surviving the first four years recurrence-free. A similar phenomenon was observed with 2-year conditional Div-RFS, which steadily increased and then plateaued after four years. While immunosuppression ($p=0.008$) and abscess ($p=0.007$) were associated with worse actuarial Div-RFS, these risk factors were no longer significant after the first year survived recurrence-free. Comparatively, age <50 years-old ($p=0.012$), Charlson Comorbidity Score >=2 ($p=0.009$), and previous diverticulitis ($p=0.036$) were associated with worse conditional Div-RFS throughout the follow-up period.

Conclusions/Discussion: Conditional Div-RFS improves with each year survived recurrence-free. While several factors at index presentation may predict early recurrence, the conditional probability of recurrence according to many of these risk factors converges with time.

Table 1 – Actuarial and conditional diverticulitis recurrence-free survival for patients presenting with an index episode of diverticulitis managed nonoperatively

	Conditional DivRFS for patients surviving without a recurrence after:									
Years after index episode of diverticulitis	0 years (actuarial DivRFS) n=991	1 year n=687	2 years n=533	3 years n=398	4 years n=281	5 years n=196	6 years n=129	7 years n=79	8 years n=47	9 years n=29
1	81.1									
2	71.5	88.2								
3	67.5	83.2	94.4							
4	62.6	77.2	87.6	92.7						
5	60.1	74.1	84.1	89.0	96.0					
6	57.8	71.3	80.8	85.6	92.3	96.2				
7	56.1	69.2	78.5	83.1	89.6	93.3	97.1			
8	53.3	65.7	74.5	79.0	85.1	88.7	92.2	95.0		
9	53.3	65.7	74.5	79.0	85.1	88.7	92.2	95.0	100.0	
10	53.3	65.7	74.5	79.0	85.1	88.7	92.2	95.0	100.0	100.0

DivRFS = diverticulitis recurrence-free survival

GLOBAL PATTERNS IN DIVERTICULITIS BURDEN.

QS443

C. Hunt, R. Chaturvedi, L. Brown, C. Stafford, T. Francone, H. Kunitake, L. Bordeianou, R. Ricciardi
Boston, MA

Purpose/Background: We sought to determine diverticulitis burden across the globe and identify indicators of elevated or rising diverticulitis mortality over the past two decades. To do so we analyzed global age-adjusted diverticulitis mortality rates and compared them to national rates of obesity, health expenditures, and dietary composition.

Methods/Interventions: First, we obtained diverticulitis mortality data by country and year (range 1/1994 through 12/2016) from the World Health Organization Vital Statistics Registry. Next, we calculated age-adjusted rates of mortality from diverticulitis by country and year (diverticulitis deaths/100,000 population). We arranged countries into tertiles of diverticulitis mortality (low burden, moderate burden, high burden). Also, to examine changes in national diverticulitis mortality over the study period, we calculated the change in diverticulitis mortality over time and categorized rate changes into decreasing rate, constant rate, or increasing rate. Last, we compared diverticulitis mortality as a function of national obesity rates, health expenditures, and dietary composition.

Results/Outcome(s): Data for 102 countries were available after excluding nations with populations under 250,000. The average diverticulitis mortality burden was 0.51/100,000 with a range of 0 to 1.7/100,000. Compared to countries with low diverticulitis burden, countries with high diverticulitis mortality burden had proportionately

greater urban populations (77.1% vs. 68.2%, p<0.0001), lower average vegetable intake (105 g/day vs. 125 g/day), and higher health expenditures per capita ($2300 vs. $860, p=0.02). During the study period, we noted that 57% of countries had increasing rates of diverticulitis while only 7% had decreasing rates. Compared to countries with decreasing diverticulitis mortality rates, countries with increasing rates had lower per capita health expenditures ($805 vs. $3220, p<0.0001), lower unprocessed red meat intake (46.6 g/day vs. 73.4 g/day, p=0.04), and were more likely to be a developing nation. Although developing nations with increasing diverticulitis mortality rates had low rates of red meat consumption, obesity rates in these nations increased by 11.5% (compared to 7.9% in developed nations), over the same study period.

Conclusions/Discussion: There is great variability in diverticulitis mortality across the globe. However, a rapid rise in diverticulitis mortality was noted in developing nations with low average health expenditure and rapidly expanding obesity rates. Public health interventions in developing nations are needed in order to help control the rapidly rising rates of mortality from diverticulitis.

TOO MANY COOKS IN THE KITCHEN: PREOPERATIVE OPIOID EXPOSURE INCREASES FRAGMENTATION OF OPIOID PRESCRIBING AFTER DISCHARGE.

QS444

S. Lumpkin, K. Stitzenberg, A. Kinlaw
Chapel Hill, NC

Purpose/Background: One in five adult colorectal surgery (CRS) patients is exposed to opioids prior to surgery. Opioid-exposed patients have unique pain management needs, which require a coordinated, longitudinal effort to reduce opioid use. Despite this, opioid-exposed patients are often excluded from studies aimed at improving opioid stewardship. While prior studies have shown fragmentation of opioid prescribing for opioid-naïve surgical patients, no study has examined the extent to which prior opioid experience impacts where a patient receives postdischarge opioid prescriptions. Our objective was to examine the relationship between preoperative opioid exposure and where patients obtained their postdischarge opioid prescription.

Methods/Interventions: We identified CRS patients, ages 18-64, in a nationwide sample of commercially-insured adults from 2001-2017 (IBM MarketScan databases). Our primary categorical exposure was preoperative opioid exposure based on days' supply of opioids in the year prior to surgery (naïve <7, tolerant 7-119, and dependent >119). The primary outcome was prescriber type of the first outpatient postdischarge opioid prescription, dichotomized as Emergency Department (ED) versus non-ED. The opioid prescriber was defined using a lookback window to determine the most recent encounter. Using log-binomial regression to estimate risk ratios, we controlled for age, gender, indication for surgery, index length of stay, diagnosis related group-based complexity, Charlson Comorbidity Index, and prior number of healthcare utilization events.

Results/Outcome(s): We identified 1,007 patients; 77% were previously opioid-naïve, 18% were opioid-tolerant, and 5% were opioid-dependent. Among 718 (71%) patients who received an opioid prescription within 30 days of discharge, 17% were prescribed opioids through the ED and 18% were prescribed opioids by a surgeon's office. Compared to opioid-naïve patients, opioid-tolerant patients were more likely to have their postdischarge opioid prescribed by the ED (20% vs 13%, aRR=1.46, 95% CI = 1.01 to 2.11). In contrast, opioid-dependent patients were less likely than opioid-naïve to have their opioid prescribed by the ED (2% vs 13%, aRR= 95% CI = 0.05 to 1.33), but these estimates were imprecise.

Conclusions/Discussion: A large number of CRS patients are receiving postdischarge opioid prescriptions from emergency departments. Opioid-tolerant CRS patients are the most likely to receive opioid prescriptions from the ED. There is an opportunity improve postdischarge opioid stewardship and decrease fragmentation of prescribing by targeting educational efforts for ED providers and shepherding patients towards more coordinated and longitudinal pain management.

DEFINING THE SPECTRUM OF UROLOGIC MORBIDITY IN CROHN'S DISEASE PATIENTS UNDERGOING COLORECTAL SURGERY.

QS445

N. Hoy, A. Feinberg, P. Vaidya, D. Giugliano, I. Sapci, K. Angermeier, T. Hull, S. Holubar, H. Wood
Cleveland, OH

Purpose/Background: Although urologic complications of Crohn's disease process are commonly encountered, there are no studies on the urologic morbidity of colorectal surgery (CRS). The objective of our study is to describe the spectrum of urologic morbidity in patients with Crohn's disease undergoing CRS.

Methods/Interventions: This is a retrospective review of our prospectively maintained institutional surgery database spanning 1991-2018. Patients with an ICD-9 Crohn's disease code at the time of CRS and a pre-determined urologic CPT code within 5 years of their last CRS were included. These patients were then reviewed to determine if the urologic surgery was a direct complication of the CRS. Patients with non-major abdominal surgery were excluded.

Results/Outcome(s): A total of 4782 patients had major abdominal CRS and a Crohn's diagnosis. Of these, 407 (8.5%) had a urologic CPT code within 5 years, and

31 (0.65%) had a urologic morbidity attributable to the CRS. The CRS consisted of 16 small bowel resections, 16 proctectomies, 7 total abdominal colectomies, and 6 colon resections, with some having multiple procedures in the same operation. Urologic morbidity consisted of 19 ureteric injuries, 9 bladder injuries, 2 iatrogenic colovesical fistulas, and 2 requiring surgery for voiding dysfunction. Most urologic interventions were performed at the time of CRS (65% [20/31]). Surgeries performed after the CRS occurred a median 1 month after (0-17 months). A total of 43 urologic surgeries were performed including 10 (23.2%) ureteric re-implants, 9 (20.9%) cystorrhaphies, 8 (18.6%) ureteroureterostomies, 5 (11.6%) endoscopic ureteral stricture repairs, 3 (7.0%) ureteric stents, 2 (4.7%) open suprapubic tubes, 2 (4.7%) bladder flaps, 1 (2.3%) nephrectomy, 1 (2.3%) sacral nerve stimulator, 1 (2.3%) abscess incision and drainage, and 1 (2.3%) colovesical fistula closure. Most patients required a single urologic surgery (71% [22/31]), though 22.6% (7/31), 3.2% (1/31), and 3.2% (1/31) required 2-4 surgeries, respectively.

Conclusions/Discussion: In our series, the rate of urologic complications requiring surgery after CRS in patients with Crohn's disease is 0.65%. This likely underestimates the true morbidity as non-operative complications such as erectile dysfunction and infertility, are not assessed. The majority can be managed with an intraoperative single urologic surgery, but up to 30% may require additional procedures. Colorectal surgeons should counsel these patients about these potential urologic complications and partner with their urologic team to provide multidisciplinary care.

PATIENT CHARACTERISTICS, OPERATIVE AND FUNCTIONAL OUTCOMES IN PATIENTS UNDERGOING HANDSEWN VERSUS STAPLED REDO ILEAL POUCH ANAL ANASTOMOSES.

QS446

E. Esen[1], A. Erkan[1], E. Aytac[2], H. Kirat[1], F. Remzi[1]
[1]*New York, NY;* [2]*Istanbul, Turkey*

Purpose/Background: Redo ileal pouch anal anastomosis (IPAA) can be successfully performed for pouch failure in experienced hands. When the rectal stump is available for a staple, a stapled anastomosis is usually preferred. However, the presence of dysplasia or wide debridement of pelvic sepsis may require rectal mucosectomy and subsequently a hand-sewn IPAA. The aim of this study is to assess indications, operative and mid-term functional outcomes in patients undergoing stapled vs hand-sewn redo IPAA.

Methods/Interventions: Patients who underwent redo IPAA for ileal pouch failure between 09/2016 – 10/2019 were included in the study. Demographics, preoperative characteristics, intraoperative findings, short- and mid-term functional outcomes and quality of life were compared between stapled and hand-sewn groups. Cleveland Global Quality of Life Scores were utilized for quality of life analyses.

Results/Outcome(s): Totally 90 patients underwent trans abdominal redo IPAA for ileal pouch failure of whom 65 (72%) had hand-sewn and 25 had (28%) stapled re-anastomosis. Patients with stapled anastomosis were significantly younger and interval between index and redo

QS446 Comparison of the perioperative outcomes between hand-sewn vs stapled re-do IPAA

	Handsewn (n=65)	Stapled (n=25)	p
Presence of pelvic sepsis, n (%)	48 (74)	11 (44)	0.008
Presence of mechanical indications only, n (%)	15 (23)	14 (56)	0.003
New pouch creation, n (%)	47 (72)	7 (28)	<0.001
Operation time (min), mean±SD	291±70	231±69	0.001
EBL (ml), median (IQR)	300 (200-500)	200 (100-400)	0.014
Overall morbidity, n (%)	33 (51)	14 (56)	0.66
Pelvic sepsis, n (%)	11 (17)	0	0.028
Wound infection, n (%)	13 (20)	4 (16)	0.66
Ileus, n (%)	10 (15)	5 (20)	0.60
Urinary, n (%)	4 (6)	0	0.57
Cardiopulmonary, n (%)	5 (8)	1 (4)	1
Renal, n (%)	4 (6)	0	0.56
Thrombotic, n (%)	2 (3)	0	1
Transfusion, n (%)	10 (15)	2 (8)	0.36
Other infectious, n (%)	0	3 (12)	0.02
Readmission, n (%)	15 (23)	5 (20)	0.75
Mid-term septic complications, n (%)	10 (15)	1 (4)	0.14
Mid-term mechanical complications, n (%)	11 (17)	2 (8)	0.28
Mid-term hernia, n (%)	1 (2)	0	1
Hospital stay (days), median (IQR)	7 (6-9)	7 (5.5-8)	0.91

IPAA was longer in this group (Hand-sewn: 41±14 years vs Stapled: 35±12 years, p=0.044). Mucosectomy with hand-sewn anastomosis was more common after pelvic sepsis (Hand-sewn: 74% vs Stapled: 44%, p=**0.008**), whereas a stapled anastomosis was more common for patients who had only technical complications after primary IPAA (Hand-sewn: 23% vs Stapled: 56%, p=**0.003**). In the stapled anastomosis group, all pouches were in J configuration and the present pouch was salvaged in 18 patients (72%). In the hand-sewn group, a new pouch was created in 47 patients (72%), 5 (8%) patients had H-pouch and 2 (3%) patients had S-pouch. Mucosectomy and hand-sewn anastomosis added median 60 minutes to the operative time (median, Hand-sewn: 291 min vs Stapled: 231 min, p=**0.001**). Overall postoperative morbidity was similar between two groups (Hand-sewn: 52% vs Stapled: 56%, p=0.66) and no pelvic sepsis was observed in the stapled group (Hand-sewn: 17% vs Stapled: 0, p=**0.028**). Redo IPAA failed in 2 patients immediately after salvage surgery and received pouch excision with permanent end ileostomy. Pouch survival rates were 92% and 94% in hand-sewn and stapled groups respectively (p=1) within in 14 months median follow-up after ileostomy closure. Daily restrictions and quality of life scores (median, Hand-sewn: 0.8 vs Stapled: 0.7, p=0.2) were similar between stapled and hand-sewn groups. Patients in both groups were equally happy with the results of the surgery.

Conclusions/Discussion: Optimization of salvage strategy for pelvic sepsis requiring a handsewn redo-IPAA seems to provide acceptable and similar operative morbidity and quality of life with stapled redo-IPAA.

DOES OVERSEWING STAPLED ILEOCOLIC ANASTOMOSES FOR CROHN'S DISEASE REDUCE ANASTOMOTIC COMPLICATIONS? AN INVERSE-PROBABILITY WEIGHTING ANALYSIS OF A SINGLE CENTER COHORT.

QS447

A. de Buck van Overstraeten, A. Boughn, J. Saini, R. Gryfe, E. Kennedy, Z. Cohen, H. MacRae, M. Brar
Toronto, ON, Canada

Purpose/Background: Between 2% and 5% of ileocolic resections for Crohn's disease (CD) are complicated by an anastomotic leak. There is conflicting evidence regarding the association between anastomotic configuration and anastomotic leaks. Data looking at the potential benefit of oversewing stapled ileocolic anastomosis (ICA) are even scarcer. In fact, only one single center retrospective series (n= 269 patients) reported a significantly lower rate of anastomotic leaks in the oversewn cohort. Therefore, this study aimed to compare the anastomotic leak rate between stapled and oversewn stapled ICAs in CD patients.

Methods/Interventions: All CD patients having undergone a side-to-side ICA performed at Mount Sinai Hospital between 2000 and 2019 were retrieved from our institutional database. Baseline demographics, surgical details and postoperative follow up data were retrieved from the database as well as from extensive chart review. We estimated the effect of oversewing the stapled anastomosis on anastomotic sepsis (leaks and/or perianastomotic abscess) using a propensity score model (PSM) with inverse-probability weighting to account for selected confounders. Standardized differences were calculated to ensure covariate balance. Secondary endpoints were length of stay and OR time.

Results/Outcome(s): 782 patients were included in this analysis. Mean age was 36 years (IQR 36, 44y), 54% were female, with a mean of 12 years of disease duration and 36% had a previous ileocolic resection. Three percent had inflammatory phenotype, 39% had stenotic phenotype, and 58% penetrating phenotype. 43% were on steroids in the perioperative period. Thirty-nine percent had laparoscopic surgery with 88% undergoing surgery electively. Intraoperatively, 19% had an additional bowel resection. 228 patients had their anastomosis oversewn at the discretion of the surgeon and these patients were more likely to have laparoscopic surgery, have preoperative biologics, and were older. In total, 57 (7%) had anastomotic sepsis. In unadjusted analysis, there was no association between oversewing and anastomotic sepsis (OR 1.13; 95% CI 0.63,2.02; p=0.68). In our PSM, there was no association between oversewing and anastomotic complications (OR 1.00, 95%CI 0.96, 1.04; p=0. 94). There was no association with oversewing and OR time in unadjusted and adjusted analysis. However, patients who underwent oversewing had a shorter length of stay (0.85 days less in adjusted analysis).

Conclusions/Discussion: Oversewing side-to-side stapled ICA was not associated with a lower rate of anastomotic leak in this large single center cohort of CD patients undergoing ileocolic resection and should therefore not be advocated to decrease anastomotic complication rate.

READINESS OF GRADUATING GENERAL SURGERY RESIDENTS TO PERFORM COLORECTAL PROCEDURES.

QS448

J. Vu, B. George, S. Rivard, M. Clark, S. Regenbogen, G. Kwakye
Ann Arbor, MI

Purpose/Background: In the US, the majority of both benign and oncologic colorectal procedures are performed primarily by non-fellowship trained general surgeons. Given that surgical technique and experience affect patient outcomes, it is important that general surgeons are well-trained to perform colorectal surgery operations. This study seeks to determine how prepared general surgery residents are to perform colorectal procedures at the end of residency.

Methods/Interventions: We used data from the Procedural Learning and Safety Collaborative (PLSC), a nationwide collaboration of 78 teaching institutions. Attending ratings of residents' intra-operative performance were collected with the System for Improving and Measuring Procedural Learning (SIMPL) app over a 16-month period. We sampled colorectal operations and categorized them as "core" or "advanced" based on the American Board of Surgery designation. In addition to descriptive analyses, a Bayesian ordinal mixed model was used to determine a resident's probability of progressing to a rating of "Competent" before the end of residency, controlling for core vs. advanced procedure, case complexity, presence of a fellowship program at the resident's institution, and rater and resident effects.

Results/Outcome(s): A total of 190 PGY-5 residents were rated after 706 procedures (77% core, 23% advanced). PGY-5 residents in their final 6 months of training were rated as Competent in 75% of core cases and 58% of advanced cases. The 5 most commonly performed *core* procedures were open colectomy, laparoscopic colectomy, anorectal procedures, Hartmann's procedure, and colostomy/ileostomy takedown. The 5 most commonly performed *advanced* procedures were open proctocolectomy, laparoscopic proctocolectomy, open low anterior resection, laparoscopic low anterior resection, and transanal tumor resection. In model-based analyses, completing an advanced procedure conferred a significantly lower probability of being deemed Competent compared to a core procedure (OR=0.24, 95% CI 0.12 – 0.48). More complex cases were associated with decreased performance. The presence of a fellowship program at the resident's institution did not have an association with performance. Using the model, the typical resident had a 92% probability of being deemed Competent for a core procedure during their last week of residency, compared to 72% for an advanced procedure.

Conclusions/Discussion: General surgery residents were not universally rated as Competent to perform colorectal procedures even at the end of residency, and these gaps were more pronounced for advanced colorectal operations. These findings suggest that current graduation requirements should be carefully reviewed to ensure residents are appropriately trained to meet the needs of their communities. Alternatively, advanced colorectal training remains a critical resource for surgeons who intend to perform advanced procedures in practice.

AN EXPLORATION OF ACGME PROFESSIONAL PRACTICE COMPETENCIES IN COLORECTAL SURGERY: CORRELATIONS WITH GENERAL SURGERY MILESTONES.

QS449

K. Mirza[1], G. Ault[1], H. Novatt[1], S. Hamstra[2]
[1]*Los Angeles, CA;* [2]*Chicago, IL*

Purpose/Background: The Colorectal Surgery (CRS) and General Surgery (GS) Milestone projects provide frameworks to evaluate residents on specialty-specific competencies. Professional Practice Competencies (PPC) are milestones for GS and CRS, and encompass systems-based practice (SBP), professionalism (PROF), practice-based learning (PBL), and interpersonal/communication skills (ICS). Despite specialty-specific adaptations, there are inherent commonalities between the PPC evaluations for GS and CRS. The goal of the study was to investigate the validity of PPC evaluation by correlating evaluations at the end of GS and during CRS training. Comparing PPC ratings obtained by different Clinical Competency Committees (CCC) may elucidate the reliability and adequacy of the current training and evaluation process. Direct correlation suggests the existence of a shared mental model of milestones across groups in the surgical community whereas lack of correlation suggests that improvements in the language, structure, or process of PPC evaluation are needed.

Methods/Interventions: From an initial list of 2018-19 CRS fellows (n=94), GS graduation milestone ratings were available for 53. Fellows were reevaluated by their CRS CCC after 6 months of training using the same GS milestones format. PPC subcategory scores were extracted, including SBP (2), PBL (3), PROF (3), and ICS (3). Data was de-identified. Descriptive statistics (mean, SD, range) of GS and CRS PPCs were calculated, as well as Spearman correlation statistic between GS and CRS CCC ratings for each competency.

Results/Outcome(s): There were no statistically significant correlations between the GS milestone ratings performed by GS CCCs at graduation and CRS CCCs six months later. GS ratings showed less variation and higher means compared to CRS ratings for all subcategories. Assuming independence in measurement of correlation for each of 11 subcategories, significance was set at p=0.045 (0.05 / 11). Mean GS ratings ranged from 3.88 +/- 0.26 to 3.75 +/- 0.32 while CRS ratings ranged from 3.48 +/- 0.58 to 2.98 +/- 0.71.

Conclusions/Discussion: While no significant correlation was found, CRS CCC evaluations tended to show lower means and greater variations across all categories, suggesting variability in the two CCCs and low interrater reliability. This may be attributable to bias towards using less of the scale by GS CCCs evaluating residents at end of training, or reflect greater depth of experience with trainees over 5 years of residency. Finally, there may be a

greater than expected difference in the process, language, and culture of PPC training between GS and CRS underlying the lack of correlation. This represents a preliminary inquiry into the complex question of how PPC should be evaluated and taught in CRS residency. Further studies, including qualitative research, may assist in validating the evaluation process and defining improvements to CRS PPC curriculum.

Table 1. Descriptive Statistics for PPC Across GS and CRS CCC

	GS Rating		CRS Rating			
Subcategory	n	Mean ± SD (Range)	n	Mean ± SD (Range)	Spearman	*p-value*
[1]SBP01	53	3.87 ± 0.26 (3 - 4)	53	3.48 ± 0.58 (2 - 4)	0.057	0.685
SBP02	53	3.76 ± 0.36 (2.5 - 4)	53	2.98 ± 0.71 (1 - 4)	0.145	0.299
[2]PBLI01	53	3.88 ± 0.26 (3 - 4)	51	3.35 ± 0.71 (1.5 - 4)	0.185	0.193
PBLI02	53	3.75 ± 0.32 (3 - 4)	53	3.24 ± 0.62 (2 - 4)	0.067	0.633
PBLI03	53	3.81 ± 0.33 (2.5 - 4)	53	3.20 ± 0.64 (1.5 - 4)	0.194	0.165
[3]PROF01	53	3.82 ± 0.41 (2 - 4)	53	3.47 ± 0.60 (2 - 4)	0.233	0.093
PROF02	53	3.87 ± 0.28 (3 - 4)	51	3.31 ± 0.65 (1.5 - 4)	0.104	0.467
PROF03	53	3.78 ± 0.49 (1 - 4)	53	3.37 ± 0.64 (2 - 4)	0.374	0.006
[4]ICS01	53	3.84 ± 0.34 (2.5 - 4)	53	3.42 ± 0.63 (2 - 4)	0.248	0.073
ICS02	53	3.86 ± 0.32 (2.5 - 4)	53	3.32 ± 0.61 (2 - 4)	0.242	0.081
ICS03	53	3.80 ± 0.36 (2.5 - 4)	53	3.25 ± 0.61 (2 - 4)	0.032	0.819

[1]SBP - Systems-Based Practice, [2]PBL - Practice-Based Learning, [3]PROF - Professionalism, [4]ICS - Interpersonal and Communication Skills

PROPOSED NOMOGRAM PREDICTING THE INDIVIDUAL RISK OF RECURRENCE IN PATIENTS FOLLOWING ANAL FISTULA SURGERY.

QS450

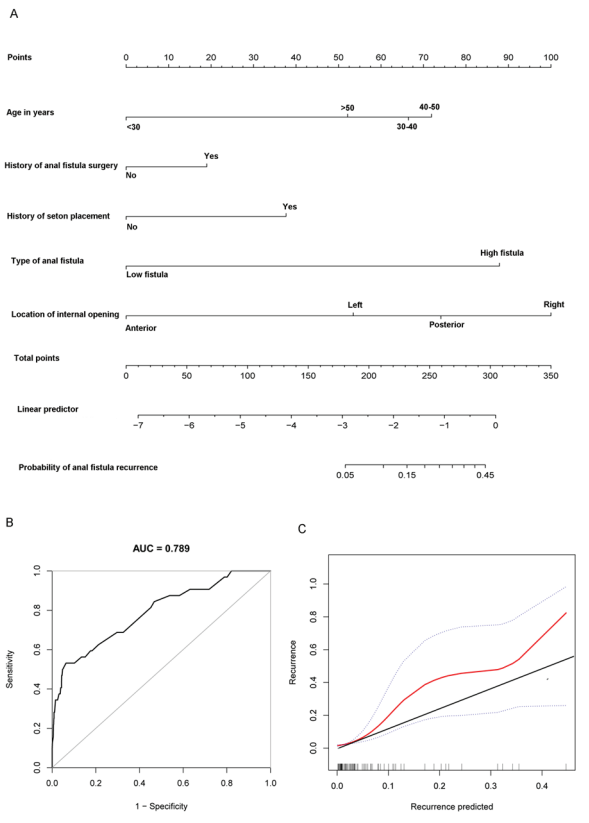
Z. Mei, H. Wang, Q. Wang, W. Yang
Shanghai, China

Purpose/Background: Estimates and prediction of recurrence are compositions to anal fistula (AF) patient care after surgery, and form the basis of early prevention and postoperative treatment planning, helping recommend optimal treatment approach and setting reasonable expectations for a specific patient. Multiple patient, surgery and fistula-related factors have been reported to influence postoperative recurrence. The aim of this study was to evaluate individual risks of recurrence and proposed a nomogram for predicting recurrence following AF surgery using the large retrospective AF cohort. Such a model can be extended and applied to all the cohort of AF patients, with the characteristic of simplicity, accuracy, fast prediction among various multiple factors affecting patient clinical outcomes.

Methods/Interventions: We used data from a tertiary referral hospital database based on a hospital-based cohort study. A total of 1998 AF patients were enrolled between 2015 and 2018 which were used to develop a nomogram to estimate AF recurrence, among which 1200 and 798 were randomly assigned to training and validation sets, respectively. Multiple imputation procedure was applied for missing data. Logistic regression and the Boruta algorithm were used to select the independent risk factors associated with AF recurrence that were incorporated into the nomogram based on the training set.

Results/Outcome(s): During a 6-month follow-up after surgery, we identified disease recurrence in 45 patients among patients in both the training set and the validation set. In the training set, factors significantly associated with AF recurrence included patient age, history of anal fistula surgery, history of seton placement, type of AF and location of internal opening. The final nomogram including these above variables was constructed (Figure 1A). For the training set, the predictive model had an area under the receiver operating characteristic curve (AUC) of 0.789 and 0.798 before and after the 500 repetitions of bootstrap sample corrections, respectively (Figure 1B). For the validation set, the predictive model had an AUC of 0.837 and 0.763 before and after the 500 repetitions of bootstrap sample corrections, respectively. The calibration curves indicated generally satisfactory agreements between the predicted AF recurrence probability and the actually observed AF recurrence probability (Figure 1C).

Conclusions/Discussion: The nomogram presents accurate and favourable prediction of recurrence risk for patients following AF surgery. This prediction tool may provide an alternative for early screening of patients with high risk of postoperative recurrence and help surgeons better understand the aetiology and outcome of AF in an earlier stage.



MEASUREMENT OF PATIENT REPORTED OUTCOMES (PROS) PROVIDES INSIGHT TO PATIENT EXPERIENCE WITH ANORECTAL DISEASE.

QS451

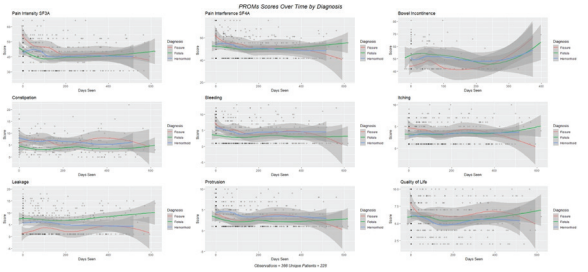
T. Peponis, H. Hubbell, R. Goldstone, M. Rubin, J. Goldberg, K. Ahmed, R. Bleday, L. Bordeianou
Boston, MA

Purpose/Background: The long-term impact of management of anorectal disease on the patients' quality of life is poorly understood. Patients are frequently lost to follow-up and rarely provide their perspective in a systematic fashion.

Methods/Interventions: We queried patients seen in the clinic for anorectal disease (12/2017 - 09/2019) with a routine set of questionnaires including measurement of pain and its impact (PROMIS), fecal incontinence (Wexner), constipation (Varma), and symptoms of bleeding, protrusion, and seepage. Patients were offered the same set of questionnaires at presentation and at each subsequent follow up visit. The primary outcome of the study was the self-reported impact of interventions (medical treatment, in office procedures or surgery) on these domains.

Results/Outcome(s): A total of 544 patients responded to these questionnaires over time (hemorrhoids: 34.1%, perianal fistulae 15.3%; fissures: 7.4%). Cumulatively these patients made 1,283 visits for their problem, many coming back at least 3 times (fissure: 40.48%, fistula: 55.2%, hemorrhoids: 21.1%) and completing instrument over time 1-5 times (mean: 2 times). Overall, patients who filled their last questionnaire within 6 months from presentation, reported improvement in pain intensity/interference, bleeding, constipation, protrusion and overall quality of life with treatment (Figure). However, a small group of patients required visits more than 6 months later, and this "persistent follow up" cohort reported increasing rates of bowel incontinence over time, and a deterioration in their quality of life (Figure). These effects were most noticeable in fistula and fissure patients. Longer duration of follow up of patients with hemorrhoidal symptoms did not alter continence curves.

Conclusions/Discussion: Routine use of PROs following evaluation and treatment of classic anorectal conditions may facilitate better understanding of patient perspective and experience with medical, procedural and surgical interventions. Clinicians must be especially aware of the increased risk of fecal incontinence in the patients whose complaints do not seem to improve with routine interventions after 6 months of treatment, with heightened deterioration for patients with persistent fissures and fistulae.



Changes in Patient Reported Symptoms Depend on Length of Needed Follow Up to Symptom Resolution (lower scores are better).

REDUCTION OF OPIOID OVERPRESCRIBING AND USE FOLLOWING STANDARDIZED EDUCATIONAL INTERVENTION: A SURVEY OF PATIENT EXPERIENCES FOLLOWING ANORECTAL PROCEDURES.

QS452

D. Yoon, K. Mirza, C. Wickham, E. Noren, S. Lee, K. Cologne, G. Ault
Los Angeles, CA

Purpose/Background: Anorectal procedures are traditionally thought to cause significant postoperative pain. Studies evaluating postoperative opioid prescription patterns describe excessive quantities of opioids prescribed by surgeons. A pilot study conducted at our institution evaluating opioid prescription patterns following anorectal procedures revealed that a significant portion of prescribed opioids remains unused and vulnerable for diversion and misuse. Based on the results of this pilot, we designed a standardized opioid prescription and educational plan. Our goal was to evaluate the impact of prescriber and patient targeted educational interventions on postoperative overprescribing of opioids following anorectal procedures.

Methods/Interventions: Patients undergoing elective outpatient anorectal procedures at a tertiary academic hospital were enrolled from July to November 2019 following the implementation of educational interventions. Prescribers received a presentation on recommended opioid prescription quantities and a multimodal pain regimen during a weekly colorectal division meeting. The multimodal regimen consisted of around-the-clock acetaminophen, ibuprofen and gabapentin. A telephone survey was conducted one week postoperatively. Patient reported pain control satisfaction levels were measured by a five point Likert scale, from 0 (very unsatisfied) to 5 (very satisfied) and reported as mean ± standard deviation. Post-intervention outcomes were compared with the retrospective cohort outcomes, with $P<0.05$ considered statistically significant.

Results/Outcome(s): A total of 70 patients were enrolled, with a telephone survey response rate of 83% (n=58). 100% of patients received on-site postoperative education regarding appropriate opioid use and multimodal pain regimen. The post-intervention (post) cohort

was compared to the 114 patients included in the pre-intervention (pre) cohort of historical controls. There were no significant demographic differences between the two groups. The post cohort was prescribed fewer milligram morphine equivalent (MME) (73.5 vs 288.8, P<0.001), used less MME (20.1 vs 57.1, P<0.001), and reported a higher compliance rate for using at least one of the three multimodal pain medications (97% vs 31%, P<0.001). There were no differences between the pre and post cohorts in patient reported satisfaction with pain control (3.86 ± 1.4 vs 3.95 ± 1.1 out of 5, P=0.727), incidence of ED visit (14% vs 9%, P=0.220), and supplemental opioid use (2% vs 4%, P=0.664).

Conclusions/Discussion: Educational interventions emphasizing evidence-based recommended opioid prescription quantities and multimodal pain regimens are effective in decreasing excessive opioid prescribing and use without compromising satisfactory pain control in patients undergoing ambulatory anorectal procedures.

RANDOMIZED PILOT STUDY OF THE RENEW™ ANAL INSERT VERSUS PERCUTANEOUS TIBIAL NERVE STIMULATION (PTNS) IN PATIENTS SUFFERING FROM FAECAL INCONTINENCE.

QS453

A. Leo[1], G. Thomas[1], J. Hodgkinson[1], E. Bradshaw[1], J. Murphy[2], C. Vaizey[1]
[1]*Harrow - Middlesex, United Kingdom;* [2]*London, United Kingdom*

Purpose/Background: The Renew™ anal insert and percutaneous tibial nerve stimulation (PTNS) may be offered to those with faecal incontinence (FI) who have failed other conservative treatments. We aimed to compare the Renew™ anal insert and PTNS in these patients.

Methods/Interventions: An investigator blinded randomised pilot study of Renew™ anal insert versus PTNS was undertaken for patients with a minimum of two episodes of FI per week. Patients were randomised to receive either the Renew™ insert or weekly PTNS for a period of three months. The primary endpoint was change in the frequency of FI recorded by bowel diary. Secondary endpoints were St Mark's incontinence score, ICIQ-B scores (for bowel pattern, bowel control and quality of life) use of antidiarrheal agents, estimates of comfort and acceptability.

Results/Outcome(s): Fifty patients were recruited between March 2017 and September 2018. Twenty five were randomised to Renew™ anal insert and 25 to PTNS. All completed treatment. A significant improvement of scores in the two-week bowel diary, the St Mark's score and the ICIQ-B scores was seen in both groups after 3 months of treatment. A reduction of 50% FI episodes was reached by 78% (n=19/25) by the Renew™ anal insert group, compared to 48% (n=12/25) of those in the PTNS group (p = 0.041). The St Mark's Faecal incontinence scores (p=0.015), ICIQ-B scores for bowel pattern (p=0.003), bowel control (p=0.008) and quality of life (p=0.019) all favoured the Renew™ anal insert. Fewer people used antidiarrheal medication after 3 months in the Renew™ group although these numbers did not reach statistical significance. Some people reported discomfort in the Renew™ anal insert group, compared to none in the PTNS group.

Conclusions/Discussion: Both Renew™ insert and PTNS improved the symptoms of FI after 3 months of treatment. The Renew™ device appeared to be more effective than PTNS. Larger studies are needed to investigate this further.

QS453 Inclusion and exclusion criteria

Inclusion Criteria	Exclusion Criteria
Female or male, > 18 year old	Pregnancy
Passive or mixed faecal incontinence	Inability to given informed consent
Minimum two or more episodes of faecal incontinence per week as assessed by prospectively collected bowel diaries	Known allergy to Silicone
Failed biofeedback, pelvic floor physiotherapy or other medical and conservative management	Patients who are mentally or physically unable to comply with the protocol of the study.
Able to self- administer the Renew™ Anal Insert	Inflammatory bowel disease, any active rectal inflammation, Per Rectal bleeding, perianal sepsis
Competent and willing to fill in questionnaires and attend clinics throughout the study	Rectal prolapse, third or fourth degree haemorrhoids, anal stricture, anal or recto-vaginal fistula, previous rectal surgery.

GOOD SYMPTOM RELIEF AFTER DIVERTING LOOP ILEOSTOMY MAY NOT PREDICT OUTCOMES AFTER A SUBTOTAL COLECTOMY IN THE MANAGEMENT OF SLOW TRANSIT CONSTIPATION?

QS454

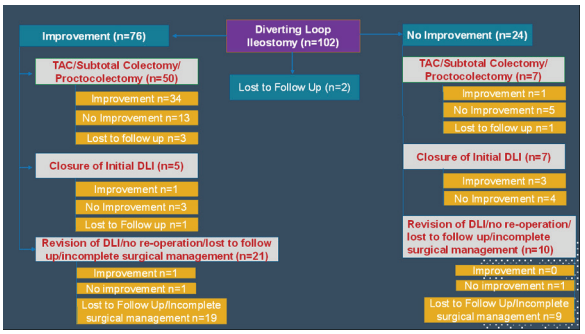
L. Hung, S. Vogler, T. Hull, M. Cline, M. Valente, S. Steele, E. Gorgun
Cleveland Heights, OH

Purpose/Background: The optimal treatment of slow transit constipation is not well understood. It is unclear why some patients do not respond well to surgical resection while others do. When the clinical picture is inconclusive for STC or if the patient is hesitant about undergoing major surgery, diverting loop ileostomy (DLI) is often initially offered, followed by a colectomy. The aim of our study was to investigate if DLI offers satisfactory outcomes and analyze the outcomes of STC patients who have DLI as part of their initial surgical management and those with DLI followed by a colectomy. We hypothesized that better patient satisfaction to DLI would be followed by similar outcomes after a colectomy.

Methods/Interventions: Patients with diagnosed or suspected STC/colonic inertia who had DLI as part of their surgical management (iDLI) in the Colorectal Surgery Department at our institution from January 2006 to August 2019 were included. Data collected included demographics, video capsule endoscopy (VCE)/sitz marker studies, anal manometry (AM) and defecography (DG), past medical history, operative data, and post-operative outcomes. Our primary endpoints were patient satisfaction and abdominal pain (AP) levels (patient reported pain scale) after DLI and if relevant colectomy (total/subtotal colectomy with ileorectal/ileosigmoid anastomosis +/- loop/end ileostomy). Patient satisfaction was measured by patient report of changes in constipation/bloating and overall feeling; issues with the DLI were not considered.

Results/Outcome(s): 102 patients were included; 76 had good satisfaction (GS) after iDLI (74.5%), 24 had poor satisfaction (PS), and 2 were lost to follow up (LTF). Of the 76 patients with GS, 50 had a subsequent colectomy, 5 had iDLI closure, 2 had iDLI revision, and 19 were LTF. Of the 24 with PS, 7 underwent a subsequent colectomy due to patient desire, 7 had iDLI closure, 1 had iDLI revision, and 9 were LTF. Slow colonic transit time demonstrated by VCE/sitz marker studies was associated with improvement in AP after iDLI (p=0.018). Older age (median 42, range 19-70) (p=0.029) and difficulty with contrast evacuation on DG (p=0.016) were associated with PS or no improvement in AP after iDLI. Amongst patients who underwent both iDLI and colectomy, **13 of 50 patients (26%) who had GS after iDLI had PS after colectomy, and 13 of 36 patients (36%) who had improvement in AP after iDLI had worsening of their AP after colectomy (p<0.05);** none of these patients underwent replacement of DLI. (Figure 1)

Conclusions/Discussion: DLI offers fairly good patient satisfaction for symptom relief. Subtotal colectomy after DLI does not translate into better patient satisfaction. Good education prior to surgery is needed to prevent patients from seeking another surgery with hopes of better symptom relief and should be selectively offered.



IMPACT OF SOCIOECONOMIC STATUS ON TRAVEL DISTANCE TO HIGH-VOLUME RECTAL CANCER HOSPITALS.

QS460

Z. Xu[1], C. Justiniano[1], C. Aquina[1], A. Becerra[1], F. Boscoe[3], M. Schymura[2], L. Temple[1], F. Fleming[1]
[1]Rochester, NY; [2]Albany, NY; [3]Renssalaer, NY

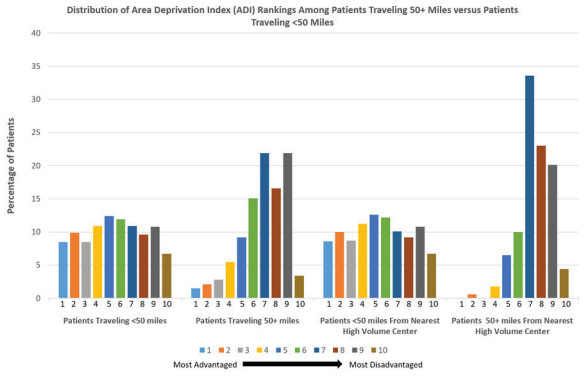
Purpose/Background: Groups such as the Leapfrog have recommended volume thresholds for hospitals to perform rectal cancer resections. Previous work has shown that a shift to high-volume centers in New York State could lead to a three-fold increase in the number of patients having to travel 50+ miles for surgery. This study aims to investigate the impact of socioeconomic status (SES) impacts on accessibility to high-volume rectal cancer resection hospitals.

Methods/Interventions: Stage I-III rectal cancer patients who underwent resection from 2004-2014 were queried from the New York State Cancer Registry. Distance was calculated as the straight line distance between the centroid of the patient residence zip code and the hospital zip code. Based on Leapfrog recommendations, high-volume hospitals were defined as hospitals performing 16+ resections per year. SES was characterized using the Area Deprivation Index (ADI) ranked as deciles within New York (higher deciles are more disadvantaged), median income, and high school graduation rate. Patients in the top three deciles (most disadvantaged) were compared to patients in the lowest three deciles (most advantaged). The ADI is based on a measure created by

the Health Resources & Services Administration which allows for ranking of neighborhoods by SES disadvantage. Descriptive statistics were summarized.

Results/Outcome(s): 5,859 patients met inclusion criteria. 22 high-volume facilities meet Leapfrog's recommendation. The most disadvantaged patients residing in zip codes in the top three decile for ADI had an average median income of $47,202 versus $80,758 among those in the lowest three deciles. The most disadvantaged patients lived in areas with an average high school graduation rate of 81.6% versus 88.4% for the most advantaged patients. Patients who currently travel 50+ miles are disproportionately in more disadvantaged ADI groups with 42% of patients being in the top three decile versus only 6.4% in the bottom three decile. [Figure] If hospitals were limited to only high-volume center, the number of patients that would have to travel 50+ miles in the most disadvantaged group would increase to 47.5%.

Conclusions/Discussion: Our study shows that patients who travel farther for their rectal cancer resections are disproportionately from zip codes of more disadvantaged ADIs. Disadvantaged patients have lower rates of high school graduation and lower median income. If rectal cancer resections were limited to high-volume centers as defined by Leapfrog, this would disproportionately impact disadvantaged patients from higher ADI areas by increasing their travel burden. Any plans for volume limits for rectal cancer resections must be mindful of the impact that may have on socioeconomically vulnerable populations.



ROLE OF PATIENT DEMOGRAPHICS IN PATIENT ENGAGEMENT TECHNOLOGY USAGE AMONG FOUR SURGICAL SPECIALTIES.

QS461

L. Theiss, F. Gleason, L. Wood, I. Marques, J. Cannon, M. Morris, G. Kennedy, D. Chu
Birmingham, AL

Purpose/Background: Patient engagement technologies (PET) are increasingly used in surgical specialties to guide patients through the perioperative period. It is unclear, however, if PET use varies by patient and specialty-level factors. We therefore aimed to determine if PET usage varied by patient demographics and surgical specialties.

Methods/Interventions: Patients undergoing elective colorectal, gynecological, thoracic, and cardiac surgery at a single institution were enrolled in a PET (SeamlessMD). Patients received educational content, reminders, health checks, and patient-reported outcome (PRO) surveys preoperatively, in-hospital, and for 30-days after discharge. PRO surveys measured surgery preparation, pre-surgery readiness, patient satisfaction, and healthcare system usage. In-hospital and post-discharge health checks assessed patient symptoms and compliance throughout the perioperative period. Patients were assessed for completion of each of the 4 PRO surveys, at least 1 in-hospital health check, and number of post-discharge health checks administered daily for 30 days after discharge. Survey and in-hospital health check completion rates and mean number of post-discharge health checks were compared by race/ethnicity and age for the whole cohort and by surgical specialty using chi-square and ANOVA tests.

Results/Outcome(s): 683 patients from 4 surgical specialties were included in the analysis. Mean age was 57 years. 75.0% of patients were white, 22.4% black, 2.6% Asian, Hispanic, or other. 60.3% of patients underwent colorectal surgery, 11.9% gynecological, 13.2% thoracic, and 14.6% cardiac. Overall, there was no difference in survey completion, in-hospital health check, or post-discharge health check completion between patients age 65 or greater and patients less than 65. Black patients completed significantly less PRO surveys than white patients, with completion rates ranging from 15.6%-32.5% compared to completion rates of 23.1%-39.94% for white patients (all $p < 0.05$, except healthcare usage survey with $p = 0.051$, Figure 1). Fewer black patients overall completed in-hospital health checks ($p = 0.001$). There was no significant difference in number of post-discharge health checks completed. When analyzed by specialty, the same differences in PET usage between white and black patients existed for patients undergoing colorectal surgery. There was a trend towards lower rates of PET usage by black patients undergoing thoracic surgery, however these differences were not statistically significant. There were no significant differences in PET usage by race among patients undergoing cardiac and gynecologic surgery.

Conclusions/Discussion: PET usage did not vary by age, but did vary by race/ethnicity among surgical patients in 4 different specialties. These differences were most pronounced amongst patients undergoing colorectal surgery. Future studies should be aimed at optimizing engagement for all patients in surgical care programs.

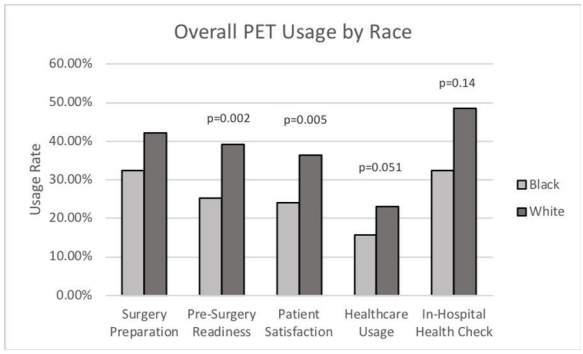


Figure 1.

THE ROLE OF TRAUMA IN CONTRIBUTING TO COLON SURGICAL SITE INFECTIONS AT A HIGH VOLUME TRAUMA CENTER.

QS462

L. Parker, Z. Roberts, A. Waddimba, G. Cantu, J. Fleshman, A. Fichera, W. Peters
Dallas, TX

Purpose/Background: The National Health Safety Network (NHSN) has developed a risk prediction model to compare rates of healthcare-associated infections (HAI), including colon surgical site infections (SSI) among hospitals. These predicted risk models are then used for CME reporting and factor into hospital reimbursement. Risk factors used in the colon procedures calculation are diabetes, ASA score, gender, BMI, closure technique, and whether the surgery took place at an oncology hospital. Trauma is not included as a risk factor despite multiple studies indicating trauma is an independent risk factor for colon SSIs. In hospitals that do not experience a high volume of trauma, the number of colon SSIs involving trauma may be negligible. However, in an urban level 1 trauma center the number of colon surgeries involving trauma becomes an influential factor.

Methods/Interventions: All SSIs following colon operations at Baylor University Medical Center are tracked and reported to NHSN as a quality measure. We conducted a retrospective chart review of colon SSI patients from 2016 to 2019. The patients were divided into colon surgeries following trauma and those that did not involve trauma. Descriptive statistics were summarized for patient demographics, comorbidities, use of colon prep bundles, infection type and when detected, length of stay, readmission rate, and other complications including mortality.

Results/Outcome(s): There were 113 total colon SSIs from July 2016 to June 2019. Colon surgeries in the setting of trauma contributed 23% of the total colon SSIs (26 of 113). When comparing NHSN risk criteria there was no difference in ASA score or BMI between trauma and non-trauma colon SSI groups. However, the trauma population was younger (31 vs. 60 median age) and had a lower rate of diabetes (0% vs. 18%). There was a higher proportions of males (100% vs. 47%) in the trauma group, which by NHSN criteria was the only risk factor increasing infection risk. At 90% trauma patient had over 3x the rate of sepsis preoperatively and none had complete colon bundle utilization compared to 45%. The trauma group had infections that were more likely to be detected during the same admission (95% vs 51%), had longer length of stay (27 versus 12 days), and had higher rates of other complications (80% vs 54%). However, they did have a lower readmission rate (15% vs. 53%). There was no difference in mortality between the two groups.

Conclusions/Discussion: Although trauma is known to be a risk factor for colon SSIs it is not currently accounted for in risk calculations for the NHSN. This disproportionately affects high volume trauma centers, such as ours, where trauma makes up a large amount of the colon SSIs. Consideration should be given to including trauma in these risk calculations.

THE IMPACT OF EMERGENCY LAPAROTOMY ON QUALITY OF LIFE AND LONG-TERM EMPLOYMENT IN PATIENTS ONE YEAR POST SURGERY.

QS463

E. McIlveen, J. Edwards, M. Vella, T. Quasim, S. Moug
Glasgow, United Kingdom

Purpose/Background: As documented by the National Emergency Laparotomy Audit (NELA) in the UK, emergency laparotomy (EmLap) is associated with high rates of mortality. This led to a big drive to improve outcomes; 30-day mortality rates improved from 11.8% to 9.5% between 2013 and 2017. Despite these improvements there is a lack of information regarding longer-term outcomes such as quality of life (QoL) or employment status after EmLap. We assessed the impact of EmLap on QoL and employment in patients at one year after undergoing surgery.

Methods/Interventions: After ethical approval was given, participants were screened and recruited. Of 224 screened patients, 157 were eligible with 42 participating in the telephone interview after completing a verbal consent form. Each participant completed the Glasgow Benefit Inventory to assess 3 aspects of QoL: general health; social support and physical health. Employment status was also defined pre and one year post EmLap: retired; employed; unemployed (not due to ill-health); sick leave; family carer; volunteer worker.

Results/Outcome(s): Responders were more likely to be older (mean 68 years) and female (64.3%). The commonest procedures performed were large bowel resection and adhesiolysis with stoma formation in 35.6% of cases. Employment status: 55% were retired at the time of Emlap which increased to 60% 1-year after surgery; 36% were in employment and that declined to 21% one

year after surgery with only two thirds managing to work the same number of hours. A change in employment was associated with poorer general and physical QoL scores ($p < 0.01$). Post-operative complications and/ or the formation of a stoma also negatively affected QoL at 1 year ($p < 0.01$). The majority of patients reported good social support. Patients reported physical, social and psychological issues even at a year: for example; stoma related issues, chronic pain, can't relax when out socialising and feeling more self-conscious.

Conclusions/Discussion: Employment and QoL can be significantly impacted after undergoing EmLap. Having this knowledge that certain patient groups may experience difficulties in the peri-operative period should allow us to pre-empt this impact. Strategies need to be developed to provide physical and emotional support in the peri and post-operative periods to improve longer term outcomes for EmLap patients. Targeted interventions are required to optimise return to work in the working population.

WHAT ARE WE MISSING? DISCREPANCIES BETWEEN TRADITIONAL NARRATIVE AND SYNOPTIC OPERATIVE REPORT IN RECTAL CANCER SURGERY.

QS464

J. Riad, T. Colbert, L. Shaffer, K. Khanduja
Columbus, OH

Purpose/Background: ***BACKGROUND:*** Synoptic operative reporting has been shown to improve the quality of care for rectal cancer patients. The American Society of Colon and Rectal Surgeons developed a Best Practices Rectal Cancer Checklist (RCC) to standardize and improve the quality of rectal cancer surgery. The OSTRiCh "Optimizing the Surgical Treatment of Rectal Cancer" Standardized Synoptic Operative Report Committee, utilized the ASCRS RCC as a guide in the development of its synoptic operative report. ***OBJECTIVE:*** The aim of this study was to identify missing documentation in narrative operative reporting, as compared to a synoptic operative report checklist.

Methods/Interventions: ***DESIGN:*** Single-institution retrospective observational study ***SETTING:*** The study was conducted at a teaching community hospital. ***PATIENTS/ INTERVENTIONS:*** Synoptic checklist of 27 points was created from the OSTRiCh synoptic operative report. The thirty most recent rectal cancer patients, five from each colorectal surgeon, were included. The narrative operative reports were compared to the synoptic operative report checklist created. ***MAIN OUTCOME MEASURES:*** Identify the missing documentation between the narrative operative reports and the synoptic checklist.

Results/Outcome(s): ***RESULTS***: The checklist points were summarized into 7 categories. These categories were; always (100%), frequently (75-99%), often (50-74%), sometimes (25-49%), rarely (1-24%), never (0%) and not applicable. Neoadjuvant chemo-radiation therapy, operation type, modality, splenic flexure mobilization, adhesions and stoma creation (when indicated) were always mentioned. Preoperative imaging (N=25, 83%), staging (24, 80%), distal margin (25, 83%), anastomotic test (24, 80%), presence or absence of metastasis (23, 77%), Intraoperative complications (24, 80%) were included frequently (75-99%). Tumor height (21, 70%), type of reconstruction (21, 70%), IMA ligation level (16, 53%) were reported often (50-74%). Tumor location (12, 40%), IMV ligation level (13, 43%), surgical specimen grading (14, 47%), resection completeness (11, 37%) were reported sometimes (25-49%). Case status (3, 10%), intent of surgery (5, 17%), anastomotic height (4, 13%) were rarely mentioned (1-24%). ASA and TME photographs were never mentioned. En bloc resection, metastectomy and blood transfusions were not applicable for any of the patients. ***LIMITATIONS:*** Small number of patients included in the study, limiting precision of the estimates.

Conclusions/Discussion: ***CONCLUSION:*** This study documents that many important operative parameters for rectal cancer are being missed within narrative operative reports. The most frequently missed data points are highlighted and confirms the need to switch to a synoptic operative report.

INCIDENCE AND CHARACTERIZATION OF COMPLICATIONS OF FECAL MANAGEMENT SYSTEMS.

QS465

W. Kane, T. Hassinger, T. Xu, T. Hedrick
Charlottesville, VA

Purpose/Background: Fecal management systems (FMS) utilizing flexible rectal devices have become ubiquitous in critically-ill patients with fecal incontinence or severe diarrhea, especially in the setting of perianal wounds. Although FMS use was shown to be safe and effective at protecting perianal skin in initial reports, these were small trials with fewer than 50 patients. Case reports of rectal ulceration and severe bleeding have also been associated with FMS administration. Anecdotally, our institution experienced a series of serious complications related to FMS devices leading to an institutional moratorium on the routine use of the FMS system in critically ill patients. Given the relative paucity of clinical safety data in the literature related to indwelling FMS devices, the objective of this study was to examine complications related to indwelling FMS within a tertiary academic center.

Methods/Interventions: A retrospective chart review of all patients who underwent FMS placement at a single institution from December 2014 to March 2017 was conducted. Duration of FMS placement, patient demographics and relevant comorbidities were obtained.

The primary outcome was any FMS-related complication, defined as any rectal ulceration or bleeding attributable to FMS-placement and confirmed by lower endoscopy or anoscopy.

Results/Outcome(s): 629 patients with FMS placement during their hospitalization were captured including and mixture of medical (392 patients, 62.3%) and surgical (237 patients, 37.7%) patients. Median FMS duration was 4.0 days, and 161 (25.6%) patients required multiple FMS placements. Overall, 8 (1.3%) patients experienced symptomatic rectal injury related to FMS use. In three patients the bleeding resolved spontaneously, while the remaining five patients required intervention: transanal suture ligation (2), endoscopic clip placement (1), rectal packing (1), and proctectomy in one patient with a history of pelvic radiotherapy. All patients had severe underlying comorbidities including two patients on dialysis, one patient with cirrhosis, and three patients with a recent history of emergent cardiac surgery.

Conclusions/Discussion: This is the largest study to date evaluating adverse events related to FMS. While complication rates are low in the setting of FMS placement, they can lead to major morbidity. Important considerations for use likely include a history of pelvic radiotherapy and severe underlying baseline comorbidities which may predispose patients to rectal injury.

OCCURRENCE OF VENOUS THROMBOEMBOLISM IN PATIENTS WITH INFLAMMATORY BOWEL DISEASE: A META-ANALYSIS OF TRENDS IN INCIDENCE.

QS466

A. Arachchi
Melbourne, VIC, Australia

Purpose/Background: Inflammatory bowel disease is a relatively common disease in the western world, with 1 in 250 Australians affected. As a sequelae of inflammation and external triggers, patients in this category are at risk of venous thromboembolism in the form of DVTs (deep vein thrombosis), PEs (pulmonary embolism) and other forms of venous coagulopathy. However, over the last decade, new biological therapies have gained widespread adoption in the management of inflammatory bowel disease, and there have been improved practices surrounding perioperative thromboprophylaxis in this patient population. Our aim to assess any changes in incidence over the last decade.

Methods/Interventions: We performed PubMed search for articles in reference to inflammatory bowel disease and venous thromboembolism, specifically for randomised control trials and cohort studies. 141 studies were then assessed for relevance and appropriateness of the data for use.

QS465 Demographics, hospitalization details, and complications of patients with FMS placement

Patient characteristics	n = 629
Age (years)	60.0 (51.0-68.0)
Male	362 (57.6%)
Diabetes mellitus	208 (33.1%)
Peripheral vascular disease	57 (9.1%)
Anticoagulation prior to admission	131 (21.8%)
History of pelvic radiation	13 (2.1%)
Hospitalization details	
Mechanical ventilation at time of FMS insertion	398 (63.3%)
Surgery during admission	237 (37.7%)
Cardiac surgery during admission	45 (7.2%)
Clostridium difficile infection at time of FMS insertion	123 (19.6%)
Hospital team	
Medical	396 (63.0%)
Surgical	181 (28.8%)
LTACH	52 (8.3%)
FMS details and complications	
Total FMS duration (including multiple insertions)	4.0 (2.0-8.0)
Multiple FMS insertions	161 (25.6%)
FMS-related rectal injury	8 (1.3%)
Complication requiring surgery	3 (0.5%)

Categorical variables listed as N (%) and continuous variables listed as median (interquartile range)
FMS=fecal management system; LTACH=long term acute care hospital

Results/Outcome(s): 9 studies were utilised to calculate overall risk ratios in IBD patients with control groups, RR was 1.61 (95% CI 1.40 – 1.87), IBD patients when compared to the general population had a RR of 1.81 (95% CI 1.66-1.97) of developing VTE. Furthermore, there was an average of 1.23 thromboembolic events per 1000 person-years in patients with IBD compared to an average of 0.63 events per 1000 person-years in patients without. 5 additional studies found a RR of 1.92 (95% CI 1.76-2.09) with a p<0.0001 in developing VTEs, when compared to surgical patients with cancers and diverticulitis. Subgroup analysis between IBD patients found, Crohn's disease had an increased risk of VTEs with a RR of 1.82 (95% CI 1.46-2.26) p<0.0001.

Conclusions/Discussion: Incidence of VTE in IBD patients is decreasing, however, more research into contributing factors for this needs to be ascertained. More studies evaluating biological agents and their effect on incidence as well as the effect of new thromboprophylaxis guidelines on VTE incidence need to be conducted

DO COST LIMITATIONS OF EXTENDED PROPHYLAXIS AFTER SURGERY APPLY TO ULCERATIVE COLITIS PATIENTS?

QS467

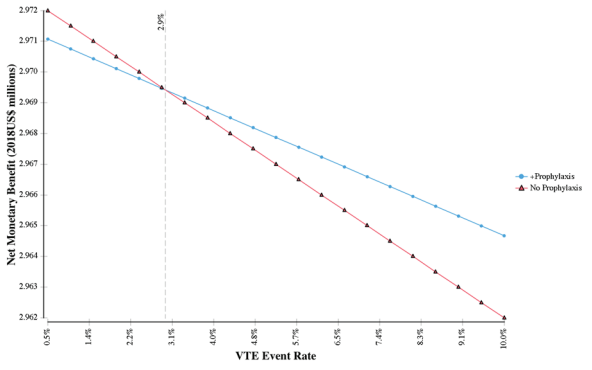
I. Leeds, J. Canner, S. DiBrito, B. Safar
Baltimore, MD

Purpose/Background: Ulcerative colitis (UC) patients develop postoperative venous thromboemboli (VTE) even more frequently than patients with colorectal cancer and Crohn's disease, who are considered high risk. Although extended outpatient prophylaxis for VTE (ePpx) has been promoted for high-risk patients, recent studies have challenged whether these populations obtain a cost-effective benefit. It is currently unknown if the even higher rate of postoperative VTE in the UC patient population justifies the use of ePpx. The purpose of this study was to assess the cost-effectiveness of ePpx in postoperative UC patients.

Methods/Interventions: We performed a societal perspective decision analysis to compare costs (2018$) and benefits (quality-adjusted life years) in postoperative UC patients with and without ePpx (low-molecular weight heparin for 4 weeks after surgery) over a lifetime time horizon. The reference risk of post-discharge VTE in UC was estimated from recent literature (1.13%). Age of onset of surgical UC, VTE event rate, effect of ePpx on VTE event rate, re-bleeding, post-thrombotic syndrome sequelae, and mortality were estimated using public data. All costs and benefits were time-discounted at 3%. Probabilistic sensitivity analysis accounted for uncertainty in probabilities, costs, and utility weights.

Results/Outcome(s): Using reference parameters, we calculated the per individual expected societal total cost of care to be $619 in the routine care group and $1,573 with ePpx. Preventing a single VTE mortality with widespread use of ePpx with surgery for UC would cost $8.14 million. The incremental cost per quality-adjusted life year (ICER) was $707,438 per life year versus a generous willingness-to-pay threshold per life year of $150,000. All conclusions were upheld under more than 75% of sensitivity analyses. The most sensitive factor was the baseline VTE rate, with rates greater than 2.9% favoring the use of ePpx (Figure).

Conclusions/Discussion: UC patients have a greatly increased risk of postoperative VTE, have a long life expectancy, and routinely undergo surgery during the most economically productive years of life. These features lead to UC patients being more likely to benefit from ePpx than most surgical patients. However, under the majority of tested conditions, ePpx for postoperative UC patients was not cost-effective. In populations of UC patients with a VTE rate higher than 2.9%, ePpx would be cost effective.



Demonstration of net monetary benefit (cost per quality-adjusted life year minus willingness to pay) across a sensitivity analysis range of venous thromboembolic event rates for two strategies (with and without extended prophylaxis). A greater net monetary benefit for a given prevalence is the preferred strategy from a cost-effectiveness approach. Dashed line represents inflection point of preferred strategy at a prevalence of 2.9%.

PREOPERATIVE PLAIN BUPIVACAINE TRANSVERSUS ABDOMINIS PLANE (TAP) BLOCK REDUCES POSTOPERATIVE INTRAVENOUS NARCOTIC USE AFTER COLORECTAL SURGERY.

QS468

R. Kalu, A. Stefanou, A. Tang
Portland, OR

Purpose/Background: Background: Enhanced recovery protocols (ERPs) aim to optimize postoperative pain control in colorectal patients in order to minimize narcotic use. This goal is frequently achieved in part by employing adjuncts to pain management such as transversus abdominis plane (TAP) block. Objective: The aim of this study was to evaluate the effect of TAP block using plain bupivacaine on postoperative narcotic use in patients undergoing colorectal surgery.

Methods/Interventions: Design: This was a retrospective cohort study that evaluated postoperative narcotic use and short-term outcomes in colorectal surgery patients who received preoperative bupivacaine TAP blocks. Setting: The study was conducted in a single tertiary care institution. Patients: Included in the study were all patients who underwent colon and rectal resections between August, 2018 and October 2019. Both minimally invasive and open approaches are included. Main outcome measures: The study measured narcotics use in the postoperative and follow-up periods, operative case length, estimated operative blood loss, length of stay, reoperation, and readmission rates.

Results/Outcome(s): Results: A total of 251 patients were included in the study; 43 (17%) patients did not receive preoperative TAP. The overall mean age was 59.4 years, 44% were males, 4% had emergent procedures. The 2 groups differed in terms of American Society of Anesthesiology score, history of hypertension (HTN), aspirin use, type of surgery, surgical approach, number of emergent procedures, and operative case length. The TAP group was less likely to require intravenous (IV) narcotics (17.7% vs. 44.2%, p<0.001), and used a significantly smaller amount of total postoperative IV narcotics. The TAP group also had a shorter length of stay (4.79 vs 6.19 days, P=0.32). There were no group differences in terms of use of oral narcotics or muscle relaxants, opioid use at follow up, request for opioid refill, reoperation, and readmission. The non-TAP group did not receive epidurals or other types of blocks and were more likely to be done emergently or urgently.

Conclusions/Discussion: Conclusion: Preoperative plain bupivacaine TAP block was associated with a reduced postoperative IV narcotic use. Length of stay was shorter for the TAP group, although this was not statistically significant. Further research should evaluate the effects of differing types of analgesic used for the TAP and also on timing of administration.

LOCAL CONSTANT PROLONGED RELEASE OF AN ANTIBIOTIC FOR THE PREVENTION OF SURGICAL SITE INFECTIONS (SSI) POST COLORECTAL RESECTION ABDOMINAL SURGERIES.

QS469

N. Emanuel[1], N. Wasserberg[1], O. Zmora[2], G. Lin[3], H. Tulchinsky[4], L. Segev[5]
[1]Petach Tikva, Israel; [2]Zrifin, Israel; [3]Rehovot, Israel; [4]Tel-Aviv, Israel; [5]Ramat-Gan, Israel

Purpose/Background: Postoperative SSI continues to be a significant problem after general surgical procedures, especially following colorectal surgery. D-PLEX$_{100}$ (D-PLEX) represents a novel locally delivered formulation of doxycycline (Doxy) with the potential to be

QS468 Study Population Characteristics And Between-group Perioperative Narcotic Usage

	Overall (n=241)	No TAP group (n=43)	TAP group (n=198)	P-value
Age in years, mean (SD)	59.4 (15.7)	63.4 (15.4)	58.5 (15.6)	0.067
Male sex, n (%)	105 (43.6)	19 (44.2)	86 (43.4)	1.000
BMI in kg/m2, mean (SD)	28.7 (7.2)	28.9 (6.3)	28.7 (7.4)	0.890
ASA ≥3, n (%)	167 (69.3)	31 (72.1)	136 (68.7)	0.798
Hypertension, n (%)	132 (54.8)	33 (76.7)	99 (50.0)	0.002
Current narcotic use, n (%)	42 (17.5)	7 (16.3)	35 (17.8)	0.991
Emergent case, n (%)	9 (3.7)	7 (16.3)	2 (1.0)	<0.001
LOS in days, mean (SD)	4.8 (4.58)	6.2 (5.93)	4.5 (4.19)	0.315
Operative case length in minutes, mean (SD)	193.1 (95.7)	147.7 (88.9)	202.9 (94.4)	<0.001
Blood thinner use, n (%)	82 (34)	21 (48.8)	61 (30.8)	0.037
Aspirin use, n (%)	55 (22.8)	16 (37.2)	39 (19.7)	0.023
PCA use, n (%)	197 (81.7)	28 (65.1)	169 (85.4)	0.004
Postoperative total IV narcotics use in mg, mean (SD)	2.09 (10.1)	5.0 (13.5)	1.5 (9.1)	<0.001
Postoperative Oral narcotics use, n (%)	192 (79.7)	31 (72.1)	161 (81.3)	0.249
Discharge opioid, n (%)	194 (80.8)	30 (69.8)	164 (83.2)	0.069
Follow-up opioid use, n (%)	16 (6.7)	2 (4.8)	14 (7.1)	0.745
Opioid refill request, n (%)	2 (0.8)	0 (0.0)	2 (1.0)	1.000

LOS: length of stay; ASA: American Society of Anesthesiologists physical status score; BMI: body mass index; PCA: patient-controlled analgesia; IV: intravenous

more effective than the current standard of care (SoC) preventive measures in the prevention of postoperative SSIs following colorectal resection abdominal surgeries. A pre-determined release rate of Doxy, a broad-spectrum antibiotic, over 30 days, has the advantage that it will generate a high local concentration within the surgical wound. **Objective:** To assess the effect of D-PLEX$_{100}$ in addition to SoC over a period of 30 days post operation in preventing SSI, defined as superficial and deep infection, in the target incision(s), compared to the SoC treated control arm, in patients undergoing colorectal resection laparotomy or laparoscopy surgeries. To assess the safety of D-PLEX.

Methods/Interventions: In a Phase 2 clinical trial we enrolled 202 patients to a prospective, multicenter, randomized, controlled, single-blind, two arm study to assess the safety and efficacy of D-PLEX in the prevention of incisional SSI. The primary efficacy endpoint was the infection rate as measured by the proportion of subjects with deep and superficial SSI events within 30 days post-surgery. Mortality within 30 days was considered as treatment failure in both arms, and included as an SSI event. The patients were followed an additional 30 days for safety analysis (overall 60 days post-surgery). PK sampling was taken from 20 subjects: 1-3 vials (5-15 g) was administered per incision length. Blood sampling was taken up to 720 hrs post-application of D-PLEX.

Results/Outcome(s): In the Intent to Treat (ITT) population (n=201), the local administration of D-PLEX resulted in a statistically significant decrease in incisional SSIs compared to SoC alone (10% vs. 23%, p<0.0136). In the Per Protocol population (n=179), which includes all ITT subjects who completed the study without any major protocol deviations, patients treated with D-PLEX + SoC achieved a statistically significant decrease in SSIs of 68%, as compared to SoC alone (8% vs. 25% p<0.0024). Within the first 30 days post-surgery there were 3 deaths in the SoC treatment arm, and 5 deaths during 60 days post-surgery, as compared to zero in the D-PLEX treatment arm. There were no D-PLEX-related serious adverse events. Doxycycline was minimally observed in the plasma for up to 1 month. Doxy Cmax was 183.04 ng/ml for D-PLEX (3 vials - 168mg Doxy), significantly lower than oral Doxy Cmax of 1613.3 ng/ml and 2600 ng/ml for 100mg and 200mg respectively.

Conclusions/Discussion: D-PLEX was found safe and demonstrated a robust and overwhelming effect for prevention of SSI in colorectal resections abdominal surgeries.

EARLY POSTOPERATIVE OPIOID USE IS ASSOCIATED WITH DELIRIUM IN OLDER COLORECTAL SURGERY PATIENTS.

QS470

A. Sarin, E. Finlayson, E. Wick, M. Varma
San Francisco, CA

Purpose/Background: Postoperative delirium can offset many of the gains of a thoughtful enhanced recovery after surgery ERAS program. Since treatment of delirium after onset has little effect on severity, duration, or likelihood of recurrence, prevention remains the mainstay of management. We studied the impact of postoperative delirium in older patients undergoing elective inpatient colorectal surgery within an ERAS program and its association with early postoperative opioid use.

Methods/Interventions: Using a prospectively maintained database, we identified patients 65 and over undergoing inpatient colorectal surgery between January 2016 and December 2018. We studied opioid use in the early postoperative period (through postoperative day 1) and analyzed its association with the risk of delirium using logistic regression analysis controlling for age, gender, prior opioid use and American Society of Anesthesiologist (ASA) rating.

Results/Outcome(s): We identified 381 patients of which 36 (9.4%) had delirium in the postoperative period. Based on postop opioid use the odds of delirium were 3.39 in the highest tertile and 1.98 in the middle tertile compared to the lowest tertile of users. In addition, controlling for opioid use, Delirium was independently associated with longer mean length of stay (22.4 days versus 7.2 p< 0.0001), delayed return of bowel and bladder function and of being discharged to a facility. (58% versus 16.8 %, Odds ratio 5.07)

Conclusions/Discussion: Early postoperative opioid use has an association with postoperative delirium. Delirium contributes to longer hospital stays and increased use of post acute care placement. Thus, protocols aimed to reduce early postoperative opioid use in the older patients should be encouraged.

QS470 Postoperative Delirium : Association with early postoperative opioid use and postoperative outcomes

OPIOD USAGE (Postop to end of POD 1)	Delirium NO	Delirium YES
Median Oral Morphine Equivalents	4.11 mEq	10.39 mEq
Mean Oral Morphine Equivalents	7.78 mEq	13.69 mEq
POSTOPERATIVE OUTCOMES	Delirium NO	Delirium YES
Postoperative Length of Stay	7 days	22 days
Mean time to Solid Food	3.1 days	6.4 days
Mean duration of Urinary catheterization	2.57 days	6.66 days

VALIDATION OF AN ENDOSCOPIC ANASTOMOTIC GRADING SCORE AS AN INTRAOPERATIVE METHOD FOR ASSESSING STAPLED RECTAL ANASTOMOSES.

QS471

C. Farzaneh, A. Uppal, M. Jafari, M. Brady, J. Carmichael, S. Mills, M. Stamos, A. Pigazzi
Orange, CA

Purpose/Background: Anastomotic leak is the dreaded postoperative complication in patients undergoing rectal anastomosis. An endoscopic grading score of the fresh peri-anastomotic mucosa has been developed and used at our institution to assess anastomotic integrity and to estimate the risk of anastomotic leak. The objective of this study is to further validate the UCI endoscopic anastomotic score and determine its impact in anastomotic failure after routine implementation at our institution.

Methods/Interventions: As a follow-up study after the prior prospective application of the UCI endoscopic grading score during 2011 to 2014, patients undergoing stapled rectal anastomoses by six colorectal surgeons at a single academic institution from 2015 to 2018 were retrospectively reviewed. Patients were stratified into three tiers based on flexible endoscopic score (Grade 1: circumferentially normal mucosa, Grade 2: ischemia/congestion < 30% of circumference, Grade 3: ischemia/congestion > 30% of circumference or on both sides of the staple line). Demographics and clinical outcomes in these patients were analyzed. Patients from the index study (2011 – 2014) were also included in statistical analysis.

Results/Outcome(s): A total of 318 patients underwent a stapled colorectal anastomosis with endoscopic anastomotic evaluation at our institution from 2011 to 2018. The levels of the colorectal anastomosis were measured to be < 5 cm (23.3%), 5-10 cm (29.6%), or > 10 cm (47.2%). Based on endoscopic mucosal evaluation, Grade 1 anastomosis was observed in 299 patients (94%), Grade 2 anastomosis in 14 patients (4.4%), and Grade 3 anastomosis in 5 patients (1.6%). All Grade 3 anastomosis were immediately revised intraoperatively with re-classification as a Grade 1 anastomosis. Anastomotic leak rate for the entire patient series from 2011 to 2018 was 6.9% (22 / 318). A Grade 2 anastomosis was associated with higher anastomotic leak rate compared to a Grade 1 anastomosis (35.7% vs. 5.7%, $p < 0.05$). None of the five Grade 3 revisions resulted in an anastomotic leak. Anastomotic leak rate in the follow-up study years 2015 – 2018 was significantly lower compared to the anastomotic leak rate in the index study years 2011 – 2014 (4.2% vs. 12.2%, $p < 0.05$).

Conclusions/Discussion: This study further validates the anastomotic grading score and suggests that its systematic implementation can result in a significant reduction in anastomotic leaks. Further studies and randomized trials are warranted to test this grading system at a national level.

	Grade I N = 304*	Grade II N = 14	p value
Operative Approach			
Laparoscopic/robotic	268 (88.2%)	12 (85.7%)	0.78
Open	36 (11.8%)	2 (14.3%)	0.78
Drain Use	152 (50.0%)	11 (78.6%)	0.04
Diverting Ileostomy	106 (34.9%)	9 (64.3%)	0.03
Anastomotic Level			
< 5 cm	68 (22.4%)	6 (42.9%)	0.07
5 – 10 cm	92 (30.2%)	2 (14.2%)	0.20
> 10 cm	144 (47.4%)	6 (42.9%)	0.74

* Grade 3 anastomosis (n=5) was converted to Grade 1 anastomosis. 60% of Grade 3 anastomosis were < 5 cm.

PREVALENCE AND RISK FACTORS FOR PROLONGED OPIOID USE IN OPIATE-NAIVE COLORECTAL SURGERY PATIENTS: ARE SURGEONS TO BLAME?

QS472

P. Daher, M. Chandra, S. Stringfield, A. Khan, A. Waddimba, J. Downs, K. Wells, R. Stadler
Dallas, TX

Purpose/Background: Opiates remain an essential component of postoperative pain control. Postoperative opiate exposure is well described as an avenue for prolonged opiate use and opiate dependence in some patients. There exists a need for risk stratification of surgical patients to better identify at risk patients and inform opioid prescribing postoperatively. We sought to identify the demographic factors and surgery specific outcomes that predispose opioid naïve colorectal surgery patients to prolonged opiate use, and in doing so, better understand one such driver of the opioid epidemic.

Methods/Interventions: This is a retrospective review of a prospectively collected demographic and outcomes database of patients undergoing colorectal surgery from January 1st 2018 to December 31st 2018 within a single colorectal surgery group. Opioid prescription data obtained from the Texas Prescription Monitoring Program for these patients was additionally collected. The primary outcome was opioid use at 4 to 6 months post operatively. Univariate analysis was performed to identify associations between prolonged opioid use and descriptive variables such as age and gender, surgical approach (open, laparoscopic, robotic), emergent vs elective surgery, preoperative diagnosis, ASA score and postoperative outcomes (anastomotic leaks, surgical site infections, perforation, sepsis, returns to the emergency room or required reoperations).

Results/Outcome(s): Of the 1,063 patients in our study, 63% (674/1,063) were found to be taking opioids 0-3 months post operatively, with a reduction to 20% (213/1,063) at 4-6 months post-surgery. 63% (667/1,063) of our patient population was opiate naïve within 6 months prior to surgical intervention. Of those patients, 82 (12%) were still taking opiates 4-6 months after surgery. Gender, age, primary diagnosis, surgical approach and post-operative complications were not found to have a significant

association with development of post-operative chronic opiate use on univariate analysis. Patients who were still using opioids at 4-6 months after surgery had higher rates of emergency surgery (30.7% vs 19.1%; p=0.0131) and significantly longer mean hospital length of stay 7.6 (95CI 4.7-10.6) versus 5.2 (95CI 4.5-5.9), p=0.0074.

Conclusions/Discussion: Up to 1 in 5 patients undergoing colorectal surgery continue to use narcotic pain medication at 4-6 months postoperatively. Up to 12% of opioid naïve patients have prolonged opioid use and may be at risk for opioid dependence. Emergent surgery and post-operative length of hospital stay are risk factors for prolonged opioid dependence. Surgeons and other prescribers in the postoperative setting need to be aware of these risks and discuss opioid cessation strategies with their patients to avoid long term dependence.

POSTOPERATIVE OPIOID USE CORRELATES WITH LEVEL OF POSTOPERATIVE PATIENT EDUCATION ON MULTIMODAL PAIN REGIMENS.

QS473

D. Yoon, K. Mirza, C. Wickham, E. Noren, S. Lee, K. Cologne, G. Ault
Los Angeles, CA

Purpose/Background: Opioids are commonly prescribed for postoperative pain management. However, liberal and wide use has contributed to the dramatic rise of the opioid epidemic. Though the efficacy of provider education for decreasing opioid prescription has been reported, the efficacy of patient education and empowerment for decreased opioid consumption has not been widely studied. Our goal was to evaluate the impact of patient targeted standardized educational interventions on postoperative opioid and non-opioid pain medication use following anorectal procedures.

Methods/Interventions: Patients undergoing elective outpatient anorectal procedures at a tertiary academic hospital were enrolled from August 2018 to November 2019. Prior to the implementation of standardized patient education, patients were divided into those who received no specific medication instructions (A) and those who received unstructured encouragement (B) regarding multimodal pain medication regimen. Starting July 2019, a standardized postoperative patient education on appropriate opioid and non-opioid use was adopted, and the third group (C) consisted of patients after this time. A telephone survey was conducted one week postoperatively for all groups. Demographic, procedure and postoperative data was collected. A P<0.05 was considered statistically significant.

Results/Outcome(s): A total of 236 patients were enrolled, with a telephone survey response rate of 72% (n=170). 82, 30, and 58 patients were identified in groups A, B, and C, respectively. The three groups had no significant differences in demographics and types of surgical procedures. With increasing levels and standardization of patient education, there were less patients who only took opioid medications (A 74% vs B 50% vs C 3%, P<0.001), more patients who used at least one non-opioid pain medications (A 24% vs B 50% vs C 97%, P<0.001) and at least two non-opioid medications (A 7% vs B 17% vs C 83%, P<0.001). There was increased compliance with the use of acetaminophen (A 35% vs B 40% vs C 88%, P<0.001) and gabapentin (A 5% vs B 0% vs C 75%, P<0.001), but not with ibuprofen (A 90% vs B 80% vs C 80%, P=0.541). The total milligram morphine equivalent (MME) used decreased significantly across the three groups (A 58.6 vs B 53.0 vs C 21.2, P<0.001) with increasing levels of education and non-opioid medication use.

Conclusions/Discussion: Standardized patient education emphasizing the appropriate use of opioids and efficacy of non-opioid medications results in increased compliance with non-opioid pain medications and decreased postoperative opioid requirement.

NATIONAL CONSENSUS OF AN OBJECTIVE ASSESSMENT TOOL FOR TRANSANAL APPROACH TO TOTAL MESORECTAL EXCISION.

QS474

V. Palter, M. Louridas, S. de montbrun
Toronto, ON, Canada

Purpose/Background: Transanal approach to total mesorectal excision(TATME) for rectal resection has gained popularity internationally. However, it has become increasingly evident that this technique has a steep learning curve and is associated with unique challenges resulting in technique specific complications. Despite this, no assessment tool exists for TATME. Therefore, the purpose of this study was to create an assessment tool to objectively measure proficiency with TATME.

Methods/Interventions: Delphi consensus methodology was used to determine the key operative steps for TATME. Sixteen expert surgeons practicing TATME for >3 years rated the operative steps on a 5-point likert scale. A Cronbach $\alpha \geq 0.7$ with 80% of responses in agreement (4-agree and 5-strongly agree) determined the threshold for consensus.

Results/Outcome(s): All 16 experts were from the United State or Canada. The majority of experts (69%) were colorectal fellowship trained surgeons and the remaining were surgical oncologists, minimally invasive surgeons or general surgeons (31%). Five key operative steps reached consensus: 1) purse-string ($\alpha = 0.74$), 2) rectotomy $\alpha \geq 0.95$, 3) TME dissection $\alpha = 0.82$, 4) anastomosis and 5) specimen extraction ($\alpha = 0.93$). The overall consensus for the tool was excellent, $\alpha = 0.86$.

Conclusions/Discussion: Five steps have reached expert consensus for inclusion in an objective assessment tool to measure proficiency for TATME. These steps have been compiled into a global rating scale that can be used to objectively asses TATME performance, either in real time or by video review.

ELDERLY AND YOUNG PATIENTS WITH CROHN'S DISEASE HAVE SIMILAR POSTOPERATIVE OUTCOMES.

QS480

T. Hassab, D. McKinney, C. D'Adamo, Y. Hung, S. Svoboda, J. Wolf
Baltimore, MD

Purpose/Background: Early surgical intervention, as opposed to increased biologic therapy, for elderly patients with Crohn's disease (CD) is controversial due to concerns over higher peri-operative risk in the elderly. In this study, we aimed to evaluate the 30 day outcomes of site-specific Crohn's disease in elderly patients, and to compare these outcomes to those of younger patients.

Methods/Interventions: Data were obtained from the American College of Surgeons National Surgical Quality Initiative Program (ACS-NSQIP) from the years 2012-2015. Patients >18 years old who underwent non-emergent resection were included using CPT/ICD9/10 codes. Patients were grouped according to anatomic site of resection (Small bowel, Ileocolic, colon, rectal resection). Patients >65 years old were considered "elderly". Primary outcomes are 30-day Length of stay (LOS) and overall morbidity (categorical variable constructed as a composite of multiple post operative complicatioons). These were compared between young and elderly patients for each anatomic site of resection using unpaired t-tests and chi-square tests. Multivariate linear and logistic regression models were constructed to estimate associations accounting for potential confounders.

Results/Outcome(s): 3852 patients were identified who underwent bowel resection for CD. The younger cohort included 3477 patients, with a mean age of 38.2 (SD 12.6), while the elderly cohort included 375 patients, with a mean age of 70.1 (SD 5). Ileocolic resection is significantly more common in the young cohort compared to the elderly population (46% versus 36%, p<0.05). On adjusted analysis, lengths of hospital stay and rates of morbidity were similar between the two groups (All P>0.05). However, elderly rectal resection group had 2.4 days longer LOS despite similar morbidity rates (Table 1). Increased length of stay for all ages was associated with dependent functional status (12 days longer, p=0.04), and race (African American, Coeff=2.1, P value=<0.001).

Conclusions/Discussion: Elderly patients with CD have similar outcomes in comparison to younger patients. In cases of failed medical therapy, early surgical intervention should not be excluded based solely on a patient's age.

Table 1: Adjusted analysis for elderly patient compared to young patients

Outcome	Coefficient	95 % CI		P value
Small bowel (Elderly n=25, young n=199)				
LOS	-2.32	-7.53	2.89	>0.05
Morbidity	3.66	0.93	14.33	>0.05
Ileocolic (Elderly n=136, young n=1575)				
LOS	0.17	-1.21	1.56	>0.05
Morbidity	1.25	0.73	2.20	>0.05
Colon (Elderly n=137, young n=1125)				
LOS	0.92	-0.64	2.48	>0.05
Morbidity	1.45	0.90	2.33	>0.05
Rectal (Elderly n=77, young n=578)				
LOS	*2.36*	*0.46*	*4.26*	***0.02***
Morbidity	1.28	0.67	2.44	>0.05

IMPACT OF MEDICAID EXPANSION ON COLORECTAL RESECTION FOR PATIENTS WITH ULCERATIVE COLITIS (UC).

QS481

M. Lin[1], J. Hsieh[2], S. Chao[3]
[1]*Buffalo, NY;* [2]*Ames, IA;* [3]*Flushing, NY*

Purpose/Background: Recent healthcare reform with adoption of Medicaid expansion by many states in 2014 attempted to increase access to health services. To our knowledge, no studies have evaluated the impact of this expansion for patient outcomes as it pertains to UC. We sought to determine how expanded health insurance coverage impacts surgical intervention for UC.

Methods/Interventions: We used the 2012-2016 National Inpatient Sample (NIS) database for this study, which represents data from 2 years prior to and 3 years after Medicaid expansion. We identified patients with UC with ICD-9-CM (2008-2015Q3) and ICD-10-CM (2015Q4-2016) diagnosis codes. Inclusion criteria were patients between ages 18-65, who had Medicaid or private insurance as the primary form of payment, and had received a resection of the colon or rectum during the same admission. Univariate analysis was performed to compare the Medicaid patients to the private insurance patients on 12 factors: age, sex, elective admission, Medicaid expansion, Medicaid adoption rate, race, income quartile, and 5 other medical factors. A total of 5 patient outcomes were measure with both univariate and multivariate analysis (logistic and linear regression).

Results/Outcome(s): From the NIS database, we identified 3,125 patients that met the selection criteria. We observed an increasing trend in the number of surgeries performed on Medicaid patients for the divisions that had a high adoption of Medicaid expansion (Figure 1). All the patient factors except for the 5 medical factors examined were significantly different between the two insurance types, and thus were included in the multivariate analysis regression models. Logistic regression showed that the private

insurance group had lower rates for severe sepsis (aOR = 0.56, p-value = 0.034) and septic shock (aOR = 0.43, p-value = 0.002) compared to the Medicaid group. Medicaid expansion also had a significant impact for the rate of septic shock (aOR = 1.65, p = 0.043). Length of stay decreased with private insurance (-3 days, p < 0.001) and Medicaid expansion (-2 day, p < 0.001). Despite a decrease in the length of stay, there was increased cost associated with medium and high Medicaid expansion adoption ($4,860 and $6,243, p < 0.001, respectively).

Conclusions/Discussion: Our study showed that Medicaid expansion had impacts on the number of surgeries performed and the outcomes from the surgical intervention for patients with UC. Hospitals in divisions that had low adoption rate of the Medicaid expansion did not follow the same trends as hospitals in divisions that had medium and high adoption rates.

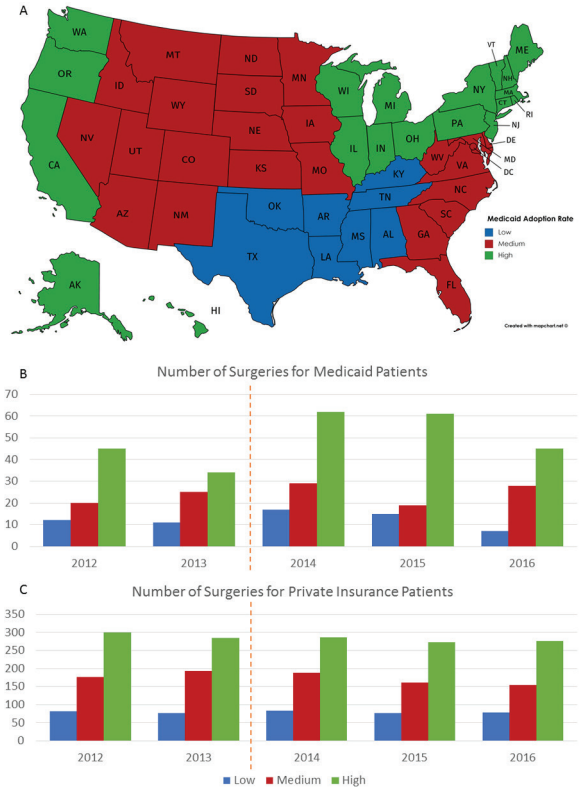


Figure 1. Number of surgeries performed during 2012-2016 for patients with ulcerative colitis. A) Adoption rates for divisions of the United States: low adoption (0-33% of states in division, blue), medium adoption (34-66%, red), and high adoption (67-100%, green). B) Patients with Medicaid as the primary form of payment. C) Patients with private insurance as the primary form of payment. The red dotted line indicates the adoption of Medicaid expansion. An increasing trend of cases was observed for the high adoption divisions for the Medicaid patients after the expansion.

DOSE-INTENSIFIED INFLIXIMAB RESCUE THERAPY FOR ACUTE ULCERATIVE COLITIS: DOES IT DECREASE THE NEED FOR COLECTOMY?

QS482

D. Wong, R. Kosaraju, N. Serifis, A. Fabrizio, T. Cataldo, J. Feuerstein, E. Messaris
Boston, MA

Purpose/Background: Salvage therapy for severe ulcerative colitis has evolved in recent years. Dose-intensified infliximab regimens with either higher dosages or shorter intervals are becoming more common. However, there is limited evidence documenting the effectiveness of dose-intensified salvage therapy as well as the perioperative course of patients requiring colectomy following infliximab salvage.

Methods/Interventions: A retrospective review of all hospitalized ulcerative colitis patients receiving inpatient infliximab therapy between 2010-2018 at Beth Israel Deaconess Medical Center was conducted. Infliximab induction with doses of 5mg/kg at 0, 2, and 6 weeks was considered "standard" dosing whereas patients receiving higher dosages or shorter intervals were considered to have received "dose-intensified" salvage therapy. Post-operative complications were classified according to the Clavien-Dindo classification.

Results/Outcome(s): 115 patients hospitalized for acute ulcerative colitis flare underwent inpatient salvage therapy with infliximab. Dose-intensified infliximab regimens were used in 88 patients (77%). Unadjusted colectomy rates for patients receiving standard vs dose-intensified regimens at 3 months were 20% vs 22%, respectively with an OR (95% CI) of 0.88 (.33-2.7), and at 6 months of 24% vs 28% with an OR (95% CI) of 0.8 (2.9-2.2). (Figure 1) In total, 40 (35%) patients required colectomy after salvage infliximab therapy with a median follow-up time of 1.2 [0.3-3.4] years. The median [IQR] time to colectomy was 40 [11-200] days. Colectomies performed during the same admission when salvage therapy was initiated constituted 28% of all colectomies. Minor post-operative complications (Clavien-Dindo Grade I-II) occurred in 16 (40%) patients whereas 6 (15%) patients had a major (Grade III-V) complication. Complication rates were not significantly different between patients who underwent standard vs dose-intensified salvage therapy. Median [IQR] length of stay after surgery was 11 [7-22] days. At the time of surgery, 29 (73%) patients remained on steroids while 3 others had been transitioned to other biologic medications.

Conclusions/Discussion: Dose-intensified salvage therapy for ulcerative colitis is utilized frequently; however, the rates of colectomy do not appear to have significantly changed. This single-center experience represents one of, if not the largest, cohort of dose-intensified infliximab

salvage therapy in ulcerative colitis to date. Further study is required to determine which patients may benefit from early colectomy.

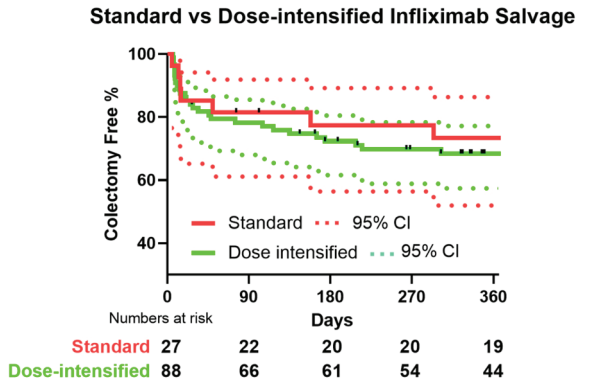


Figure 1. Kaplan—Meier curve showing post salvage therapy colectomy rates for patients receiving standard vs dose-intensified regimens do not differ.

EXPLORING OPTIMAL TREATMENT FOR CROHN'S RELATED BOWEL OBSTRUCTIONS: RESCUE STEROIDS VS UPFRONT SURGICAL INTERVENTION.

QS483

D. Koller, K. Allen, S. Maroney, A. Harzman, A. Traugott, E. Huang, M. Arnold, A. Gasior, L. Cunningham, A. Afzali, S. Husain
Columbus, OH

Purpose/Background: The natural history and optimal management of Crohn's related bowel obstruction (CrBO) remains unknown. There is considerable debate between upfront surgery or a trial of high-dose steroids. The proponents of upfront surgery feel that CrBO is an absolute indication for surgery due to a very high likelihood of recurrence. On the other hand, the advocates of medical therapy propose placing patients on a trial of steroids in an attempt to preserve bowel, avoid an urgent operation, convert an urgent situation into an elective operation or possibly avoid an operation altogether. The intent of this study was to compare patient outcomes between the two approaches to determine the best course of action in CrBO.

Methods/Interventions: A retrospective analysis of CrBO over an 8-year period was performed. Patient demographics, surgical interventions, readmissions, outcomes, inflammatory biomarkers and steroid use were recorded. Fisher's exact test and unpaired t-test were used where appropriate.

Results/Outcome(s): A total of 214 patients with 294 inpatient admissions for CrBO were identified. Emergent operations were excluded. The average hospital stay for the entire cohort was 13.4 days and the overall admission rate for bowel obstruction was 1.37 per patient over the study period. Thirty-four patients underwent upfront surgical interventions (42 operations) whereas 180 patients were placed on a trial of medical management. Age and gender distribution between the two groups were similar. Medical management group had a higher prevalence of HTN, CAD and DM. The average hospital days were 11.7 for medical treatment group and 22 for the upfront surgery group. Average follow-up was 1250 days for the medical management group and 1408 days for the upfront surgery group. Sixty four patients experienced 88 readmissions for bowel obstruction in the medical management group whereas 19 patients in the upfront surgery arm were readmitted a total of 35 times. Of the 180 patients in the medical management arm, 19(11%) failed treatment and required an unplanned surgery (23 operations) whereas 161(89%) patients were successfully discharged. Out of these 161 patients, 25 returned for 26 elective operations on a later date. The medical management arm had a significantly lower ostomy rate compared to the upfront surgery arm (3.33 vs 22.52%, p=0.0003).

Conclusions/Discussion: Our research indicates that CrBO treated with a trial of medical management has favorable outcomes compared to upfront surgical management. While a proportion of patients failed medical management or required an elective operation on a later day, majority (75%) of patients were able to avoid any surgical intervention. Our data suggests that CrBO should not be considered an absolute indication for surgical intervention; these patients should be managed with a trial of medical management and surgery should be reserved to cases that fail medical therapy.

Variable	Medical Rx Group	Upfront Surgery Group	P value
Number	180	34	N/A
Age	49.23	46.62	0.3684
Female: Male	103:77	21:13	0.7065
Diabetes	13.33%	5.88%	0.3878
HTN	26.11%	8.82%	0.0280
CAD	3.33%	0%	0.5926
COPD	11.66%	11.76%	1.0
Hospital Days	11.7 days	22 days	0.0001
Readmissions	64	19	0.0342
Stoma Rate	3.33%	23.52%	0.0003
Follow-up	1250 days	1408 days	0.3382

THE ROLE OF LAPAROSCOPIC SURGERY IN REPEAT ILEOCOLIC RESECTION FOR CROHN'S DISEASE.

QS484

V. Baratta[1], D. Peyser[2], D. Bhasin[2], S. Khaitov[2], A. Greenstein[2], P. Sylla[2]
[1]*New Haven, CT;* [2]*New York, NY*

Purpose/Background: Surgery for recurrent ileal Crohn's disease (CD) is associated with a higher risk of postoperative complications. While laparoscopic surgery is the preferred approach for primary uncomplicated ileocolic resection (ICR), the role and outcomes of a laparoscopic approach for repeat ICR are unclear.

Methods/Interventions: All patients undergoing ICR for ileal CD between 2013-2019 at a high volume tertiary center were retrospectively identified from an IRB-approved, prospectively maintained IBD database.

Patient demographics, disease characteristics, intraoperative procedures and perioperative outcomes were analysed and compared between primary (1R), secondary (2R) and tertiary or more (> 2R) ICR groups. Continuous normal and non-normal data were analyzed using student's t-tests/ANOVA or Mann-Whitney/Kruskal-Wallis for pairwise or multiple comparisons. Categorical data were compared with the Chi-square test. Risk factors for postoperative complications were assessed by binary logistic regression.

Results/Outcome(s): Between 2013-2019, 474 consecutive patients underwent ICR for CD-related complications including 370 primary (1R, 78.1%), 64 secondary (2R, 13.5%), and 40 tertiary or more resections (>2R, 8.4%). A laparoscopic approach was most commonly used among the 1R group (84.6%), followed by 2R (76.6%), and >2R group (65.0%, P 0.007). There were no significant differences in conversion rates (8.9% vs 7.8% vs 7.5% respectively) or rates of fecal diversion (4.3% vs 6.3% vs 2.5%) between the 1R, 2R, >2R groups. Operative time was significantly longer in the 2R and >2R vs 1R group, (120 min vs 140 vs 167 min, P < 0.001) but length of stay and 30-day readmission rates were comparable. Although the 30-day morbidity rate was significantly higher in the 2R vs 1R or > 2R group (12.7% vs 26.6% vs 15.0%, P < 0.05), the rate of major complications (Clavien-Dindo III/IV) did not differ significantly between the groups (3.5% vs 6.3% vs 2.5%). By binary logistic regression analysis, age (OR = 1.02, P < 0.05) and 2R resections were associated with increased postoperative complications (OR = 2.21, P < 0.05) while a laparoscopic approach reduced the risk of complications (OR = 0.38, P 0.05).

Conclusions/Discussion: In this contemporary series of primary and repeat ICR for ileal CD, when performed at a high volume tertiary center, a laparoscopic approach was found to be feasible and safe for repeat ileocolic resections, and to reduce the risk of postoperative complications.

Table 1. Patient, disease, surgical characteristics of the included patients

	1R N=370	2R N=64	>2R N=40	P ¶	1R vs. 2R	1R vs. >2R	2R vs. >2R
Patient and Disease Characteristics							
Male	265 (71.6%)	43 (67.2%)	23 (57.5%)	0.160	0.567	0.283	0.567
Age at surgery (years)	36.0 (15.6)	40.2 (13.7)	47.7 (15.0)	**0.001**	0.113	**<0.001**	**0.040**
Body mass index (kg/m²)	23.2 (5.03)	23.4 (5.37)	22.1 (4.20)	0.401	0.937	0.419	0.414
Smoking status (active or former)	29 (7.83%)	16 (25%)	12 (30%)	**0.001**	**0.001**	**<0.001**	0.567
ASA classification				0.130	0.888	0.198	0.341
1/2	261 (70.5%)	44 (68.8%)	22 (55.0%)				
3/4	109 (29.5%)	20 (31.2%)	18 (45.0%)				
Emergency	9 (2.43%)	3 (4.69%)	0 (0.00%)	0.418	0.596	1.000	0.596
History of abdominal surgery (ICR excluded)*	55 (14.9%)	19 (29.7%)	9 (22.5%)	**0.009**	**0.016**	0.427	0.564
Perioperative Steroids	45 (12.2%)	12 (18.8%)	5 (12.5%)	0.351	0.645	1.000	0.857
Perioperative Biologics	50 (13.5%)	11 (17.2%)	7 (17.5%)	0.621	0.977	0.977	1.000
Length of Stay (days)	6.47 (4.21)	6.98 (3.97)	7.42 (3.89)	0.291	0.631	0.352	0.858
30 Day Readmissions	13 (3.51%)	1 (1.56%)	2 (5.00%)	0.586	0.704	0.704	0.704
Postoperative Outcomes							
Clavien-Dindo score				**0.049**	**0.023**	0.683	0.683
1	18 (4.86%)	10 (15.6%)	3 (7.50%)				
2	16 (4.32%)	3 (4.69%)	2 (5.00%)				
3	8 (2.16%)	1 (1.56%)	0 (0.00%)				
4	5 (1.35%)	3 (4.69%)	1 (2.50%)				

ASA, American Society of Anesthesiologists
¶ Overall P value using Kruskal-Wallis, one-way ANOVA, or Chi-square test. Pairwise comparisons using Mann-Whitney or Student's t-test.
*appendectomy, cholecystectomy, ventral hernia repair, hysterectomy

EQUIVALENT OUTCOMES OF STOMA-LESS ILEAL POUCH ANAL ANASTOMOSIS (IPAA) AFTER STAGED TOTAL ABDOMINAL COLECTOMY (MODIFIED II) VERSUS I-STAGE IPAA.

QS485

E. Olecki, A. Kronfli, W. Koltun
Hershey, PA

Purpose/Background: Ileal-Pouch-Anal Anastomosis (IPAA) is typically created with a protective ileostomy. Single stage procedures (I-stage) are reserved for healthy Ulcerative Colitis (UC) patients who are not on high dose steroids. However, after total abdominal colectomy (TAC), relatively sicker patients can become healthy enough to tolerate IPAA creation without diverting loop ileostomy, termed a modified II-stage procedure (MII). To our knowledge, there is no existing literature comparing MII and I-stage procedures. The goal of this study was to compare operative outcomes of IPAAs done without a protective stoma after TAC (MII) versus I-stage procedures.

Methods/Interventions: A retrospective review at a tertiary center was performed reviewing all IPAAs from 1990 to 2018 done for UC. Patients who underwent a I-stage (n=33) or MII (n=50) were included. Descriptive statistics were used to characterize preoperative characteristics. Univariate analysis was performed using χ^2 and Wilcoxon Rank Sum to determine statistical difference in categorical and continuous outcomes comparing MII and I-stage approaches.

Results/Outcome(s): At the time of TAC a majority of the MII were acutely ill with 92% on steroids, 56% on >20mg per day of oral prednisone, 32.6% were underweight (BMI<18.5), and 44% of surgeries were performed for toxic colitis. The average time from TAC to IPAA was 11 months (+/- 3 months). There was no significant difference in I-stage and MII patients in terms of age, gender, smoking, and nutritional status at the time of IPAA. There was also no significant difference in operative outcomes at the time of IPAA including length of stay, transfusion requirements, unplanned return to the OR, anastomotic leak, superficial site infection, deep site infection, deep vein thrombosis, ileus, and small bowel obstruction. At a mean follow up of 8 years, there was no significant difference in pouch failures between MII and I-stage. See attached table.

Conclusions/Discussion: This study shows that relatively ill UC patients who first undergo TAC for severe UC are equivalent in preoperative characteristics at time of IPAA to those patients selected to undergo a I-stage procedure. Patients who undergo IPAA after TAC are good candidates for stoma sparing reconstruction and can expect equivalent perioperative results to those undergoing a I-stage procedure.

Characteristics at time of IPAA I-stage vs MII.	1 Stage (N=33)	Mod 2 (N=50)	p value
Average LOS at IPAA (days)	9.1	9.1	0.433
Indications for Surgery			
Failure Medical Management	18 (54.5%)	26 (52%)	0.029*
Toxic Colitis	0 (0%)	22 (44%)	
Dysplasia/Cancer	15 (45.5%)	2 (4%)	
Perioperative Transfusion Requirement			0.720
No	31 (93.9%)	46 (92%)	
Yes	2 (6.1%)	4 (8%)	
Unplanned Return to OR			0.765
No Return to OR	32 (97%)	49 (98%)	
Unplanned Return to OR	1 (3%)	1 (2%)	
Anastomotic Leak			0.765
No leak	32 (97%)	49 (98%)	
Leak	1 (3%)	1 (2%)	
Superficial Surgical Site Infection			0.150
No	32 (97%)	44 (88%)	
Yes	1 (3%)	6 (12%)	
Deep Surgical Site Infection			0.096
No	33 (100%)	46 (92%)	
Yes	0 (0%)	4 (8%)	
Post-operative Ileus			0.480
No	28 (84.8%)	45 (90%)	
Yes	5 (15.2%)	5 (10%)	
Small Bowel Obstruction (within 30 days)			0.163
No	27 (81.8%)	46 (92%)	
Yes	6 (18.2%)	4 (8%)	
Pouch Failure (At 8 Years)			
No	32 (97%)	47 (95.9%)	0.804
Yes	1 (3%)	2 (4.1%)	

Table comparing outcomes of I-stage procedure and MII procedure. * indicates statistical significance at the alpha=0.05 level.

A COMPARISON OF POSTOPERATIVE OUTCOMES IN PEDIATRIC PATIENTS WITH ULCERATIVE COLITIS UNDERGOING A ONE-STAGE VERSUS TWO STAGE ILEAL POUCH ANAL ANASTOMOSIS.

QS486

M. Westfal[1], N. Perez[1], A. Letica-Kriegel[1], A. Ordoobadi[2], Y. Baez[2], D. Chang[1], C. Kelleher[1]
[1]*Charlestown, MA;* [2]*Boston, MA*

Purpose/Background: The optimal surgical approach for ileal pouch anal anastomosis (IPAA) in patients with ulcerative colitis (UC) remains controversial. A recent systematic review reported on several case series but revealed little analysis of peri-operative covariates. Therefore, we compared post-operative outcomes in patients undergoing one versus two stage IPAA, accounting for patient demographics, surgical characteristics, and perioperative medication use.

Methods/Interventions: This 26 year (1994-2019) multi-institutional retrospective cohort study included patients £ 21 years who underwent IPAA for UC. Comparisons between one versus two-stage patients were made for unplanned 30 and 90-day reoperations and readmissions using a chi-square test. Sub-group analyses accounted for surgical technique (laparoscopic vs. laparoscopic-assisted vs. open), anastomotic technique (hand-sewn vs. stapled), urgency of surgery (elective vs. urgent/emergent), and pre-operative and post-operative steroid, biologic, immunologic, aminosalicylate and antibiotic use. Adjusted analysis was performed using a logistic regression accounting for patient demographics, number of surgical

QS486 Adjusted Analysis of Surgical Outcomes

	30-Day Readmission		90-Day Readmission		30-Day Reoperation		90-Day Reoperation	
	OR	p-value	OR	p-value	OR	p-value	OR	p-value
Stage:								
One-Stage	Ref	-	Ref	-	Ref	-	Ref	-
Two-Stage	1.34	>0.1	6.20	<0.001	0.65	>0.1	1.71	>0.1
Age at Surgery	1,07	0.041	1.05	>0.1	1.12	0.037	1.20	<0.001
Female	0.83	>0.1	0.64	>0.1	0.69	>0.1	2.96	0.068
Elective	0.67	>0.1	1.17	>0.1	0.55	0.076	1.23	>0.1
Pediatric Surgeon	0.67	>0.1	1.23	>0.1	1.24	>0.1	36.20	0.002
Pre-operative Steroids	1.05	>0.1	1.12	>0.1	5.11	>0.1	12.07	0.013
Post-operative Steroids	1.95	>0.1	1.79	>0.1	0.68	>0.1	0.26	0.073
Pre-operative Biologics	0.79	>0.1	0.69	>0.1	1.83	>0.1	1.42	>0.1
Pre-operative Immunosuppressants	0.39	0.049	0.62	0.052	0.37	>0.1	0.33	0.001
Pre-operative Aminosalicylates	0.65	>0.1	2.20	>0.1	0.84	>0.1	0.67	>0.1
Pre-operative Antibiotics	0.71	>0.1	2.31	>0.1	0.86	>0.1	0.79	>0.1
Post-operative Antibiotics	0.80	>0.1	1.99	>0.1	3.51	0.007	1.85	>0.1

stages, urgency of surgery, surgeon-type and perioperative medication use.

Results/Outcome(s): Of 132 patients, 52.3% underwent one-stage IPAA while 47.7% underwent a two-stage procedure. Pediatric surgeons performed nearly all of the one-stage procedures (98.6%) compared to two-stage procedures (55.6%). Patients undergoing one-stage procedures more often underwent an open procedure (87.0%) compared to the first stage of a two-stage IPAA (68.3%). Nearly all pouch anastomoses for one-stage patients were hand-sewn (94.2%) while two-stage patients had a hand-sewn anastomosis at a lower rate (46.5%). Comparison of surgical outcomes revealed higher 90-day readmission rates for two-stage patients compared to one-stage patients (28.6% vs. 8.7% respectively, p=0.003). Comparison of 30-day and 90-day reoperation rates did not show any significant differences. On adjusted analysis patients who underwent two-stage IPAA remained at significantly higher risk for 90-day readmission compared to one-stage patients (OR 6.2, p= <0.001). On adjusted analysis, there were no significant differences between groups for 30-day readmissions or 30-day and 90-day reoperation rates.

Conclusions/Discussion: When considering post-operative outcomes following IPAA for ulcerative colitis in pediatric patients, the morbidity associated with two-stage procedures is significantly higher than one-stage procedures even after adjustment for several peri-operative covariates.

ILEAL POUCH-ANAL ANASTOMOSIS (IPAA) WITH OR WITHOUT MUCOSECTOMY FOR PEDIATRIC ULCERATIVE COLITIS: EARLY AND LONG-TERM OUTCOMES.

QS487

D. Peyser, V. Bangla, A. D'Andrea, J. Atahar, D. Bhasin, G. Alexander, K. Sergey, P. Sylla
New York, NY

Purpose/Background: Despite advances in medical management, up to 20% of pediatric patients with ulcerative colitis (UC) will require surgery within 5 years of diagnosis. Restorative proctocolectomy with ileal-pouch anal anastomosis (RPC + IPAA) is the preferred procedure for patients with UC. Controversy exists over the role of mucosectomy with few contemporary studies reporting on short and long-term outcomes.

Methods/Interventions: An IRB-approved retrospective review was performed to identify pediatric patients (age ≤ 18) who underwent IPAA between 2008 and 2018 at a tertiary referral hospital. Patients undergoing IPAA with mucosectomy and handsewn anastomosis vs IPAA and stapled anastomosis were compared. Outcomes included 30-day perioperative and long-term outcomes. Univariate analysis was performed using Mann-Whitney U test or Student t-test for continuous variables and χ^2 or Fisher exact test for categorical variables.

Results/Outcome(s): Among 55 pediatric IPAA patients, 24 (43.6%) underwent mucosectomy. There were no significant differences between the groups with respect to preoperative BMI, duration of disease, medications or laboratory values except median age at colectomy (15 vs 16 years, p = 0.035). The groups did not differ significantly in number of operative stages, surgical approach, or interval between 1st and 2nd stages. A trend toward increased laparoscopic approach was observed over the 10-year timeframe, with laparoscopic cases comprising 0% of the cases in 2008 vs 100% since 2013. The 30-day perioperative complication rate following IPAA was comparable between the groups (46 vs 36%, p = 0.437), with no significant differences in septic complications, anastomotic leak or bowel obstruction or reoperations. The time to ileostomy reversal or reversal-related 30-day complications rate did not differ between the groups. Long-term follow-up was available for 46 patients with a median follow-up of 34 months (10 – 126 months). Although there were no significant difference in the rate of chronic pouchitis (19 vs 16%), temporary fecal diversion (10 vs 12%), or pouch revision (0 vs 8%), a higher proportion of mucosectomy patients subsequently developed anastomotic strictures (29 vs 16%), Crohn's disease of the pouch (33 vs 16%) with subsequent pouch failure (9.5% vs 0%), although these differences did not reach statistical significance.

Conclusions/Discussion: In this series of pediatric patients undergoing RPC for UC, IPAA with mucosectomy could be completed laparoscopically without increased postoperative morbidity relative to IPAA with stapled anastomosis, although mucosectomy was associated with a higher rate of anastomotic strictures. The higher incidence of pouch failure observed in this group reflects the relatively high rate (24%) of interval diagnosis of CD of the pouch in this contemporary pediatric IPAA cohort.

Clinical and Surgical Outcomes following IPAA

	All n = 55	No mucosectomy n = 31	Mucosectomy n = 24	*p*-value
Sex				0.685
Male	36 (65.5%)	21 (67.7%)	15 (62.5%)	
Age at colectomy, years	16.0 [4 – 18]	16.0 [12 – 18]	15.0 [4 – 18]	0.035
BMI (kg/m^2) at colectomy	18.2 [14.1 – 32.5]	18.2 [14.1 – 32.5]	18.1 [14.4 – 30.9]	0.194
Disease duration, months	16.0 [1 – 121]	19.0 [1 – 121]	16.0 [1 – 63]	0.702
Preoperative medications				
Steroids	36 (65.5%)	17 (54.8%)	19 (79.2%)	0.060
Biologics	33 (60.0%)	20 (64.5%)	13 (54.2%)	0.437
Preoperative laboratory values				
C-reactive protein	23.7 [0.8 – 230.8]	22.5 [2.3 – 127.1]	32.2 [0.4 – 230.8]	0.744
Leukocyte count	11.5 [2.6 – 29.4]	11.5 [2.6 – 27.7]	11.5 [4.8 – 29.4]	0.633
Hemoglobin	10.3 [7.7 – 16.0]	10.6 [8.5 – 16.0]	9.9 [7.7 – 14.6]	0.298
Albumin	3.3 [1.0 – 4.7]	3.5 [1.0 – 4.2]	3.0 [1.8 – 4.7]	0.377
Surgical approach				0.071
Open	14 (25.5%)	5 (16.1%)	9 (37.5%)	
Laparoscopic	41 (74.5%)	26 (83.9%)	15 (62.5%)	
Length of stay after IPAA, days	5 [3 – 20]	5 [3 – 20]	6 [4 – 14]	0.013
30-day complications	22 (40%)	11 (35.5%)	11 (45.8%)	0.437
Unplanned reoperations	5 (9.1%)	4 (12.9%)	1 (4.2%)	0.373
Long-term follow up	n = 46	No mucosectomy n = 25	Mucosectomy n = 21	*p*-value
Length of follow up, months	34 [10 – 126]	32 [10 – 126]	45 [11 – 122]	0.791
CD of the pouch	11 (23.9%)	4 (16%)	7 (33.3%)	0.170
Chronic pouchitis	8 (17.4%)	4 (16%)	4 (19%)	>0.999
Stricture	10 (21.7%)	4 (16%)	6 (28.6%)	0.475
Obstruction	3 (6.5%)	2 (8%)	1 (4.8%)	>0.999
Pouch revision	2 (4.3%)	2 (8%)	0	0.493
Temporary diversion	6 (13%)	3 (12%)	2 (9.5%)	>0.999
Pouch failure	2 (4.3%)	0 (0%)	2 (9.5%)	0.203

ILEAL POUCH REVISION: SURGICAL APPROACHES AND LONG-TERM STOMA-FREE SURVIVAL.

QS488

C. Klos, B. Rademacher, C. Heise, E. Lawson, C. Geltzeiler, B. Harms, E. Carchman
Madison, WI

Purpose/Background: Ileal pouch anal anastomosis (IPAA) is an alternative to permanent ostomy for patients undergoing total proctocolectomy for ulcerative colitis or familial adenomatous polyposis. While IPAA is generally associated with high patient satisfaction and quality of life, complications or structural defects related to pouch size, inlet and/or outlet may lead to pouch dysfunction that is not manageable with nonoperative treatments alone. Currently, there is a paucity of literature describing surgical approaches to pouch revision. Our objective was to review our experience with ileal pouch revision surgery in terms of indications for revision, surgical approach, and long-term outcomes.

Methods/Interventions: We performed a retrospective review of patients having an ileal pouch revision between December 1995 and September 2019 at a single academic medical center. Patients without a final diagnosis of ulcerative colitis or familial adenomatous polyposis were excluded. Pouch dysfunction was classified by anatomic location in the pouch (inlet, outlet, body), nature of complication (stricture, fistula, sinus, volvulus, torsion, capacity), and surgical approach for revision (transanal, transabdominal pouch disengagement, detorsion/pexy). Patients undergoing pouch excision without attempt at revision were excluded. Long-term stoma-free survival was measured from dates of initial pouch creation and ileal-pouch revision to date of last follow up.

Results/Outcome(s): We identified 66 patients that underwent an ileal pouch revisional procedure in the study period. The median time from initial pouch construction to last follow-up was 102 months (range 4-428). Ileal pouch revision occurred at a median of 26 months after ileal pouch creation (range 2-423). Transabdominal pouch disengagement with outlet revision was the most common procedure performed (45%, n=30), followed by transanal anastomotic revision (38%, n=25). The remaining surgical approaches to revision occurred infrequently (3-8%, **see Table 1**). The median follow-up was 38 months (range 0.6-282) following ileal-pouch revision. At the time of last follow-up, five patients had an ostomy in place, for an overall revisional pouch failure rate of 8%. The incidence of pouch failure was highest (13% n=4) after the open outlet revision type (IIa). Indications for revision in patients with pouch failure included: Elongated outlet (n=2), complex fistula (n=2), and anastomotic leak (n=1). Early revision (<1yr from initial pouch construction) was associated with a significantly higher failure rate than later revision (19% vs 2%, p=0.03).

Conclusions/Discussion: Ileal pouch revision is associated with high rates of stoma-free survival. Most pouch losses occurred in patients requiring early (<1yr) outlet revision via a transabdominal approach (Type IIa). These results may aid in decision making regarding surgical approach for ileal-pouch revision and guide patient counseling.

Table 1 **Pouch Revision Classification**

Type	Treatment	Indications	n(%)	Pouch failure
I	Transanal anastomotic revision	Stricture, fistula, cuffitis, elongated outlet	25 (38%)	1 (4%)
II	Pouch disengagement and revision of:			
a)	Outlet	Stricture, fistula, elongated outlet	30 (45%)	4 (13%)
b)	Inlet	Proximal stricture	2 (3%)	0
c)	Combined inlet, outlet, and/or pouch body revision	IIa & IIb, size adjustment	5 (8%)	0
III	Detorsion and pexy	Torsion, volvulus	4 (6%)	0
IV	Pouch excision	Pouch failure	not recorded	na

INCREASED SAGITTAL OUTLET LENGTH IS AN INDEPENDENT FACTOR FOR PELVIC SEPSIS IN PATIENTS UNDERGOING RE-DO ILEAL POUCH ANAL ANASTOMOSIS.

QS489

E. Esen[1], E. Aytac[2], A. Erkan[1], C. Huang[1], M. Grieco[1], Z. Gajic[1], J. Ray[1], F. Remzi[1]
[1]*New York, NY;* [2]*Istanbul, Turkey*

Purpose/Background: Ileal pouch anal anastomosis (IPAA) is the procedure of choice in patients with ulcerative colitis (UC) and familial adenomatous polyposis (FAP). Ten percent of IPAAs fail. Re-do IPAA is legitimate option in the setting of failed pouch to maintain gastrointestinal continuity. Pelvic anatomy is one of the major denominators of operative difficulty. However, there are no data about the impact of pelvimetric characteristics

on the outcomes of transabdominal redo-IPAA surgery. This is the first study addressing the value of pelvimetric measurements on outcomes after re-do IPAA.

Methods/Interventions: Patients who had re-do IPAA for ileal pouch failure in 9/2016 – 10/2019 were included. Preoperative computerized tomography (CT) or magnetic resonance imaging (MRI) studies were evaluated. Following parameters were recorded: Transverse inlet (TI), obstetric conjugate (OC), sagittal outlet (SO), pelvic height (PH), distance between SMA and inferior pubic symphysis, interischiatic spinous distance (IS), intertuberous distance (IT) and pelvic volume (PV). Patients without available preoperative imaging were excluded. Association of pelvic distances with intraoperative, short- and mid-term postoperative outcomes were evaluated.

Results/Outcome(s): Ninety-one patients underwent re-do IPAA in the 3-year study period; 71 of whom had perioperative imaging available and were included [male, n=31 (44%); female, n=40 (56%)]. Mean age and mean body mass index were 39.9±12.7 years and 23.7±4.4 kg/m^2, respectively. Most common reasons for ileal pouch failure were pelvic sepsis [n=46 (65%)] and mechanical complications after initial IPAA [n=23 (32%)]. Increased sagittal outlet distance was found to be associated with increased risk of postoperative pelvic sepsis [mean±SD, pelvic sepsis: 99.5±16 vs no sepsis: 90.1±11, **p=0.034**). None of the other measurements were associated with any other postoperative morbidity (Table 1). Female sex (female, 23% vs male, 7%, p=0.064), handsewn anastomosis (handsewn, 21% vs stapled, 0, p=**0.03**), new pouch creation (new pouch, 23% vs old pouch, 4%, p=**0.032**) were associated with increased pelvic sepsis rates in univariate analyses. In the multivariate analysis, female sex and increased sagittal outlet were found to be independent predictors of pelvic sepsis (OR: 12.6, 95% CI: 1.4 – 112) and (OR: 1.12, 95% CI: 1.03 – 1.22) respectively. No associations were found between pelvic measurements and neither estimated blood loss nor length of hospital stay.

Conclusions/Discussion: Increased sagittal outlet length is a risk factor for development of pelvic sepsis in patients undergoing re-do IPAA. The mechanism behind sagittal outlet's association with leak is unproven but tension is suspected. Compact nature of male pelvis may reduce the risk of pelvic sepsis.

IMAGING BEFORE SETON REMOVAL DECREASES RETURN TO THE OPERATING ROOM.

QS490

J. Felton, L. George, A. Bafford
Baltimore, MD

Purpose/Background: Perianal fistulizing disease affects 5-40% of patients with Crohn's disease. Therapeutic options include eradication of infection, medical treatment, and surgical intervention. First line surgical interventions include exam under anesthesia with fistulotomy and/or seton placement. The timing of seton removal is controversial and no standard guidelines exist. We sought to determine if undergoing imaging before seton removal was associated with a decreased rate of perianal symptom recurrence and seton replacement.

Methods/Interventions: We surveyed a previously collected database of IBD patients for those with perianal disease. The database contains approximately 1700 patients with 7700 patient visits included over the past 10 years. Two hundred and fifty-eight patients were documented as having perianal Crohn's disease. We performed univariate analysis to describe the population and bivariate analysis using Fisher's exact test to compare patients who underwent imaging versus those who did not to determine any association between variables.

Results/Outcome(s): Seventy-six patients had a seton placed for a fistula; 23 (30%) were lost to follow up after seton placement. Forty of these patients were male (53%) and the average Charlson Comorbidity Score was 1. Twenty-two patients (29%) had imaging (MRI or TRUS) before seton removal. Of the patients that had imaging before seton removal, 6 patients (27%) had recurrence of symptoms with all requiring repeat EUA and only 4 (18%) requiring seton replacement. Of those that did not have imaging before seton removal, 21 (68%) had recurrence of symptoms with 20 (65%) requiring repeat EUA and 14 (45%) requiring seton replacement. There is a significant association between lack of imaging before seton removal and recurrence of perianal symptoms (p = 0.005), as well as repeat seton placement (p = 0.002).

QS489 Associations of pelvic measurements with postoperative pelvic sepsis in re-do IPAA

	Pelvic sepsis	No pelvis sepsis	p
Transverse inlet diameter (mm), mean±SD	128.1±6.2	126.6±8.8	0.595
Obstetric conjugate (mm), mean±SD	126.3±14.0	122.4±12.9	0.359
Sagittal outlet (mm), mean±SD	99.5±16.0	90.7±11.8	0.034
Pelvic height (mm), mean±SD	102.8±8.0	101.5±11.4	0.705
Interschiatic spinous (mm), mean±SD	110.8±13.0	106.6±13.0	0.325
Intertuberous distance (mm), mean±SD	135.1±15.6	129.9±13.2	0.246
SMA to pubic symphysis (mm), mean±SD	311.9±18.1	312.8±19.8	0.902
Pelvic volume (cm3), mean±SD	867.0±135.1	822.0±157.8	0.379

Conclusions/Discussion: There is an association between imaging before seton removal and a decreased rate of recurrent perianal symptoms, exam under anesthesia, and seton replacement. Obtaining imaging studies, in addition to assessing clinical symptoms and physical exam findings, may be beneficial in preventing Crohn's patients with perianal symptoms from returning to the operating room for replacement of seton.

LONG-TERM OUTCOME AFTER SPHINCTER-PRESERVING SURGERY FOR PERIANAL FISTULAE WITH CROHN'S DISEASE IN THE ERA OF ANTI-TNF AGENTS.

QS491

Y. Watadani, H. Ohge, S. Uegami, N. Shimada, K. Yoshimura, K. Uemura, Y. Murakami, S. Takahashi
Hiroshima, Japan

Purpose/Background: Anti-TNF agents had shown to be effective for closing perianal fistulae with Crohn's disease and maintaining this response up to one year. However, little evidence was available regarding long-term outcome after surgery. The purpose of this study was to evaluate long-term outcome after sphincter-preserving surgery for perianal fistulae with Crohn's disease with and without subsequent anti-TNF agents.

Methods/Interventions: Fifty-nine patients who underwent sphincter preserving procedures for perianal abscess and fistulae with Crohn's disease, and were closely followed over 12 months after surgery at Hiroshima University Hospital from 2006 through 2016 were enrolled in the study. Patient demographics, type of fistula, type of surgical procedure, and combined medical therapy including anti-TNFs, were retrospectively reviewed. The recurrence of perianal sepsis requiring surgery and/or diversion were compared between with and without subsequent anti-TNFs by using Kaplan-Meier curves.

Results/Outcome(s): The analysis included 46 men and 13 women with a median age at the time of surgery of 30 (range, 10-56) years. The median postoperative follow up periods was 40 (IQR, 16-91) months. The type of fistula was classified as simple (66.1%) or complex (33.9%). A non-cutting seton placement with drainage was performed in the majority of cases (79.7%), and five cases underwent fistulotomy for their uncomplicated low anal fistula. Anti-TNFs were administered in 12 patients (20.3%) before surgery, and 32 patients (54.2%) received anti-TNFs after surgery. Loss of response to anti-TNFs were observed in 16 patients (50.0%) during post-operative follow up periods. There was no difference in the background factors between with and without postop anti-TNFs group. The 5-year recurrence rate of perianal sepsis requiring surgery was 34.5% with postop anti-TNFs, and 54.7% without postop anti-TNFs, which was statistically not significant (log-rank test, $p = 0.17$). Loss of response to anti-TNFs and timing of administration (continuous or new) were not related to the recurrence.

Conclusions/Discussion: Anti-TNF agents did not affect the recurrence of perianal sepsis after surgery in the long-term follow up. A wide variety of medical management beyond appropriate surgery should be discussed for the treatment of perianal fistulae with Crohn's disease.

TERMINAL ILEAL CROHN'S DISEASE THAT DOES NOT EXTEND TO THE ILEOCECAL VALVE IS ASSOCIATED WITH SYNCHRONOUS STRICTURES AND EARLY ENDOSCOPIC RECURRENCE.

QS492

P. Krishnan, S. Feldt, L. Zhang, D. Rubin, N. Hyman, B. Shogan
Chicago, IL

Purpose/Background: The terminal ileum (TI) is the most common site of involvement in patients with Crohn's disease. Clinical observations have found that the degree to which the disease extends to the ileocecal valve (IC-valve) is variable, ranging from severe TI stenosis with extension into the cecum to TI inflammation that spares the most distal ileum. We hypothosized that patients with TI disease, but with distal TI sparing, have an increased incidence of synchronous lesions and postop recurrence.

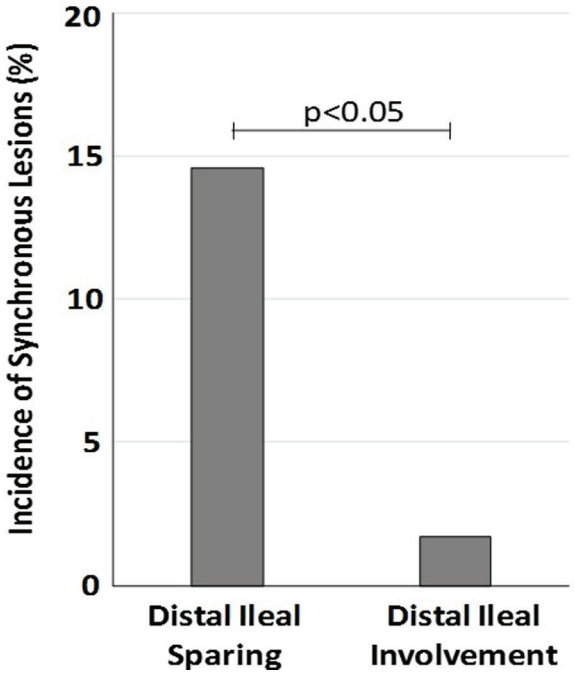
Methods/Interventions: We performed a retrospective study on patients undergoing ileocecectomy for TI Crohn's disease between 4/1/14-4/1/19 at a tertiary care IBD center. Patients with concomitant colitis, ileosigmoid fistula, or prior intestinal surgery were excluded. The most recent preop colonoscopy report and imaging were reviewed by 2 independent observers, and patients were stratified into 2 groups based upon the location of the TI disease: ileal stenosis/inflammation extending to and involving the IC-valve vs. ileal stenosis/inflammation that did not extend to the IC-valve resulting in distal ileum sparing. We reviewed the operative note for the presence of synchronous strictures, and endoscopy reports for the presence of endoscopic recurrence. Demographics and medications were abstracted from the chart. Statistics were performed by T-test and Chi-squared.

Results/Outcome(s): 156 patients met inclusion criteria, of which 73.7% (n=115) were categorized with ileum disease extending to the IC-valve and 26.3% (n=41) with TI disease but with distal ileal sparing. There were no differences in gender, race, age, smoking, BMI, or use of preop biologics/steroids/immunomodulators between the 2 cohorts. 8 patients were found to have incidental small bowel synchronous lesions at the time of ileocecectomy, all of whom underwent stricturoplasty. The incidence of synchronous lesions was significantly higher in the cohort

of patients in which their disease spared the distal TI vs those in which the disease included the IC-valve (14.6% vs 1.7%;p<.05;fig 1). Within the cohort in which the distal TI was involved, those that had the most severe stenosis of the IC-valve preventing intubation of the TI (n=32), never had synchronous lesions. Postop endoscopy data was available in 95 patients at a mean follow up of 14 months. Despite no differences in demographics or postop medical prophylaxsis, patients with distal TI sparing had a significantly higher incidence of endoscopic recurrence compared to patients in which the distal TI was involved (62.5% vs. 28.8%;p=0.002).

Conclusions/Discussion: TI Crohn's disease that spares the distal most ileum is associated with synchronous strictures and earlier postoperative endoscopic recurrence compared to when it extends into the cecum. These patients require heightened surgical awareness at the time of ileocecectomy, and may warrant more aggressive postop prophylaxis.

Figure 1



PARTIAL COLECTOMY FOR COLORECTAL CANCER IN PATIENTS WITH INFLAMMATORY BOWEL DISEASE REMAINS INADEQUATE.

QS493

N. Sell, Y. Qwaider, T. Francone, R. Ricciardi, L. Bordeianou, D. Berger, H. Kunitake, R. Goldstone
Boston, MA

Purpose/Background: Inflammatory bowel disease (IBD) is associated with an increased risk of colorectal cancer (CRC) with a greater incidence of synchronous and metachronous tumors. While total proctocolectomy remains the standard of care for resection of IBD-associated CRC, this study aimed to re-evaluate recurrence and survival outcomes of patients with IBD-CRC based on resection type in the era of improved surveillance and medical therapy.

Methods/Interventions: Clinicopathologic data was retrospectively collected for all patients age 18 and older diagnosed with CRC who underwent operative resection at a single institution between 1/1/2004 through 12/31/2016. Patients were included if they had a prior diagnosis of either Ulcerative Colitis (UC) or Crohn's Disease (CD). Patients with indeterminate colitis or CD without history of colitis were excluded. The cohort was divided by the type of operative resection: total proctocolectomy, subtotal colectomy, or segmental resection, which included right, left, transverse, & sigmoid colectomy, as well as low anterior resection and abdominoperineal resection.

Results/Outcome(s): Of 2,042 patients with CRC that underwent surgery within the time frame, 45 (2.2%) had a prior history of IBD of which 38 (84.4%) met inclusion criteria. Eighty-four percent of patients had colon cancer, while 16% had rectal cancer with no significant difference between UC or CD (Table). Operative resections included 17 segmental resections (45%), 8 subtotal colectomies (21%), and 13 total proctocolectomies (34%). Men were more likely to undergo a subtotal colectomy (87.5%) rather than a segmental resection (35.3%) or a total proctocolectomy (46.2%, p=0.05). No significant differences were found in rates of lymph node positivity, extramural venous invasion, or pathological stage of disease. Patients who underwent a total proctocolectomy more often had multifocal dysplasia noted on their final operative pathology (46.2% total v 25.0% subtotal vs. 5.9% segmental; p=0.04). While there was no significant difference in overall survival between the three groups, patients who underwent a segmental resection were more likely to have locoregional or metastatic recurrence of their CRC (41.2% segmental v 0% subtotal vs. 7.7% total; p=0.02).

Conclusions/Discussion: Segmental colectomy for CRC for patients with Ulcerative or Crohn's colitis remains inferior to both subtotal colectomy and total proctocolectomy. Patients who underwent segmental resections were significantly more likely to have CRC recurrence. Patient counseling regarding risk of tumor recurrence is warranted for appropriate decision making prior to performing a segmental resection for cancer in IBD.

Total Patients (n = 38)	Segmental Resection (n = 17)	Subtotal Colectomy (n = 8)	Total Proctocolectomy (n = 13)	*P*-value
Ulcerative Colitis, n (%)	7 (41.2%)	3 (37.5%)	7 (53.9%)	0.71
Crohn's Colitis, n (%)	10 (58.8%)	5 (62.5%)	6 (46.2%)	
Male, n (%)	6 (35.3%)	7 (87.5%)	6 (46.2%)	**0.05**
Age at CRC Surgery, yr, median (IQR)	62 (55-79)	55 (53-69)	59 (50-63)	0.52
Steroids, n (%)	4 (23.5%)	1 (12.5%)	5 (38.5%)	0.40
Biologics, n (%)	3 (17.7%)	1 (12.5%)	1 (7.7%)	0.73
Years of IBD Disease, median (IQR)	20 (10-22)	10 (5-29)	21 (13-33)	0.38
Follows IBD Endoscopic Surveillance, n (%)	9 (52.9%)	5 (62.5%)	8 (61.5%)	0.86
IBD Activity				
Quiescent	8 (47.1%)	2 (25.0%)	1 (7.7%)	0.11
Mildly Active	5 (29.4%)	2 (25.0%)	3 (23.1%)	
Severely Active	4 (23.5%)	4 (50.0%)	9 (69.2%)	
Primary Tumor, n (%)				
Colon	13 (76.5%)	8 (100%)	11 (84.6%)	0.32
Rectum	4 (23.5%)	0 (0%)	2 (15.4%)	
Pathologic AJCC Stage, n (%)				
Stage I	7 (41.2%)	2 (28.6%)	8 (66.7%)	0.29
Stage II	5 (29.4%)	3 (42.9%)	0 (0%)	
Stage III	4 (23.5%)	2 (28.5%)	4 (33.3%)	
Stage IV	1 (5.9%)	0 (0%)	0 (0%)	
Positive Lymph Nodes, n (%)	5 (29.4%)	1 (12.5%)	4 (30.8%)	0.61
EMVI, n (%)	6 (35.3%)	1 (12.5%)	4 (30.8%)	0.49
Multifocal Dysplasia on Final Pathology	1 (5.9%)	2 (25.0%)	6 (46.2%)	**0.04**
CRC Recurrence, n (%)	7 (41.2%)	0 (0%)	1 (7.7%)	**0.02**
CRC Related Death, n (%)	2 (11.8%)	0 (0%)	0 (0%)	0.27
Overall Survival, yr, median (IQR)	6.3 (3.4-10.8)	9.4 (8.1-12.8)	7.1 (4.8-9.8)	0.21

CRC, colorectal cancer; yr, year; IQR, Interquartile range; m, months; IBD, inflammatory bowel disease; AJCC, American Joint Committee on Cancer; EMVI, extramural venous invasion

IS COMPLETION COLECTOMY INEVITABLE AFTER PROCTECTOMY ALONE FOR PERIANAL CROHN'S DISEASE?

QS494

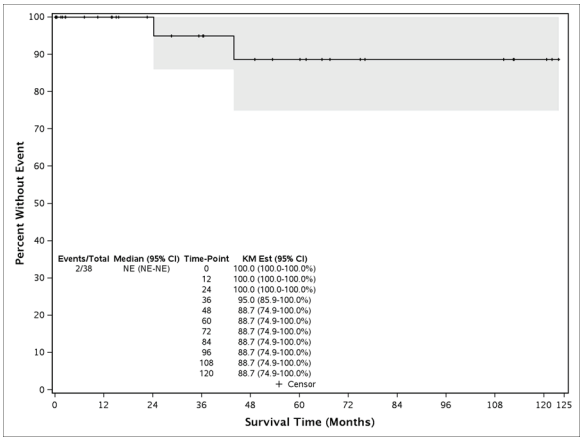
N. McKenna, K. Singh, K. Bews, E. Dozois, K. Mathis
Rochester, MN

Purpose/Background: Limited data exist on performing a proctectomy alone instead of a total proctocolectomy for refractory perianal Crohn's disease (CD), but a total proctocolectomy is favored due to the fear of proximal colonic CD recurrence requiring completion colectomy. However, an end colostomy offers better long-term function than an end ileostomy and is preferred for permanent diversion in patients without CD. Therefore, our aim was to determine if preservation of the remnant colon is possible after proctectomy for perianal CD.

Methods/Interventions: A retrospective chart review of was conducted of all patients with CD who underwent proctectomy with end colostomy between January 2006 and December 2017 at our institution. Operations were classified as either intersphincteric or extrasphincteric and any flap-assisted closure of the perineum was noted. CD characteristics and the occurrence of perineal wound complications were also recorded. Completion-colectomy free survival was calculated from the time of proctectomy to the date of completion colectomy, censoring at the date of last follow-up. Univariate comparisons between intersphincteric and extrasphincteric proctectomy were performed and Kaplan-Meier survival analysis was used to determine completion colectomy-free survival.

Results/Outcome(s): 38 patients (68% female) with a median age of 47 years (interquartile range [IQR], 30-59) underwent proctectomy for perianal CD. The median age at CD diagnosis was 23 (IQR, 17-40) and 61% had undergone a prior intestinal resection for CD, primarily in the form of an ileocecal resection. The majority of patients were on immunosuppression at the time of surgery (58% on a biologic, 32% on an immunomodulator, and 11% on a corticosteroid) and 34% were on combination immunosuppression. At surgery, an intersphincteric dissection was performed in 58%, an extrasphincteric dissection in 13%, and the dissection plane was unspecified in 29%. An omental flap was used in 24% of patients and was more common in extrasphincteric resections (60% vs 18% intersphincteric/unknown, $p=0.04$). Colostomy type was end descendostomy in 90% and end transversostomy in 10%. Perineal wound complications requiring an unplanned return to the operation room occurred in 21% of patients and were more common in patients with an extrasphincteric resection (40% vs 18% intersphincteric/unknown). Only 2 patients required completion colectomy for the development of proximal colonic CD, yielding a 10 year completion colectomy-free survival of 89% (95% confidence interval, 75-100) (FIGURE).

Conclusions/Discussion: Significant short-term perineal wound morbidity was common after proctectomy for CD, even with the use of an intersphincteric dissection plane. However, long-term completion colectomy-free survival was high suggesting proctectomy alone in patients with perianal CD and sparing of the proximal colon is an acceptable surgical option.



Kaplan-Meier Curve of Completion Colectomy-Free Survival and Survival Estimates with 95% Confidence Intervals. NE: Not evaluable

CRITICAL EVALUATION OF THE EFFICIENCY OF COLORECTAL FELLOWSHIP WEBSITES.

QS500

Q. Yan, H. Dao, M. Davies
San Antonio, TX

Purpose/Background: A fellowship website in an important source for prospective applicants to access how well a program will fit their career, educational and

cultural goals. A poorly-developed website has been should to deter applicants. However, the quality of the colorectal fellowship websites is not known. The aim of this study is to evaluate the current efficiency of colorectal fellowship websites.

Methods/Interventions: The list of colorectal surgery fellowships was obtained through the ACGME website. Two raters evaluated each website independently for 68 content items in categories of accessibility (4), application (13), education (24), personnel (13), and benefits (14). Each component was awarded a score of 1 weighted equally with a total score of 68 available. Statistical analysis was performed in R.

Results/Outcome(s): A total of 64 ACGME accredited colorectal fellowships were identified and evaluated. Five programs (8%) did not have a functional website. Programs with functional websites have a median total score of 22 (IQR 14.8-27.5). The best program scored 39.5 points. Programs median score (IQR) on accessibility, application, education, personnel, and benefits were 3 (2-3), 5 (3.5-6.5), 6 (2.3-9.3), 3 (2-5), 3.5 (0.5-5.8), respectively. Most colorectal fellowship website had program description (93%), faculty listing (93%), faculty education (90%), faculty profiles (88%), contact information for administrators (85%), and didactic conference listings (75%). Only one program had information on the board pass rate. While over half of the programs described research requirements, few had research descriptions or past research project information. Only 58% of fellowship websites listed the number of positions available. Sixty-nine listed current fellows while 66% listed alumni. Contact information for faculty (11%), resident (0%), and alumni (0%) were rarely reported. There was no difference in the total score between programs in different geographical regions within the USA. Interrater correlation coefficients were good with 0.84 for the total score, 0.90 for accessibility, 0.79 for application, 0.85 for education, 0.78 for Personnel, and 0.69 for benefits.

Conclusions/Discussion: Currently, colorectal surgery fellowship websites (45) have insufficient content for applicants to make informed decisions and this places them at a prospective disadvantage in the application season. Efforts are needed by programs to evaluate and improve their digital footprint and ensure colorectal surgery fellowship websites are competitive, accessible and provide insights for applicants.

EXPERT LEARNING AMONG PRACTICING COLORECTAL SURGEONS IN A PEER COACHING ENVIRONMENT.

QS501

C. Harbaugh[1], M. Byrnes[1], J. Stulberg[2], J. Dimick[1], J. Byrn[1]
[1]*Ann Arbor, MI;* [2]*Chicago, IL*

Purpose/Background: Peer coaching is a well-validated approach to adult learning; yet, little evidence exists that peer coaching among practicing surgeons is feasible or improves patient outcomes. Moreover, the principles of coaching run antithetical to the hierarchy and invulnerability traditionally ascribed to the surgical culture. The objective of this study was to explore how surgeons engage as expert learners providing and receiving formative feedback to guide design of an effective peer coaching program.

Methods/Interventions: The Michigan Surgical Quality Collaborative (MSQC) has launched a 3-year longitudinal study of surgical peer coaching. As part of this longitudinal study, 13 practicing surgeons within the MSQC participated in a 3-hour focus group during which two anonymous videos of laparoscopic right colectomies were viewed and discussed collaboratively to train surgeons to provide formative feedback. The session was recorded, transcribed, and analyzed using focused coding. Codes were aggregated into themes pertinent to the interactions among expert learners providing formative feedback.

Results/Outcome(s): Three major themes of expert learning were identified. First, surgeons focused on mental models (the explanation of a thought process) more often than specific skills or techniques. For example, surgeons identified multiple processes through which they decided when to switch between a medial or a lateral approach, but did not recommend which approach to use. Second, provision of formative feedback required experts to challenge the existing mental models of other experts. Yet, they exhibited discomfort and thus limited the situations in which they challenged the surgical video to when they felt the operation was "dangerous." Third, a safe environment for expert learning promoted vulnerability, inquiry, and growth. Although vulnerability was attempted, it was met with resistance and was difficult to achieve.

QS500

	N	Accessibility	Application	Education	Personnel	Benefits
Midwest	16	3 (2.75-4)	4 (3.9-5.3)	6 (3.9-9.6)	3.3 (2.8-6)	5 (3.9-8)
Northeast	20	3 (2.75-3)	5 (4.4-6)	5.3 (1.9-9)	3.8 (2.3-5.5)	2.8 (1.8-5)
South	20	3 (2-3)	4.5 (0.8-7)	5.5 (0.4-7.9)	3 (1.8-5)	2.5 (1.8-5)
West	7	3 (1.5-3.5)	6 (3.3-6.8)	11 (5.8-12.3)	2.5 (1.8-3)	3 (0.8-3.5)

Conclusions/Discussion: Expert learning among practicing surgeons is feasible and should focus on thought processes rather than specific techniques during video review. Challenges to effective peer coaching such as discomfort in challenging the expertise of other experts and difficulty exhibiting the vulnerability to accept room for improvement may limit the current effectiveness of formative feedback at the practicing surgeon level. While this study examines a single focus group, it is the first of a longitudinal series in which future peer coaching approaches will be adapted to address identified challenges with formative feedback.

YOUNG COLORECTAL SURGEONS & ADVANCED ENDOSCOPIC PROCEDURES: IS EXPOSURE & HIGHER CONFIDENCE ENOUGH FOR INCORPORATING ADVANCED ENDOSCOPIC PROCEDURES INTO PRACTICE?

QS502

D. Yoon, K. Mirza, C. Wickham, E. Noren, S. Lee, K. Cologne, C. Hsieh
Los Angeles, CA

Purpose/Background: While colon cancer rates have fallen, surgery for removal of advanced adenomas has increased in recent years. Development of advanced endoscopic procedures (AEPs), such as endoscopic mucosal resection (EMR), have allowed resection of larger, potentially benign, premalignant lesions where a lack of available tools previously would require colectomy. However, AEPs are challenging and have steep learning curves. This study assessed changes in colorectal fellows' attitudes and perspectives towards AEPs after an advanced endoscopy course as well as once they had started their career.

QS501 Major themes of expert learning among surgeons in a peer coaching environment

Theme	Representative quote
	1. Peer coaching occurred through the sharing of mental models.
Adjusting approaches	"I mean, what's your next move if you don't see the plane, like if your mental model fails you 90 seconds into the operation?"
Recognizing red flags	"I don't know. If you have haptic feedback, you may not do that, like those type of moves right there."
Taking a global view	"Zoom out, get a global picture."
	2. Peer coaches were uncomfortable challenging the mental models of other experts.
Fear of disagreement	"Some people in the room might not necessarily agree with that approach, and but I know why we do it that, you know, I have reasons why I do it that way, but…"
Fear of language	"It's hard, I think it would be hard not to sound insulting to say, well, you know, this is not where you ligate the vessel to, you know, cure lymph nodes for a cancer operation. I mean, I don't know how to say that without sounding insulting."
Fear of passing judgment	"So I think, you know, one of the things is, is if this is one of our videos, and we're in the room, and you're anxious because really, you know, you're seeing some dangerous moves, how can we… how could, we don't have to be nice. I mean, we are in the Midwest, but we don't have to be nice. We can be constructive. But I do think we have to formulate in our minds, and I think what Dr. X said to me is kind of a big issue, is, 'It is probably fine. It is probably fine.'"
	3. A safe environment promotes expert learning.
Vulnerability	"Because it's real, and because what we're doing is we're accepting fault for our insufficiencies at some level."
Inquiry	"I'll just say, this is making me very uncomfortable, this video right now." "Tell me why. Tell me why."
Growth	"The point is that we

Methods/Interventions: Participants in an annual advanced endoscopy course for colorectal fellows 2018 and 2019 completed surveys immediately before and after the course, and at least six months after. Fisher exact and chi-square test were used for nominal data, and Mann-Whitney U test for ordinal data. P<0.05 was considered statistically significant.

Results/Outcome(s): There were a total of 74 participants. The pre and post-course survey response rates were 82% and 91%, respectively. Fellows had low baseline experience performing AEPs compared to basic endoscopic procedures (29 vs 90%, p<0.01). After the course, more fellows felt confident to independently perform submucosal injection (55 vs 82%, p<0.01) and most AEPs (stenting 0 vs 16%; epinephrine injection 31 vs 58%; endoclip for hemostasis 38 vs 58%; EMR 11 vs 27%; endosuture 0 vs 12%; all p<0.05). Fellows were more likely to include stenting (34 vs 66%), epinephrine injection (64 vs 93%) and EMR (52 vs 82%) in their practice (all p<0.04). The follow up survey was sent to 65 (88%) participants with known contact information, with a response rate of 43%. Most (96%) felt that colorectal surgeons should perform AEPs. However, the desire for additional training waned following graduation (87 vs 46%, p<0.01). 75% performed a total of 25 or less AEPs after fellowship. The desire to increase or incorporate advanced endoscopy procedures in their practice was only reported by 55% and 29%, respectively. There was increase in barrier elements related to technical and referral factors, as well as low interest when compared to the post-course survey (Table 1).

Conclusions/Discussion: Trainees in colorectal surgery have low baseline AEP experience. A national course during training provides a unique opportunity to introduce AEPs in high fidelity and low stakes setting, with resulting improvement in participants' confidence and likelihood of AEP incorporation in practice. Most participants in practice have a strong interest but low volume of AEPs, due to technical and referral barriers and lack of interest. Ongoing training following graduation focused on addressing these barriers may increase early and wider adoption of AEPs as part of the colorectal surgeons' practice.

QS502 Table 1. Changes in Barriers to Incorporating Advanced Endoscopic Procedures

		Post Course (n=61)		Follow Up (n=27)		
Types of Barriers		N	%	N	%	P Value
Technical Elements		15	25%	14	52%	0.01
	Technical challenge	11	18%	11	41%	
	Steep learning curve	6	10%	0	0%	
	Low confidence level	0	0%	8	30%	
Support Elements		38	62%	20	74%	0.28
	Lack of dedicated time	6	10%	10	37%	
	Lack of institutional support	16	26%	9	33%	
	Lack of necessary infrastructure	21	34%	9	33%	
	Lack of mentors	7	11%	11	41%	
Referral Elements		27	44%	23	85%	<0.01
	Low referral pattern	5	8%	7	26%	
	Other specialty competition	9	15%	13	48%	
	Low financial yield	14	23%	13	48%	
Miscellaneous		2	3%	5	19%	0.03
	Lack of interest	0	0%	5	19%	
	Prior bad outcome	0	0%	0	0%	
	Coding/billing	2	3%	0	0%	

*Each percentage is out of the total participants in each cohort.

WHAT'S STOPPING YOU? – A QUALITATIVE SYSTEMATIC REVIEW ON BARRIERS TOWARDS COLONOSCOPY.

QS503

K. Lim, C. Ng, G. Decruz, S. Shefaly, C. Chong
Singapore, Singapore

Purpose/Background: The growing incidence of colorectal cancer in developed countries poses as a cause of concern. Yet, the use of colonoscopy for colorectal cancer screening remarked with low uptake rates, often accompanied with numerous barriers affecting the use of colonoscopy. The aim of this qualitative review is to map the current literature available for patients' and providers' perceptions of the barriers towards undergoing colonoscopy. Qualitative reviews allow us to forge a deeper understanding towards valuable literature revealing the multifaceted nature of human behaviours affecting screening uptake.

Methods/Interventions: This qualitative review was guided by the PRISMA guidelines. Searches were conducted on 5 electronic databases including Medline, Embase, CINAHL, Web of Science Core Collection and PsycINFO from inception to 8/14/2019. Initial searches after duplicate removal yielded 3282 results. Using the selection criteria guided by the PICO framework, a total of 366 studies were included in the full text review, and 52 in the synthesis of the data. Thematic analysis was preceded with Thomas and Harden methodology in the synthesis of the results.

Results/Outcome(s): 5 major analytical themes were identified, namely, procedural issues, personal apprehension, societal concerns, doctor-patient relationship and limitations of health system. Procedural barriers entailed repulsive bowel preparation, nature of colonoscopy procedures, presence of alternative cancer detection methods and false positives of referral procedures. Personal concerns included personal fears, patients' procrastination, lack of perceived need to screen, social stigmas, dissuasion from others' personal recounts, personal inconveniences and physician doubts on the capabilities of colonoscopy procedures. Societal concerns encompassed the imminent knowledge gaps in the general population, minimal personal discourse on healthcare issues, cultural influences and gender-variant perceptions. The aspects of doctor-patient relationship which posed as barriers for colonoscopy uptake were physician insensitivity, absence of proper communication and lack of explanation on colonoscopy findings. Healthcare system barriers composed of financial burden, flawed delivery of procedural information, inadequate support for patients and knowledge disparities amongst providers.

Conclusions/Discussion: To our knowledge, this is the first qualitative systematic review on the barriers towards colonoscopy from the collective views of patients and providers. Their innate concerns regarding colonoscopy have shaped the findings provided in this review. This provides the crucial groundwork for interventional mitigations to be enacted in reducing potential barriers towards colonoscopy, engendering a higher uptake rate for early cancer detection.

PATIENT EDUCATION AND PROCESS OPTIMIZATION AS ADJUNCTS TO ENHANCE RECOVERY AFTER SURGERY PROTOCOLS.

QS504

K. Climaco, C. McKinnon, D. Riley, A. Dagher, A. Walker
El Paso, TX

Purpose/Background: In an era where information is readily available, it is important that patients get the correct information, are able to understand what's being conveyed, and have the ability to follow through on plans. These are crucial to fostering strong physician-patient relationships, increasing patient satisfaction, and maximizing good outcomes. Many physicians assume that the patient is an informed one however, patients do not always understand instructions, do not understand the risks and benefits associated with their care, or simply do not comply. Good patient education allows for decreased anxiety, improved compliance, and decreased complications. We, as surgeons, should lead the process to optimize patient education and streamline the processes in surgery. A two-phased plan to address these factors was devised at our institution.

Methods/Interventions: The first phase was to determine the current health literacy of our over 18 year old surgery population. A questionnaire was offered to all general surgery clinic patients over a one year period. The second phase involved the creation of an Enhanced Recovery After Surgery (ERAS) Box to streamline and simplify the process for patients undergoing colorectal surgery. The ERAS Box included all the medications and instructions for our ERAS pathway. The patient's condition and the ERAS Box were explained to the patient during their preoperative visit.

Results/Outcome(s): Our questionnaire yielded 327 participants (55% male), aged 18-79. 79% percent of the patients took medications on a daily basis, 46% taking 1-4 medications per day, 21% taking 4-8 medications per day, 8% taking 9-12 medications per day, and 2% taking more than 12 per day. 67% of patients did not use a tool to help with their medications. 25% report forgetting to take a medication at least once a month. 45% would be comfortable with a new addition to their current health regimen. 22% knew little to nothing about their condition. 88% of our patients were interested in an adjunct to help with their overall health, medications, and informing them about their condition. Eight randomly polled postoperative patients

found their condition to be fully explained and all felt like they knew "a lot" about their condition. All of the patients felt "comfortable" to "very comfortable" with the nine additional medications/supplements within the ERAS Box. All patients stated they took all the medications within the box at the specified times and felt it to be helpful, practical, and convenient.

Conclusions/Discussion: Patient empowerment and compliance is an avenue that can have significant effects on end results. Our knowledge of our patients difficulties with compliance and the addition of the ERAS Box ensures we are setting our patients up for the best possible outcomes. Addressing this key aspect of patient education can help in satisfaction, improve patient knowledge, and decrease medication compliance issues.

The ERAS Box with all medications and supplements

COMPARING COLORECTAL OUTCOMES BETWEEN A PROTOCOL AND AN INDIVIDUAL SURGEON DRIVEN HOSPITAL.

QS505

K. Jreije[1], M. Bilal[1], J. Kim[1], J. Romero[2], S. Jeremy[2]
[1]*Oxnard, CA;* [2]*Ventura, CA*

Purpose/Background: While post operative protocols after Colorectal surgery are well supported by evidence to decrease complications and lengths of stay, their implementation has appeared to only slowly take hold by many individual surgeons. In our community we have a Safety-net hospital that has a robust Enhanced Recovery After Surgery(ERAS) protocol. We also have a private hospital, which is composed of several independent surgeons, who each dictate their own post operative management. This abstract aims to look at the differences in management and outcomes of 2 hospitals within the same community and the approach to the post-operative Colorectal patient.

Methods/Interventions: At each of the hospitals, we retrospectively looked for any patient from 2016-2018 with a 44207 associated CPT code(laparoscopic sigmoid resection with coloproctostomy). We chart checked 39 patients at our community hospital, and 24 patients at the county hospital. For each patient, we charted length of stay, complications, narcotic use (in morphine equivalents), start of DVT prophylaxis, antibiotic use, and how long a Foley catheter was left in place.

Results/Outcome(s): Hospital A represents our county facility and hospital B represents the private hospital. A total of 63 patients from the participating hospitals: A(N=24); B (N=39) were included in this study for the two-year period. Bivariate analyses showed that hospital A compared to B had lower length of stay (LOS), but was not statistically significant (3.8 days vs. 5.15 days, p<0.18); had used lesser nasogastric tubes in their patients (12.5% vs 15.4%, P<.0341); and fed their patients sooner (0 days vs. 2.35 days, p<.00130). The readmission rate was significantly lower in Hospital A than B (13.6% vs. 25.8%, p<.042), as well as the anastomotic leak rates (8% vs. 16%, p<.0017). A multivariate analysis showed that the time to feeding (p<.0135) and anastomotic leak (p<.0002) were significant predictors for length of stay. Univariate analyses showed that, there were proportionately higher males than females (64% vs. 36%) in this cohort.

Conclusions/Discussion: At our county facility, we have a very structured ERAS protocol. Almost all the patients at the county facility do not require patient controlled analgesia, and narcotic requirements are almost nil by post op day one. Our data suggests that following ERAS protocol, and having a standardized and consistent postoperative course for patients' status post colon resection is associated with a decreased length of stay and fewer complications. While this is a snapshot of one community, the adoption of patient protocols that profoundly benefit patients needs to be more universally implemented, and it requires a combination of surgeon champion and active hospital administration to make these protocols implemented more universally.

MAKING DECISIONS IN A SETTING OF GREAT UNCERTAINTY: AMBIGUITY IN DECISION-MAKING FOR HIGH-RISK COLORECTAL SURGERY.

QS506

C. Harbaugh, C. Vitous, M. Byrnes, A. De Roo, P. Suwanabol
Ann Arbor, MI

Purpose/Background: Ambiguous patient outcomes frequently complicate surgical decision-making. Although risk stratification tools (e.g., American College of Surgeons Risk Calculator) and communication frameworks (e.g., Best Case/Worst Case) exist, it is unknown whether these

adequately support patients and surgeons when making the decision to pursue surgery. The objective of this study was to explore the impact of uncertainty on surgeons who perform high-risk colorectal operations.

Methods/Interventions: As part of a larger study of 46 surgeons exploring their approaches to decision-making and palliative care involvement for high risk patients, we interviewed 14 colorectal surgeons and 23 general surgeons who perform colorectal operations. Semi-structured, in-depth interviews were recorded, transcribed, and deidentified. Transcripts were analyzed using focused coding with interpretive description in MaxQDA (version 18.2.3), a computer-assisted qualitative data analysis software. For this study, we focused our analysis on the topics of uncertainty and ambiguity in surgical decision-making.

Results/Outcome(s): Four major themes of uncertainty were identified, describing the ways in which surgeons (1) conceptualize, (2) manage, (3) communicate, and (4) cope with uncertainty (Figure). First, uncertainty is seen as complex and multi-layered. Uncertainty encompasses not only the risk of mortality based on chronic comorbidities, but also ambiguity with regard to diagnosis, functional and cognitive outcomes, the role of luck, and lack of clarity in patient wishes and values. Second, surgeons vary in how they manage uncertainty, which ranged from avoidance, to acceptance, to transference of the burden of unknown outcomes onto the patient or family. Third, when surgeons communicated their uncertainty with patients, they often did so in the preoperative setting using statistical guidance or scenario-based examples. However, surgeons often felt that patients had a difficult time understanding functional and cognitive outcomes more than that of mortality. Fourth, surgeons identified individual strategies to cope with uncertainty. These included realism (accepting a situation for what it is), belief in their best, optimism, and empathy for the patient and family.

Conclusions/Discussion: Uncertainty is inevitable in the practice of medicine, particularly in the setting of high-risk surgery including colorectal surgery. Yet, how such ambiguity is managed may bias the way in which information is communicated with patients and families, and ultimately bias surgical decision-making. Future efforts should go beyond risk stratification calculators and communication frameworks to guide surgeons on how to manage and cope with uncertainty effectively to promote patient- and family-centered care.

The Impact of Uncertainty on Surgical Decision-Making for High-Risk Colorectal Surgery

Theme	Conceptualizing the layers of uncertainty	Managing the burden of uncertainty	Communicating uncertainty	Coping after uncertainty
Codes	• Diagnosis • Function/cognition • Luck/misfortune • Patient values	• Avoiding discussion • Accepting uncertainty over poor outcomes • Transferring uncertainty	• Preoperative discussion • Statistical guidance • Scenario-based stories • Limited understanding	• Realism • Belief in their best • Optimism • Empathy
Representative quote	Patient values: "It becomes a moral issue in that the family is not completely sure of what the patient would have wanted us to do, or they're dragging their feet because the patient is not in the situation or not aware enough or awake enough or in a condition to make his or her wishes known." (Participant 33)	Transferring uncertainty: "But I think its' kind of, I try and let the patient and their family members kind of make the decision. A lot of times I'm willing to attempt the surgery if, as long as they know all the potential outcomes." (Participant 4)	Limited understanding: "That's probably the biggest roadblock that I encounter on a day-to-day basis is everything thinks that whatever condition they have is something that we're going to be able to cure and that its' not going to impact their longevity." (Participant 1)	Empathy: "But I found the best way is not to ignore it, not to poo-poo it. I mean, acknowledge their concerns. Ask what you can do to help, and given them a time frame of, or some realistic expectations for what it's going to mean." (Participant 15)

"And that's what makes these conversations so difficult, is that the patients have to make decisions in a setting of great uncertainty, and we have to guide them with the same uncertainty."

BIBLIOMETRIC ANALYSIS OF FIVE MAJOR COLORECTAL SURGERY CATEGORIES: SURPLUSES AND SHORTAGES.

QS507

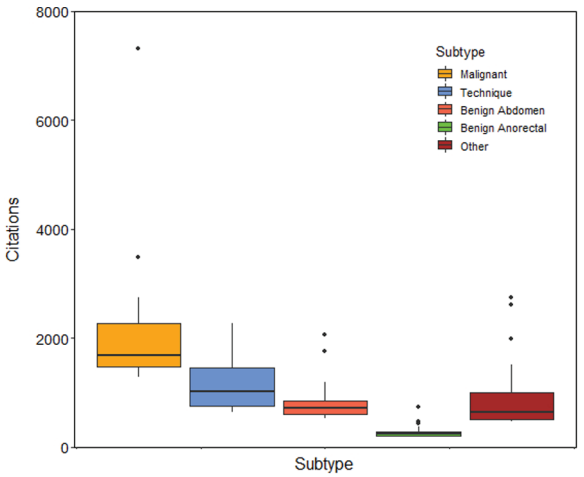
B. Allar, A. Ore, A. Fabrizio, E. Messaris, T. Cataldo
Boston, MA

Purpose/Background: Bibliometric analysis is one of our best methods to highlight key studies which have led to the present understanding and treatment of disease. This type of analysis can highlight key studies while also demonstrating critical areas of the field that lack high quality evidence. This original research analyzed the top 30 cited manuscripts in five distinct fields of colorectal surgery.

Methods/Interventions: A Thomson Reuters Web of Science database was searched using common CRS identifiers in five major categories noted from the ASCRS 3rd edition textbook: malignancy, benign anorectal, benign abdomen, pelvic floor/functional disease, and technique/procedures. The top 30 top cited papers were identified from each category and analyzed by topic, level of evidence, study type, journal, author, year, and country of origin. Two authors independently reviewed the articles, confirming that the study was categorized correctly. General linear modeling using a log transform of citations was used to estimate the association between subtype and citations. Logistic regression was used to assess the association between subtype and the likelihood of a randomized controlled trial. General linear modeling using a Poisson link was used to assess the association between subtype and level of evidence.

Results/Outcome(s): Out of the five categories, there were 140 unique articles, with median citations of 717 (range 185 – 7320). There were 41 randomized controlled trials and 33 expert opinions/systematic reviews. 55 articles were from authors in the USA. The most common decade of publication was 2000s (n=73), followed by the 1990s (46). The most common journals were New England Journal of Medicine (n=21), Gastroenterology (n=20), and Lancet (n=17). Articles about malignant disease were cited significantly more than the four other categories ($p<0.001$, Figure 1). Malignant disease articles also included more randomized controlled trials ($p<0.001$) and were of better quality as demonstrated by level of evidence ($p<0.001$).

Conclusions/Discussion: These manuscripts highlight the studies that have shaped the current practice of colorectal surgery and act as a small resource for residents and fellows in training. This work also serves as a reference for clinicians and fellows for studies that have made a significant impact on the field. Studies focused on malignancy are higher quality studies with significantly more citations while there are very few high-quality studies on pelvic floor or functional disorders. This may demonstrate the funding and publishing differences between these different subspecialties within colorectal surgery, even though colorectal surgeons interact with and treat benign diseases more frequently.



Boxplot representing number of citations by colorectal surgery category

TOTAL PSOAS AREA IS A MEASURE FOR DECONDITIONING IN COLORECTAL SURGERY PATIENTS.

QS508

D. Yackzan, Y. Chang, S. Thomas, D. Davenport, S. Beck, A. Bhakta
Lexington, KY

Purpose/Background: Deconditioning and frailty in the surgical population are well-known risk factors for worse post-operative outcomes and increased hospital costs. However, there is no routinely used measure to characterize this in our patients. Multiple studies have studied sarcopenia and attempted to use CT imaging to measure muscle mass as a surrogate for functional status. The psoas major is a commonly chosen muscle, being the primary flexor of the hip and because it provides postural support to the spine. We hypothesize that a standardized approach to preoperative psoas muscle measurement is predictive for postoperative morbidities in the colorectal surgery population.

Methods/Interventions: We queried our ACS-NSQIP database for adult patients (age ≥18 years) undergoing a colectomy (any indication) at the University of Kentucky from 1/1/13 to 12/31/16. We excluded patients if they had an open abdomen or if they did not have a preoperative CT within three months of their operation. We measured the cross-sectional area of the left and right psoas muscles at the lumbosacral joint and used the sum for our total psoas area (TPA).

Results/Outcome(s): We enrolled 336 patients in our study with an average age of 56.4 years and predominantly male (52%). Our patient population had significant tobacco use (32.4%) and comorbidities including diabetes (16.7%), hypertension (48.8%), functional dependence (6.3%), and ASA Class 3/4 (70.2%). Of note, patients with preoperative albumin < 3 had a lower average TPA than those above 3 (16.5 vs. 19.8 cm^2, p<0.001). We performed the majority of our operations without an ostomy (55%), electively (60%), and with an open approach (62%). Our average length of stay was 9.8 days. When we examined NSQIP morbidities, there were differences in TPA for mortality (15.1 vs. 18.8 cm^2, p=0.13), postoperative transfusion (16.3 vs. 19.1 cm^2, p<0.01), and respiratory failure (16.2 vs. 18.9 cm^2, p=0.03). When we examined discharge disposition, patients who went to rehab or a skilled nursing facility also had a lower average TPA than patients who went home (15.6 vs. 19.1 cm^2, p = 0.03).

Conclusions/Discussion: In conclusion, we demonstrate that the TPA is an appropriate surrogate for deconditioning. Decreases in TPA were associated with worse NSQIP outcomes.

AMBULATORY COLECTOMIES – ARE THEY POSSIBLE?

QS509

M. Harmouch
Houston, TX

Purpose/Background: To evaluate the safety and short-term outcomes of same day discharge after segmental colectomy. Current data suggest that the implementation of a minimally invasive approach along with a well-developed enhanced recovery program allows for faster recovery, quicker return of bowel function, and decreased length of hospital stay. In addition, a multi-modal pain regimen has decreased the need for narcotics as the cornerstone of pain management which further hastens the return of bowel function. The implementation these protocols has allowed for same day discharges after elective segmental colectomy

Methods/Interventions: Between August 2019 and November 2019, all patients undergoing robotic assisted laparoscopic elective segmental colectomy were included if they meet the following criteria: first case of the day, segmental resection, and absence of an ostomy. Discharge criteria included stable labs, tolerating full liquid or soft diet, pain controlled without need for IV narcotics, and unremarkable abdominal examination.

Results/Outcome(s): 10 patients were included (5 men). Segmental colectomy (3 right hemicolectomy, 3 sigmoid and 4 LAR) were completed robotically in all patients. Median operative time was 188min (range 118 – 280) and median console time was 89 min (range 27 – 146). 7 of 10 patients were successfully discharged on the day of surgery. 2 patients stayed overnight secondary to drowsiness after the procedure and 1 patient stayed two days as she sustained a minor ankle fracture from a fall at home the morning of her surgery. Readmission rate was 0%. Morbidity rate was 10 % which included a blister at trocar incision site. Mortality rate was 0%. No patients required narcotics at discharge and 8 of the 10 patients

had completely narcotic free hospitalizations (including the operation). Average maximum pain score after surgery was 5.5 (range 1-8). Bowel function was also assessed after surgery. Four patients had return of bowel function (either flatus of bowel movement) prior to discharge. On follow-up, all patients had full return of bowel function by POD 3. On average patients passed gas on POD 0.56 and stool on POD 1.22, respectively.

Conclusions/Discussion: Implementation of a comprehensive enhanced recovery protocol can allow for safe same day discharge in patients undergoing segmental colectomy for benign or malignant etiology. In addition, narcotic sparing or narcotic free hospitalization is feasible using a multimodal pain regimen. Given the success of this pilot project, all patients undergoing segmental colectomy, regardless of start time, will be considered for same day discharge. A longer follow-up and larger cohort are needed to validate our results.

HAS MINIMALLY INVASIVE SURGERY CHANGED OUR SELECTION FOR THE SURGICAL APPROACH TO RECTAL PROLAPSE?

QS520

V. Kurbatov, B. Resio, W. Longo, H. Pantel
New Haven, CT

Purpose/Background: Surgical treatment of rectal prolapse traditionally involves either an abdominal or perineal procedure, with the latter often reserved for those with more comorbid conditions. It has been suggested that robotic assisted and minimally invasive (MIS) approaches are becoming more common in older and ill patients. The purpose of this study was: (1) to examine changes over time in the surgical approaches to rectal prolapse, whether they be perineal or open or MIS, (2) in less fit patients has an MIS approach increased with less perineal procedures, and (3) is the morbidity and mortality increased by either approach.

Methods/Interventions: The American College of Surgeons National Quality Improvement Program was reviewed from 2006 to 2017 for patients undergoing rectal prolapse surgery. Patients were divided into groups based on current procedural terminology codes into either perineal or MIS abdominal or open abdominal approach. A subgroup of patients with American Society of Anesthesiologists (ASA) classification ≥ 3 was also examined. The primary outcome was yearly percent of procedures by each approach which was tested for significance using a linear regression model. Rates of mortality and postoperative complications by approach were also examined for the entire cohort and in those with an ASA ≥ 3 and compared with a chi-squared test.

Results/Outcome(s): During the study period 10,685 patients underwent operative treatment of rectal prolapse with 5,863 perineal, 2,769 MIS, and 2,053 open abdominal operations. Overall 5,553 (52%) had an ASA ≥ 3. Linear regression showed no change in yearly rates of perineal procedures for the entire cohort. Among those with ASA ≥ 3 there was a significant decrease (-7%) in yearly rates of perineal procedures. For MIS prolapse repairs there was a significant increase (+200%) in yearly rates, which was also seen (+342%) in the ASA ≥ 3 cohort. Conversely for open abdominal approaches there was a significant decrease (-62%) in yearly rates for the overall population and those with an ASA ≥ 3 (-48%). Postoperative mortality was highest in the perineal group compared to both abdominal groups (1%, 0.5%, 0.3%, $p<0.01$) for the entire cohort, and lowest for MIS compared to open or perineal approaches (0.4%, 1%, 2%, $p<0.01$) in the ASA ≥ 3 group. Major postoperative complication rates were lowest in the MIS group compared to both open and perineal approaches (3%, 5%, 5%, $p<0.01$) in the entire cohort, and no different in the ASA ≥ 3 group.

Conclusions/Discussion: In less fit patients over time the surgical approach to rectal prolapse has changed, with perineal procedures becoming less common and an increase in MIS abdominal procedures. This has been

QS509

Procedure	Reason	LOS	OP time	Console time	Max Pain	Total Narcotics (mg IV dilaudid)	Narcotic Free	Same day discharge
Sigmoid	diverticulitis	0	2:42	1:17	6	0	y	y
LAR	Cancer	0	2:07	1:07	4	0	y	y
Right	Polyp	0	3:12	NA	4	0	y	y
Sigmoid	Diverticulitis	0	2:54	1:18	1	0	y	y
Right	polyp	2	3:17	1:55	8	0.3		
Sigmoid	Diverticulitis	1	1:58	0:27	7	0.8		
LAR	Cancer	0	3:57	2:04	8	0	y	y
Right	Cancer	0	3:41	NA	5	0	y	y
LAR	polyp	0	2:54	1:21	7	0	y	y
LAR	Cancer	1	4:40	2:26	5	0	y	
	Average	0.4	3:08	1:29	5.5			

accompanied by a lower mortality rate and no difference in major complications between approaches in these less fit patients. Carefully selected patients with comorbidities can be offered a MIS abdominal procedure with acceptable outcomes.

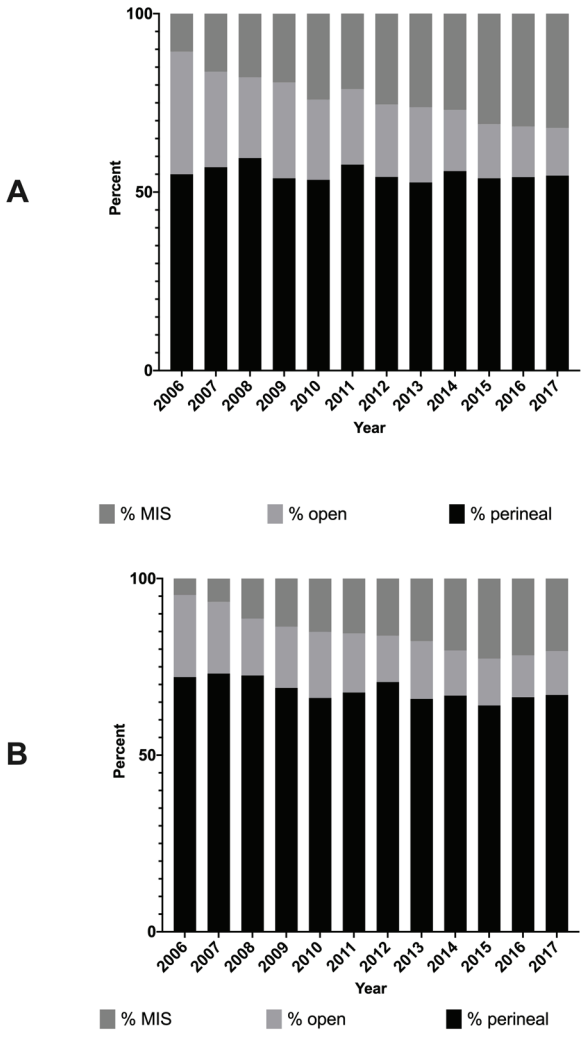


Figure 1. Yearly percent of operations for rectal prolapse by surgical approach for all patients (a) and those with ASA ≥ 3 (b).

WHICH SYMPTOMS ASSOCIATED WITH RECTAL PROLAPSE ARE MOST LIKELY TO MOTIVATE WOMEN TO SEEK MEDICAL CARE?

QS521

L. Neshatian, A. Lee, K. Arnow, B. Gurland
Stanford, CA

Purpose/Background: Rectal prolapse (RP) has a diverse symptom profile that affects patients of all ages. Our aim was to identify the bothersome symptoms and clinical presentations that motivated RP patients to seek care, characterize differences in symptom severity, and determine the factors associated with bothersome symptoms according to patients' age.

Methods/Interventions: We performed a retrospective analysis of a prospectively maintained IRB approved registry. Validated questionnaires (Obstructed Defecation Score (ODS) and Cleveland Clinic Fecal Incontinence (CCFI)), and patient-reported most bothersome symptoms (pain, discomfort, fecal incontinence (FI), mucus discharge, ODS, bleeding) were collected. We evaluated differences between younger (<65 years) and older (>= 65 years) women using chi-square, Fisher's exact tests, and Student's t-tests, and used logistic regression for symptoms association.

Results/Outcome(s): 129 consecutive women with external RP, median age of 69 (18-94), were included. CCFI>9 was reported by 86% of older and 60% of younger patients (p=0.002). However, FI was reported as a motivator for evaluation in 42% of older and 30% of younger patients (p=0.168). Patients with CCFI>9 were more likely to be bothered by FI (OR=11.9, 95% CI [2.69- 52.99], p=0.001). ODS>8 was noted in 57% of younger patients and 28% of older patients (p<0.001), but was reported as bothersome in approximately 10% of all patients with no correlation between higher ODS scores and reports of being bothersome. Interestingly, after FI, the most commonly reported bothersome symptoms were pain in older patients (38%) and discomfort in younger patients (30%). Pain and bleeding were significantly more likely to be reported as bothersome symptoms by older patients (38% vs 19%, p=0.019 and 12% vs 2%, p=0.046, respectively). Mucus discharge was commonly experienced in both age groups (72% older vs. 66% younger patients, p=0.538) but was reported as a primary bothersome symptom in only 18% of patients regardless of age. The majority of younger patients reported the presence of RP only during defecation (77% vs 57%, p=0.022) whereas significantly more older patients had RP at rest (33% vs 11%, p=0.005). Older patients more frequently sought care within 6 months of RP (29% vs 11%) whereas many younger patients waited for 1-2 years before undergoing evaluation (40% vs 20%). Nearly 20% of patients in each group had RP for more than 5 years. Increasing age and non-protracting RP at rest were independently associated with pain.

Conclusions/Discussion: Bothersome symptoms and healthcare seeking behavior related to RP are different among various age groups. Although rectal pain is often not regarded as a common symptom associated with RP, it bothers many women and motivates older women to undergo evaluation. Patient-reported functional questionnaires may not reflect bothersome symptoms and may be limited in their ability to aid individual RP management.

FEMALE PATIENTS WITH CHRONIC CONSTIPATION HAVE MORE BOTHERSOME URINARY SYMPTOMS.

QS522

M. Ortega, L. Savitt, E. Von Bargen, L. Bordeianou, M. Weinstein
Boston, MA

Purpose/Background: Chronic constipation is a highly prevalent condition, estimating to affect over 3 million adult women in the US. Given overlapping neural pathways, prior studies have shown an association between chronic constipation and overactive bladder. We hypothesized that the severity of the chronic constipation is associated with multiple urogenital symptoms in female patients. The aim of our study was to characterize urinary symptoms in women with and without constipation.

Methods/Interventions: We conducted a retrospective cohort study of women seen for initial evaluation of pelvic floor disorders at a large tertiary hospital from May 2007 through August 2019. We collected demographic, urinary and bowel symptoms, and quality of life questionnaires from electronic medical records. The Urinary Distress Inventory, short form (UDI-6) was completed by the subjects. This questionnaire consists of 6 items examining 3 subscales including stress urinary symptoms, irritative urinary symptoms, and discomfort. Constipated participants completed a Constipation Severity Instrument (CSI). We excluded women with history of bowel resection, inflammatory bowel disease or pelvic organ prolapse symptoms. The cohort was then divided into two groups constipated and non-constipated, and a comparison of urinary-associated symptoms was carried. A secondary analysis was made among constipated subjects stratified by constipation severity based on CSI scores. High CSI score was defined as participants that were above the 75th percentile (CSI score = 43). A Chi square test was used to compare categorical variables. Independent sample ttest and one way ANOVA were used when comparing continuous variables. All statistical tests were 2 sided.

Results/Outcome(s): During this period, 1492 women met inclusion criteria, 900 (60.3%) women had chronic constipation. There was no difference in age, diabetes, stroke, history of prior hysterectomy, oophorectomy, prior prolapse or urinary incontinence surgery between constipated and non-constipated participants. Women with chronic constipation were more likely to report dyspareunia, urinary hesitancy and sensation of incomplete bladder emptying ($p<0.05$). They were also more likely to have a history of hemorrhoids, anal fissures and prior posterior vaginal wall repair ($p<0.05$). Moreover, women with high CSI scores were found to have higher UDI-6 scores in comparison to low CSI scores (Table 1). In addition, constipated women who reported straining for more than 75% of bowel movements were more likely to report nocturia and perception of difficulty to empty their bladder ($p<0.05$).

Conclusions/Discussion: We found that severity of chronic constipation worsens urinary incontinence and the degree of bother from other urogenital symptoms. Given that chronic constipation can worsen urinary symptoms, our study suggests that pelvic floor specialists should assess urinary symptoms along with severity of bowel symptoms to provide comprehensive care.

TRANSVAGINAL RECTOCOELE REPAIR FOR OBSTRUCTIVE DEFAECATION SYNDROME IN A LARGE SERIES OF 215 PATIENTS.

QS523

L. Ferrari, K. Cuiñas, A. Schizas, A. Darakhshan, A. Williams
London, United Kingdom

Purpose/Background: Rectocoele is a common finding in up to 93% of asymptomatic women. When symptomatic might affect their quality of life with symptoms of obstructive defecation (ODS), straining, feeling of vaginal heaviness and dyspareunia. Surgery might be considered for small group of patients when conservative management

QS522 Table 1. Comparative analysis of urinary symptoms between High and Low CSI scores.

	Low CSI					High CSI (75th percentile score = 43)					
	N	%	Mean	SD	95% CI	N	%	Mean	SD	95% CI	p-value
UDI-6	672		9.43	6.82	8.91 - 9.94	203		10.94	7.61	9.89 - 11.99	<0.05
POPDI-6	672		39.47	32.03	37.04 - 41.89	203		59.60	32.72	55.07 - 64.13	<0.05
Sensation poor bladder emptying	337	50.83				109	53.96				0.43
Enuresis	85	12.78				28	14.14				0.62
Bladder splinting	74	11.16				41	20.81				<0.05
Pad use	179	27.33				38	19.79				0.04
Nocturia	256	38.10				87	42.86				0.22
Urinary hesitancy	175	26.28				59	29.35				0.38
Dyspareunia	140	40.00				57	51.82				<0.05

has failed. The indication for surgical treatment is predominantly based on patients' symptoms and not by the radiological findings. At least 7 different surgical procedures have been described to treat symptomatic rectocoele. Transvaginal rectocoele repair seems to be more effective to prevent recurrence, and has been our standard approach. The aim of this study is to audit our results for transvaginal rectocoele repair (TVRR) in a tertiary pelvic floor referral centre.

Methods/Interventions: Retrospective review of TVRR cases operated from October 2006 until November 2018 by 3 pelvic floor surgeons on a recorded database created by our Pelvic Floor Unit. All patients prior to surgery underwent conservative treatment to improve their defaecatory function. The results of their investigations were discussed in a multidisciplinary meeting (MDM).

Results/Outcome(s): 215 patients had a TVRR during this period. 182 (86.5%) patients had pre-operative conservative treatment with a mean number of sessions of 2.7 (range 1-9). Indications for surgery were persistent symptoms combined with identified anatomical abnormalities precluding defaecation. Main symptoms were ODS (97.2%), incomplete evacuation (98.6%), feeling of vaginal bulge (81.4%), need for vaginal splinting (46%), dyspareunia (7.9 211 (98.1%) patients had a defaecation proctography, of which 151 (71.6%) of patients had a large (more 4 cm), 58 patients had a medium (27.5%) and 2 patients had a small (0.9%) rectocoele. 24 patients (11.2%) had complications, of which 12 patients had type I in the Clavien-Dindo classification (5.6%), 4 patients had type II (1.9%) and 1 patient had a type IIIb complication (0.5%). Length of follow-up was 12.7 months (range 1.4-71.5), with post-operative symptoms improvement recorded in 188 (87.4%) and no change in preoperative symptoms in 18 patients (8.4%).

Conclusions/Discussion: Improvements on evaluation and understanding of our current surgical practice helps us to provide accurate information for patients in the consent process and help to deal with their post-surgical expectations. This allows patients to make an informed decision regarding benefits of surgery against the potential risks. One of the possible key for success is preoperative improvement of their defaecatory function through conservative measures clustered in what is commonly referred to as biofeedback. Transvaginal rectocoele repair is a safe and valid option for treatment of patients with symptomatic rectocoele leading to ODS might be considered when different conservative strategies have failed to achieved satisfactory improvements.

HOW USEFUL IS MAGNETIC RESONANCE DEFECATING PROCTOGRAPHY (MRDP) IN ASSESSING OBSTRUCTIVE DEFECATION SYNDROME (ODS)?

QS524

C. Grant, I. Tapiolas, E. Courtney
Bath, United Kingdom

Purpose/Background: MRDP is widely recognised as one of the best ways to investigate obstructive defecation type symptoms, which has, in many centres replaced the need for fluoroscopic investigation[1,2]. It offers a dynamic view of all parts of the pelvis during defecation, without the use of ionising radiation[3]. However, this is an investigation needing both equipment to perform the investigation and specialist opinion to report it. The biggest challenge with an MRDP is that it is most commonly performed in a supine position, a non-physiological position which often limits the ability of the scan to diagnose intussusception[4,5,6].

Methods/Interventions: We looked at 525 patients who underwent MRDP between 2013 and 2019 in a district general hospital. Symptoms and clinical examination were noted, along with the formal MRDP report. Further investigations and procedures relating to the symptoms were recorded, along with outcomes. We paid particular attention to the presence and grade of intussusception on MRDP compared with that when undergoing examination under anaesthesia (EUA).

Results/Outcome(s): 94% of these patients were female, and 84% had obstructed defecation symptoms. There was less incidence of faecal incontinence (30%) and pelvic pain (6%) in our cohort of patients. Not all patients underwent surgery but of those who did, and had a documented examination using circular anal dilator in their documentation, we found a large discrepancy between intussusception identified and graded by MRDP; compared with EUA .76% of those patients undergoing examination under anaesthesia, were found to have had a rectal intussusception which had been 'down-graded' by MRDP. In some instances, patients who were not noted to have rectal intussusception on MRDP, in fact had up to grade 4 rectal intussusception upon EUA.

Conclusions/Discussion: These results highlight a major limitation with MRDP for investigating patients with ODS. Under-grading a rectal intussusception is an acknowledged problem with supine MRDP[4,5,6], but could possibly be reduced by offering an open MRI scan[3], whereby the patient can adopt a physiological position, and reduce false negatives and under-grading of rectal prolapse. However, the problem with this solution is the limited availability of such scanners. These results also raise the importance of EUA in investigating and managing such patients in the pelvic floor clinic. Although, of course, EUA does not come without it's own risks, and can prove costly compared with radiological investigation. Fluoroscopic

examination has been found to lessen the discrepancy of identifying and grading rectal intussusception, but as previously mentioned, also has a number of limitations[7,8]. Therefore, in patients presenting with symptoms of ODS, it is probably worth considering a multi-modal approach to investigation if initial investigation does not correlate with severity of symptoms.

THE FATE OF SPHINCTEROPLASTY IN THE POST SACRAL NERVE STIMULATION ERA: A NATIONAL INPATIENT SAMPLE DATABASE ANALYSIS.

QS525

O. Monton, M. Alqahtani, D. Marinescu, R. Garfinkle, C. Vasilevsky, N. Morin, M. Boutros
Montreal, QC, Canada

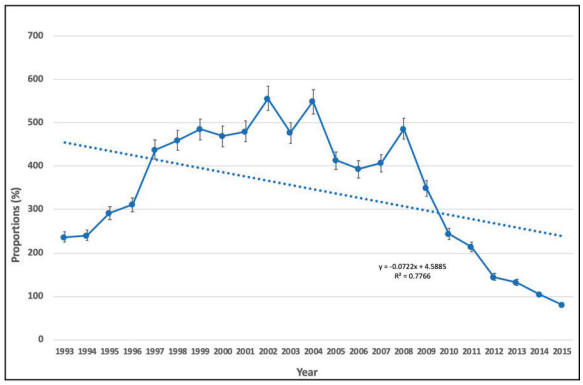
Purpose/Background: Fecal incontinence (FI) is a debilitating condition with a stable prevalence of approximately 11% in the general population. In patients who fail conservative management, sphincteroplasty has historically been the operation of choice. In 2011, sacral nerve stimulation (SNS) was approved by the Food and Drug Administration (FDA) as an effective treatment of FI. The objectives of this study were to describe the national trends in sphincteroplasty pre- and post- FDA approval of SNS for the treatment of FI, and to identify variables associated with sphincteroplasty in the post-SNS era.

Methods/Interventions: Using the Nationwide Inpatient Sample (NIS) from 1995-2016, adult patients who underwent in-patient sphincteroplasty (ICD-9-CM code: 49.79; ICD-10-PCS codes: 0DQR0ZZ, 0DQR3ZZ, 0DQR4ZZ) for FI (ICD-9-CM: 787.60, ICD-10-CM: R15) were identified. The pre-SNS era was defined as the years 1995-March 2011, while the post-SNS era was defined as April 2011-2016. Univariate analysis was performed to compare variables associated with sphincteroplasty in the pre- and post-SNS era. The rates of sphincteroplasty during the study period were assessed using linear regression. Predictors of sphincteroplasty in the post-SNS era were examined using multiple logistic regression, adjusting for relevant patient and hospital characteristics.

Results/Outcome(s): A total of 8,032 patients underwent in-patient sphincteropolasty for FI. The absolute number of sphincteroplasty procedures significantly declined over the study period, from 237 procedures in 1993 to 70 procedures in 2016 (p^{trend}=0.009) (Figure 1). There was a significant difference in the mean annual rates of sphicteroplasty in the pre- and post-SNS eras (404.8 ± 103.3 vs. 124.0 ± 52.5 procedures/year, p<0.001). On multiple logistic regression, smaller hospital bedsize (OR 1.30, 95% CI 1.00-1.70), teaching hospital and metropolitan hospital status (OR 2.09, 95% CI 1.18-3.71 and OR 1.66, 95% CI 0.92-3.01, respectively), lack of private insurance status (OR 1.36, 95% CI 1.10-1.68), non-white race (Black, OR 1.10, 95% CI 0.75-1.61; Hispanic, OR 1.70, 95% CI 1.26-2.30; Asian, OR 1.38, 95% CI 0.66-2.88; Native American, OR 2.61, 95% CI 0.63-10.77; and Other, OR 1.34, 95% CI 0.82-2.18; p=0.013]; significant severity of illness (moderate, OR 1.10, 95% CI 0.89-1.35; severe, OR 3.21, 95% CI 1.83-5.63; and extreme, OR 7.75, 95%CI 1.11-53.9; p<0.001]); hypertension (OR 1.38, 95% CI 1.11-1.70), and obesity (OR 1.61, 95% CI 1.11-2.32) were predictors of sphincteroplasty in the post-SNS era.

Conclusions/Discussion: There has been a significant decline in the number of adults undergoing sphincteroplasty as definitive treatment for FI in the post-SNS era. This suggests uptake of SNS as an effective treatment alternative for FI. Sociodemographic factors and health care practice settings are significantly associated with sphincteroplasty in. the post-SNS era.

Figure 1. Trends in Sphincteroplasty for FI (1992-2016)



SACRAL NERVE STIMULATION FOR TREATMENT OF FECAL INCONTINENCE: COMPLICATION RATES AND POST-REVISION OUTCOMES.

QS526

P. Hernandez, R. Straker, D. Murken, E. Paulson, J. Bleier
Philadelphia, PA

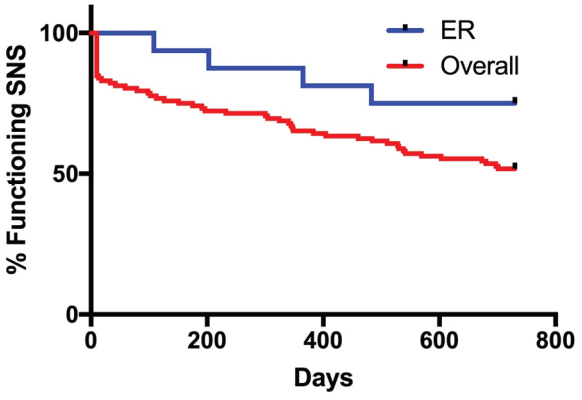
Purpose/Background: Fecal incontinence (FI) is a common and devastating functional disorder. Sacral Nerve Stimulation (SNS) is an effective treatment for FI, but a fraction of patients suffer from complications requiring stimulator explant. Currently, the data surrounding complications, rate of explanation, and success after explanation and re-implantation (ER) is limited. We conducted a retrospective study of a single surgeon's series of SNS to evaluate the complication rate, explant rate, and rate of success after ER.

Methods/Interventions: We performed a retrospective chart review of 135 patients who underwent SNS placement by a single surgeon between January 2011 and December 2016. Complications were defined as patient-reported symptoms that could be attributed to the

SNS device, or physician-documented signs of infection or device erosion. Patients who suffered complications attributed to their SNS device, those who underwent SNS explant, and those who had a re-implantation were identified. Success after first SNS placement, and post-ER, was defined ≥50% decrease in the frequency of FI.

Results/Outcome(s): Of the 135 patients, 27 (20%) reported complications. Of those with complications, radiculopathy (8, 29.6%), device infection/erosion (I/E) (8, 29.6%), and pocket pain (7, 25.9%) were the most common. 35 patients had their SNS explanted (25.9%). Among this cohort, 14 patients were explanted for complications (40%), including 7 with I/E (20%), 4 with radiculopathy (11.4%), and 3 with pocket pain (8.6%). Among the remaining explanted patients, 7 (20%) experienced lead fracture with loss of effect (LOE), 10 (28.6%) had primary LOE without lead fracture, and 4 (11.4%) required an MRI for an unrelated indication. 17 patients underwent SNS ER, including all 7 patients with lead fractures, 5 patients with I/E, and 4 patients with primary LOE. We identified 112/135 (83%) patients overall and 16/17 ER patients with at least 2 years of follow-up after initial implantation. The overall success rate at 2 years was 51.8% (58/112), while the success rate in the ER cohort at 2 years was 75% (12/16). When evaluated by indication for explant, the success rates of ER were 50% (2/4) for patients with primary LOE, 100% (5/5) in patients with I/E, and 71.4% (5/7) for patients with lead fracture.

Conclusions/Discussion: Data regarding complication rate and success after reimplantation of SNS is limited. This is the largest reported single-surgeon series of SNS focusing on this important outcome. In our cohort, 20% of patients experienced complications, but only about half of those patients required device explant. Even after device explant and re-implantation, two-year success rates were similar to those after primary implantation, irrespective of the indication for explant. This suggests that reimplantation can continue to provide FI patients with effective therapy and should be actively discussed with patients who have required explant.



NUMBER OF ELECTRODE MOTOR RESPONSES AND OUTCOMES AFTER SACRAL NEUROMODULATION FOR FECAL INCONTINENCE.

QS527

S. McChesney, J. Jorden, S. Galandiuk, C. Ellis, R. Farmer
Louisville, KY

Purpose/Background: Sacral neuromodulation (SNM) has become a first-line intervention in fecal incontinence treatment. During SNM implantation, a patient's motor responses are used to confirm adequate placement. The two key responses recorded are the following: 1) levator muscle contraction, or "bellows," and 2) plantar flexion of the great toe. These motor responses are tested and recorded with four different electrodes, however the prognostic value of incomplete motor responses is unknown. We hypothesize a motor response in all 4 electrodes is associated with decreased SNM complications.

Methods/Interventions: In a high-volume single center, we performed a chart review of all patients with fecal incontinence who underwent a two-stage SNM (n=120) from 2012 - 2019. Bellows and plantar flexion motor responses were measured across the 4 electrodes for each patient at the time of SNM implantation. We defined a successful implantation when both motor responses were elicited in all electrodes, and a non-successful implantation as anything short of a complete motor response. Patient demographic and postoperative courses were tracked for further interventions and complications. Outcomes of interest included lead revision, pocket revision, or explantation.

Results/Outcome(s): The majority, 82.5%, of patients had successful implantation. The remaining patients underwent suboptimal implantation at the time of surgery due to difficulty obtaining appropriate lead placement (body habitus, angle of sacrum, etc). Of patients implanted, 11.6% (n=14) had incomplete pelvic floor response and 13.5 % (n=19) had incomplete toe response. The overall complication rate was 22%, and non-successful implantation was more likely associated with complications: 38% vs. 18%, p=0.04, **Table 1**. When successful compared to non-successful implantation was evaluated by each outcome of interest, non-successful implantation in either pelvic (p = 0.135) or toe (p=0.064) motor function was unable to predict the type of complication the patient developed.

Conclusions/Discussion: In our cohort, complete motor response, i.e. successful implantation, was associated with less SNM revisions and fewer explantations. Yet, neither pelvic floor nor great toe motor response independently predict non-successful implantation. Further

investigation should focus on better understanding predictors and solutions of incomplete motor response during SNM implantation.

DEGREE OF FUNCTION	TOTAL % (N)	NO COMPLICATION % (N)	COMPLICATION % (N)	P VALUE	OR
INCOMPLETE MOTOR RESPONSE	17.5 (21)	61.9 (13)	38.1 (8)		
SUCCESSFUL IMPLANTATION	82.5 (99)	81.8 (81)	18.2 (18)		
TOTAL	100 (120)	78.3 (94)	21.7 (26)	0.04	2.77

COMPREHENSIVE ANATOMICAL REVIEW OF THE SUPERIOR HYPOGASTRIC PLEXUS AND ITS RELATIONSHIP WITH PELVIC SURGICAL LANDMARKS: DEFINING THE SAFE ZONE AROUND THE PROMONTORIUM.

QS528

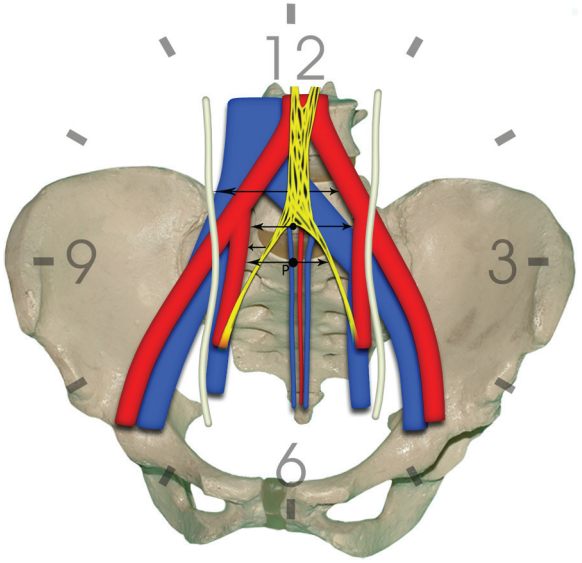
B. Kutlu, M. Guner, C. Akyol, Y. Gungor, C. Benlice, M. Ozdemir, H. Acar, A. Kuzu
Ankara, Turkey

Purpose/Background: Pelvic surgery have the inherent risk of autonomic nerve injury that leads to urinary and sexual dysfunction due to close proximity of the superior hypogastric plexus (SHP). In addition to this, mesh fixation to the promontory may also increases the morbidity. The aim of this study is to define the neuroanatomy of the superior hypogastric plexus (SHP) and identify its location and relation to vascular landmarks and ureters for pelvic autonomic nerve-preserving surgery.

Methods/Interventions: A total of 45 adult fresh cadavers (39 male) were dissected with emphasis on the SHP. Dissections were carried out in accordance with mesorectal excision technique. The SHP, hypogastric nerves, ureter, aortic, vena cava inferior and iliac bifurcations, and median sacral vessels around the promontorium were demonstrated. The distances between the SHP bifurcation and other anatomical landmarks were measured (Demonstrated in the figure by arrows). The prominent midpoint of the anterior edge of the S1 was defined as promontorium. All measurements were done with a fine caliper accurate to 0.1 mm. The whole surgical techniques were recorded with video clips.

Results/Outcome(s): Three different morphologies of SHP were observed in the present study: mesh (64.8%), single nerve (24.4%) and fiber (10.8%). SHP was located inferior to the aortic bifurcation for all the cases however, it was observed cranial to the promontorium for 80% of the cases whereas 18% of them were located caudal and only one case was located on the promontorium. SHP was located inferior to the aortic bifurcation for all the cases. While the closest vessel on the left to the SHP bifurcation was the left common iliac vein (LCIV) (86.2%, N=25) and the mean distance was 8.49 mm, on the right side it was the right internal iliac artery (RIIA) (48.2%, N=14) and the mean distance was 13.4 mm. At SHP bifurcation level, SHP was detected on the LCIV in 22 cases and on the RIIA for 10 cases for the left and right side, respectively. The distance between the SHP bifurcation and the ureters was 27.9 mm on the right; 24.2 mm on the left. The thickness of the left (LHN) and right hypogastric nerves (RHN) were 4.35 mm and 4.62 mm at 2 cm below the SHP bifurcation, respectively. LHN was on the vascular structures in 13 cases whereas RHN only in one case. The median sacral artery was located on the promontorium in 6 (13.3%) cases while 26 (57.7%) cases on the left side and 12 (26.6%) on the right side of the promontorium. The median sacral vein in 3 (7.6%) cases on the promontorium.

Conclusions/Discussion: An understanding of the location of the SHP, including its relationship with the important anatomical landmarks, might prevent iatrogenic injury and reduce postoperative morbidity in the setting of pelvic surgery.



INTERSTIM PERIPHERAL NERVE EVALUATION (PNE) FOR FECAL INCONTINENCE: FEWER COMPLICATIONS IN A SINGLE SURGEON EXPERIENCE WHILE RETAINING HIGH-FIDELITY.

QS529

T. Kaur, B. Das
Houston, TX

Purpose/Background: Sacral neuromodulation (SNM) has been an emerging technology that is a minimally invasive method for the treatment of fecal incontinence. Over the past two years and at last year's ASCRS conference, we were struck by many groups presenting substantial radiculopathy and explantation. Given increasing use of SNM, these complication rates have been mirrored in wider literature. In our practice we have not seen the same degree of complications – particularly, we commented last year upon: lead revisions, explantation, and radiculopathy. The purpose of this study was to review these complication rates of SNM by a single surgeon.

Methods/Interventions: We studied a single surgeon's experience performing SNM over the first two years with a PNE screening. 60 patients were randomly selected using a random number generator as a sample set of approximately 100 SNM procedures that were performed by one surgeon over that time; randomization was performed to eliminate chronological bias that has been mentioned in the literature across multiple disciplines. Such bias in these areas has been referenced as the change in experience in performance of SNM. Also, the sample size would allow granular review of clinic follow-up data as well as interviews and radiographic review should they be necessary. No interview or review was necessary.

Results/Outcome(s): A randomized sampling of 60 patients with fecal incontinence underwent PNE followed by implantation over 2 years. Median follow up from implantation was 12 months. All patients moved to implantation. There were no patients in whom radiculopathy was observed. We did not observe any explantation of the device as well. No lead revisions were necessary. In stark contrast to prior reports, we did not observe radiculopathy, explantation or a need for lead revision in a sizable sample set of our patient, all of whom underwent a PNE-based approach under a single surgeon.

Conclusions/Discussion: InterStim Peripheral Nerve Evaluation for fecal incontinence is a simple, efficacious method of treatment which has **NOT** proven to carry the same complication rate as we have seen in other cohorts of a similar sample size. Notably, our indications for SNM were limited to purely fecal incontinence; other colorectal colleagues with higher complications had expanded its use to constipation and other pelvic floor issues. We surmise that lead placement and indication could be a cause for higher rates of radiculopathy explantation. Subtle changes like using a straight versus curved lead placement can cause stimulation of the S2 nerve root rather than S3, leading to radiculopathy. Additionally, an initially successful placement may ultimately create radiculopathy by increasing energy of stimulation which will stimulate S2, particularly as programming of the quadripolar lead changes.

TO DRAIN OR NOT TO DRAIN: INCIDENCE AND CURRENT MANAGEMENT OF PERIRECTAL ABSCESS IN NEUTROPENIC PATIENTS.

QS530

E. Munding, L. DeCesare, S. Jochum, E. Ritz, H. Govekar, A. Bhama, T. Saclarides, D. Hayden
Chicago, IL

Purpose/Background: Neutropenia is a common admitting diagnosis amongst patients who are receiving chemotherapy or immunosuppressive treatment for a variety of cancers and diseases. During admission, patients may complain of rectal pain, or perirectal abscess or fistula (PAF) may be found incidentally on imaging. To date, there are no large studies that define incidence of PAF in neutropenic patients or guidelines for surgical management.

Methods/Interventions: Using the 2016 National Inpatient Sample Database, patients were included in the study if they had a primary diagnosis of "neutropenia" (ICD-10 codes D70.0-70.9) and a secondary diagnosis of perianal or perirectal abscess or fistula ICD-10 codes K60.3-5 and K61.0-5). This patient group was further stratified based on CPT drainage procedure codes to determine the rates of operative vs. non-operative management as a secondary outcome.

Results/Outcome(s): 40,252 patients were admitted for neutropenia and 9,677 for PAF. Only 201 or 0.50% of patients with a diagnosis of neutropenia also had PAF. The majority were male (68%) and the mean age was 47. The majority of patients were white (55.7%), 14.9% Hispanic, 12.5% black and 4.7% Asian/Pacific Islander. 17 patients were obese. Of the most common comorbidities, 48 (23.9%) patients had a coagulopathy, 29 (14.4%) had anemia and 24 (11.9%) patients had diabetes mellitus. Most (87.6%) were admitted to urban, teaching institutions; 50.8% had private insurance and 44.8% had either Medicare or Medicaid. Of the 201 patients admitted for neutropenia and PAF, 38 patients (18.9%) underwent a drainage procedure. Rates of drainage were not different by gender. Although a higher percentage of Asian/Pacific Islanders (44.4%) had drainage performed, the rates were not statistically different between races. Obesity and comorbidities were also not different for those who underwent abscess drainage. Although not statistically significant, length of stay was shorter (13.7 vs. 17.4 days, $p=0.22$) and discharge home was more frequent when patients did not undergo drainage (66.2% vs. 57.9%, $p=0.25$). The mortality rates between those who underwent drainage versus those who did not were also similar (2.63% vs. 3.68%, $p=0.75$).

Conclusions/Discussion: Patients admitted for neutropenia rarely have perirectal abscess or fistula as well, occurring in less than 1% of admissions. They were more frequently male, white, and treated at urban teaching hospitals. When perirectal infectious pathology was diagnosed, only a minority of patients underwent surgical drainage. However, both intervention and observation appeared to be safe, as mortality rates were not different. Prospective studies at high volume oncology centers may help to create guidelines for neutropenic patients with perirectal abscess and fistula.

SAFETY AND EFFICACY OF THREE-CAVITY CLEARANCE IN MANAGEMENT OF CRYPTOGLANDULAR PERIANAL ABSCESS: A MULTICENTER RANDOMIZED CONTROLLED STUDY.

QS531

X. Zhang, H. Jin
Nanjing, China

Purpose/Background: To evaluate the safety and efficacy of three-cavity clearance (TCC) in management of cryptoglandular perianal abscess.

Methods/Interventions: A multicenter, randomized, parallel and controlled study was designed and approved by the Ethics Committee of the second affiliated hospital of Nanjing University of Traditional Chinese Medicine. The study was registered in Chinese Clinical Trial register center(ChiCTR1800016958). The study was conducted in the department of colorectal surgery of the second affiliated hospital of Nanjing University of Traditional Chinese Medicine, Rugao TCM hospital, Lianyungang TCM hospital, Changshu TCM hospital and Shuyang TCM hospital. All enrolled cases were randomizedly divided into three-cavity clearance group (TCC group) and simple incision and drainage group (control group). Hospitalization time, wound healing time, postoperative pain visual analogue scale(VAS)score, anal fistula formation rate, anal incontinence(Wexner score)and abscess recurrence were compared between the two groups.

Results/Outcome(s): From Sept. 2018 to Sept. 2019, 334 patients were included in this study.162 cases were divided in TCC group and 172 cases were divided in control group. The mean age was 41.9±13.3yrs in TCC group and 39.1±13.1ysr in control group(p=0.082). The defference of the absecss position betweent TCC group and Control group was not significant(p=0.067). Tthe postoperative VAS score in day 3 in TCC group was lower than that of control group, with statistically significant difference(p=0.002). The hospitalization time was 9.0±5.4 days in TCC group and 10.4±6.1days in control group, The defference of the hospitalization time betweent TCC group and Control group was significant(p=0.049). The wound healing time was 27.1±16.4 days in TCC group and 28.2±14.1days in control group, The defference of the wound healing time was not significant(p=0.764). The anal fistula formation rate and abscess recurrence rate in TCC group were 6.2% and 1.9% respectively, while they were 18.0% and 8.1% respectively in control group (P=0.001 and P=0.009). None of the patients in TCC group and control group suffered fecal incontinence.

Conclusions/Discussion: This RCT study showed that three-cavity clearance for perianal abscess charaterized by reduced postoperative pain, reduced postoperative anal fistula formation rate, minimal anal sphincter injure, and reduced abscess recurrence. It is a safe and effective surgical method for management of cryptoglandular perianal abscess.

RAPID RECOVERY AND EXCELLENT LONG-TERM OUTCOMES WITH THE CLEFT LIFT PROCEDURE FOR PILONIDAL DISEASE.

QS532

J. Sternberg[1], E. Herrera[1], A. Adame[1], L. Goetz[2]
[1]*San Francisco, CA;* [2]*Duarte, CA*

Purpose/Background: Pilonidal Disease (PD) is a common surgical disorder with a high recurrence rate. Even though the congenital theory of PD has long been dispelled, many surgeons still treat PD with wide excisional operations in order to remove a congenital "cyst". These operations have high failure rates and morbidity. Operative failure is a large problem in the US as over 100,000 operations are performed annually with recurrence rate rates greater than 30%. While there is no accepted gold standard procedure for the treatment of PD, much evidence indicates that off-midline closure techniques are superior. The Cleft Lift Procedure (CLP) is one such technique that has been shown to have superior long-term outcomes. This paper will present a single surgeon's experience with the CLP in a clinical practice setting.

Methods/Interventions: We present data from a retrospective case series of 726 patients undergoing the CLP by a single surgeon over the last 12 years. Patients included those who were naïve to prior surgical procedures and those who had undergone up to 7 prior operations by other surgeons which didn't resolve their PD. The author used a consistent approach in each operation to yield reproducible outcomes. Short-term follow-up (4-6 weeks) was available on all patients and long-term follow-up

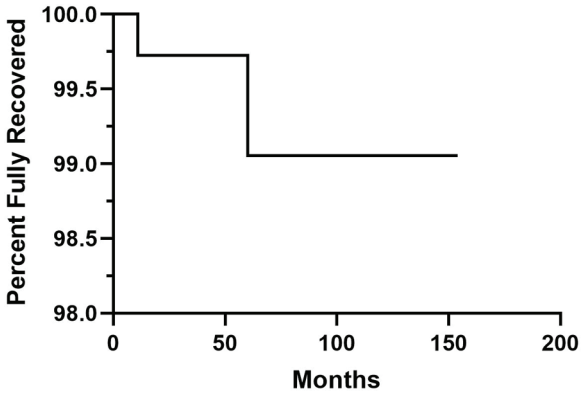
QS531 Results of the two groups after surgery

	TCC group	Control group	P-value
			TCC group vs Control group
Wound-healing time, day	27.16±16.44	28.19±14.09	0.764
Hospitalization time, day	9.03±5.44	10.46±6.06	0.049
Fistula rate, n (%)	10(6.2)	31(18.0)	0.001
Recurrence, n (%)	3(1.9)	14(8.1)	0.009
Anal incontinence, n (%)	0 (0.0)	0 (0.0)	

(6 to 154 months) was available on 60% of patients. Logistic regression for rare events was performed using R software version 3.4.0.

Results/Outcome(s): Of the 726 patients undergoing the CLP, 140 (19%) were women. Age range was 11 to 74 years. Mean age was 26.9 and the median was 25.2. 268 (37%) had at least one prior operation. Mean follow-up in months was 30 and the median was 11. Only 6 patients of the 727 (0.8%) required repeat operations for PD. All 6 had undergone 1 or more prior operations by other surgeons. 2 of the 6 (33%) failed due to extensive infection at the time of surgery. 2 patients had dead space that couldn't be eliminated at the first operation and were successfully repaired in a staged approach. 2 patients developed "true" recurrent PD with recurrent midline natal cleft pits. In all cases, these patients were re-operated on, healed, and have not experienced any ongoing issues related to PD. At the follow-up 4-6 weeks after surgery, 90% of subjects had returned to full activity. At 3 months 100% of patients were back to full activity including 9 patients who had small residual wounds that took up to 11 months to completely heal. Logistic regression for rare events did not show any significant association between recurrence and complexity of disease, BMI, sex, prior operations, or number of prior operations.

Conclusions/Discussion: In this large series, the CLP is a curative operation for PD even in difficult recurrent cases. While performing the CLP in a reproducible manner requires time and experience, it should be examined as the standard surgery for PD.



DOES PREOPERATIVE ANTIBIOTICS REDUCE THE INCIDENCE OF POSTOPERATIVE SURGICAL SITE INFECTIONS IN ANORECTAL SURGERY?

QS533

A. Almusaileem, S. Al Ben Ali, F. Jeragh, M. Hassan, K. Alyatama, F. Abdul Raheem, J. Alabbad
Jabriya, Kuwait

Purpose/Background: Surgical site infections (SSI) following anorectal surgery are infrequent but can lead to substantial morbidity in case they occur. It is difficult to quantify the exact rate of SSI following anorectal surgery as the wounds are expected to be colonized by bacteria and transient postoperative bacteremia is not uncommon. SSI may manifest as mild cellulitis, perianal discharge, abscess or fulminant necrotizing soft tissue infection. There is limited evidence to support or refute the use of preoperative prophylactic antibiotic prior to elective anorectal surgery. The aim of this study was to determine whether preoperative prophylactic antibiotics reduce the incidence of SSI after elective anorectal surgery.

Methods/Interventions: A retrospective study of adult patients who underwent 3 common anorectal surgeries: excisional hemorrhoidectomy, anal fistulotomy, or lateral internal sphincterotomy at Mubarak Al Kabeer Hospital in Kuwait between January 2015 and July 2019. Data collected included patients' demographics, comorbid conditions, and preoperative antibiotic use. Patients were grouped into group 1 (patients who did not receive prophylactic antibiotics) and group 2 (received prophylactic antibiotics). The primary outcome was the development of SSI within 30 days of surgery.

Results/Outcome(s): Two hundred and ninety-four patients were included in this study, 86 patients in group 1 and 208 patients in group 2. Table 1 summarizes the patients' characteristics. There were no differences between the 2 groups with regards to age, sex, procedure performed, or comorbid conditions. Overall, 28 patients developed SSI (9.52%). Seven patients (8.1%) from group 1 and 21 patients (10.1%) from group 2, $p=0.669$. Of note, none of these SSI were clinically significant as none of the patients required any intervention besides local wound care with or without antibiotics.

Conclusions/Discussion: Prophylactic antibiotics for elective anal surgery did not alter the postoperative SSI rate with most SSI being clinically insignificant. Prophylactic antibiotics prior to elective anorectal surgery can be safely omitted.

	Group 1 N=86	Group 2 N=208	p-value
Mean Age (SD)	39.10 (12.06) years	40.62 (11.48) years	0.220
Mean follow-up time (SD)	82.6 (238.59) days	95.47 (237.13) days	0.965
Sex			
Male	54 (62.8%)	137 (65.9%)	0.687
Female	32 (37.2%)	71 (34.1%)	
Procedure			
Hemorrhoidectomy	38 (44.2%)	81 (38.9%)	0.518
Fistulotomy	22 (25.6%)	67 (32.2%)	
Lateral internal sphincterotomy	26 (30.2%)	60 (28.8%)	
Diabetes Mellitus	7 (7.1%)	10 (4.8%)	0.280
Crohn's disease	0	3 (1.4%)	0.558
Smoking	25 (29.1%)	68 (33.0%)	0.582
Steroids	0	1 (0.5%)	1.00

UTILITY OF ROUTINE PREOPERATIVE LABORATORY TESTING AMONG LOW-RISK PATIENTS IN ELECTIVE ANORECTAL SURGERY.

QS534

S. Kling, G. Taylor, M. Philp, H. Ross, L. Kuo
Philadelphia, PA

Purpose/Background: Routine preoperative laboratory testing (PLT) is not recommended for patients designated American Society of Anesthesiologists (ASA) classification 1 or 2. Despite this recommendation, a majority of PLT in other low-risk ambulatory surgery settings. However, abnormal results are not associated with postoperative complications. This has not been studied in patients undergoing elective outpatient anorectal surgery. Using the American College of Surgeons National Surgical Quality Improvement Program (NSQIP) database, we examined the utilization of PLT in patients who underwent elective anorectal surgery.

Methods/Interventions: The 2015-2017 NSQIP databases were queried for elective ambulatory anorectal surgeries. ASA 1 and 2 patients were included. Laboratory testing was defined as chemistry, hematology, coagulation, or liver function studies obtained within 30 days preoperatively. Patient demographics, comorbid conditions, and postoperative outcomes (return to the operating room, wound complications, NSQIP-defined major complications, 30-day readmission, and death) were compared between those who did and did not receive PLT. Multivariate regression analysis determined patient characteristics predictive of receiving PLT.

Results/Outcome(s): Of 2,730 patients studied, 1,390 (50.9%) received PLT. Patients who received PLT were more likely to be Black or Hispanic (14.1% vs. 10.9% and 10.5% vs. 9.0%, p=0.02), older (mean age 47.7 vs. 43.2, p=0.00), or to have one or more comorbidity (52.6% vs. 40.1%, p=0.00) than patients without PLT. In multivariate analysis, older age, Black or Hispanic ethnicity, and the presence of at least one comorbidity were predictive of receiving PLT. Complications occurred in 123 (4.5%) patients. The overall complication rate was similar between patients who received PLT and those who did not (5.2% vs. 3.8%, p=0.08). There were no differences in the rates of return to the operating room, wound complications, major complications, readmission or death between the two cohorts. Of patients receiving PLT, there was no difference in the overall complication rate between those with abnormal versus normal results (5.8% vs. 4.4%, p=0.27). This similarity persisted for labs performed on the day of surgery (12.0% vs. 7.6%, p=0.19).

Conclusions/Discussion: Preoperative laboratory testing is performed in over half of ASA 1 and 2 patients receiving elective anorectal surgery. Postoperative complications are infrequent in this population. There was no difference in the rate of postoperative complications between patients who did and did not receive testing, nor between patients with normal and abnormal laboratory results. Furthermore, there was no difference in the rate of postoperative complications in patients with abnormal versus normal labs when performed on the day of surgery. These results suggest that preoperative testing can be used more judiciously in low-risk elective anorectal surgery.

IS A LATERAL INTERNAL SPHINCTEROTOMY NECESSARY AFTER FISTULOTOMY IN A FISSURE/FISTULA COMPLEX?

QS535

S. Diaz[1], B. Morgan[4], A. McClure[2], J. Hain[3]
[1]*Waterford, MI;* [2]*Ann Arbor, MI;* [3]*Sterling Heights, MI;* [4]*Wyandotte, MI*

Purpose/Background: Fissure-fistula complex is a poorly described condition that occurs when a patient with a chronic fissure develops an associated fistula. Our hypothesis is that when the infectious fistula component of this complex is addressed with a simple fistulotomy, the amount of sphincter sacrificed will be sufficient to address the hypertonicity associated with the original fissure pathology. This would eliminate the need for a lateral internal sphincterotomy and its inherent risk of incontinence. Currently, there is a paucity of surgical literature and no guidelines regarding the management of a fissure-fistula complex.

Methods/Interventions: We conducted a retrospective, multi-institutional study utilizing several colorectal surgical practices in southeast Michigan, analyzing data from 2000-2019. Patients included in the study were those who presented with a fissure-fistula complex and underwent only simple fistulotomy at the time of their initial surgery. Charts were reviewed for age, sex, race, tobacco use, previous anorectal surgery, location of fissure/fistula complex, classification of fistula, surgical complications, post-operative incontinence, and need for additional anorectal surgeries. The primary outcome was the necessity of a lateral internal sphincterotomy after initial surgery.

Results/Outcome(s): Our study included 49 patients with fissure-fistula complexes. The average age of the patients was 45 years old. There were 23 female patients and 26 male patients. The majority (92%) of the patients had no previous anorectal surgery with two patients having a prior incision and drainage of an abscess and two patients having a previous fistulotomy. The majority (92%) of patients had a posterior fissure complex. 26 patients (53%) had an intersphincteric fistula and 23 patients (47%) had a superficial transphincteric fistula. There were three patients who had a post-op abscess requiring drainage. Our average follow-up period was 51 days. Only 1 patient required a lateral internal sphincterotomy after fistulotomy for resolution of fissure. 98.0% (95% CI, 89.1, 99.9) of patients healed their fissure after fistulotomy without lateral internal sphincterotomy.

Conclusions/Discussion: Our study demonstrates that in patients with a fissure-fistula complex, there is likely no need for lateral internal sphincterotomy at the time of initial surgery.

EFFECTS OF ANAL FISTULA PLUG ON POSTOPERATIVE ANAL FUNCTION IN PATIENTS WITH TRANSSPHINCTERIC PERIANAL FISTULAS.

QS536

Y. Tao, H. Jiagang, Z. Wang
Beijing, China

Purpose/Background: To evaluate the effect of anal fistula plug on postoperative anal function in patients with transsphincteric perianal fistulas, and assess the factors that may affect anal function.

Methods/Interventions: From August 2008 to September 2012, patients with transsphincteric perianal fistulas who were treated with anal fistula plug in Beijing Chaoyang Hospital were followed up. Wexner score were used to evaluate pre- and postoperative anal function, and the clinical data were analyzed statistically.

Results/Outcome(s): The study population comprised 207 patients treated with anal fistula plug for transsphincteric perianal fistulas. 123 patients (69 patients were healed and 54 patients were unhealed) were followed up. The average follow-up time was 8 years(75 ~ 119 months), and the follow-up rate was 60%. Compared with preoperative, postoperative scores of flatus incentinence, liquid incontinence, alteration in lifestyle and total score were increased significantly ($P<0.05$). Among them, the score of flatus incentinence, alteration in lifestyle and total score in the healing group were significantly higher than those before surgery ($P<0.05$); the score of flatus incontinence, liquid incontinence, solid incontinence, alteration in lifestyle and total score in the unhealing group were significantly higher than those before surgery($P<0.05$). Univariate analysis shows that the decline of anal function was significantly associated with body mass index (BMI), preoperative fasting blood glucose, history of alcohol abuse, distance between the external opening and the anal verge, and operating time ($P<0.05$). Logistic regression analysis shows that increased BMI or increased distance between the external opening and the anal verge are risk factors for postoperative decline in anal function.

Conclusions/Discussion: Although the treatment of anal fistula plug is a minimally invasive surgery, it will also lead to postoperative decreased anal function. With the increase of BMI or the increase of the distance between the external opening and the anal verge, postoperative anal function decline is likely to occur. Therefore, more attention should be paid to the protection of anal sphincter during the surgery.

LIGATION OF INTER-SPHINCTERIC FISTULA TRACT (LIFT) WITH OR WITHOUT PLATELET RICH PLASMA (PRP) INJECTION IN MANAGEMENT OF HIGH TRANS-SPHINCTERIC FISTULA-IN-ANO: A PROSPECTIVE RANDOMIZED STUDY.

QS537

K. Madbouly[1], W. Omar[2]
[1]*Alexandria, Egypt;* [2]*Mansoura, Egypt*

Purpose/Background: Success rate after ligation of the intersphincteric fistula tract (LIFT) ranges from 40 to 75 %. Platelet-rich plasma (PRP) is hypothesized to improve healing by slowly releases growth factors and it had 30-40% success rate in treatment of fistula in ano in previous studies. Objective was to assess the success rate of combining (LIFT) with adjuvant local injection of PRP in management of high transsphincteric fistula-in-ano (TS-F)

Methods/Interventions: This was a prospective randomized study. Patients with (TS-F) involving > 50% of anal sphincter were included. Exclusion criteria were age <18 years, recurrent, secondary anal fistulae and active sepsis. Clinical examination, and anal MRI were done preoperatively. Patients were randomized to either (LIFT) or LIFT with adjuvant local injection of PRP (LIFT-PRP). In LIFT group, the fistula tract was double ligated and divided in the intersphincteric space. The external opening induration was excised. In LIFT-PRP group, LIFT was done first, then 2 ml of autologous PRP solution was injected into the internal opening at the submucosal level and 2 ml injected in small aliquots along the wall of the fistula tract. PRP gel was injected via the external opening to fill the outer segment of the tract. All patients were discharged on the same day. Patients were examined by a specialist coloproctologist after 2 weeks then after 1, 3, 6, and 12 months. The primary end point was successful fistula closure without recurrence after 1 year. Secondary end points included continence status by using the Wexner score, and quality of life using Cleveland Global Quality of life score (CC-QOL).

Results/Outcome(s): There were 92 patients (46 in each group). Both groups were matched regarding age and gender distribution. Primary healing was achieved in 38 patients in LIFT group vs. 39 in LIFT-PRP (p= 0.99). Mean primary healing time was 27.6 days in LIFT group vs 22.1 days in LIFT-PRP (p = 0.21). After 1 year, complete healing without recurrence was achieved in 29 patients in LIFT group vs 36 patients after LIFT- PRP (p = 0.05). All adverse events were minor and no patient experienced a negative impact Wexner continence score postoperatively in either group. There was no significant difference between groups regarding CC-QOL (p = 0.8 and 0.9 after 4 and 12 weeks). However, after 1 year, LIFT-PRP patients had significantly better CC-QOL (p=0.04). Study is limited by the relatively short follow-up.

Conclusions/Discussion: Combining LIFT with local injection of PRP for the treatment of (TS-F) is a promising treatment modality and seems to establish a high healing and significantly less recurrence rate compared to LIFT alone. In the current study, there were no significant difference as regard, complication, incontinence rates and early QOL score. However, after 1 year, QOL is significantly better with LIFT-PRP

INCREASING EXPERIENCE WITH LIFT PROCEDURE IN CROHN'S DISEASE PATIENTS WITH COMPLEX ANAL FISTULA.

QS538

T. Wood, A. Mujukian, K. Zaghiyan, P. Fleshner
Los Angeles, CA

Purpose/Background: Background Surgical management of anal fistulas in Crohn's disease (CD) is associated with high failure rates, and treatment options are limited due to ongoing proctitis, multiple tracts, and concern for incontinence and non-healing wounds. Ligation of the intersphincteric fistula tract (LIFT) is an attractive option in CD as it has little effect on anal continence and the perineal wound is small. Our initial report of LIFT in CD showed initial healing rates of 67% (n=15; average length of followup 11 months) which declined in our followup report to 48% (n=23, average length of followup 23 months). We postulated that the development of expertise in performing LIFT would be associated with higher rates of fistula healing in CD. **Objective** To investigate the healing rate of LIFT for anal fistulas in CD and identify prognostic factors for healing.

Methods/Interventions: Methods Prospectively generated clinical profiles of consecutive CD patients undergoing LIFT by two colorectal surgeons for anal fistulas between March 2012 and September 2019 at a single center were reviewed. Patients were classified into 2 groups (healed or failed). Fistula healing was defined as closure of external wounds, cessation of drainage and

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	Study Cohort (n=46)	Healed (n=30)	Failed (n=16)	p-value
Age at surgery (yrs)	34 (13)	32 (13)	38 (11)	0.17
Gender (male)	18 (40)	13 (43)	5 (31)	0.53
Disease duration (yrs)	14 (10)	13 (11)	15 (9)	0.45
History of smoking	13 (27)	5 (17)	8 (50)	0.04
History of proctitis	33 (67)	21 (70)	12 (75)	1
Proctitis at surgery	21 (43)	11 (37)	10 (63)	0.12
Disease Location	-	-	-	-
Small bowel/Ilecocolic	23 (47)	16 (53)	7 (44)	0.76
Colorectal	23 (47)	14 (47)	9 (56)	0.75
Type of Fistula (%)	-	-	-	-
Transsphincteric	35 (76)	24 (80)	11 (69)	0.48
Anovaginal	10 (22)	5 (17)	5 (31)	0.28
Pouch-perineal	1 (2)	1 (3)	0	1
Preoperative biologics	29 (59)	19 (63)	10 (63)	1
Prior surgical repair	13 (27)	8 (27)	5 (31)	0.74
Preoperative seton	38 (78)	23 (77)	15 (94)	0.23
Length of followup (mos)	33 (28)	28 (25)	41 (31)	0.12

All values expressed as mean (SD) or n (%)

absence of pain. Demographic and disease characteristics were compared between groups using Students *t* test and Fisher's exact test.

Results/Outcome(s): Results The study cohort of 46 consecutive patients had a mean age of 34 (13) years and included 18 (40%) males. After a mean followup time of 33 (28) months, fistula healing was seen in 30 (65%) patients. Mean followup time was not significantly different between the healed and failed patient groups. LIFT healing was significantly lower in cigarette smokers compared to nonsmokers (p=0.04). Other factors such as age, gender, race, disease duration and location, type of fistula history of proctitis, preoperatively use of biologics or a seton, and previous repair attempts did not appear to influence LIFT healing. Although not statistically significant, there was a trend towards increase in failure amongst patients with active proctitis at the time of surgery (p=0.12).

Conclusions/Discussion: Conclusion This is the largest series of LIFT procedure for CD anal fistulas with an average follow up of nearly 3 years. Our increasing experience with LIFT for anal fistula in CD demonstrates a higher rate of healing (67%) than previously reported (48%). Smoking appears to negatively influence healing of LIFT in CD. Patients with active proctitis may benefit from aggressive medical therapy prior to LIFT.

CLINICAL OUTCOMES OF STAPLED TRANS-PERINEAL REPAIR VERSUS TRADITIONAL REPAIR TECHNIQUE FOR RECTOVAGINAL FISTULA: A SIX-YEAR EXPERIENCE.

QS539

H. Lin[1], Q. Zhou[1], H. Chen[2], D. Ren[1]
[1]*Guangzhou, China;* [2]*Foshan, China*

Purpose/Background: Stapled trans-perineal repair is a novel trans-perineal repair technique which uses the Echelon Flex 60 Endopath stapler to dissect the fistula instead of suture[1]. This study aims to compare the effectiveness, safety and outcomes of stapled trans-perineal repair and traditional repair in treating rectovaginal fistula (RVF). Stapled trans-perineal repair is a novel trans-perineal repair technique which uses the Echelon Flex 60 Endopath stapler to dissect the fistula instead of suture[1]. This study aims to compare the effectiveness, safety and outcomes of stapled trans-perineal repair and traditional repair in treating rectovaginal fistula (RVF).

Methods/Interventions: The clinical data of patients with RVF who underwent stapled or traditional trans-perineal repair the Sixth affiliated hospital of Sun Yat-sen University between March 2013 and October 2019 was collected and analyzed retrospectively. Basic characteristics, peri-operative details and surgical outcomes were evaluated. Recurrence was defined as the relapse of any vaginal passage of feces, flatus or mucous discharge and/or appearance of the fistula tube by defecography or MRI.

Results/Outcome(s): Thirty-eight patients were included in this study, twenty-nine patients were in stapled trans-perineal repair group (group 1) and nineteen in traditional repair group (group 2). All patients were followed up for a median period of 18 months (ranged 3-68). Fistula duration time (95.97±125.2 vs 75.45±111.3, $P=0.611$) and repair history (0.59±1.01 vs 0.47±0.96, $P=0.826$) showed no significant difference between two groups. The peri-operative data including operative time (89.11±31.74 vs 82.42±33.39, $P=0.792$) and estimated blood loss (24.48±19.88 vs 30.79±21.75, $P=0.653$) also appeared no significant difference in two groups. Importantly, there was significantly less recurrence in Group 1 compared with Group 2 (4/29 (13.79%) vs 10/19 (52.63%), $P=0.008$), the survival cure drawn by Kaplan-Meier method suggest significant difference ($P=0.039$) between two groups (Figure 1A). It is noticed that the majority of recurrence occurred in the first month post-operation, owing to the wound disruption.

Conclusions/Discussion: High quality of the stapler appeared to be strong enough to with stand the normal rectal pressure, it help close the orifice on the rectal side better (Figure 1B). Our study suggest the stapled trans-perineal repair a safe and effective in the management of RVF, the novel technique could be a promising surgical option in treating RVF.

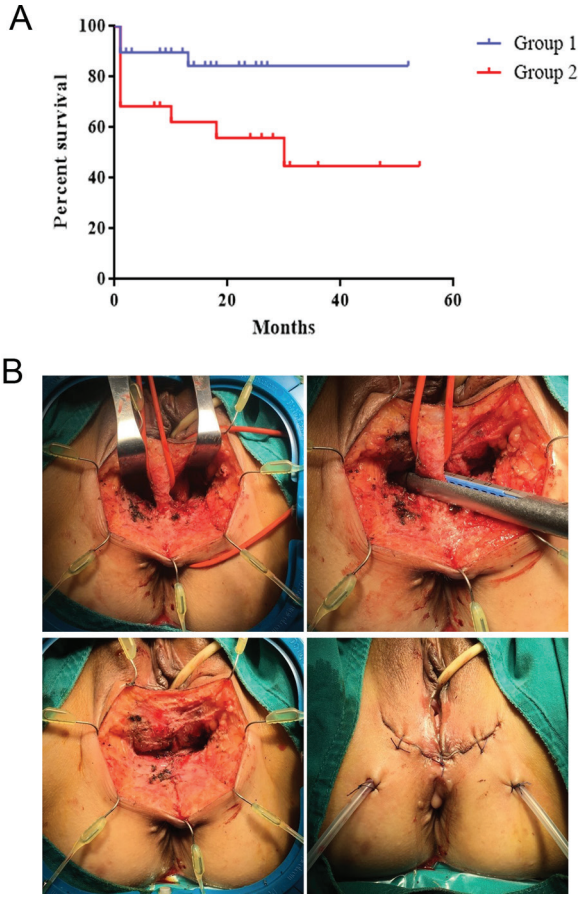


Figure 1 Stapled trans-perineal repair technique in RVF. (A) Cumulative recurrent rate stratified by surgical options. (B) The usage of stapler in the repair surgery.

WOULD LOWERING THE AGE FOR SCREENING COLONOSCOPY REALLY HELP? UNDERSTANDING THE BURDEN OF ADENOMAS IN PATIENTS <50 YEARS OF AGE WHO UNDERWENT COLONOSCOPY.

QS540

A. Pang, L. Chen, Z. Harra, N. Morin, G. Ghitulescu, J. Faria, M. Boutros, C. Vasilevsky
Montreal, QC, Canada

Purpose/Background: The incidence of colorectal cancer (CRC) is increasing in young adults, manifesting as a rise in left-sided cancers. Much of our understanding of the adenoma-carcinoma sequence is based on a screening population of older adults (≥50 years); however, we do not yet fully understand the phenotypic spectrum and burden of colorectal polyps in younger adults. Thus, decreasing the age of screening colonoscopy may not be an appropriate solution. Our aim was two-fold: (i) to characterize the incidence, location, and histology of colorectal polyps in young adults aged <50 years, and (ii) to explore predictors of adenoma formation in this population.

Methods/Interventions: After IRB approval, a retrospective cross-sectional cohort study was performed using a tertiary care endoscopy database. Study subjects included adults <50 years of age who underwent a colonoscopy with polypectomy between 2014-2019. Patients with inflammatory bowel disease and genetic syndromes were excluded. Demographic and clinical characteristics were analyzed by univariate analysis according to age. The incidence and phenotypic spectrum of polyps were similarly described. Predictors of adenoma formation were investigated by stepwise multiple logistic regression.

Results/Outcome(s): A total of 4,850 patients underwent colonoscopy, 714 (14.7%) of whom had a polypectomy performed or were diagnosed with CRC. The mean age was 43.0 ± 6.4 years, 48.5% were female, and the mean BMI was 27.5± 5.7 kg/m^2. One-third of patients reported a family history of CRC (not strictly according to guidelines) and 9.5% had a similar family history of polyps. The indication for colonoscopy was associated with age; as older patients were more likely to be scoped for screening or surveillance (p<0.001). Among patients who underwent a diagnostic colonoscopy, rectal bleeding was the most common indication (51%). A total of 1085 polypectomies were performed. Polyps were more likely to be adenomatous (59%) and located in the left colon or rectum (70%). A total of 108 advanced neoplasias and 30 cancers were identified. The detection rates of polyp, adenoma, advanced neoplasia, and cancer were 22%, 13%, 2.2%, and 0.6%, respectively. The highest detection rates were found in patients aged 45-49 years (p<0.001). Exclusion of patients with any family history of CRC or polyps resulted in an even lower adenoma detection rate (8.1%). Of the 714 patients who underwent polypectomy, age (OR=1.04, 95%CI 1.01-1.08) and BMI (OR=1.04, 95% CI 1.01-1.09) were independent predictors of adenoma detection.

Conclusions/Discussion: Adenoma detection rates were low in young adults, suggesting that lowering the age for screening colonoscopy may not yield the anticipated consequential benefit. Instead, patients who are overweight and > 45 years old, may be a more at-risk population to target for CRC screening.

Table 1. Clinical information and description of colorectal polyps found in the study population based on age.

	All ages* (n = 714)	Age 18-29 (n = 42)	Age 30-39 (n = 108)	Age 40-44 (n = 176)	Age 45-49 (n = 388)	P-value
Female, n (%))	346 (48.46)	19 (45.23)	54 (50.00)	83 (47.16)	191 (49.23)	0.848
Age, mean (+/- SD)	42.98 +/- 6.39	25.31 +/- 2.99	35.22 +/- 2.77	42.46 +/- 1.36	47.29 +/- 1.35	-
BMI, mean (+/- SD)	27.46 +/- 5.72	25.20 +/- 4.21	28.00 +/- 6.37	27.65 (5.82)	27.45 (5.58)	0.117
Family history, n (%)*	232 (32.50))	11 (26.19)	38 (35.19)	61 (34.86)	122 (31.44)	0.663
CRC ≥ 60	63	2	8	17	35	
CRC < 60	73	8	17	18	30	
Family history of polyps	68 (9.52)	3 (7.14)	13 (12.04)	20 (11.36)	32	0.614
Screening/surveillance colonoscopy, n (%)**	320 (44.88)	5 (11.90)	44 (41.12)	70 (39.77)	201 (51.80)	<0.0001
Total number of polypectomies, *n*	1085	48	153	244	640	-
Adenomas per patient	0.90	0.57	0.81	0.93	0.94	-
Polyp histology, *n (%)*						
adenoma (includes tubular, tubulovillous and villous)	508 (46.82)	20 (41.67)	65 (42.48)	137 (56.15)	286 (44.69)	0.043
sessile serrated adenoma	133 (12.26)	4 (8.33)	23 (15.03)	26 (10.66)	80 (12.50)	0.575
advanced neoplasia (HGD, adenoma/SSA>1cm)	108 (9.95)	7 (14.6)	14 (9.15)	26 (10.66)	61 (9.53)	0.883
≥ 3 polyps, *n* patients	85 (11.90)	1 (2.38)	8 (7.41)	16 (6.56)	60 (9.37)	0.008
Adenocarcinoma, *n*	30	3	5	8	14	0.918
Polyp detection rate	22.37%	8.30%	12.98%	19.30%	34.85%	<0.0001
Adenoma detection rate	13.22%	4.15%	7.46%	12.9%	19.93%	<0.0001
Cancer detection rate	0.62%	0.52%	0.42%	0.63%	0.76%	-

DOES TIME OF DAY MATTER FOR COLONOSCOPY QUALITY? A REVIEW OF OVER 13,000 SCREENING COLONOSCOPIES IN A COLORECTAL SURGERY UNIT.

QS541

I. Sapci, X. Jai, J. Wu, E. Gorgun, J. Church, S. Steele, M. Valente
Cleveland, OH

Purpose/Background: There exists conflicting data in the literature with regard to adequate adenoma detection rate (ADR) as well as other quality metrics during colonoscopy based on the time of day the procedure is performed. The aim of this study was to investigate the effect of time of day on quality metrics in patients undergoing screening colonoscopy by colorectal surgeons. We hypothesized that afternoon colonoscopies have worse bowel preparations and lower adenoma detection rates.

Methods/Interventions: Screening colonoscopies performed between January 2010 and September 2018 by twenty-eight colorectal surgeons were queried from a prospectively maintained database. Quality parameters examined were adenoma detection rate (ADR), gender-specific ADR, examination time, cecal intubation rate, withdrawal time, bowel preparation quality, and intra-procedural complications. Bowel preparations were completed according to our institutional protocol which is to give patients polyethylene glycol split-dose for morning colonoscopies and split-dose or single morning dose for afternoon colonoscopies. Colonoscopies were compared between morning (07:30-11:59 AM) and afternoon (12:00-17:00 PM) groups. Univariate analyses were conducted and Pearson's chi-square or Fisher's exact test was used.

Results/Outcome(s): There were 13,809 endoscopic screening examinations performed in asymptomatic patients older than 45 years. Patients had a mean age of 59.8 years, and 48.5% were female. A total of 8,868 (64%) of the scopes were performed in the morning and 4,941 (36%) were performed in the afternoon. Median endoscopist volume was 189 [54, 701] and included surgeons who performed both afternoon and morning colonoscopies. There was no difference in both ADR and bowel preparation quality between the two groups. Additionally, cecal intubation rate, withdrawal time, and polypectomy rates were comparable. Both groups exceeded all national quality benchmarks, with the morning group having significantly shorter examination times.

Conclusions/Discussion: In our practice, colonoscopies meet and exceed all national quality benchmarks, independent of the time of day they are performed.

QS541 Demographics and Metrics by Time of Day

	AM (N=8,868)	PM (N=4,941)	p-value
Age	60.2 ± 8.4	58.9 ± 8.1	<0.001
Gender (Female)	4,533 (51.2)	2,562 (52)	0.4
Withdrawal Time (minutes)	9 [7, 12]	9 [7, 12]	0.051
Total Scope Time (minutes)	21.7 (9.9)	22.4 (10)	<0.001
Cecal intubation (Yes)	8,747 (98.7)	4,869 (98.6)	0.64
Polypectomy rate	3,751 (42.3)	2,119 (42.9)	0.51
Adenoma detection rate	2,930 (33)	1,642 (33.2)	0.83
Adenoma detection rate (Female)	1,295 (28.6)	697 (27.2)	0.23
Adenoma detection rate (Male)	1,629 (37.7)	943 (39.9)	0.09
Excellent/good bowel preparation	8,258 (95.5)	4,662 (96.1)	0.09
Intraprocedural complications (Yes)	9 (0.1)	4 (0.05)	0.34

RADICAL EXCISION VERSUS LOCAL RESECTION FOR THE RESECTION OF PRIMARY RECTAL GASTROINTESTINAL STROMAL TUMORS.

QS542

W. Guo
Guangzhou, China

Purpose/Background: Rectal gastrointestinal stromal tumor (GIST) is a rare digestive disease that originates in mesenchymal tissues and has malignant tendencies. At present, no standard treatment has been developed, and surgical approaches and the resection scope of rectal GIST are controversial.

Methods/Interventions: The clinical, surgical, pathological and prognosis data of patients with primary rectal GIST at the Sixth Affiliated Hospital of Sun Yat-sen University from January 2008 to January 2019 were retrospectively collected. The patients were divided into the radical excision (RE) and local resection (LR) groups.

Results/Outcome(s): In all, 537 GIST cases were collected from 2008 to 2018, and 64 patients with primary rectal GIST were included in this study, including 25 cases in the RE group and 39 cases in the LR group. Tumor size ($p = 0.013$), distance from the anus ($p = 0.038$), NIH (National Institutes of Health, NIH) criteria ($p = 0.001$), preoperative adjuvant therapy ($p = 0.016$), postoperative adjuvant therapy ($p = 0.028$), blood loss ($p = 0.048$), operative time ($p = 0.020$) and duration of hospitalization ($p = 0.021$) were statistically different between these 2 groups. The mean overall follow-up time was 46 months (range, 1-122 months). Disease recurrence was observed in 12 patients. No statistical differences were observed in the 5-year DFS (disease-free survival, DFS) (93.3% vs 92.6%, $p = 0.952$) or the OS (overall survival, OS) (90.0% vs 91.6%, $p = 0.832$) between the RE group and the LR group.

Conclusions/Discussion: Our study showed that local resection has the advantages of short operation time, less blood loss and fast recovery. Moreover, local resection has a similar prognosis to that of radical excision with respect to DFS and OS. Therefore, local excision is an effective method for resection of rectal GIST, which is worthy of clinical endorsement.

ELEVATED INCIDENCE OF NODAL POSITIVITY IN SUB TWO CENTIMETER CARCINOID TUMORS OF THE APPENDIX NEGATIVELY IMPACTS OVERALL SURVIVAL.

QS543

M. Skancke, S. Sharp, S. Wexner
Weston, FL

Purpose/Background: Appendiceal carcinoid tumors are rare neoplasms of the appendix found in approximately one percent of appendectomy specimens. Historically appendiceal carcinoids < two centimeters distal to the base of the appendix were treated by appendectomy alone. The aim of this study is to better define this subject using a large observational dataset to evaluate the rate of occult nodal positivity in appendiceal carcinoid tumors.

Methods/Interventions: The 2019 National Cancer Database (NCDB) was reviewed for all cases of carcinoid tumor of the appendix (SEER Histology Code 824X). Clinically node negative disease was stratified based on primary lesion size in 5mm increments. Multivariate regression analysis was used to account for differences in preoperative characteristics and the impact of nodal positivity. The primary outcomes were incidence of nodal positivity and impact of nodal positivity on overall survival following resection.

Results/Outcome(s): We identified 2207 cases of clinically node negative carcinoid tumors of the appendix which were stratified based on size in 5mm increments. The incidence of occult nodal positivity, metastatic spread and hemicolectomy were then evaluated per size group (Figure 1). The rate of occult nodal disease was 1.9% for specimens between 0.5cm and 1.0cm, 7.0% for specimens between 1.0 and 1.5cm and 17% for specimens between 1.5cm and 2.0cm; and 35% for specimens > 2.0cm ($p<0.001$). Statistical significance of these differences was verified on post-hoc testing. After correcting for differences in comorbidities among groups, cox regression analysis indicated that a positive nodal status (N1) was associated with a 109% increase in mortality (HR 2.089, CI 1.4 to 3.11, $p<0.001$) while N2 disease was associated with a 588% increase in mortality (HR 6.876, CI 4.38 to 10.8, $p<0.001$).

Conclusions/Discussion: Clinically node negative carcinoid tumors of the appendix > 1.0cm have a higher rate of nodal positivity based on these results. Hemicolectomy should be considered for lesions > 1.0cm.

Primary Tumor Size (cm)	Nodal Positivity	Metastatic Spread	Hemicolectomy
Less than 0.5	0.85%	0.34%	68.03%
0.5 to 1.0	1.86%	0.37%	72.81%
1.0 to 1.5	7.02%	0.88%	80.70%
1.5 to 2.0	17.00%	1.00%	81.00%
2.0 to 2.5	34.93%	2.74%	97.26%
2.5 to 3.0	34.02%	5.15%	91.75%
Greater than 3.0	39.39%	11.45%	94.28%
Difference Within Groups (P)	<0.001	<0.001	<0.001

Figure 1: Univariate evaluation of nodal positivity, metastatic spread and hemicolectomy based on primary tumor size for clinically node negative appendiceal carcinoid tumors.

TRANSSACROCOCCYGEAL APPROACH IN RESECTION OF RECTAL GASTROINTESTINAL STROMAL TUMORS.

QS544

X. Qin, W. Guo, C. Li, H. Wang, H. Wang
Guangzhou, China

Purpose/Background: Clinically, resection of rectal gastrointestinal stromal tumor by trans-sacrococcygeal approach is rare. This study investigated the management and outcome of this procedure for rectal GISTs.

Methods/Interventions: This study retrospectively analyzed the cases of rectal GISTs from February 2011 to February 2018, who underwent resection of rectal gastrointestinal stromal tumors by the transsacrococcygeal approach in a specialist hospital of gastroenterology.

Results/Outcome(s): Over 8 years, 14 patients presented with a rectal GIST, including 2 patients having a local recurrence after transanal local resection surgery in other hospitals. The median age was 60 (range 26–73) years. The tumor size initially diagnosed in our hospital and before the operation was 6.5±2.1 cm and 4.2±1.7cm respectively. And 12 patients received preoperative imatinib neoadjuvant therapy and the meantime was 134 days. There were differences in tumor diameter before and after treatment with imatinib,significantly reducing mean tumor size from 6.3 (4.5 to 8.6) to 4.5 (2.0 to 6.8) cm ($P < 0.05$). Operative time was 130.2±47.4 min. Seven of the 14 patients had different degrees of postoperative complications (30 days postoperatively), and 5 patients were cured by conservative treatment. According to the modified NIH risk classification system,there were 1 case (7.1%), 2 cases (14.2%), 1 case (7.1%) and 10 cases (71.4%) in the category of very low risk, low risk, intermediate-risk, and high risk respectively. Of the 14 patients, 1 was lost to follow-up, while the others have a recurrence-free survival in the recent follow-up. All 13 patients who were well followed up have no low anterior resection syndrome one year after the operation, which means they all have a good defecation function.

Conclusions/Discussion: Currently, although the transsacrococcygeal approach is rarely used in clinical practice and may cause some complications, it can be used as an effective treatment for middle and lower rectal gastrointestinal stromal tumors.

QS544 Postoperative therapy and prognosis

Postoperative therapy and prognosis	n(%)
Postoperative adjuvant therapy	
Yes	11(78.6%)
No	3(%)
Recurrence	
Yes	0(0%)
No	13(92.9%)
Lost to follow-up	1(7.1%)
Median follow-up(month)	56
Survival rate	100%
Median follow-up(month)	
Survival rate	100%
Recurrence free survival	100%
LARS	0%

LARS : low anterior resection syndrome

RECURRENCE AND SURVIVAL OF LOCALIZED NEUROENDOCRINE TUMORS OF THE RECTUM: SINGLE CENTER EXPERIENCE.

QS545

A. Storino, D. Wong, A. Ore, I. Gaytan Fuentes, A. Fabrizio, T. Cataldo, E. Messaris
Quincy, MA

Purpose/Background: In 2010, the World Health Organization proposed that rectal neuroendocrine tumors (NETs) be categorized as malignant, yet the prognosis of small, low grade tumors is thought to be rather good. The diagnostic and therapeutic approach, specifically the role of surgery in management of rectal NETs is an evolving topic.

Methods/Interventions: Retrospective review of National Cancer Database (NCDB) was performed for adult patients with newly diagnosed neuroendocrine tumors of the rectum between 2006 and 2016 at Beth Israel Deaconess Medical Center. We hypothesized that patients with small, low grade, locally excised tumors have a low risk of recurrence and death. Kaplan Meier curve and survival analysis were used to determine risk of recurrence and 5-year survival.

Results/Outcome(s): We identified 114 patients diagnosed with rectal NETs (median age 54, 50% male). Most patients were asymptomatic and diagnosed during screening colonoscopy (65.5%), had small tumors (65.8% < 1 cm) with an intact muscularis propria on EUS (53/65, 94.6%) and were low grade (I-II, 96.6%). Lymph node and distant metastasis were found in 2.6% and 3.5% of patients, respectively. Patients were treated with local excision in 95.6% of cases, which included polypectomy or endoscopic mucosal resection (EMR) (82.5%) and transanal excision

(13.2%). Only 2.6% of patients underwent more extensive surgery with abdominoperineal resection or low anterior resection, and 6% received adjuvant chemotherapy. Of 83 patients surveilled, 5 (6%) recurred at a median time of 1.4 years (IQR 0.6 – 7.9). Death from NET occurred in 5 (4.4%) patients, all with lymph node (1/4) or metastatic disease (4/5) on presentation. Median time to death from NET was 0.8 years (IQR 0.7 – 2.4). Overall 5-year survival for patients with localized disease was 98% (95% CI 0.92 - 0.995).

Conclusions/Discussion: Most patients diagnosed with small, low grade rectal NETs can be appropriately managed with local excision by polypectomy, EMR and transanal excision with excellent oncologic outcomes. More extensive surgery may not improve oncologic outcomes in these patients. Patients with regional and distant disease appear to have a significantly worse prognosis.

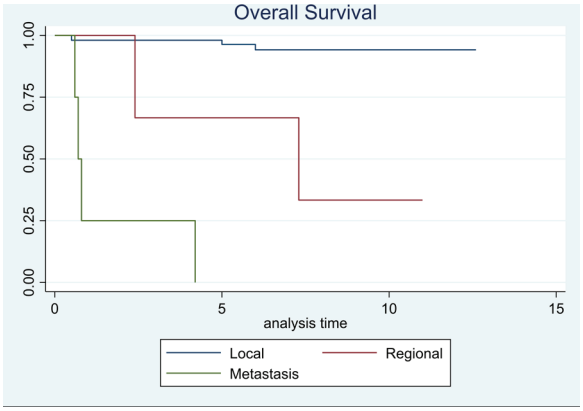


Figure 1. Overall survival estimates for patients with local, regional and metastatic disease

CHEMORADIATION WITH OR WITHOUT SURGERY IS BENEFICIAL IN THE MANAGEMENT OF PRIMARY RECTAL SMALL CELL CANCER.

QS546

R. Kalu, E. Wood, A. Tang, C. Reickert, S. Nalamati, M. Asai
Portland, OR

Purpose/Background: Rectal small cell cancer (SCC) is a rare pathologic entity comprising less than 0.2% of all colorectal malignancies. Rectal SCC exhibits aggressive biologic behavior with very poor prognosis. The reported 5-year survival is about 6%. Given the rarity and aggressiveness of this disease, there is little data to guide optimal treatment. Rectal SCC is chemo- and radio-sensitive, similar to pulmonary SCC. Hence, it is traditionally treated with chemo- and radio-therapy (CRT). Surgery may be beneficial, but its role remains to be fully elucidated. The aim of our study is to identify the treatment patterns and survival rates of patients with rectal SCC.

Methods/Interventions: Using appropriate primary site and history codes, we queried the National Cancer Database (NCDB) from 2004-2016 to identify patients diagnosed with primary rectal SCC. The patients were grouped based on their disease stage and treatment modality received. The overall, 3- and 5-year survival rates were analyzed based on these groups.

Results/Outcome(s): Of the 598 patients identified, 49% were males, 84% were Caucasian and 12% were Black; the mean age at diagnosis was 62.2 years. The majority had advanced disease – stage 3 (18.7%) and 4 (54%). The treatment modalities administered included chemotherapy alone (26%), CRT (25.8%), CRT plus surgery (11%), chemotherapy plus surgery (5%), and no treatment (11%). CRT alone or CRT with surgery was advantageous compared to no treatment or single treatment modality such as radiation therapy only or chemotherapy only. When comparing CRT with surgery and CRT alone, CRT plus surgery had improved overall, 3-year and 5-year survival rates in all stages except for stage 2 (HR 0.73-0.82). This was, however, not statistically significant, likely due to small sample size.

QS546 Hazard rate of each treatment modality compared to chemoradiation therapy including all stages.

	Overall survival, HR (95% CI)	3-year survival, HR (95% CI)	5-year survival, HR (95% CI)
No treatment	4.25 (3.14-5.76)	4.45 (3.27-6.06)	4.34 (3.20-5.89)
Chemotherapy alone	1.85 (1.45-2.35)	1.89 (1.47-2.41)	1.88 (1.48-2.39)
RXT alone	3.04 (1.89-4.88)	3.21 (1.99-5.17)	3.09 (1.92-4.96)
Surgery alone	1.00 (0.62-1.62)	0.98 (0.59-1.62)	1.04 (0.64-1.68)
Surgery+RXT	2.69 (1.36-5.29)	2.74 (1.39-5.41)	2.73 (1.38-5.37)
Surgery+CRT	0.68 (0.49-0.94)	0.68 (0.48-0.95)	0.69 (0.50-0.97)
Surgery+chemotherapy	1.12 (0.73-1.72)	1.25 (0.81-1.92)	1.17 (0.77-1.80)

RXT: radiotherapy; CRT: chemoradiotherapy; HR: hazard ratio; CI: confidence interval

Conclusions/Discussion: For patients with primary rectal SCC, CRT alone was beneficial compared to no treatment or single treatment modality such as chemotherapy or radiotherapy alone. CRT is underutilized in the care of rectal SCC and this could be improved in the future treatment. Surgery with perioperative CRT may improve survival in appropriately selected patients, and surgical resection should not be excluded solely based on diagnosis.

INCREASING INCIDENCE OF SQUAMOUS CELL CARCINOMA OF THE ANUS AND RISK FACTORS INFLUENCING SURVIVAL: A SEER ANALYSIS.

QS547

T. Liu, M. Cusick, H. Bailey, M. Snyder, E. Askenasy
Houston, TX

Purpose/Background: Anal cancer incidence is increasing in large part due to the increase in squamous cell carcinoma of the anus (SCCA). Characterizing epidemiologic trends may help to guide anal cancer screening practices and guidelines. This study evaluates the incidence and risk factors in patients with SCCA.

Methods/Interventions: 19,118 anal cancer patients from the 2000 - 2016 Surveillance, Epidemiology, and End Results Program (SEER) database were evaluated. Age, race, year of diagnosis, cancer stage at initial diagnosis, and overall survival were extracted. Cox regression for survival was used to show the correlation of independent variables affecting cancer survival.

Results/Outcome(s): Among the 19,118 anal cancer cases, 86.1% (16,459) were SCCA, 7.0% (1,332) were adenocarcinoma, and 6.9% (1,327) were other including neuroendocrine and melanoma. Between 2000 and 2016, the incidence of SCCA increased from 0.87 to 1.46 per 100,000, regional and distant disease increasing at a higher rate than localized disease. Regional disease increased 217% from 0.24 to 0.52 per 100,000; distant disease increased 230% from 0.07 to 0.15 per 100,000; localized disease increased 55% from 0.45 to 0.70 per 100,000. In 2016, incidence of SCCA was 1.16 per 100,000 among men and 1.73 per 100,000 among women, occurrence being highest in ages 45- 54. According to the Cox regression model (Table 1), the hazard ratio indicates each variables' correlation to cancer survivability. The HR shows that race, year of diagnosis, cancer stage, and gender significantly affect survivability ($p<0.05$), while the age of the patient at diagnosis has minimal impact ($p<0.005$). A later year of diagnosis shows improved survival as the HR coefficient of 0.90 indicates a negative correlation to mortality. Patients of the black race have an HR of 1.10 indicating an increased correlation to mortality. For every stage of the disease (local, regional, and distant), each additional level of advancement is associated with an HR of 2.12, indicating a strong correlation to mortality. Despite lower occurrence in men, the HR is 1.54 ($p<0.005$), indicating higher mortality.

Conclusions/Discussion: Analysis of the SEER database shows an increased incidence of SCCA in all stages: localized, regional, and distant. Despite advances in screening and prevention, more patients are diagnosed with advanced stages. However, the overall survival of patients with SCCA appears to be improving with time. Although SCCA occurrence is higher in women, the rate of survival in men is lower. While age at the time of diagnosis did not have a clinically significant influence on survival, disease stage at the time of diagnosis, male gender, and black ethnicity are risk factors. These epidemiological trends should influence anal cancer screening practices and guidelines.

REFUSAL OF CHEMORADIATION FOR ANAL SQUAMOUS CELL CANCER.

QS548

A. Fields, P. Lu, J. Yoo, J. Irani, J. Goldberg, R. Bleday, N. Melnitchouk
Brookline, MA

Purpose/Background: Anal cancer is a rare disease comprising approximately 2% of gastrointestinal malignancies. There will be an estimated 8,300 new cases of anal cancer diagnosed in the United States in 2019. Squamous cell carcinoma is the most common histologic subtype of anal cancer. The standard first line treatment for squamous cell anal cancer is chemoradiation and five-year survival often exceeds 70%. Despite this, some patients refuse chemoradiation for a variety of reasons, and the rate of refusal is currently unknown. The goal of this study is to

QS547 Table 1. SCCA Cox proportional hazards regression model

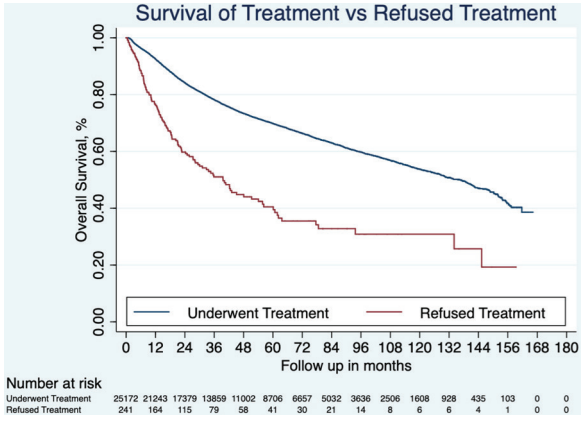
	Parameter Estimate	Hazard Ratio	95% CI LB-HR	95% CI UB-HR	p-value	Effect	Survival Rate Impact
Age at Diagnosis	0.00618	1.0062	1.0033	1	3.07E-05	Negligible	None
Race (Black)	0.097695	1.1026	1.0207	1.19	0.0132	Increased Risk	Decrease
Year of Diagnosis	-0.103919	0.9013	0.8937	0.9	< 2e-16	Decreased Risk	Improve
Cancer Stage	0.751168	2.1195	2.0162	2.22	< 2e-16	Increased Risk	Decrease
Gender (Men)	0.428646	1.5352	1.4203	1.65	< 2e-16	Increased Risk	Decrease

quantify the rate of refusal for chemoradiation and determine risk factors of refusal.

Methods/Interventions: The National Cancer Database from 2004-2016 was utilized to identify patients with stage I-III anal squamous cell carcinoma. Patients who refused chemoradiation were compared to those who underwent chemoradiation. The primary outcome was predictors of chemoradiation refusal and the secondary outcome was overall survival. Multivariable analysis was used to determine independent predictors of chemoradiation refusal and log-rank tests of propensity matched cohorts were used to determine differences in survival.

Results/Outcome(s): 25,420 patients with stage I-III anal squamous cell carcinoma were identified and 242 (1.0%) patients refused recommended chemoradiation. In multivariable analysis, age over 81 (OR: 5.0, 95%CI: 2.9-8.3, p<0.001), Black race (OR: 1.5, 95%CI: 1.0-2.3, p=0.03), Charlson score of 1 (OR: 1.5, 95%CI: 1.0-2.1, p=0.03) or 2 or greater (OR: 1.9, 95%CI: 1.3-2.9 p=0.001), and having Medicaid (OR: 2.2, 95%CI: 1.5-3.4, p<0.001) or no insurance (OR: 2.9, 95%CI: 1.7-4.9, p<0.001) were independent predictors of chemoradiation refusal. Patients were less likely to refuse chemoradiation if they had stage II (OR: 0.4, 95%CI: 0.3-0.6, p<0.001) or stage III (OR: 0.4, 95%CI: 0.3-0.6, p<0.001) disease. There was a significant decrease in adjusted five-year survival for patients who refused chemoradiation (39.3%, 95%CI: 31.7%-46.8%) compared to those who underwent recommended chemoradiation (58.3%, 95%CI: 50.4%-65.4%; p<0.001; Figure 1).

Conclusions/Discussion: Few patients refuse chemoradiation for the treatment of anal squamous cell cancer, but refusal significantly affects survival. These results can help with patient counseling while discussing treatment options. Several factors were identified that were associated with refusal of chemoradiation; further studies are needed to investigate the drivers of these predictors.



Adjusted overall survival for patients undergoing chemoradiation versus refusing chemoradiation

ANORECTAL MUCOSAL MELANOMA IN THE ERA OF IMMUNE CHECKPOINT INHIBITION: SHOULD WE CHANGE OUR SURGICAL MANAGEMENT PARADIGM?

QS549

J. Yuval, M. Adileh, S. Huang, A. Shoushtari, F. Quezada-Diaz, E. Pappou, M. Weiser, J. Garcia-Aguilar, J. Smith, P. Paty, G. Nash
New York, NY

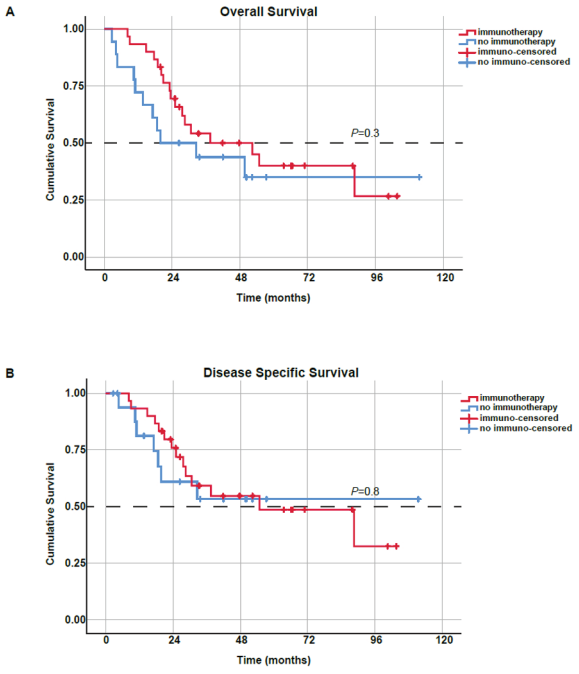
Purpose/Background: The advent of immune checkpoint inhibition (ICI) therapy has dramatically improved survival in patients with cutaneous melanoma. Survival outcomes after resection of anorectal melanoma treated with ICI have not been reported. Our aim is to compare survival outcomes following surgical resection of anorectal melanoma between patients who received ICI and patients who did not.

Methods/Interventions: We performed a retrospective analysis of data from a prospectively maintained database at a comprehensive cancer center to identify patients who underwent surgery for anorectal melanoma between 2006 and 2017. Patients were stratified according to the use of ICI.

Results/Outcome(s): Of the 48 patients included in the analysis, 30 (63%) received ICI therapy. Twenty-three (77%) of the 30 patients received ICI therapy after detection of metastasis or disease progression rather than in the neoadjuvant or adjuvant setting. Overall survival did not differ significantly between patients who received ICI therapy and patients who did not (median, 55 and 20 months, respectively; 5-year rate, 40% vs. 35%, respectively; p = 0.3). Disease-specific survival also did not differ significantly. Our analysis did not identify any clinical or pathological features associated with response to ICI therapy or with survival.

Conclusions/Discussion: ICI therapy by itself does not appear to improve survival in patients who undergo resection or excision of anorectal melanoma. Combinations of ICI with other therapeutic modalities warrant further investigation.

Figure 1. Overall and disease specific survival of patients treated with immunotherapy compared to no immunotherapy group



RATES AND PREDICTORS OF REPEAT PREOPERATIVE ENDOSCOPY FOR ELECTIVE COLORECTAL RESECTION: HOW CAN WE AVOID REPEATED PROCEDURES?

QS550

O. Hershorn, J. Park, H. Singh, K. Clouston, A. Vergis, R. Helewa
Winnipeg, MB, Canada

Purpose/Background: Despite limited endoscopy resources, repeat lower endoscopy prior to surgery is commonly practiced. In addition to delaying curative resection, it is associated with higher procedure costs, patient discomfort, and potential delays for other patients who require endoscopy. Our aim was to determine repeat preoperative endoscopy rates and factors influencing this practice at a high volume Canadian tertiary centre.

Methods/Interventions: A retrospective chart review was conducted on all patients undergoing elective colorectal resection for benign and malignant neoplasms between 2007 to 2017. Patient demographics, as well as, endoscopic and tumour related characteristics were collected. Multivariable logistic regression analysis was used to identify predictors of repeat preoperative endoscopy.

Results/Outcome(s): Of 1,062 patients identified, mean age was 68 years and 56% were male. Laparoscopic approach occurred in 59% of patients. Index endoscopy was performed by a Surgeon in 53% of cases with a tattoo localization rate of 57% at index endoscopy. We identified a repeat preoperative endoscopy rate of 29%. When stratified by lesion location, colonic lesions had a repeat preoperative endoscopy rate of 21% compared to 52% for rectal lesions. Discordance between reported anatomical segment at index endoscopy and repeat endoscopy was 19%. When comparing anatomical segment at index endoscopy to radiographic imaging, discordance was 21%. Median time to surgery for colonic lesions was 2.48 times longer for those with a repeat preoperative endoscopy ($p<0.001$). For rectal lesions, median time to surgery was 1.36 times longer with a repeat endoscopy ($p=0.003$). On multivariate analysis, male sex (OR 1.68, CI 1.19-2.34, $p=0.003$), and lesions located in the left colon (OR 2.73, CI 1.79-4.14, $p<0.001$), rectosigmoid (OR 9.11, CI 2.14-38.8, $p=0.003$), and rectum (OR 4.06, CI 2.58-6.38, $p<0.001$) were at increased odds of undergoing repeat endoscopy prior to surgery. Patients with a tattoo placed at index endoscopy were at lower odds of undergoing repeat preoperative endoscopy (OR 0.48, CI 0.34-0.68, $p<0.001$). Index endoscopist specialty was not a significant predictor of repeat endoscopy ($p=0.09$).

Conclusions/Discussion: Repeat preoperative lower endoscopy is commonly practiced and may be unnecessary if appropriate identification and documentation of lesions has been achieved. Tattooing of suspicious lesions is a key modifiable factor associated with reduced likelihood of repeat preoperative endoscopy. Despite a higher number of Surgeons performing the initial endoscopy, endoscopist specialty was not a significant predictor of increased rates of repeat endoscopy. This study highlights the need for standardized guidelines and endoscopic reporting practices given the delays that repeat preoperative endoscopy is associated with.

GENETICS COUNSELING: REFERRALS AND PATIENT ATTRITION.

QS551

T. Teetor, E. Bowen, W. Main, B. Kerner
Columbus, OH

Purpose/Background: Genetic testing has an increasing role in the screening, diagnosis, and management of colorectal cancers (CRC), with up to 6% of CRC associated with germline mutations. Screening can be directed by NCCN guidelines and revised Bethesda criteria, which has shown sensitivity as high as 82%. There have been more recent proposals to provide universal testing to all patients. The accuracy of these databases is dependent on patient participation in formal genetic counseling (GC). In this study, genetic testing referral patterns and compliance were evaluated.

Methods/Interventions: Between 2016 and 2018, 851 patients of Ohiohealth (a healthcare system in central Ohio) were retrospectively reviewed after being diagnosed with colorectal cancer. Pathologic specimens underwent immunohistochemistry (IHC) testing for mismatch repair genes (MMR). Patients were screened for recommendation

to GC based on 2 criteria: age < 50 or one of the following MMR patterns: MLH1/PMS2 absent without BRAF mutation or MHL1 hyper-methylation, MSH2/MSH6 absent, MSH6 only absent, or PMS2 only absent. Patients meeting criteria were then recommended for referral to genetic counseling and multi-gene panel testing. Additional referrals were made at surgeon discretion. Genetic counseling recommendations for referral, actual patient referrals, initial appointment completion, and genetic testing results were tracked and recorded.

Results/Outcome(s): Of the 851 patients, 58 were unable to have IHC testing (no residual tumor, incomplete tissue for analysis, outside institution, etc.). Of the 793 patients remaining for analysis, 121 patients (15.2%) met criteria to be recommended for referral to genetic counseling either by age or IHC results; 42 (34.7%) of these were never referred. 69 additional patients who did not meet inclusion criteria were referred due to patient or surgeon request. In total, 148 patients received referrals for counseling. Only 71 patients (48%) who received referrals presented for their scheduled appointment, and 77 patients (52%) who received referrals were lost to follow up for various reasons: 63 never scheduled and 14 cancelled. Of those who completed formal genetic testing, 15 patients (21%) were positive for hereditary syndromes (MLH1, MSH2, BRCA2, BRCA1, APC, ATM, PMS2, EPCAM, MSH6, MUTYH, and AXIN2) and 16 patients (23%) revealed variations of undetermined significance.

Conclusions/Discussion: Only 48% of referred patients completed their genetic counseling and 34.7% of patients who were recommended for referral never received a referral. A large number of patients who meet criteria are not sent for counseling and of those that are, less than half complete their initial appointment. This poor compliance and follow-up reveals the significant hurdles involved in genetics evaluations and the need for improved quality measures. In addition, with 44% of patients who completed genetic testing revealing a mutation, we would advocate moving towards a universal testing protocol.

A COMPUTED TOMOGRAPHY-BASED NOMOGRAM FOR PREOPERATIVE PREDICTION OF SYNCHRONOUS PERITONEAL CARCINOMATOSIS IN COLORECTAL CANCER.

QS552

Z. Yuan, H. Wang, X. Qin, H. Wang, J. Cai, W. Cao, L. Wu, L. Chu
Guangzhou, China

Purpose/Background: Peritoneal carcinomatosis (PC) of colorectal cancer remain poor and early detection is limited. The aim of this study is to develop and validate a CT-based nomogram for preoperative prediction of synchronous PC in CRC.

Methods/Interventions: The specific features of synchronous PC were extracted from arterial stage of preoperative CT scans. A CT-based model was constructed by Boruta algorithm and multivariate logistic regression in the training set and validated in test set. A nomogram based on CT model was built to predict the individual risk of PC.

Results/Outcome(s): 170 eligible CRC patients were divided into a training set (n=92) and validation set (n=78) by different time point. After data processing and partition, five items including tumor location, cT stage, distant metastasis, thickened greater omentum and pelvic nodules were enrolled into this CT-based model. In the training set, Area under curve (AUC) was 0.929(95% CI: 0.764-0.946). The sensitivity of model was 73.2% and specificity was 98.3%. The positive predictive value was 82.26% and negative predictive value was 100%. In the test set, AUC was 0.855(95% CI: 0.764-0.946). The sensitivity was 72.7% and specificity was 93.3%. The PPV was 82.35% and NPV was 88.89%. These results show high predicted accuracy in diagnosis of synchronous PC. The CT-based nomogram showed good diagnostic performance by calibration curve and high benefit by decision curves analysis in clinical decision.

Conclusions/Discussion: The CT-based nomogram has shown great potential in the detection and diagnosis of synchronous PC in CRC.

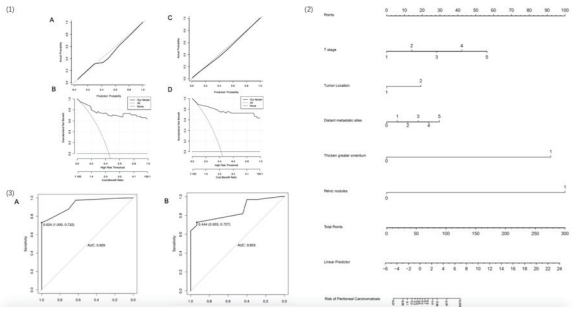


Figure (1). ROC shows high predicted accuracy of CT-based model in diagnosis of PC. (A) the AUC value in the training set in ROC curve was 0.929(95% CI: 0.764-0.946). (B) the AUC in the test set was 0.855(95% CI: 0.764-0.946).
(2). The CT-based nomogram for the risk prediction of PC. The referred score of each variable in this nomogram was 100 points. Each down line can be matched to scores according to the above reference score. The total score was 300 points. The summary of five variables represent the score of each patient, which can be matched to the risk of PC.
(3). The Calibration Curve and Decision Curve of CT-based nomogram for the prediction of PC in colorectal cancer. (A-D) the training set (A-B) and the test set (C-D).

DEVELOPMENT AND VALIDATION OF RESNET-3D BY DEEP LEARNING AND SUPPORT VECTOR MACHINE IN PREDICTION OF SYNCHRONOUS PERITONEAL CARCINOMATOSIS IN COLORECTAL CANCER.

QS553

Z. Yuan[1], T. Xu[2], H. Wang[1], J. Yao[2], X. Qin[1], J. Wang[1], J. Cai[1], H. Wang[1]
[1]Guangzhou, China; [2]Shenzhen, China

Purpose/Background: Peritoneal carcinomatosis (PC) of colorectal cancer remain difficult to be detected by current imaging tools. Deep learning and artificial intelligence (AI) involve automatic feature extraction and machine learning algorithm, and have shown great advantage in discrimination of cancers. In this study, we have created and validated a ResNet-3D algorithm by deep learning and a support vector machine (SVM) for prediction of synchronous PC in colorectal cancer (CRC).

Methods/Interventions: The preoperative contrast-enhanced CT images of primary tumor in synchronous PC were extracted and sketched. The ResNet-3D algorithm for PC differentiation was constructed in the trained set and validated in test set. The features of adjacent peritoneum were extracted to build a SVM model were constructed along with ResNet-3D algorithm. The performance of SVM to discriminate PC was measured by area under curve (AUC).

Results/Outcome(s): The training set consisted of 19,814 images from 54 patients with PC and 76 patients without PC (mean age, 55 years; 54% women). The ResNet-3D required only 34s to analyze the test images of 7,837 images of 40 test patients. The AUC was 0.764 (95% CI: 0.747-0.781) in the training set and 0.711 (95% CI: 0.700-0.722) in the validation set. To increase the accuracy of PC detection, we integrated ResNet-3D with twelve PC-specific features (P<0.05) to build the SVM system in the training set. The performance of SVM system showed 94.11% of accuracy and AUC of 0.928(95% CI: 0.912-0.944) in the test set. The sensitivity was 93.75% and specificity was 94.44%. The PPV was 93.75% and NPV was 94.44%.

Conclusions/Discussion: The SVM system based on ResNet-3D algorithm has shown high accuracy in prediction of synchronous PC in CRC.

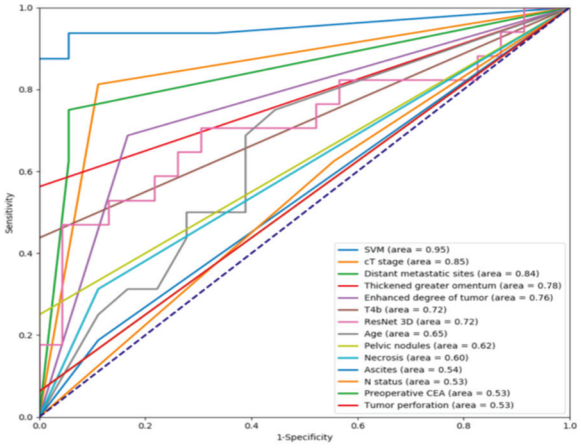


Figure 1 The SVM system by integrated ResNet-3D with thirteen PC-specific features (P<0.05) was constructed in the training set and validated in the test set. The performance of SVM system showed 94.11% of accuracy and AUC of 0.928(95% CI: 0.912-0.944) in the test set. The sensitivity was 93.75% and specificity was 94.44%. The PPV was 93.75% and NPV was 94.44%.

PATTERNS AND YIELD OF SURVEILLANCE COLONOSCOPY AFTER POTENTIALLY CURATIVE RESECTION OF COLORECTAL CANCER.

QS554

K. Brennan, M. Plourde, P. Johnson
Halifax, NS, Canada

Purpose/Background: Colonoscopy is an important component of surveillance after colorectal cancer (CRC) surgery. Most guidelines recommend that the 1st and 2nd surveillance scopes be performed one year and four years after resection, respectively. The need for colonoscopy one year after surgery is based on high rates of metachronous cancer reported in previous studies. However the evidence to support these post-operative colonoscopy intervals is limited. The purpose of this research was to examine the patterns and yield of surveillance colonoscopy after potentially curative resection for CRC.

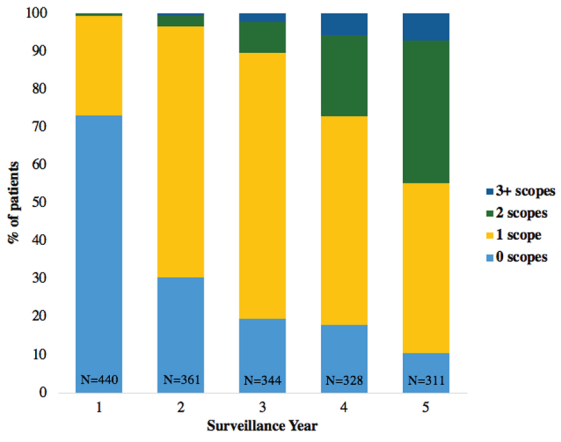
Methods/Interventions: All patients who underwent a complete pre-operative colonoscopy followed by potentially curative surgery for sporadic CRC at a tertiary care teaching hospital between June 2000 and June 2008 were identified. Detailed patient-level data were collected regarding demographics, pre- and post- operative colonoscopy exams, surgery and pathology. The rates of advanced neoplasia (local recurrence, metachronous CRC or adenoma ≥1cm) were determined.

Results/Outcome(s): During the study period, 440 patients had a complete pre-operative colonoscopy (mean age 67 years, 58% male). The most common tumor locations were right colon (48%), rectum (26%) and sigmoid (22%), and the majority of patients had stage II or III disease. After surgery 343/440 patients (78%) had at least one colonoscopy. Death (n=40), advanced age (n=26)

and metastatic disease (n=14) were the most frequent reasons for no surveillance scopes. The distribution of colonoscopy procedures per patient by surveillance year is presented in figure 1. The median time to the first colonoscopy was 13 months (inter-quartile range (IQR) 11-21) and 0.9% had a local recurrence, 0.9% had a metachronous CRC, 1.5% had adenomas ≥1 cm and 16.4% had adenomas <1 cm. The median time to the second scope was 53 months after surgery (42-68 IQR) and 0.4% had a metachronous CRC, 2.6% had adenomas ≥1 cm and 22.2% had adenomas <1 cm. The cumulative yield of surveillance colonoscopy in the first five years after surgery among patients who had one or more scopes was local recurrence in 1.4%, metachronous CRC in 1.2%, adenomas ≥1 cm in 2.7% and adenomas <1 cm in 20%. Three of the four metachronous cancers were identified at the 1st surveillance scope and likely represented missed synchronous lesions.

Conclusions/Discussion: There was substantial variation in the timing and frequency of surveillance colonoscopy after surgery for CRC. It is unclear how this may impact outcomes. Advanced neoplasia was uncommon during the 1s 5 years after surgery and the rate of metachronous CRC was lower than previously reported. In the era of high-quality colonoscopy, these data suggest that extending the time to the 1st surveillance scope or increasing the interval between the surveillance scopes may be appropriate.

Figure 1. Distribution of colonoscopy procedures performed per patient by surveillance year after potentially curative resection for sporadic colorectal cancer



COMPARISON OF SEGMENTAL TRANSVERSE COLECTOMY VERSUS EXTENDED RIGHT OR LEFT HEMICOLECTOMY FOR TRANSVERSE COLON ADENOCARCINOMA.

QS555

G. Lee[1], R. Ricciardi[1], H. Kunitake[1], C. Cauley[1], D. Chang[1], T. Francone[2], L. Bordeianou[1], R. Goldstone[2]
[1]*Boston, MA;* [2]*Newton, MA*

Purpose/Background: Important knowledge gaps remain concerning the optimal operative approach for patients with transverse colon adenocarcinoma. In this study, we compare postoperative and oncologic outcomes of patients who underwent segmental transverse colectomy versus extended right or left hemicolectomy for transverse colon cancer.

Methods/Interventions: We selected a cohort of patients who underwent resection of stage I-III transverse colon adenocarcinoma from the National Cancer Database (1/2004-12/2016). Patients who received palliative treatments and patients with prior, synchronous, or subsequent malignancies were excluded. Patient demographics and tumor characteristics were abstracted. Primary outcome measures were margin status, number of lymph nodes harvested, 30-day mortality, and overall survival. Differences in outcomes and survival were assessed using logistic and Cox regressions.

Results/Outcome(s): We identified 33,390 patients with primary transverse colon adenocarcinoma; 39.4% underwent segmental (transverse) colectomy and 60.6% underwent extended right/left hemicolectomy. Extended hemicolectomies were performed on younger patients (mean age 68.3 vs. 69.7 years old, p<0.001), with larger tumors (26.2% vs. 21.3% greater than 6 cm, p<0.001), and higher stages (21.7% vs 19.2% Stage III, p<0.001) as compared to segmental colectomy. On univariate analysis, patients who underwent extended hemicolectomy tended to have larger nodal harvests (median 18 vs 14 nodes, p<0.001), and were more likely to have adequate nodal harvests for proper staging (≥12 nodes) (83.7% vs 66.0%, p<0.001). There were no significant differences in 30-day mortality (4.0% vs 4.1%, p=0.63) or overall survival (p=0.61). On multivariable analysis adjusting for age, sex, race, Charlson comorbidity score, insurance status, income, academic status, year, tumor stage, size and grade, there were no significant differences in margin status (p=0.30) or 30-day mortality (p=0.40) based on operative type. Patients who underwent extended hemicolectomy continued to be more likely to have oncologically adequate nodal harvests (OR 2.51, 95% CI 2.24-2.81, p<0.001), which did not result in a difference in overall survival (HR 0.97, 95% CI 0.90-1.05, p=0.44).

Conclusions/Discussion: Using this nationwide tumor registry, we demonstrate that extended hemicolectomy for transverse colon cancer was associated with higher rates of adequate nodal harvests for appropriate oncologic staging,

but no significant differences in margin status, 30-day mortality, or overall survival as compared to segmental transverse colectomy. These data indicate that performance of extended colectomies in transverse colon cancer does not translate into better survival outcomes.

Table. Multivariable models of postoperative and oncologic outcomes of patients with stage I-III transverse colon adenocarcinoma, who underwent extended right/left hemicolectomy compared to those who underwent segmental (transverse) colectomy (n=33,390).

Characteristic	Segmental Colectomy (n=13,149, 39.4%)	Extended Right/Left Hemicolectomy (n=20,241, 60.6%)	Unadjusted P-value	Odds Ratio*	95% CI	Adjusted P-value
Positive resection margins	530 (4.1%)	889 (4.4%)	0.10	1.13	0.90-1.41	0.30
Positive CRM	291 (5.1%)	514 (5.5%)	0.25	1.10	0.85-1.43	0.47
Examined ≥12 lymph nodes	8,621 (66.0%)	16,852 (83.7%)	<0.001	2.51	2.24-2.81	<0.001
Positive lymph nodes	4,218 (32.1%)	6,906 (34.2%)	<0.001	0.94	0.84-1.06	0.34
Length of stay >6 days	5,492 (41.8%)	9,531 (47.1%)	<0.001	1.30	1.19-1.42	<0.001
Unplanned 30-day readmission	740 (5.8%)	1,200 (6.1%)	0.25	0.98	0.81-1.17	0.79
30-day mortality	490 (4.1%)	728 (4.0%)	0.63	1.11	0.87-1.40	0.40
90-day mortality	794 (6.7%)	1,194 (6.6%)	0.75	1.05	0.87-1.26	0.64
1-year overall survival	87.3% (86.7-87.9%)	87.6% (87.2-88.1%)	0.61	HR 0.97^	0.90-1.05	0.44
5-year overall survival	63.2% (62.2-64.2%)	62.7% (61.9-63.4%)				

CRM: circumferential resection margin; CI: confidence interval

* Multivariable logistic models adjusted for segmental colectomy versus extended right/left hemicolectomy, age>65, sex, race, Charlson score, insurance status, type of facility, regional income level, urban or rural designation, year of diagnosis, clinical stage, tumor size, and tumor grade.

^ Cox model for overall survival adjusted for segmental colectomy versus extended right/left hemicolectomy, age>65, sex, race, Charlson score, insurance status, type of facility, regional income level, urban or rural designation, pathologic stage, tumor size, tumor grade, lymphovascular invasion, margin status, lymph node positivity, and receipt of adjuvant chemotherapy.

THE MEDIAL BORDER OF LAPAROSCOPIC RIGHT HEMI-COLECTOMY WITH D3 LYMPHADENECTOMY FOR COLON CANCER: A MULTI-CENTER RETROSPECTIVE COHORT STUDY.

QS556

L. Zhou[1], Y. Sun[2], D. Diao[3], Z. He[1], M. Zheng[1], B. Feng[1]
[1]Shanghai, China; [2]Nanjing, China; [3]Guangzhou, China

Purpose/Background: The adoption of complete mesocolon excision(CME) and D3 lymphadenectomy has improved the oncological outcomes for right colon cancer patients. But the exact extent of surgical resection was still debatable, especially the medial border. The current clinical practice defined the left side of superior mesenteric vein(SMV) as the medial border. The latest anatomical findings indicated the left side of superior mesenteric artery(SMA) as the proper medial border. The aim of the study was to evaluate the perioperative and oncological outcomes of laparoscopic right hemi-colectomy with D3 lymphadenectomy along the left side of SMA by comparing with the current practice.

Methods/Interventions: Clinical data of all patients who received elective laparoscopic right hemi-colectomy for right colon cancer were retrieved for this multi-center retrospective cohort study. The SMA group consisted of patients underwent laparoscopic right hemi-colectomy by placing the medial border along the left side of SMA; the control group consisted of patients underwent laparoscopic right hemi-colectomy along the left side of SMV. Patients were excluded if they had preoperative metastasis, neoadjuvant therapy, history of prior malignancy, less than 12 lymph nodes harvested and familial adenomatous polyposis.

Results/Outcome(s): The SMA group consisted of 397 patients and the control group consisted of 365 patients. There was no significant difference observed between the two groups concerning operation time, blood loss and post-operative hospital stay. The SMA group harvested more lymph nodes than the control group(22.94±8.25 VS 20.87±6.58, p=0.000). As for the post-operative complications, the overall rate was similar but the rate of chylous leakage in the SMA group was significantly higher than the control group(8.1% VS 2.7%, p=0.001). For all patients, the 5-year overall survival and 5-year disease-free survival didn't differ between the two groups(93.7% VS 94.5%, p=0.613; 85.9% VS 86.0%, p=0.738). However, in stage III patients, the 5-year disease-free survival of SMA group was statistically higher than the control group(74.6% VS 66.7%, p=0.048). In the multivariable Cox analysis, the SMA surgery was a significant, independent predictive risk factor in stage III patients(HR=2.00;95% CI,1.25-3.20).

Conclusions/Discussion: Placing the medial border along the left side of SMA during laparoscopic right hemi-colectomy with D3 lymphadenectomy was safe and feasible, though there was an increased rate of chylous leakage. The survival outcomes were comparable to the current mainstay of laparoscopic right hemi-colectomy, but the disease-free survival in stage III patients was significantly improved.

REDEFINING COLLATERAL VASCULATURE OF THE LEFT COLON: A NOVEL CLASSIFICATION.

QS557

A. Kuzu, M. Guner, F. Kocaay, E. Ismail, M. Arslan, I. Tekdemir, H. Acar
Ankara, Turkey

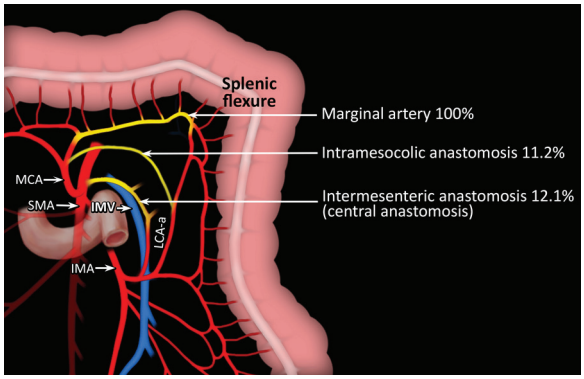
Purpose/Background: High ligation of the inferior mesenteric vein (IMV) is crucial for tension free anastomosis. However, the collateral vascular anatomy within the left mesocolon is complex and may be compromised during splenic flexure mobilisation that leads to ischemia. Moreover, the correct descriptive terminology and the classification of the vasculature within the left mesocolon is still missing. Riolan arch is a misnomer and confusing entity. The aim of the present study, therefore, is to establish a descriptive classification of the vasculature within the left mesocolon and to evaluate the arterial collateral vasculature between superior and inferior mesenteric artery (SMA, IMA).

Methods/Interventions: A total of 107 adult fresh cadavers (94 male) were dissected with emphasis on the vascular anatomy of the left colon. Dissections were carried out in accordance with low anterior resection technique. The vasculature with the left mesocolon and the collaterals between the SMA and IMA with respect to their relationship to the IMV were encountered and classified. The whole surgical techniques were recorded with audio

and video clips. Collaterals were classified into 3 different groups: Marginal anastomoses (marginal artery), intramesocolic anastomoses (parallel to the marginal artery but neither adjacent to the IMV nor close to the duodenum) and intermesenteric (central) anastomoses (next to the IMV at the level of the duodenojejunal junction and the lower border of the pancreas).

Results/Outcome(s): All have patent marginal artery. Intramesocolic anastomoses were found in 12 of the 107 cases (11.2%). A central anastomosis was observed in 13 of the 107 cases (12.1%). These central anastomoses consisted of the following types: between the accessory middle colic artery and the left colic artery (aMCA-LCA), between the left branch of the MCA and the LCA (MCAl-LCA), between the main trunk of the MCA and the LCA (MCA-LCA) and between the ileocolic artery (ICA) and the LCA (ICA-LCA).

Conclusions/Discussion: The knowledge of this new classification, normal pattern and variations of the blood supply of the left colon is crucial for the precise mesocolic excision technique and splenic flexure mobilization.



SARCOPENIA, AS ASSESSED ON COMPUTED TOMOGRAPHY, AS A PREDICTIVE FACTOR FOR CURATIVE COLON CANCER RESECTION OUTCOMES: A 5-YEAR AUSTRALIAN COHORT.

QS558

V. Chai, A. Cocco, M. Chia, M. Bhamidipaty, B. D'Souza
Melbourne, VIC, Australia

Purpose/Background: Patients affected by colorectal cancer often show signs of malnutrition and the presence of cachexia and sarcopenia correlate to poorer short and long term surgical and oncological outcomes. Computed tomography (CT) derived body composition is an easily accessible substitute for dedicated body composition scans. We hypothesised that sarcopenia, as assessed on routine pre-operative CT, can be used as a readily available predictive factor for outcomes in patients undergoing curative resection for colorectal cancer.

Methods/Interventions: The study population included all consecutive cases of curative colonic cancer resection at a single tertiary referral centre between 2014-2019. Patients who had previous or concurrent malignancy, metastatic disease or irretrievable pre-operative CT scans were excluded. Data was collected from the perioperative period as well as within a 30 day and 1-year follow-up timeframe. Skeletal muscle area was assessed on pre-operative CT images at the third lumbar vertebra level and standardised for individual height to determine skeletal muscle index (SMI). Sarcopenia was defined by the gender-specific SMI cut-offs established by Prado et al. Patient characteristics, staging criteria and perioperative data was collected, including measures of perioperative risk. Associations were determined by univariate analysis using Pearson's Chi-square and by multivariate analysis using stepwise binary logistic regression with prespecified models. Primary outcomes assessed included complications as assessed by Clavien-Dindo score (CD), anastomotic leak and both disease-free and overall survival.

Results/Outcome(s): A total of 141 patients who underwent colon cancer resection at the participating centre met inclusion criteria. Mean SMI was 41.8 cm2/m2 for males and 33.4cm2/m2 for females, with 118/140 (83.7%) sarcopenic. In univariate analysis 16/22 (72.7%) of non-sarcopenic patients compared to 105/118 (89.0%) of sarcopenic patients experienced a postoperative complication (OR 3.03, P=0.049) with a trend towards 1-year recurrence (0/21 vs 13/105 p=0.089). In a multivariate stepwise regression model including age, gender, emergency vs elective admission, CCI score, cancer stage, preoperative albumin, access type, BMI and anatomical resection site, sarcopenia was shown to be predictive of postoperative complications (OR=3.08, P=0.065). No associations were demonstrated with overall mortality, anastomotic leak or severe (CD>2) complications.

Conclusions/Discussion: The presence of sarcopenia on pre-operative CT scan and lower muscle mass assessed by SMI is independently predictive of post-operative complications. Sarcopenia represents a new modifiable patient risk factor for colonic cancer resections in patients and CT measures of skeletal muscle mass may provide an easily accessible stratification tool.

CHARACTERISTICS AND SYMPTOMATOLOGY OF COLORECTAL CANCER IN THE YOUNG.

QS559

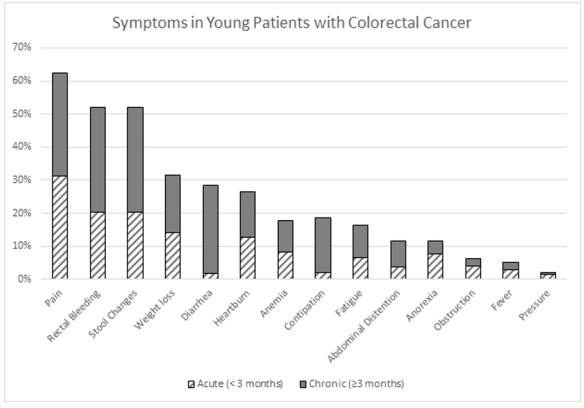
P. Zhou, M. Skalitzky, P. Goffredo, I. Gribovskaja-Rupp, M. Kapadia, I. Hassan, J. Hrabe
Iowa City, IA

Purpose/Background: The incidence of colorectal cancer (CRC) in individuals younger than 50 years of age has rapidly risen in the last decades, with studies demonstrating a predominance of left-sided cancers. To date, there has been little research on how these patients present. This study aims to delineate patient characteristics, symptomatology, overarching risk factors, and outcomes.

Methods/Interventions: A retrospective chart review identified all patients < 50 years presenting to a single tertiary-care institution with diagnosis of colorectal adenocarcinoma between 2005 and 2019. Patient, tumor, and outcome data were collected. Symptoms at presentation were evaluated: rectal bleeding, rectal or abdominal pain, rectal pressure, abdominal distention, weight loss, fatigue, change in stool habits, anemia, anorexia, and heartburn.

Results/Outcome(s): Two hundred and ninety-two patients were included with mean age 42±6 years, with 57% of patients <45; 52% were male, 86% were Caucasian, 34% had a family history of colorectal cancer, and 15% had inflammatory bowel disease. Nearly all patients (98%) were symptomatic at presentation with 86% having two or more symptoms. The most common symptoms at presentation were pain (62%), followed by change in stool habits (52%), rectal bleeding (52%), and weight loss (32%). Diarrhea was more common than constipation (29% versus 18%). Only six patients were asymptomatic with detection due to screening for family history of colorectal cancer, surveillance for personal history of another malignancy, or surveillance for inflammatory bowel disease. Of 262 patients with available symptom chronicity, 132 had symptoms lasting three months or longer prior to diagnosis. The number and duration of symptoms were similar in patients older than 45 compared to those younger, as well as those with inflammatory bowel disease compared to those without. Most cancers were left-sided (73.4%) and advanced stage at presentation (32.5% stage III, 39% stage IV). Patients with advanced stage at presentation typically had symptom duration greater than one month (78%). The mean overall follow-up was 3.0±2.4 years with an overall mortality rate of 34%.

Conclusions/Discussion: In this single institutional cohort of young patients presenting with colorectal cancer, we observed that the most common symptoms at presentation included abdominal or rectal pain, rectal bleeding, change in stool habits, and weight loss. It is essential that providers evaluating these patients be vigilant to rule out colorectal malignancy, especially in those with multiple symptoms and prolonged duration as delay in detection likely correlates with advanced stage at diagnosis.



NOVEL HYBRID PELVIC FLOOR RECONSTRUCTION USING BIOLOGIC MESH AND BILATERAL GRACILIS FLAPS AFTER ABDOMINOPERINEAL RESECTION.

V1

B. Sadowski[1], N. Ayoub[2], Y. O'Neill[2], C. Ternent[2]
[1]*Anderson, SC;* [2]*Omaha, NE*

Purpose/Background: Abdominoperineal resections, including extralevator and multivisceral resections, leave large pelvic wounds that have historically been fraught with slow or poor wound healing, seroma, dehiscence, and other complications. Delayed wound healing and wound complications have the potential to delay or prevent adjuvant therapy in advanced disease. Because of these perioperative issues, multiple methods of mesh and flap reconstruction have been previously described. Larger defects have been classically addressed by a rectus abdominis flap with or without skin. The gracilis muscle flap is another option for perineal reconstruction, but its bulk may be inadequate in large wounds. By reconstructing the pelvic floor with biologic mesh, the size of the perineal defect is decreased, improving the ability to use gracilis muscles for reconstruction. Additionally, gracilis reconstruction has the flexibility to use unilateral or bilateral flaps, depending on the volume of the cavity to be filled.

Methods/Interventions: Bilateral gracilis muscles are mobilized and harvested, preserving the vascular pedicle arising from the medial circumflex femoral artery. The cut edges of the levator muscles are identified bilaterally. A 10 x 10 cm piece of thick biologic mesh is trimmed to fit the defect. Using 0 PDS sutures, this mesh is anchored in the left anterior and right anterior locations in the urogenital diaphragm. The pelvic floor is re-created by tacking the mesh to the remnant levator muscle. The gracilis muscles are carefully pulled through the soft tissue tunnels from the leg incisions into the perineal defect. Drains are placed transabdominally on top of the mesh and as well as via transperineal route external to the mesh. The muscles are tacked to each other and to the mesh using 2-0 Vicryl suture. The subcutaneous tissues are then reapproximated in layers. Additional drains are left in the leg donor sites.

Results/Outcome(s): Pelvic floor reconstruction using this method decreases the size and volume of the pelvic defect that needs to be filled by the muscle flap. The gracilis flap reconstruction assures that healthy, non-irradiated, well vascularized muscle tissue remains in good contact with the mesh, which helps to encourage incorporation of it into the surrounding tissues. This reconstruction also brings the healthy muscle in contact with the previously irradiated pelvic sidewalls and perineal soft tissues. Finally, this repair provides an excellent alternative in patients who require bilateral stomas and rectus flap is less desirable, and in patients with previous surgical history who lack intact abdominal wall vascular pedicles.

Conclusions/Discussion: Pelvic floor reconstruction using a biologic mesh and bilateral gracilis muscle flaps is an excellent option in patients requiring abdominoperineal resection.

LAPAROSCOPIC "MODIFIED IMV-FIRST" APPROACH TO LEFT SIDED COLON CANCER.

V2

D. Schwartzberg
Port Jefferson, NY

Purpose/Background: Laparoscopic surgical extirpation of non-metastatic colon cancer is the standard of care for left and right colon cancers. The "no-touch technique" was established for right colon cancers as a way to ligate the vessels prior to colon manipulation to prevent hepatic metastasis. Left colon cancers are treated in a similar manner, however, the artery and vein have different courses in the retroperitoneum compared to the right colon. Often, the inferior mesenteric artery (IMA) is ligated first, followed by mobilization of the colon and the splenic flexure and selective division of the inferior mesenteric vein (IMV) however, ligation of the IMV at the start of the operation is oncologically select. A "modified IMV-first" approach affords an early IMV-first ligation with a limited mesocolic dissection, followed by a splenic flexure takedown with customary laparoscopic views of the splenic flexure, stomach, pancreas and spleen. In addition to allowing for a full IMV and splenic flexure mobilization for a tension-free anastomosis, it also permits a limited lower midline incision should a bulky tumor require conversion to an open procedure.

Methods/Interventions: After presenation at a multidisplinary conference, a metastatic work up was negative in a 78 year old female with biopsy proven rectosigmoid adenocarcinoma at Mather Memorial Hospital-Northwell Health, New York.

Results/Outcome(s): A laparoscopic modified inferior mesenteric vein-first approach was used to resect a rectosigmoid adenocarcinoma. The patient had an uncomplicated post operative course and was discharged on post operative day 4. The patient's tumor pathology was pT3N2b and the patient is currently receiving adjuvant cytotoxic chemotherapy.

Conclusions/Discussion: A 'modified IMV-first' approach to sided colon cancer is feasible and enables the principles of a no-touch technique operation with early venous ligation. After a limited IMV and mesocolic mobilization, early ligation of the IMV is followed by splenic flexure mobilization in familiar planes in traditional laparoscopic views, rather than a full flexure mobilization in an infra-IMV manner. In addition, by mobilizing the IMV and splenic flexure first, bulky tumors that may demand a hybrid laparoscopic surgery, may only require a lower midline incision as the superior colon has already been mobilized.

ENDORECTAL MUCOSAL ADVANCEMENT FLAP BY THE TRANSANAL ENDOSCOPIC MICROSURGERY TECHNIQUE.

V3

J. Frezin, P. Bouchard, A. Bouchard
Quebec, QC, Canada

Purpose/Background: We present the case of a 74 years old Caucasian female. Her previous medical history includes type 2 diabete, high blood pressure, total radical hysterectomy and cystocele. The cystocele was addressed with a pessary for 3 years. She developed a rectovaginal fistula due to erosion from the pessary.

Methods/Interventions: We decided for surgery by transanal endoscopic microsurgery with the Buess device. The fistula was closed in three planes with slowly absorbable sutures: first the vaginal wall, then the rectal muscularis layer and finally the rectal mucosa

Results/Outcome(s): Early post-operative period was uneventful. Seven months follow up didn't show any sign of recurrence.

Conclusions/Discussion: Surgery for rectovaginal fistula is delicate and is burdened with a high recurrence rate. We believe that the transanal endoscopic microsurgery technique allows for a better visualization and a stronger repair. Our technique doesn't hold higher risks than the classic transanal technique.

ENDOLUMINAL VACUUM-ASSISTED THERAPY AND TAMIS CLOSURE OF LEAK FOLLOWING ILEAL POUCH-ANAL ANASTOMOSIS.

V4

S. Hahn, P. Gupta, S. Hill, J. Davids, P. Sturrock, K. Alavi, J. Maykel
Worcester, MA

Purpose/Background: Anastomotic leaks (AL) occur 4-17% of the time following ileal pouch procedure and can be a devastating complication resulting in pelvic sepsis, stricture, delayed ileostomy closure or eventual pouch failure. Redo pelvic surgery to manage this complication is technically demanding and fraught with a high failure rate. With increasing expertise in Transanal Minimally Invasive Surgery (TAMIS), it is now possible to surgically manage AL through a novel approach. We describe the combination of endoluminal vacuum-assisted therapy using custom-made sponges and TAMIS closure of an AL following ileal pouch procedure.

Methods/Interventions: This is a 51-year old male with a history of medically refractory ulcerative colitis for 3 years who underwent restorative total proctocolectomy with ileoanal pouch anastomosis and diverting loop ileostomy. On contrast enema prior to ileostomy closure, an AL with pelvic presacral sinus from the EEA anastomosis was

discovered. Pouchoscopy at that time revealed a presacral sinus filled with mucoid debris.

Results/Outcome(s): The pelvic presacral sinus was managed by endoluminal vacuum therapy with six serial custom-made sponge exchanges over four weeks, which debrided the cavity and stimulated a lining of granulation tissue. We then utilized the TAMIS approach to close the sinus tract over a pre-sacral drain. Repeat pouchoscopy and contrast enema at two months showed that the anastomotic defect was healed.

Conclusions/Discussion: In patients with ileal pouch-anal anastomosis leak, Gardenbroek et al. showed that this innovative method of serial sponge exchange can improve outcomes by reducing the anastomotic healing time versus conservative approach alone. The use of endoluminal vacuum-assisted therapy with custom-made sponges promotes drainage of contaminated fluids in the sinus cavity and ingrowth of granulation tissue prior to closing the defect surgically. Combining this with a TAMIS approach that affords better pelvic maneuverability, it becomes possible to expeditiously achieve resolution of AL. This staged or stepwise approach appears to facilitate effective closure. **Early intervention with endoluminal vacuum-assisted therapy and TAMIS closure is a feasible alternative to redo pelvic surgery in patients with AL following an ileal pouch procedure.**

LOOK BEFORE YOU SLIP: THE KADLEC TECHNIQUE.

V5

C. Gall[2], L. Ailabouni[1]
[1]*Richland, WA;* [2]*Yakima, WA*

Purpose/Background: Incarcerated Foreign Body Extraction is a relatively frequent occurrence throughout most operating rooms within the United States with no clear epidemiology outlined in the literature. Often, the object is shaped with a conical tip and a widened flat base. This presents a challenge in removing the object once it projects past the sphincter mechanism. Once the object becomes incarcerated, the surgeon has a discretion in which technique is appropriate to remove the object. For cases where transanal extraction with a more conservative treatment has failed, a laparotomy becomes necessary. This video provides an evolution and a detailed description of three plastic flat bottomed self-placed Rectal Foreign Body Extraction procedures.

Methods/Interventions: This video demonstrates the evolution of a conservative approach to Rectal Foreign Body Removal via three consecutive cases. First, a 60-year-old male presented for an incarcerated foreign object. X-Ray displayed a 2.1 x 2.1 x 2 inch object. No perforation. The patient was anesthetized and placed in a modified lithotomy position. Three Foley catheters were placed lateral to the object in order to equalize pressures on both the apical and basal sides. Next, three triangulated apertures were drilled in the basal surface of the object with a Midas Drill. Each opening was then threaded with a size 16 Foley catheter. Manual traction was applied to the catheters and the object was expelled without complication. Secondly, a 35-year-old male presented with an incarcerated foreign object. Imaging and physical exam revealed an 4 x 2 inch conically shaped object within the rectal vault. Three triangulated apertures were drilled in the basal surface and threaded with size 16 Foley catheters. No lateral catheters were attempted. Upon inflation and traction of the catheters the object was expelled. Thirdly, a 54-year-old male presented similarly to the first two patients. The object measured approximately 2.5 x 2.5 x 8 inches. Again, three triangulated apertures were drilled in the basal side of the object and threaded with size 16 Foley catheters. The catheters were inflated and traction was applied. The object was expelled without complication.

Results/Outcome(s): There were no intraoperative complications. Postoperative Flexible Sigmoidoscopy was performed for each patient and only in the third patient a mucosal pressure necrosis at the site of the object's apex was revealed. All three patients were admitted overnight for observation. None of the patients had signs or symptoms of perforation.

Conclusions/Discussion: Incarcerated Foreign Body Extraction is a diverse and challenging procedure. Several techniques can be employed based on an objects shape, size, material, and positioning. However, prioritizing conservative management results in better long-term outcomes for patients. The technique we are presenting represents a versatile and conservative option for surgeons to consider in rectal foreign object removal.

SP ROBOTIC TRANSANAL MINIMALLY INVASIVE SURGERY (SP RTAMIS) EXCISION OF A RECTAL PROLAPSE POLYP.

V6

S. Agarwal, E. Kunkel, J. Salem, C. Martin,
H. Schoonyoung, J. Marks
Wynnewood, PA

Purpose/Background: The Single Port (SP) DaVinci robot is a new robotic platform ideally suited for endoluminal surgery. Utilizing a fully articulated 3D camera and three working arms via a 2.5cm trocar, this robotic system improves operative exposure, reach and precision which is historically a challenge in transanal surgery. Prior transanal platforms, including transanal endoscopic microsurgery (TEM) and transanal minimally invasive surgery (TAMIS), have evolved to make transanal surgery feasible, but are accompanied by their own limitations. The SP robot tackles these limitations and provides operative advantages which we demonstrate in our video.

Methods/Interventions: The patient is a 55-year-old female with a 2.5cm mass incidentally found on screening colonoscopy. The lesion is located anteriorly in the rectum, 4cm from the anorectal ring. While the biopsy showed mucosal prolapse, it was uncertain whether the polyp was neoplastic or reactive. This was discussed with the patient and a decision was made to proceed with a full thickness local excision. The robot is first deployed and docked to a 2.5cm transanal port. The 3D camera and three working arms are inserted after insufflation is achieved via an accessory air seal port. The lesion is circumferentially scored and dissected in a full thickness fashion. The specimen is extracted and the operative field is irrigated with a betadine-saline solution. The robot is then re-docked and the defect is closed with two 2-0 Vicryl stiches in a running fashion.

Results/Outcome(s): The patient tolerated the procedure well, with estimated blood loss of 25mL. She was started on a regular diet immediately post-operatively and discharged home on post-operative day 1 without any peri-operative complications.

Conclusions/Discussion: The SP robot provides many advantages in performing transanal excisions. While the surgeon has operative control of the camera, the exposure and clarity of the image is superior to prior techniques. The 3D wrist articulation allows for precision in movements, avoidance of instrument collisions, adequate cephalad reach and access to the operative target. This video demonstrates the feasibility and advantages of the SP robot in performing transanal surgery.

TRANS-ANAL LATERAL PELVIC LYMPH NODE DISSECTION (TALLPND) FOR LOCALLY ADVANCED LOW RECTAL CANCER.

V7

M. Albert[1], T. Aiba[2], R. Yap[1], P. Johnson[1], T. Mukai[2], A. Tanaka[2], M. Nagino[2], K. Uehara[2]
[1]*Winter Park, FL;* [2]*Nagoya, Japan*

Purpose/Background: Preoperative radiologically enlarged lateral lymph nodes (LLN) are a risk factor of lateral pelvic recurrence and should be considered for removal even after chemoradiotherapy (CRT). However, the most frequent site of LLN metastasis occurs in the deep lateral pelvis, creating anatomic challenges to access from the traditional abdominal approach. Transanal total mesorectal excision (taTME) is gaining rapid adoption as a promising method to access the distal rectum in the difficult pelvis. Transanal lateral lymph node dissection (taLPND) enables similar advantages to access the deep lateral pelvis as taTME.

Methods/Interventions: After taTME has been completed, the inferior pubic ligament is divided to enter the obturator space. The dissection along the internal obturator muscle is then continued in a cephalad fashion. The obturator nerve is identified and preserved and the peripheral obturator vessels are divided. Within obturator space, the dissection along the vesicohypogastric fascia between the inferior vesical vessels and obturator fat is continued cephalad. At the bottom of the obturator space, the root of the obturator vein and artery are divided. Finally, the proximal obturator fat is divided at the bifurcation of the external and internal vein.

Results/Outcome(s): See Video

Conclusions/Discussion: Radiological enlarged LLNs should be removed even after preoperative CRT. This novel technique enables us to access to the deep lateral pelvis with obvious potential advantages over the abdominal approach.

ROBOTIC INTERSPHINCTERIC RESECTION WITH PARTIAL LEVATOR ANI MUSCLE RESECTION.

V8

Y. Lee
Seoul, Korea (the Republic of)

Purpose/Background: Although sphincter preservation surgery in rectal cancer is increasing. Lower rectal cancer which invades levator ani muscle is still an indication of abdominoperineal resection. But in selected patients with a good response after neoadjuvant chemoradiation, robotic intersphincteric resection with partial resection of levator ani muscle could be an option for sphincter preservation. The author introduces a surgical video.

Methods/Interventions: 40 years old female was diagnosed as rectal cancer. The tumor was located 2.5 cm above the anal verge and the clinical stage was cT4N1M0 with an invasion of levator ani muscle. The patient underwent long-course neoadjuvant CCRT followed by robotic surgery. First, transanal intersphincteric dissection up to anorectal angle was performed. Then the robotic system was docked and robotic TME was performed. Intersphincteric space was opened and partial levator ani muscle was resected. Then specimen was retrieved through the anus and hand-sewn coloanal anastomosis and diversion stoma were performed.

Results/Outcome(s): Total operation time was 200 minutes and the estimated blood loss was 30 ml. The patient discharged 4 days after surgery. The final pathology was ypT3N0M0 with a distal 1.0 cm and circumferential 0.5cm safety margin.

Conclusions/Discussion: Robotic intersphincteric resection with partial levator ani muscle resection is technically feasible and could be an option for sphincter preservation in highly selected patients.

ROBOTIC RECTAL RESECTION WITH INTRACORPOREAL ANASTOMOSIS WITH RECTOPEXY FOR RECTAL PROLAPSE.

VR1

M. Tampo[1], S. Hota[3], S. Parascandola[4], V. Obias[2]
[1]San Pedro, Philippines; [2]Washington DC, DC; [3]Norfolk, VA; [4]Bethesda, MD

Purpose/Background: Surgery is the mainstay of treatment for rectal prolapse. Abdominal approaches, in conjunction with minimally invasive techniques, to rectal prolapse show a great advantage over perineal approaches in terms of decreased recurrence rate. Several techniques have been described in literature. Resection rectopexy offers the advantage of having decreased recurrence rate and decreased constipation rate, particularly in patients who have reported constipation preoperatively. Complications from the resection are among the most feared in using this technique, however, literature reports rates of 0-20%, which is lower than most of the other rectopexy techniques. The advent of a robotic platform has provided the ease in performing abdominal approaches with minimally invasive technique. This video will then demonstrate a step-by-step technique in performing resection rectopexy with intracorporeal anastomosis for rectal prolapse. Key technical steps will be highlighted and outcomes of a single-institution experience will be reported.

Methods/Interventions: not applicable

Results/Outcome(s): not applicable

Conclusions/Discussion: not applicable

WHEN THINGS GO WRONG DURING ANASTOMOSIS CONSTRUCTION, AND HOW TO FIX THEM.

VR2

A. Uppal, A. Pigazzi
Tustin, CA

Purpose/Background: Intra-operative assessment of colorectal anastomoses is an important step to minimize leaks. Endoscopic evaluation facilitates this by identifying areas of ischemia or dehiscence. Prompt revision or complete replacement of the anastomosis can be then be easily performed.

Methods/Interventions: We present a 60 year old male with chronic diverticulitis who underwent a laparoscopic Hartmann's reversal. After the rectal stump was identified and cleared, an initial EEA anastomosis was performed. An area of ischemia was noted on the distal colon from a laparoscopic and endoscopic view. The anastomosis was taken down by dividing the ischemia portion of the colon, then dividing the rectal stump to excise the anastomosis. A small staple dehiscence was noted on leak testing of the stump. After preparation of the colon with a new EEA anvil, this dehiscence was incorporated into the anastomotic rings of the stapler. Adequate perfusion was noted on endoscopy. The rectal stump was reinforced by oversewing the staple line and carrying this suture line onto the distal colon. No diversion was necessary.

Results/Outcome(s): The patient recovered well and was discharged on post-operative day 4. On longer follow-up he has had no anastomotic complications.

Conclusions/Discussion: Identifying an inadequate colorectal anastomosis at the time of surgery can prevent severe complications from leaks, and allows for prompt revision without added morbidity. Intra-operative endoscopy is an essential step in assessing the anastomosis.

ROBOTIC PARSTOMAL HERNIA REPAIR (TOTALLY EXTRAPERITONEAL MODIFIED RETROMUSCULAR SUGARBAKER REPAIR) AND INGUINAL HERNIA REPAIR (TOTALLY EXTRAPERITONEAL REPAIR) IN SETTING OF INTRAOPERATIVE ENTEROTOMY.

VR3

S. Berkey, I. Pardo, B. Bello
Washington, DC

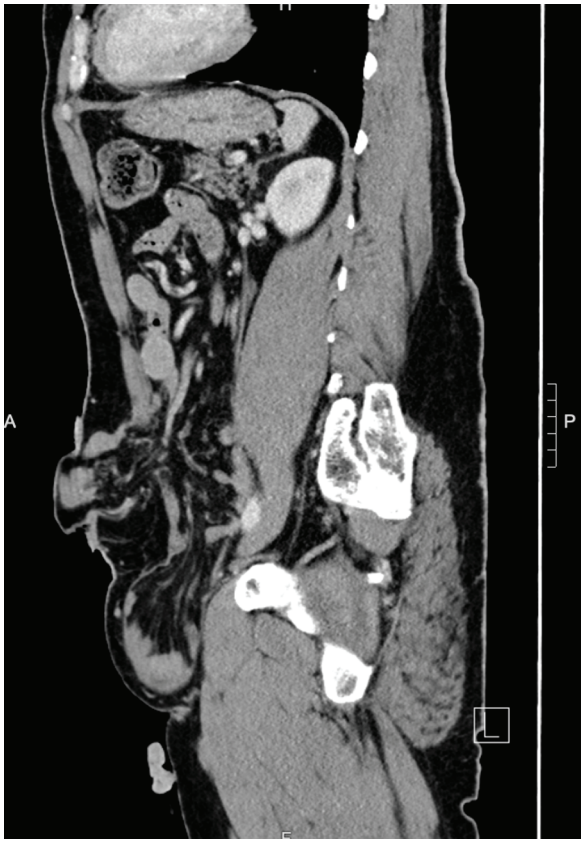
Purpose/Background: We present a 60 year old male with Crohn's disease who previously underwent an APR and end colostomy in 1987. He came to the office with a two month history of symptomatic bulges around his stoma and his left inguinal region. CT is attached and showed small bowel contents in the hernias. The purpose of the submited video is to demonstrate a minimally invasive approach for a combined parastomal hernia and left inguinal hernia repair. In the operating room we had an inadvertent enterotomy and we demonstrate the use a fully absorbable poly-4-hydroxybutyrate/absorbable barrier composite mesh in the setting of a contaminated field.

Methods/Interventions: Access to the abdomen was gained on the right side and four robotic ports were placed. The small bowel contents of the inguinal hernia were easily reduced. There were dense adhesions in the parastomal hernia and upon attempted reduction there was an inadvertent enterotomy. This was repaired in two layers. Because of the contamination, decision was made to use a fully absorbable poly-4-hydroxybutyrate/absorbable barrier composite mesh. The left posterior sheath was then separated from the linea alba using the robotic scissors with monopolar energy. We gained access into the left retrorectus space. Dissection was continued laterally and cephalad to create a big enough space for mesh placement. Caudally, a preperitoneal dissection was continued down the visualize the entire myopectineal orifice. The hernia defect at the ostomy was closed in running fashion. The colon was then lateralized by securing it to the anterior abdominal wall with running absorbable suture. The defect

on the peritoneal layer was closed in running fashion. A 20 x 15 cm mesh was chosen and cut in half. A 10 x 15 cm segment was position to cover the entire myopectineal orifice. The mesh was secured to the pubic tubercle and Cooper's ligament, medial and lateral to the inferior epigastric vessels. A second 10 x 15 cm mesh was used to around the ostomy in modified Sugarbaker fashion. The mesh was fixated in several points including around the ostomy. The posterior flap was reapproximated to the midline using 0 PDS suture.

Results/Outcome(s): The patient tolerated the procedure well. He was admitted then discharged on postoperative day #3 after having good return of bowel function. A small hematoma was noted postop that resolved. He is doing well in follow-up and has not had any recurrence.

Conclusions/Discussion: We demonstrated a combined repair of a large parastomal hernia and large left inguinal hernia repair. We were able to use a minimally invasive approach and were able utlize a retromuscular repair avoiding leaving a prosthetic inside the abdominal cavity. We utilized a fully absorbable poly-4-hydroxybutyrate/absorbable barrier composite mesh in the setting of a contaminated field.



SURGICAL MANAGEMENT OF COLORENAL FISTULA WITH RENAL PRESERVATION.

VR4

O. Beresneva, J. Hall
Boston, MA

Purpose/Background: This is a video presentation of surgical management of colorenal fistula, a pathology that is rarely encountered in clinical practice. The video walks a viewer through a difficult dissection, segmental colon resection, and subsequent reconstruction. Limited review of available literature on the topic is briefly discussed at the end. This video raises surgeons' awareness of this rare entity and educates them on the management strategies.

Methods/Interventions: NA

Results/Outcome(s): NA

Conclusions/Discussion: NA

AN EDUCATIONAL TOOL FOR SURGEON'S NIGHTMARE: STEP BY STEP LENGTHENING MANEUVERS IN A CADAVERIC MODEL FOR A TENSION FREE COLOANAL ANASTOMOSIS.

VR5

H. Acar[1], C. Benlice[1], B. Kutlu[1], Y. Gungor[1], B. Arpak Berk[2], A. Kuzu[1], A. Parvaiz[3]
[1]Ankara, Turkey; [2]Istanbul, Turkey; [3]Portsmouth, United Kingdom

Purpose/Background: Tension at the anastomosis can lead to the need for extensive mobilization or put the anastomosis at devastating risk of a leak. It is desirable to have at least 10 cm colon length from the inferior edge of the symphysis pubis available to form a tension free well-vascularized colo-anal anastomosis. Several maneuvers can be used to overcome the reaching problems and establish a healthy colorectal/anal anastomosis. This study is designed to demonstrate step-by-step colon lengthening maneuvers to achieve a tension-free coloanal anastomosis by using a fresh cadaver model.

Methods/Interventions: The length of the colon after each mobilization technique, which are mobilization of splenic flexure (Step 1), ligation of the middle colic vessels (Step 2), mobilization of the right colon (Step 3), mesenteric root mobilization (Step 4), retroileal transposition (Step 5) and inversion of the right colon (Deloyer's procedure, Step 6) is measured after each step from the inferior edge of the symphysis pubis. For the procedure, after mobilization of the left colon and lateral attachments is taken down, we perform medial-to-lateral dissection and high-ligation of the both inferior mesenteric artery and vein. The splenic flexure is fully mobilized to overcome reach issues. Subsequently, middle colic vessels are ligated and hepatic flexure is mobilized. Both right colon and radix mesentery are completely mobilized. Ultimately, retroileal anastomosis

and inversion of the right colon (Deloyer's procedure) was performed to provide enough length for an anastomosis.

Results/Outcome(s): After mobilization of the splenic flexure and high ligation of the vessels, 18 cm was measured from the inferior edge of the pubic symphysis. By dissecting and ligating the middle colic vessels, 27 cm was measured. Right colon was fully mobilized and an additional 1cm length was obtained. Subsequently, radix mesentery is mobilized which added extra 14 cm segment (total colon segment: 42 cm) and retroileal window is created, a mobilized colon segment measuring 45 cm was obtained. Ultimately, inversion of the right colon (Deloyer's procedure) is conducted and an additional 5 cm colon is achieved (total colon segment: 50 cm)

Conclusions/Discussion: Technical steps of the colon lengthening maneuvers with important anatomical landmarks in a cadaveric model are demonstrated in the present study. Achieving a tension-free colorectal/anal anastomosis is the key to avoiding morbidity related to complex colorectal surgery.

ROBOTIC COLECTOMY, COLOVESICAL AND ENTEROENTERIC FISTULA TAKEDOWN WITH TRANSANAL EXTRACTION IN A HIGH-RISK PATIENT.

VR6

A. Iqbal, C. Taylor
Houston, TX

Purpose/Background: Recent advances in robotic techniques has allowed easier postoperative recovery.

Methods/Interventions: We present a case of a 69 year old morbidly obese female with multiple comorbidities who had a diverticulitis-induced colovesical fistula and an entero-enteric fistula (from small bowel to sigmoid colon) with a miserable quality of life. She was deemed too high-risk for surgery by multiple surgeons. She underwent a robotic sigmoidectomy with takedown of colovesical fistula and colorectal anastomosis, takedown of entero-enteric fistula and small bowel resection with anastomosis, and transanal extraction of all specimen.

Results/Outcome(s): The case proceeded without complications. She had five trocar incisions without any extraction site. Patient was discharged home on post-operative day 1 without narcotic pain medications. She continues to do well on 6 month follow up.

Conclusions/Discussion: Robotic colonic resection with transanal extraction in high-risk patients with complicated underlying pathology is feasible with good outcomes.

FULL-THICKNESS LAPARO-ENDOSCOPIC EXCISION FOR MANAGEMENT OF COMPLEX COLON POLYPS.

VR7

K. Mirza, C. Wickham, E. Noren, G. Low, J. Shin, K. Cologne, S. Lee
Los Angeles, CA

Purpose/Background: Benign colon polyps are increasingly being detected due to improved colonoscopic screening and early detection of masses on the adenoma to carcinoma pathway. Full-thickness Laparo-Endoscopic eXcision (FLEX) is a colon-preserving technique for endoscopically unresectable polyps consisting of endoscopically-guided non-anatomic wedge. The goal of this study was to evaluate the safety and success of FLEX compared to formal colectomy for complex polyps not amenable to endoscopic resection.

Methods/Interventions: A prospectively maintained database identified 19 patients with benign complex polyps managed with FLEX from 2015-2019 at a tertiary academic hospital. Propensity-score-matched controls were identified from the same database, which had undergone corresponding formal segmental colectomy. Primary outcome was inpatient length of stay. Secondary outcomes included operative time, post-operative complications, unplanned 30-day readmission, and 30-day mortality.

Results/Outcome(s): Colon-preserving FLEX colectomy was successful in all 19 patients. Cases were average age 65, and 79% male. The majority of cases involved right-sided lesions (63.2%), with the remainder located in the transverse colon and flexures. Final pathology revealed complete excision of adenomatous polyps in 17/19 and adenocarcinoma in 2/19. Of the two cancers, one underwent subsequent elective segmental colectomy without complication, and the other declined surgery. Propensity score matching was successful for age, gender, BMI, ASA, colon location, and prior abdominal surgery. Compared to controls, FLEX cases had significantly shorter hospital length of stay (1.9 ± 3.7 vs 3.8 ± 1.5; $p=0.047$) and reduced EBL (6.7 + 3.2 vs 45.5 + 42.7, $p<0.001$). Operative time trended lower in the FLEX group (106.6 + 58.6 vs 131.4 + 33.3, $p=0.118$), but was not statistically significant. Unplanned 30-day reoperation was performed in one FLEX patient for suspected small bowel obstruction. There was one mortality due to decompensated cirrhosis in a patient in the FLEX group. Overall 30-day morbidity trended lower in the FLEX group (10.5% vs 26.3%, $p=0.405$), with ileus and lower gastrointestinal bleed being most common.

Conclusions/Discussion: Full thickness laparoendoscopic excision is a safe and highly successful method for removal of complex colon polyps not amenable to endoscopic excision. When compared to propensity matched controls undergoing colectomy, FLEX demonstrates shorter LOS and blood loss, and trends toward lower

morbidity and operative time. FLEX represents a safe and useful approach to the management of benign colon polyps on the endoscopy to colectomy continuum.

Table 1: Operative and Postoperative Outcomes FLEX vs Control

	FLEX n=19	Control n=19	p
Op time (Mean ± SD)	106.6 ± 58.6	131.4 ± 33.3	0.118
EBL[1] (Mean ± SD)	6.7 + 3.2	45.5 ± 42.7	**<0.001**
Transfusion n (%)	0	3 (15.8)	0.088
LOS[2] (Mean ± SD)	1.9 ± 3.7	3.8 ± 1.5	**0.047**
30d Morbidity n (%)	2 (10.5)	5 (26.3)	0.405
Ileus	1 (5.3)	3 (15.8)	0.604
SSI[3]	0	0	1.000
UTI[4]	1 (5.3)	0	1.000
LGIB[5]	0	2 (10.5)	0.487
30d Unplanned Readmit	1 (5.3)	0	1.000
30d Unplanned Reoperation	1 (5.3)	0	1.000
Mortality n (%)	1 (5.3)	0	1.000

[1]EBL - estimated blood loss, [2]LOS - inpatient length of stay, [3]SSI - surgical site infection, [4]UTI - urinary tract infection, [5]LGIB - lower gasatrointestinal tract bleed

LAPAROSCOPIC LOW ANTERIOR RESECTION OF THE RECTUM FOR DEEPLY INFILTRATING INTESTINAL ENDOMETRIOSIS.

VR8

H. Kessler
Cleveland, OH

Purpose/Background: Several organ structures may be affected in patients with deeply infiltrating endometriosis with rectal involvement, and the treatment consequently often requires a multidisciplinary approach.

Methods/Interventions: The gold standard is resection with healthy margins in a single procedure, which should be laparoscopic if possible. Patients with deeply infiltrating endometriosis often have severe fibrosis and adhesions of anatomic structures. The radical surgical approach needed is comparable with techniques used for malignancy surgery. In addition to anterior rectal resection, surgery may also be necessary in the area of the vagina, rectovaginal space, and/or sacrouterine ligaments. Segment-preserving procedures such as shaving techniques or wedge resections seem to have lower success rates relative to pain reduction.

Results/Outcome(s): The 32-year old patient presented in the video is morbidly obese. She has a long- standing history of endometriosis and has been status post laparoscopic total hysterectomy and left salpingo-oophorectomy. She had presented with recurrent left lower quadrant and pelvic pain. An MRI demonstrated likely endometrial implant associated with sigmoid colon, possibly rectum, abutting the vaginal cuff. She reported rectal bleeding with bowel movements. A last colonoscopy in September 2018 had been negative for any masses. At diagnostic laparoscopy, a rectosigmoid endometriotic lesion extending to the rectovaginal septum into the vaginal cuff was encountered, it was completely excised by resection of the rectum and lower sigmoid. An end-to-end double stapled colorectal anastomosis was created. At flexible sigmoidoscopy, there was no leak, the anastomosis was at about 8 cm above the anal verge. There were no postoperative complications.

Conclusions/Discussion: Intestinal endometriosis may be managed laparoscopically, even in cases with previous surgeries and multiple locations. An individual and tailored diagnostic and surgical approach is warranted.

TAKEDOWN OF POST-LAR RECTOVAGINAL FISTULA USING A COMBINED TRANSANAL ENDOSCOPIC AND LAPAROSCOPIC APPROACH.

VR9

D. Peyser, C. Dickler, M. Sur, K. Zakashansky, P. Sylla
New York, NY

Purpose/Background: Repair of rectovaginal fistula (RVF) complicating low anterior resection (LAR) can be challenging, especially in the setting of prior radiation. We present a case of a laparoscopic-assisted transanal endoscopic takedown of a failed colorectal anastomosis and RVF.

Methods/Interventions: A 54-year-old female with prior ypT2N1b mid-rectal cancer treated with neoadjuvant treatment and robotic-assisted LAR, presented 6 months following loop ileostomy closure with a large RVF at the level of the colorectal anastomosis. After ruling out recurrent cancer, she underwent repeat loop ileostomy to control her symptoms. Based on multidisciplinary input, she was offered takedown of her colorectal anastomosis and RVF using a hybrid laparoscopic and transanal endoscopic approach, with redo coloanal anastomosis and flap interposition.

Results/Outcome(s): The left colon was entirely mobilized laparoscopically with preservation of the mesentery. At the level of the sacral promontory, further pelvic mobilization was complicated by severe scarring. The colon was transected above the pelvic inlet and the perineal team initiated the transanal dissection. A TEO endoscopic platform (Karl Storz, Germany) was inserted transanally and the rectovaginal defect visualized 6 cm from the anal verge. The rectum was incised full-thickness with monopolar cautery starting just below the RVF, followed by circumferential mobilization of the rectum just distal to the fistula. The dissection was most difficult posteriorly, where in the absence of any residual mesorectum, the dissection planes were completely scarred. The plane between the rectum and vagina was identified below of the fistula, and further dissection cephalad unroofed the fistula tract. Staple material was encountered and removed, and further dissection of the posterior vaginal wall was carried

out proximal to the RVF. Full circumferential mobilization of the colon was carried out heading cephalad until the lower pelvis could be reached from below. At that point, the abdominal and transanal teams connected the dissection planes until the segment containing the stapled anastomosis and RVF could be extracted transanally. Laparoscopic TAH-BSO was then performed followed by laparoscopic suture closure of the vaginal defect. Following further mobilization of the transverse colon and creation of an omental flap, the left colon conduit was exteriorized transanally and omentum interposed between the colon and vagina. Adequate perfusion of the colon was confirmed and tension-free end-to-end handsewn coloanal anastomosis was performed. The patient was discharged 5 days postoperatively without complications and is awaiting ileostomy reversal.

Conclusions/Discussion: A hybrid laparoscopic-transanal endoscopic approach is a promising minimally invasive strategy to repair failed colorectal anastomoses including complex rectovaginal fistulas.

MARTIUS FLAP FOR RECTOVAGINAL FISTULA.

VR10

A. Gultekin, I. Buzkan, A. Ismayilzada, M. Aydin, M. Kabuk
Zonguldak, Turkey

Purpose/Background: Complex, rectovaginal fistulas (RVF) are uncommon but difficult therapeutic problems. Selected complex RVF can be reliably repaired with good functional outcomes using the Martius flap. In this video we present repair of RVF result of previous transanal mass excision with Martius flap.

Methods/Interventions: a 63 y.o. female admitted to hospital with vaginal fecal discharge. In her medical history, 3 months ago she underwent transanal excision of rectal gastrointestinal stromal tumor (GIST). Gynecological examination revealed the vaginal opening of the rectovaginal fistula 3 cm proximal to the vaginal introitus. Colonoscopy was performed and the rectal opening was seen 1 cm above the dentat line. Since she had a previous transanal rectal mass excision, we decided to perform Martius Flap.

Results/Outcome(s): The patient was put in the lithotomy position and iv antibiotics were given prior to the incision. Local anesthetics was injected rectovaginal septum. The incision was made inside the vagina 2 cm distal to the vaginal fistula to create large broad base vaginal flap. Dissection was continued with in the rectovaginal septum up to the level of the fistula, taking care not to injure sphincter complex. This dissection was carried beyond the most proximal to the fistula in an attempt to gain proper mobility and to develop well vascularized vaginal flap. Once dissection passed the fistula the rectal side of the fistula was curated out and close primarily with figure of eight 2-0 vycro suture. The vaginal portion of the fistula was excised of and only healthy vaginal tissue remains. A vertical incision was made in the left labia majora to expose the labial fat and bulbocavernousus muscle. Bulbocavernosus fat was identified and mobilized laterally, medially and superiorly, down to the level of the periosteum. It is important to note that the blood supply for the martius flap comes from posterior and inferior location from the posterior labial vessels therefore during the dissection, extreme caution was taken to preserve the posterior vascular pedicle. Pedicle was detached superiorly and inferiorly along the pubic bone. A tunnel was created using a Kelly clamp from the base of the labial incision to the rectovaginal septum the tunnel widened to prevent damaged to blood supply and to prevent kinking of the blood supply. The flap gently was delivered through the tunnel into the rectovaginal septum avoiding twisting and proper orientation. The flap was than attached into the rectovaginal septum with interrupted 2-0 vycro suture to hold it in place. The vaginal flap was then reapproximated intraoitus using 3-0 vycro sutures, making sure avoid any tension. The labial wound was irrigated with saline and closed two layers.

Conclusions/Discussion: The postoperative course was uneventful. The drain could be removed on the second postoperative day and the patient could leave our ward on postoperative day two.

RESECTION OF PRESACRAL CYST WITH COCCYGECTOMY.

VR11

S. Marecik, J. Martinolich, J. Singh, K. Kochar, J. Park
Park Ridge, IL

Purpose/Background: The patient is a 19 year old female with an asymptomatic presacral cyst found incidentally during imaging of the spine. MRI identified a 3.5cm lesion located in the lowest portion the mesorectal compartment wedged between the coccyx, the domes of the levators, the posterior rectum and the sphincter complex, with suspicion of adherence to the coccyx. A colonoscopy revealed a bulge pushing on the posterior distal rectum without involvement of rectal wall.

Methods/Interventions: A pericoccygeal approach was selected for adequate exposure of this retrorectal mass. The patient was placed in the prone jackknife position. An incision was carried on the right side of the coccyx between the sacrospinous ligament and the sphincter complex. The incision was taken down through the perianal and ischioanal fat to the level of the levators from the sacrospinous ligament to the sphincter complex. Frequent palpation of

the coccyx and sacrospinous ligament as well as bimanual exam with one finger in the rectum and another in the operating field assisted in determination of the exact location and extent of the lesion. A Lone Star retractor was used for retraction. The cyst wall was slowly dissected off the levators and the posterior rectal wall, however there was no clear dissection plane between the cyst and the coccyx. The posterior surface of the coccyx was cleared and a ronjeur was used to disarticulate the coccyx en bloc with the cyst. The post-resection field revealed superficial tear in the muscularis propria of the rectum, which was repaired with 3-0 vicryl sutures. A surgical drain was placed in the area of coccygeal resection.

Results/Outcome(s): The patient was discharged home the same day. She healed her incisions without any difficulties. The pathology specimen revealed a benign tail gut cyst.

Conclusions/Discussion: Trans-sacral exposure of this tail gut cyst allowed for excellent exposure with en bloc coccygectomy for dense adherence of cyst to the coccyx.

VIDEO-ASSISTED ANAL FISTULA TREATMENT (VAAFT) COMBINED WITH ADVANCEMENT FLAP IN HIGH COMPLEX ANAL FISTULA.

VR12

Y. Yao, C. Wang, H. Liang, Y. Cao, C. Xiao
Shanghai, China

Purpose/Background: Surgical treatment of the complex anal fistula remains challenging. The operation s election must balance the choice between the healing rate and the quality of life. It was the goal of clinicians that is reducing the recurrence rate, curing the disease and reduce the damage of the anal function.

Methods/Interventions: this patient is male,31 years old. He underwent surgery for perianal abscess in other hospital 3 years ago. physical examination: two E.O.s are observed at the LP7 points away from the anal edge about 15cm. Digital rectal examination : a sag can be touched at the LP6 points near the dentate line. This patient was treated with VAAFTcombined with advancement flap. excision of the external opening; fistula tract was destroyed by using electrocautery or brushing; the internal opening closure procedure is treated with advancement flap.

Results/Outcome(s): This patient was followed up for 24 months without recurrence and postoperative continence problem (evaluated by Wexner Score for Incontinence).

Conclusions/Discussion: VAAFT combined with advancement flap is safe and feasible for treating high complex anal fistula with a low recurrence rate. The anal function is protected better than any other procedure.

SPHINCTEROPLASTY AND CLOACA REPAIR: A VIDEO CASE REVIEW OF ADULT CLOACA FROM OBSTETRICAL TRAUMA.

VR13

L. Heidelberg, A. Bastawrous
Seattle, WA

Purpose/Background: Cloacal defects in adulthood are typically acquired, traumatic malformations of the distal rectovaginal septum. These most commonly occur secondary to obstetrical injury, but remain rare with a developmental incidence of only 0.3% of complicated deliveries. As such repairs are not commonly performed, the purpose of this video is to demonstrate operative repair of this defect.

Methods/Interventions: This case report is a 44 year old multiparous woman with a large cloacal defect and associated incontinence to feces and flatus. She developed a cloacal defect after her fourth of seven children. She presented for operative evaluation after completion of child bearing. Preoperatively she was noted to have a 180-degree defect of the sphincter complex, destruction of the entire perineal body, and loss of the distal rectovaginal septum. This video outlines the sphincteroplasty and cloacal defect repair. Permission to film was obtained from the patient preoperatively and the video was edited for content.

Results/Outcome(s): After dissection of the obliterated rectovaginal septum, the sphincter complex was isolated on both sides of the muscular defect. An overlapping sphincteroplasty was performed with adequate reapproximation of her sphincter complex. A perineal body was reconstructed and lateral wound loosely reapproximated for drainage postoperatively. At three week follow-up, the patient reported dramatic improvement in incontinence. She no longer experienced incontinence to feces or flatus and her wound was healing well.

Conclusions/Discussion: Cloacal defects are a rare and debilitating complication of obstetrical trauma. As repairs are not commonly performed, this video provides a summary of operative technique in sphincteroplasty and cloaca repair.

ROBOTIC ASSISTED ENDORECTAL ADVANCEMENT FLAP: A NOVEL TECHNIQUE FOR SUPRALEVATOR FISTULA REPAIR.

VR14

M. Rojas[1], T. Kamal[2], A. Khan[1], J. Estrada[1], J. Kaminski[1]
[1]*Chicago, IL;* [2]*Mt. Pleasant, MI*

Purpose/Background: Anal fistulae are abnormal inflammatory tracts closely associated with anorectal absesses. Fistulae can have a debilitating impact on the quality of life of patients and thus should be treated surgically. Complex fistulae can be difficult to manage and are associated with high recurrence rates. Endorectal advancement flap is a surgical option for the management of these complex fistulae. Traditionally, these repairs have been limited by the confinement of the rectal lumen. Here we present the case of a robotic assisted endorectal flap for a supralevator fistula.

Methods/Interventions: After placing the patient in the lithotomy position, an exam under anesthesia is done to confirm the location of the fistula. A gel point is placed within the rectum and secured. The instrument and air seal ports are then placed and the robot is docked. Using cautery the outline of the flap is marked with the apex just distal to the internal opening. A partial thickness endorectal flap is created starting at the most distal part of the outline. Dissection is then carried out proximally for 2 to 4 cm. The base of the flap should be at least 2 to 3 times the width of the apex to ensure adequate perfusion. The internal opening is then closed with an absorbable suture and the flap is secured to the overlying tissues with a V lock suture. At this point the robot is undocked and flexible sigmoidoscopy is performed to assess for a hemostatic endorectal advancement flap. Robotic assisted endorectal advancement flap is a novel technique that allows for excellent exposure and multiple degrees of freedom with minimal collision of instruments. Fistulae at the anorectal angle can be challenging to access and difficult to repair with open and laparoscopic techniques. The robot enhances visualization of this area and provides maximal exposure for the surgeon and their assistants. The robot also provides improved ergonomics when compared to other approaches allowing for better dissection, mobilization of the flap, and intraluminal suturing.

Results/Outcome(s): The patient's hospital course was uneventful and he was discharged home on post-operative day one. Subsequent outpatient follow up showed a well-healed flap with complete resolution of his prior symptoms. Physical exam showed no signs of recurrent fistulae.

Conclusions/Discussion: Complex suprasphincteric fistula can be challenging to repair due to the confinement of the rectal lumen. Robotic assisted endorectal advancement flap provides improved ergonomics, tremor elimination, and instruments with multiple degrees of freedom that allow for better exposure, more proximal dissection, and easier intraluminal suturing as compared to open or laparoscopic repair. In this case, we present a successful robotic assisted endorectal flap repair for a supralevator fistula.

MICROSINUSECTOMY WITH VIDEO-ASSISTED LASER ABLATION FOR PILONIDAL SINUS DISEASE.

VR15

I. Sahin, A. Aghayeva, I. Bilgin, V. Ozben, E. Aytac, I. Hamzaoglu, T. Karahasanoglu, B. Baca
Istanbul, Turkey

Purpose/Background: Excision with primary or secondary wound healing is a well-known traditional treatment of pilonidal sinus disease (PSD). However, faster wound healing, rapid return to work, less pain and better aesthetic results increase the popularity of minimal invasive techniques such as phenolisation and laser ablation. In this video, we present the feasibility and safety of microsinusectomy with video-assisted laser ablation for PSD.

Methods/Interventions: This procedure is performed under general anesthesia with the patient placed in a prone position. After making a 3-6 mm full-thickness skin incision with punch biopsy instrument and cleaning of the sinus tract with brush and curette, the sinus tract was visualized with a 4-mm sinuscope. Then, a diode laser probe is introduced into sinus tract and 1470-nm wavelength laser ablation is performed.

Results/Outcome(s): Between November 2017 and September 2019, 50 patients (16 females) with a mean age of 28 years underwent this procedure. Of those, 5 patients had recurrent PSD. All the procedures were completed with no complication. The mean hospital stay was 1 ±0.27 days. The mean healing time was 2-6 weeks. Two patients had chronic pain and two patients had seroma, these patients responded well to conservative treatment with analgesics and antibiotic. No recurrence occurred during a 10±6.18 months of follow-up period.

Conclusions/Discussion: According to our subjective view of experience, microsinusectomy with video-assisted laser ablation is feasible, safe, less painful, and effective minimal invasive procedure for the treatment of PSD.

REDO REPAIR OF TRAUMATIC RECTOVAGINAL FISTULA, RECONSTRUCTION OF CLOACAL DEFORMITY, REDO SPHINCTEROPLASTY AND LEVATORPLASTY.

VR16

S. Marecik, M. Ng, R. Kumar, T. Kim, K. Kochar, J. Park
Park Ridge, IL

Purpose/Background: Severe obstetric injuries can result in traumatic cloacas causing significant conditions that can worsen a patient's quality of life. Symptoms often include fecal incontinence, sexual dysfunction and psychosocial burden. Repair is often complex and challenging for surgeons with no defined technique outlined in the literature. Here we present the case of a 30-year old female who presented with an obstetric-related traumatic cloaca after several previous repairs and a Vaizey score of 6.5.

Methods/Interventions: The patient was taken to the operating room for complex repair that included reconstruction of the perineum with sphincteroplasty and levatorplasty. Specific anatomical landmarks are clearly outlined for educational purposes.

Results/Outcome(s): The patient tolerated the procedure well. All details of the operation are depicted and described in the accompanying video. Her post-operative course proceeded as planned with parenteral nutrition and bowel rest for 2 weeks, while avoiding a proximal diversion. Her wounds healed well. On outpatient follow up, she experienced a significant improvement in her incontinence with an improvement of her Vaizey score to 3 at 11 months.

Conclusions/Discussion: Perineal reconstruction for a traumatic cloacal deformity is both safe and feasible even after previous repairs have failed. Sphincteroplasty and levatorplasty are useful adjuncts to bolster the repair.

BEYOND TOTAL MESORECTAL EXCISION (TME) FOR RECURRENT RECTAL CANCER WITH INVOLVEMENT OF LEFT PELVIC SIDEWALL.

VR17

X. Pare, S. Drolet, P. Bouchard
Quebec, QC, Canada

Purpose/Background: A 68 years old patient who first presented a rectal polyp containing a T1 adenocarcinoma partially removed during a coloscopy. The polypectomy site was then resected using a transanal endoscopic microsurgery (TEM) device. There was no evidence of remaining neoplasia on the newly resected specimen. The patient presented two years later with a recurrent lymph node with contact on the left internal iliac vessels. She underwent a chemoradiotherapy prior to surgery.

Methods/Interventions: An inferior midline laparotomy was performed. The left ureter was identified and preserved. The TME plan was followed for the anterior and right part of dissection of the rectum. The left lateral compartment was removed with *en bloc* excision of the internal iliac vessels. The sacral roots and obturator nerve were preserved. Colorectal anastomosis with a protective ileostomy were performed.

Results/Outcome(s): Surgical margins were negative on the final pathological report with good clinical outcomes.

Conclusions/Discussion: Beyond TME approach with resection of internal iliac vessels for recurrent rectal cancer involving the pelvic side wall can achieve negative margins.

EXTENDED RIGHT HEMICOLECTOMY WITH EN BLOC WHIPPLE'S PROCEDURE.

VR18

M. Onglao
Manila, Philippines

Purpose/Background: Locally advance right-sided colon cancer with involvement of the duodenum and pancreas is surgically challenging. The survival of these patients is greatly improved if an R0 resection is performed. T4 tumors also have the highest rate of apical node metastasis and benefit the most from a D3 lymphadenectomy. Morbidity and mortality rates for these procedures are acceptable with experienced surgeons. We are presenting the case of hepatic flexure tumor with pancreatic head involvement successfully treated with extended right hemicolectomy with en bloc pancreaticoduodenectomy and D3 lymph node dissection.

Methods/Interventions: This is a case report of a 31-year-old female with a hepatic flexure adecarcinoma with duodenal involvement. She completed 6 cycles of neoadjuvant chemotherapy with FOLFOX. Post-chemotherapy imaging showed minimal tumor regression with persistent involvement of the duodenum and pancreatic head. This was confirmed with gastroduodenoscopy. Decision was made to proceed with extended right hemicolectomy with en bloc pancreaticoduodenectomy and D3 lymph node dissection.

Results/Outcome(s): Final histopathology showed a T4 adenocarcinoma with invasion into the duodenum. All margins of resection were negative. 16 nodes were harvested, all negative for tumor. 1 of 4 peripancreatic nodes was positive for cancer. lymphovascular invasion was also present. The patient was discharged well at post-operative day 7 with no complications. She is disease-free after 2 years of follow-up.

Conclusions/Discussion: In conclusion, complete resection of locally adavanced colon cancer improves survival. R0 resection for T4 tumors of the right colon

involving the pancreas is challenging but can be safely achieved with a right hemicolectomy with en bloc pancreaticoduodenectomy. T4 tumors also have the highest rates of central lymph node metastasis. These patients may receive the most benefit from D3 lymph node dissection.

LAPAROSCOPIC EXTENDED RIGHT COLECTOMY WITH COMPLETE MESOCOLIC EXCISION AND ILEO-DESCENDING INTRACORPOREAL ANASTOMOSIS FOR TRANSVERSE COLON CARCINOMA.

VR19

K. Stasinos[1], E. Kouroumpas[1], W. Stupalkowska[1], P. Tejedor[3], R. De Luca[1], J. Davies[1], R. Bergamaschi[2], S. Di Saverio[1]
[1]Cambridge, United Kingdom; [2]New York, NY; [3]Portsmouth, United Kingdom

Purpose/Background: This video presents a laparoscopic right extended hemicolectomy for adenocarcinoma of the transverse colon, providing insight into the steps and difficulties encountered during complete excision of the transverse mesocolon.

Methods/Interventions: During the operation the approach to important vascular structures for the dissection of the ascending and transverse colon is described in detail showing the relevant anatomical landmarks. In particular, the identification and dissection of the middle colic vessels at their root is depicted in detail. Consequently, the approach needed to provide good mobilization of the transverse colon, by dissecting the mesentery near the ligament of Treitz next to the pancreatic gland and the duodenum, is described and provides a thorough evaluation of the caveats that the surgeon should take into consideration. Finally, after completion of the dissection we depict the steps needed to complete and intracorporeal ileo – descending anastomosis in a safe and secure manner.

Results/Outcome(s): Right extended colectomy, although is considered a common procedure, in the context of oncological dissection involves difficult technical aspects especially when a complete mesocolic excision is desirable.

Conclusions/Discussion: Overall, this video provides a thorough description of a laparoscopic extended right colectomy, detailing the complete oncological excision of the transverse mesocolon and acts as a proof of principle for the benefits that laparoscopic surgery provides for both the surgeon and the patient.

ROBOTIC EXTRAMESORECTAL EXCISION (EME) WITH REPAIR OF INTERNAL ILIAC VEIN.

VR20

S. Marecik, J. Singh, A. Perez-Tamayo, K. Kochar, J. Park
Park Ridge, IL

Purpose/Background: Operative treatment of rectal cancer has continued to progress with advancements in robotic surgical techniques. While total mesorectal excisions (TME) have been well described, extramesorectal excisions (EME) are less common and pose new challenges for surgeons. The use of the robotic system allows for improved visualization of unconventional planes and superior visualization of fat planes, nerves, and vessels. This video aims to not only demonstrate the anatomical considerations of an extramesorectal excision, but also potential complications and minimally invasive corrective measures.

Methods/Interventions: This is a male patient with distal rectal cancer who completed neoadjuvant therapy and subsequently underwent recording of an extramesorectal excision due to an involved mesorectal fascial margin at the level of S3. The differences between total and extramesorectal excision planes are highlighted, as well as management of internal iliac vein bleeding, utilizing the robotic system to obtain control of the bleeding and perform a suture ligation.

Results/Outcome(s): This 65 year old male with T3/4 N2 M0 rectal cancer underwent neoadjuvant therapy with good clinical response. The patient opted for surgical management. Due to the known threatened mesorectal fascial margin, he underwent extramesorectal excision of the left posterior position. The transition from a total mesolectal plane to an extramesorectal plane was demonstrated, as well as the transition back to the standard dissection. When bleeding was encountered in the dissection, two different techniques were emphasized. First, tamponade and cautery was used to achieve hemostasis. When the bleeding recurred and notably more brisk, proximal and distal control was obtained with robotic instrument retraction, and the venotomy was optimally exposed for minimally invasive suture ligation with durable hemostatic results.

Conclusions/Discussion: We would like to emphasize the flexibility of the robotic platform to facilitate precise extramesorectal excision but also to aid in control of complicated surgical situations, should the need arise.

TAILORED ROBOTIC APR WITH AN INTRA-ABDOMINAL LEVATOR TRANSECTION.

VR21

S. Marecik, J. Singh, M. Rojas, K. Kochar, J. Park
Park Ridge, IL

Purpose/Background: Knowledge of the pelvic floor anatomy is crucial for a safe and successful APR. The standard ELAPE technique involves the resection of the coccyx with the coccygeus muscle resulting in a large defect and potential morbidity. Our selective approach allows for saving of the coccyx in the majority of cases and a significant portion of the pelvic floor which is not directly involved by the tumor. Here we present the case of a tailored robotic APR with an intraabdominal levator transection. Our presented patient had a T2N1 tumor occupying the right half of the anorectal circumference extending to the dentate line which did not respond to total neoadjuvant therapy.

Methods/Interventions: The right iliococcygeous muscle is transected starting at the S5 midline level. The incision is carried circumferentially toward the pelvic sidewall where the pelvic plexus is located. The ischioanal fat can be appreciated underneath the levators. A more conservative approach is performed on the left side where the same muscle will be transected closer to the unaffected sphincter side. After the standard dissection in the TME plane is finished, a full thickness transection of the pubo and iliococcygeus muscle on the left side at the level of the levators is performed. A semi circular detachment of the mesorectum from the posterior vaginal wall reaching the pubococcygeous muscle level anterolaterally and tendinous portion of the perineal body in the anterior midline is then completed. After the anterior and lateral dissections are finished, the posterior levators are detached from the anterior surface of the coccyx by joining the previous levator incisions. Due to favorable anatomy the perineal part of the procedure was completed in the lithotomy position. However, for more demanding cases, such as anterior tumors in males, the prone position is often used. The excised specimen revealed the levators were still attached to the rectal ampulla. The cylindrical appearance of the specimen, in our opinion, has secondary importance as long as the tumor is resected in a controlled oncologic fashion

Results/Outcome(s): The patient's hospital course was uneventful. She was discharged on day 3. Subsequent outpatient follow up showed well healed incisions with good oncologic outcomes.

Conclusions/Discussion: Tailored robotic APR with an intraabdominal levator transection can have less morbidity when compared to the standard ELAPE technique. Intraabdominal levator transection allows for precise incision of the levators just medial to the pelvic plexus and neurovascular bundles of the genitourinary organs, while during the ELAPE technique these structures can be easily injured as the levators are frequently transected underneath the lateral compartment and lateral to the pelvic plexus.

TOTAL ROBOTIC COMPLETION ABDOMINOPERINEAL RESECTION AND POSTERIOR VAGINECTOMY WITH INTRAABDOMINAL LEVATOR TRANSECTION AND ROBOTIC RECTUS MUSCLE FLAP RECONSTRUCTION FOR RECURRENT RECTAL CANCER.

VR22

G. Doyle, A. Davila, R. Baynosa, O. Bardakcioglu
Las Vegas, NV

Purpose/Background: Surgery for recurrent rectal adenocarcinoma is challenging. The goal is an oncologic R0 resection with precise visualization and identification of unique anatomy and tumor extent. Frequently, larger perineal defects require a rectus muscle flap necessating a laparotomy.

Methods/Interventions: In this video we present a total robotic completion abdominoperineal resection including posterior vaginectomy and intraabdominal levator transection followed by a robotic rectus muscle harvest and perineal reconstruction. The patient presented with a recurrent adenocarcinoma of the anastomosis invading the vaginal wall and had a history of a prior robotic low anterior resection with coloanal pullthrough and handsewn anastomosis for a T2N0 adenocarcinoma with negative margins.

Results/Outcome(s): The video highlights several advantages of a total robotic approach including (1) maintaining a minimal invasive approach (2) direct visualization and tailored approach to the levator transection minimizing the perineal defect (3) direct visualization and wide resection of the vaginal involvement (4) retaining abdominal wall integrity during the rectus muscle harvest maintaining the anterior rectus sheath (5) easy identification of the deep epigastric vessels and (6) harvest of the posterior rectus sheath as the ideal conduit for posterior vaginal wall reconstruction.

Conclusions/Discussion: Complex redo pelvic surgeries for recurrent adenocarcinoma including reconstruction can be successfully approached fully robotically with several unique advantages over the traditional open approaches.

ROBOT-ASSISTED TOTAL PELVIC EXENTERATION WITH INTRAOPERATIVE RADIATION AND SIGMOID URINARY CONDUIT.

VR23

J. Huang, I. Ibrahim-Zada, A. Menon, M. Mikucki, Q. Li, D. Mattson, S. Nurkin
Buffalo, NY

Purpose/Background: Pelvic exenteration for locally advanced rectal cancer is associated with high morbidity. Robotic multi-visceral pelvic resection may decrease post-operative complications associated with this procedure without compromising oncologic outcomes. The morbidity of pelvic exenteration may be further mitigated by the use of colon as conduit rather than small bowel, which may decrease the risks associated with another anastomosis.

Methods/Interventions: In this video, we highlight steps of a robot-assisted total pelvic exenteration with intraoperative radiation and sigmoid urinary conduit for a 49 year-old male with locally advanced, low rectal cancer with evidence of persistent disease with invasion into prostate and pelvic sidewall, after neoadjuvant chemoradiation and chemotherapy.

Results/Outcome(s): After placement of ports, we proceeded with a medial-to-lateral dissection into the mesocolic/retroperitoneal plane and completed the mobilization of the descending and sigmoid colon while preserving the mesocolon and branches of the inferior mesenteric artery. The left colon and sigmoidal branches were identified and preserved, while the superior rectal vessels were ligated. This allowed for isolation of the sigmoid colon as a urinary conduit, while ensuring adequate lymphadenectomy for optimal oncologic resection of this low-rectal tumor. Radical cystoprostatectomy was then performed for the en bloc resection. Due to concern for residual tumor at the left pelvic sidewall, intraoperative brachytherapy was applied. The colonic conduit was completed with end-to-side anastomoses of the ureters to sigmoid colon. The patient's final pathology showed a T4N1a rectal tumor with invasion into the rectoprostatic fascia and 1 positive lymph node. All surgical margins were otherwise negative.

Conclusions/Discussion: Minimally invasive pelvic exenteration for locally advanced rectal cancer is feasible with colonic conduit, especially in the setting of multidisciplinary management, and can reduce the morbidity associated with additional bowel anastomosis.

TRANSPERINEAL TOTAL MESORECTAL EXCISION IN THE PRONE JACKKNIFE POSITION.

VR24

D. Uematsu
Saku, Japan

Purpose/Background: Intersphincteric resection or abdominoprineal resection (APR) is performed for very low rectal cancer. However, APR has a high rate of positive surgical margin and rectal perforation compared with sphincter-preserving surgery. Surgical margin involvements and intraoperative perforations are located anteriorly in most cases. One of the causes of this high rate is the difficulty of determing the proper dissection plane around the anterior anorectum, which contains the anterior region of the external anal sphincter (EAS) or the rectourethralis muscle without a clear anatomic border. At the anterior region of the EAS, the striated fibers from the EAS, bulbospongiosus muscle, and superficial transverse perineal muscle are intertwined with each other. Recently, transperineal total mesorectal excision (TpTME) has attracted attention as a promising alternative to the anterior approach. However, urethral or rectal injury in male patients has been recognized commonly by colorectal surgeons despite magnified endoscopic visualization. One of the causes of this injury is the difficulty of mainitning a proper surgical field while performing TpTME in the Lloyd-Davies (LD) position, particularly in cases of huge tumors or obesity. From the perspective of pelvic morphology, the sacral bone prevents the mobilized rectum from moving away from the pelvic bottom. Some studies have suggested that APR performed in the prone jackknife (PJK) position improves visibility of the perineal portion and reduces local recurrence. Threfore, we used PJK position for TpTME to maintain a proper surgical field.

Methods/Interventions: A total of 7 consecutive male patients underwent TpTME in the PJK position for very low rectal cancer between February 2018 and June 2019. TpTME consisted of resection of the levator ani muscle in proportion to cancer involvements and TME. During TpTME in the PJK position, the mobilized rectum spontaneously moved toward the head by gravity and the supplied CO2 without the restraint of the sacral bone. Therefore, especially in dissection of the rectourethralis muscle, a proper surgical fied could be obtained. The superficial skin area of the entire sacrum was exposed in the PJK position. This enables insertion of another access port beside the coccyx in addition to the platform. After the patient was located in the LD position, remaining procedures were laparoscopically performed.

Results/Outcome(s): None of these procedures had to be converted to other surgeries. Neither urethral injury nor rectal perforation was identified. The median surgical blood loss was 10 mL (range, 10-50mL). The median

surgical time was 245min (range, 215-366min). The positive circumferential resected margin rate was 0%.

Conclusions/Discussion: TpTME in the PJK position had the significant advantage of improving the surgical field.

NOVEL TECHNIQUE FOR REPAIR OF PERINEAL HERNIA USING BOTH MESH AND GRACILIS FLAP.

VR25

T. Kaur, E. Askenasy, M. Cusick
Houston, TX

Purpose/Background: Perineal hernia (PH) is a rare condition, most often as a complication after major pelvic surgery such as Abdominoperineal Resection (APR) or pelvic exenteration. Rates of PH vary widely in the current literature. This video provides a detailed description of a novel robotic assisted laparoscopic (RAL) perineal hernia repair with mesh and muscle flap.

Methods/Interventions: A 68-year-old man presented after the treatment of a low rectal cancer for which he received neoadjuvant chemotherapy and radiation followed by a laparoscopic single site APR. A year after his surgery, he presented with a large perineal hernia which progressively increased in size and limited his daily activities. We describe the technique of RAL mesh placement to exclude the pelvis and repair the hernia as well as discuss the key steps needed to secure the mesh. We present some understanding into limitations and future function.

Results/Outcome(s): The patient recovered from his perineal hernia uneventfully. He has no evidence of recurrent hernia at 4 months follow up and his quality of life improved dramatically.

Conclusions/Discussion: RAL perineal hernia repair with mesh and gracilis flap closure is a novel and innovative technique for perineal hernia repair. The procedure has low morbidity and results in a significant improvement in quality of life. Long term follow-up is required to evaluate the rates of recurrent hernia.

NERVE DIRECTED ROBOTIC TOTAL MESORECTAL EXCISION.

VR26

A. Pai[1], N. Padmanabhan[1], G. Melich[3], J. Park[2], S. J Marecik[2]
[1]Chennai, India; [2]Chicago, IL; [3]New Westminster, BC, Canada

Purpose/Background: Incidences of sexual and urinary disturbances after open and laparoscopic TME are 2%- 27% and 11%-50% respectively. Lack of advanced knowledge of complex pelvic nerve anatomy and poor visualization of pelvic autonomic nerves (PAN) in open and laparoscopic surgery leads to nerve injury. Robotic platforms with stable operating field, excellent 3-dimensional optics and precise movements, facilitate identification and preservation of PAN which should improve functional outcomes.

Methods/Interventions: In this video presentation we demonstrate the anatomy of Pelvic autonomic nerves and sites of potential nerve injury. 1. **Superior Hypogastric Plexus (SHP) and Hypogastric nerve (HGN) injury:** SHP rests in the pre- aortic plane and is intimately associated with the origin of Inferior mesenteric artery (IMA). During high ligation of IMA, the plane is entered close to the IMA and all the nerve fibers of the SHP are visualized and dissected away from the IMA. An advantage is that the ureter which is always dorsal and lateral to the nerve plexus, drops away and ceases to be at risk. In the posterior dissection, HGN is adherent to the mesorectum. Accurate identification of nerves at the promontory level and dissection anterior to pre-hypogastric nerve fascia enables the nerves to be preserved and dropped away from the field. 2. **Lateral ligament**: At the mid rectal level the mesorectum is closely related to inferior hypogastric plexus (IHP) and is a site for potential damage. Surgical and cadaveric dissections have demonstrated that lateral ligament consists of lateral segment of IHP carrying parasympathetic outflow (nervi erigentes) and medial segment with rectal branches of the pelvic plexus (nervi recti) and lymphatics. These attachments can be gently separated from mesorectum by sharp dissection and middle rectal artery can be identified and controlled with monopolar or bipolar diathermy, close to the rectum. 3. **Sacral splanchnic nerves:** They are 3-4 pairs of nerves arising from the pelvic sympathetic trunk [secondary sympathetic outflow] running below and almost parallel to HGN and join the IHP to supply the urogenital viscera. Extreme lateral dissection in the postero-lateral compartment leads to damage to these nerves. 4. **Denonvilliers' fascia (DF):** Neurovascular bundles from IHP pass through 2 'o' & 10 'o' clock positions of DF to supply bladder and genitalia. There also exists communications between right and left pelvic plexus in front of DF which compensates for unilateral nerve damage. Hence in non-anterior tumors the dissection is done preserving DF [posterior to DF].

Results/Outcome(s): Our Prospective review of patients has shown decreased incidence of autonomic dysfunction following nerve directed approach.

Conclusions/Discussion: An intimate knowledge of pelvic autonomic nerve supply is needed for accurate identification and preservation of these nerves. Technical advantages offered by robotic system aid in visualizing and preserving the finest of nerve fibers.

TURNBULL CUTAIT PULL-THROUGH IN A RECTAL CANCER PATIENT WITH CHRONIC ANASTOMOTIC LEAK.

VR27

H. Kirat, E. Esen, M. Grieco, J. Ray, A. Erkan, F. Remzi
New York, NY

Purpose/Background: The Turnbull-Cutait abdominoperineal pull-through procedure may be used as a last resort to avoid permanent diversion in patients with complex anorectal conditions. Here we present a 57-year old male who underwent Turnbull-Cutait abdominoperineal pull-through procedure for chronic colorectal anastomotic leak and multiple enterovesical, colovesical fistulae.

Methods/Interventions: Our patient was referred for evaluation of restoring gastrointestinal continuity in the setting of entero-vesicle and colo-vesicle fistulas. He initially had an open low anterior resection followed by chemoradiation for T3N0 rectal cancer. This was complicated by anastomotic leak, multiple fistulas and ureteral strictures. Prior coming to our institution, he underwent bilateral ureteral reimplants and enterovesical fistula takedown at an outside hospital but his symptoms persisted and he was referred to our center.

Results/Outcome(s): He underwent a 2-stage Turnbull Cutait pull-through procedure. His gastrointestinal continuity was preserved.

Conclusions/Discussion: Turnbull-Cutait pull-through is an option to preserve gastrointestinal continuity for patients with complex anorectal conditions that might otherwise require permanent diversion and can be performed with good outcomes.

LAPAROSCOPIC MULTIVISCERAL RESECTION WITH FLUORESCENCE-GUIDED PARA-AORTIC LYMPH NODE DISSECTION FOR ADVANCED T4B COLON CANCER.

VR28

H. Kim, G. Choi, J. Park, S. Park, S. Song
Daegu, Korea (the Republic of)

Purpose/Background: Laparoscopic approach has been adopted for complicated procedure for the treatment of colon cancer. However, the surgical procedure of multivisceral resection for treating T4b colon cancer or paraaortic lymph node dissection (PALND) has not been well established. In addition, fluorescence imaging (FI) may improve surgical view and provide distinguishable anatomical information about lymph nodes during complicated operation in real-time. In this video, we demonstrated the surgical skills in detail with laparoscopic approach and FI technique for the treatment of maximally advanced colon cancer which had adjacent organ invasion with paraaortic lymph node metastasis.

Methods/Interventions: A 58-year-old female had rectosigmoid colon cancer with direct invasion into left adnexa and simultaneous paraaortic lymph node metastasis identified in abdominopelvic CT and PET/CT scan. Clinical stage was T4bN2M1. She received 5 cycles of mFOLFOX6 with bevacizumab preoperatively. For FI, indocyanine green was injected in colon preoperatively. During laparoscopic exploration, tumor directly invaded into left adnexa. En-bloc resection of left salpinx with tumor was performed without spillage of tumor cells. Actual PALND began from the aortic bifurcation. After en-bloc resection of regional lymph nodes, inferior mesenteric artery was ligated. PALND was proceeded upto the lower border of renal vessels and laterally off the anterior surface of psoas muscle. During lymph node dissection, FI was repeatedly used for identifying lymph node from surrounding structures. Lymph nodes were safely and completely removed during FI. After pelvic dissection, rectum was transected using an endolinear stapler. After complete PALND, FI was performed again for identifying any remained lymph nodes. We finally confirmed there is no remaining lymph nodes around the aorta. Specimen with en-bloc resection of the colon, Lt. salpinx, regional and paraaortic lymph node was extracted through mini-laparotomy using plastic bag. Intra-corporeal anastomosis was performed using double stapler technique

Results/Outcome(s): The operation time was 150 minutes and the estimated blood loss was approximately 30 ml. There were no intraoperative and postoperative complications. The pathologic stage was ypT4bN1a. Tumor directly invaded into left salpinx. The number of harvested PALN were 40, but no metastatic lymph nodes in para-aortic area was identified.

Conclusions/Discussion: In this video, maximally advanced rectosigmoid colon cancer was treated by laparoscopic approach with FI after neoadjuvant chemotherapy. Especially, FI helped to prevent residual lymph nodes around para-aortic area during surgery. However, this technique should be confirmed by large cohort study and be more standardized. Further studies are needed to identify benefits of this approach and evaluate oncologic safety.

ROBOTIC TRANSANAL AND TRANSABDOMINAL INTERSPHINCTERIC RESECTION WITH COLOANAL ANASTOMOSIS.

VR29

G. Choi, H. Kim, S. Song, J. Park, S. Park
Daegu, Korea (the Republic of)

Purpose/Background: Optimal treatment of distal rectal cancer can be an intersphincteric resection (ISR) with coloanal anastomosis (CAA) after preoperative chemoradiotherapy (CRT), if it does not invade the external anal sphincter muscle. In this video, we aimed to describe the surgical technique of robotic transanal and transabdominal ISR with CAA as a sphincter-preserving method.

Methods/Interventions: A 24-year-old female was revealed a lower rectal cancer at 3cm from anal verge. Pelvic MRI showed T3N2 with threatened mesorectal fascia. This patient received long-course preoperative CRT (50Gy in 25 fractions for 5 weeks). After completing radiation, the status of rectal cancer was improved and MR imaging noticed T2N0 with moderate regression. Robotic ISR with side-to-end CAA was performed at 8 weeks after completing radiation. For transanal dissection, distal rectum was closed at the distal margin for resection to reduce the risk of tumor-cell dissemination. Under direct vision, total intersphincteric dissection was performed following the total mesorectal escision (TME) plane without bleeding. After finishing transanal dissection of the rectum in the anal canal, we moved to the transabdominal phase. After ligation of IMA and full mobilization of the left colon, pelvic dissection was started by using robotic system. The rectum was mobilized using monopolar cautery scissors by dissecting through the avascular plane between the endopelvic fascia to keep the autonomic nerves intact. During continued downward dissection using monopolar scissor, we finally cut the thin membrane to form an opening into the previously dissected extra-abdominal space. All procedure was completed within pelvic cavity. Hypogastric and pelvic nerves are well preserved. The specimen was extracted through the anus and proximal colon was transected. And then side-to end handsewn anastomosis was created on the perineal side.

Results/Outcome(s): The operation time for transanal approach was 21 minutes and operation time only for transabdominal pelvic dissection was 28 minutes. The pathology revealed T2N1 rectal cancer with both negative circumferential and distal resection margins.

Conclusions/Discussion: Robotic transanal and transabdominal ISR is a safe option in the treatment of lower rectal cancer. Additional study in a larger series of patients is required to refine this technique and to establish its safety.

REALTIME 3D MODELLING IN ROBOTIC MULTIVISCERAL ONCOLOGICAL RESECTION: A FUSION OF TECHNOLOGIES.

VR30

A. Das, T. Pham, T. Larach, A. Heriot, S. Warrier
Melbourne, VIC, Australia

Purpose/Background: Understanding of spatial anatomical relationship during multivisceral oncological resection is important to ensure R0 resection. The Peter MacCallum Cancer Centre (Melbourne, Australia) has pioneered the use of realtime 3D modelling of tumour in relation to complex pelvic anatomy to augment robotic and transanal surgical approaches. We present an illustrative video that highlights the fusion of robotic surgery and 3D-modelling to aid precision dissection.

Methods/Interventions: 60-year-old female with T3N1 low rectal adenocarcinoma extending into uterus, vagina and with involved left pelvic side wall lymph node. She underwent neoadjuvant long course chemoradiotherapy after which a robotic ultra-low anterior resection with transanal total mesorectal excision with enbloc hysterectomy with posterior vaginectomy in conjunction with left pelvic side wall dissection was performed. Using 3D Slicer (version 4.10; Harvard, US, 2019), routine preoperative CT imaging was reconstructed in 3D. The tumour and its relations to surrounding structures were further highlighted and superimposed on the 3D reconstruction.

Results/Outcome(s): Abdominal phase: Following placement of ports, medial to lateral dissection of the left colon was carried out. The inferior mesenteric artery and vein were ligated high followed by splenic flexure mobilisation. The left pelvic side wall dissection was done by opening the peritoneal sheath overlying the left ureter to reach the round ligament. The boundaries of this dissection was defined by the common iliac vein laterally and vesicohypogastric facia medially. Psoas, internal obturator muscles along with obturator nerve and vessels were identified. Lymphofatty tissue was cleared from common iliac vessels, obturator fossa and internal iliac vessels. Tissue was retrieved in Endocatch. The pelvic dissection was carried out circumferentially in conjunction with the second surgical team. The distal margin in vaginal wall was defined from the transanal side. The rest of the pelvic dissection was continued with the two surgical teams working simultaneously from the abdomen and transanal side until specimen was resected. The vaginal wall closed with 2.0 v-lock. TRANSANAL PHASE Rectum was closed with a 2.0 Prolene pursestring suture. Dissection was continued in the TME plane circumferentially until communication was achieved with the proximal dissection plane from the abdominal side. The distal vaginal margin was defined and transected. The specimen was retrieved on block.

Conclusions/Discussion: *We have shown that ULAR with TaTME and hysterectomy with posterior vaginectomy and pelvic side wall dissection can be safely performed with the robot lending itself to improved visualisation and precise movement. Furthermore, we have shown successful and safe integration with new technology in utilising the 3D reconstruction of pelvic anatomy to improve preoperative planning and intraoperative dissection.*

ROBOTIC-ASSISTED LOW ANTERIOR RESECTION FOR LARGE RECTAL GIST EXTENDING INTO ISCHIO-RECTAL FOSSA.

VR31

J. Rousseau, F. Dagbert
Montreal, QC, Canada

Purpose/Background: A 70 years old male patient presented with a large rectal GIST (8,5 x 6,7 x 9,1 cm). Pelvic MRI showed the tumor to be mainly extra-luminal and originating for the distal third of the rectum. The lower part of the tumor extended through the levator on the right side and was in contact with the prostate, right seminal vesical and internal obturator muscle. No signs of direct invasion of these structures were shown on MRI and therefore sphincter-sparing resection was deemed possible.

Methods/Interventions: Treatment with Imatinib was started and maintained for a year until maximal response was achieved. The patient was then scheduled for a robotic assisted low anterior resection with colo-anal anastomosis.

Results/Outcome(s): This video shows the pelvic dissection of the rectum following the total mesorectal excision plane all the way down to the proximal anal canal using a robotic assisted approach. The tumor was freed from its adhesion to the levator muscle and the ischiorectal fat. There was no rupture of the tumor during the surgery. After resection, the pelvic floor defect was closed trans-anally and the patient had a hand-sewn coloanal anastomosis with loop ileostomy. Pathology report showed a complete TME with an intact tumor and negative margins. After loop ileostomy reversal, patient maintained good functional outcomes and follow-up imaging did not show any signs of recurrent disease.

Conclusions/Discussion: The use of a robotic approach allowed for a minimally invasive approach and sphincter-sparing surgery and represent an important tool to have in facing these difficult cases.

ROBOTIC SIGMOID RESECTION WITH NATURAL ORIFICE INTRACORPOREAL ANASTOMOSIS WITH TRANS-ANAL EXTRACTION OF SPECIMEN (NICE) + ANTERIOR MESH RECTOPEXY: CASE VIDEO FOR RECTAL PROLAPSE.

VR32

R. Patron-Lozano, D. Maun, T. Reidy, R. Melbert, F. Lane, B. Tsai, O. Johansen
Indianapolis, IN

Purpose/Background: The surgical technique of natural orifice intracorporeal anastomosis with trans-anal extraction of specimen (NICE) has been well described in recent literature. However, there hasn't been a case described in which this technique is employed with simultaneous anterior mesh rectopexy.

Methods/Interventions: We present the case of a 49 year-old female with severe constipation and rectal prolapse who presented for surgical evaluation. The patient was very interested in a minimally invasive approach with quick return to her everyday life and minimal surgical scars. The patient underwent a robotic assisted natural orifice intracorporeal anastomosis with trans-anal extraction of specimen and anterior mesh rectopexy.

Results/Outcome(s): The patient had an excellent cosmetic and functional outcome with no recurrence of her rectal prolapse and marked improvement on her constipation six months after surgery.

Conclusions/Discussion: Natural orifice intracorporeal anastomosis with transrectal extraction of specimen is a safe and feasible procedure that can be offered with anterior mesh rectopexy when a resection is warranted with excellent functional and cosmetic outcomes. More studies are required to fully evaluate and compare traditional resection and mesh rectopexy with the NICE approach but, in our limited experience, the results have been favourable.

ENDOSCOPIC MANAGEMENT OF ANASTOMOTIC STRICTURE WITH ACUTE LARGE BOWEL OBSTRUCTION.

VR34

M. Oner, M. Abbas, H. Darr
Dubai, United Arab Emirates

Purpose/Background: To describe the endoscopic management of large bowel obstruction secondary to a benign anastomotic stricture. Various etiologies can lead to large bowel obstruction including benign conditions and malignancy. Patients who present with large bowel obstruction pause significant challenge to the surgeon. Emergency surgery carries significant morbidity and frequently leads to stoma.

Methods/Interventions: A 63-year-old woman presented with acute large bowel obstruction secondary to a chronic anastomotic stricture following left hemicolectomy for recurrent diverticulitis. Endoscopic decompression of acute large bowel obstruction by balloon dilation and subsequent needle knife stricturoplasty.

Results/Outcome(s): Immediate resolution of the large bowel obstruction following the first dilation, subsequent bowel preparation with repeat dilation, and definitive needle knife stricturoplasty was carried out. The patient did well long-term without the need for surgical intervention.

Conclusions/Discussion: Endoscopic management of anastomotic stricture presenting as acute large bowel obstruction is feasible and provides a treatment option with minimal morbidity and avoidance of stoma.

LAPAROSCOPIC EXCISION OF SMALL BOWEL MESENTERIC CYST.

VR35

M. Oner, M. Abbas
Dubai, United Arab Emirates

Purpose/Background: To describe the laparoscopic management of large mesenteric cyst. Definitive diagnosis of mesenteric cyst is rarely established without surgical intervention due to the rarity of the lesion. In terms of treatment, simple aspiration and drainage usually is not advisable as there is a high recurrence rate. Resection is advisable and when done laparoscopically provides short and long-term benefits.

Methods/Interventions: A 47-year-old woman, who presented with generalized abdominal pain for approximately a month. CT scan of the abdomen revealed a cystic lesion in the left upper abdomen which was attached to the proximal to mid-jejunum. Diagnostic laparoscopy surveying the abdominal cavity followed by running the small intestine to localize the cystic lesion followed by excision of the lesion with preservation of the small bowel and extracting the lesion through a Pfannenstiel incision.

Results/Outcome(s): Two years following her operation, she remains asymptomatic without any clinical evidence of recurrent disease.

Conclusions/Discussion: Laparoscopic management of large mesenteric cyst is feasible and provides a treatment option with minimal length of stay in hospital and recurrence rate.

MYOMECTOMY FOR HIRSCHSPRUNG'S DISEASE IN ADOLESCENTS.

VR36

M. Oner, M. Abbas, H. Darr
Dubai, United Arab Emirates

Purpose/Background: To describe the surgical management of adolescents who present with ultrashort segment Hirschsprung's disease. 1 in 5,000 newborns have Hirschsprung's disease. Typically, this condition is diagnosed in infancy and managed by pediatric surgeons. Ultrashort segment disease can present in adolescence (<1% of all cases).

Methods/Interventions: 3 males (age 13 to 16 years) presented with severe constipation since early childhood. Symptoms were progressively getting worse with a frequency of bowel movements between 1 and 4 weeks despite comprehensive medical therapy. Myomectomy was carried out in the posterior anal canal removing a strip of about 1 x 4 cm of rectal wall.

Results/Outcome(s): Patients were discharged on the second postoperative day without any complications. They remained well at last follow-up with resolution of the constipation with bowel movements every 2 to 3 days with the intake of fiber supplementation and occasional use of laxatives.

Conclusions/Discussion: Posterior strip myomectomy significantly improves the symptoms of adolescent patients who present with ultrashort segment Hirschsprung's disease. The procedure is safe with long-term efficacy

DEVELOPMENT AND IMPLEMENTATION OF A NOVEL COMPUTER-BASED TRAINING MODULE FOR THE STANDARDIZATION OF THE SPLENIC FLEXURE MOBILIZATION.

VR33

A. Kuzu[1], C. Benlice[1], C. Akyol[1], M. Akkoca[1], A. korkmaz[1], I. Coban[2], H. Acar[1]
[1]Ankara, Turkey; [2]Istanbul, Turkey

Purpose/Background: Computer-Based Training modules employ various multi-media components such as text, graphics, animation, and videos that can theoretically facilitate the learning process. Splenic flexure mobilization is a crucial step for tension free colorectal/anal anastomosis that can be technically demanding step. This study is designed to demonstrate our novel training module for the splenic flexure mobilization with high-vessel ligation during surgery.

Methods/Interventions: An education video was prepared in order to standardize and teach the technical steps of the splenic flexure mobilization. 3D animation was prepared and cadaveric dissection was performed in a step by step fashion similar to minimally invasive surgery. This is followed by laparoscopic technique. In order to mobilize the splenic flexure, the inferior mesenteric artery is dissected and ligated at 1 to 1.5 cm distal of the aorta. Then the inferior mesenteric vein is divided at the inferior border of the pancreas. Subsequently, the entrance of lesser sac is accomplished by dissecting through anterior border of the pancreas. After lateral attachments and distal transverse colon are mobilized and the splenocolic ligament is dissected, fully mobilization of the splenic flexure is achieved. Since we have started this modular training program in our department, a consecutive of 100 patients underwent total mesorectal excision and covering stoma with coloanal anastomosis.

Results/Outcome(s): Surgical anatomical planes and important vascular structures/variations are both shown by 3D animation, cadaveric dissection and laparoscopic surgery. Out of 100 consecutive cases, there were no mortality, five anastomotic leakage one of which necessitates reoperation and two splenic injuries which were managed conservatively.

Conclusions/Discussion: This unique video demonstrates the step-by-step full mobilization of the splenic flexure by a novel computer based training module and

improved the knowledge of the technique among our residents. The employment and implementation of time- independent multimedia components lead to effective learning.

LONG-TERM STENT PLACEMENT FOR CROHN'S STRICTURE -IS THERE A LIMIT?

VR37

D. Borsuk[2], A. Studniarek[1], K. Kochar[2], S. Marecik[2], J. Park[2]
[1]*Chicago, IL;* [2]*Park Ridge, IL*

Purpose/Background: We present a case of the longest-known living patient with a functioning endoluminal stent for Crohn's J-pouch stricture. The 64-year-old patient had a J-pouch created at age 37 for Crohn's disease and had an endoluminal stent placed in a small bowel J-pouch ten years ago, at age 54, to manage the stricture. The patient also has concomitant anal stenosis from his Crohn's. Approximately every two years the patient undergoes prophylactic endoscopic stent replacement or at any time the stent becomes clogged with food debris.

Methods/Interventions: We present the Borsuk-Park method for endoscopic replacement of an endoluminal stent. Due to his anal stenosis, balloon dilation is used prior to advancing the endoscope to prevent sphincter damage during stent removal. Following endoscopic visualization, the stent is removed by grasping the pursestring suture using alligator graspers and collapsing the distal end of the stent thereafter. If the endoscopic clips previously placed are no longer present, the distal and proximal clips are replaced to aid in later fluoroscopic visualization. Following stent removal, an esophageal, partially covered 10 cm flared stent (20 mm lumen and 25 mm flare) is prepared. The new stent is then deployed over a wire and advanced using fluoroscopic visualization. The stent is placed at the end of the distal clip. Following stent deployment, proper placement is confirmed endoscopically.

Results/Outcome(s): The patient's stent was placed 5 months prior to this procedure and has since become clogged with food debris. The stent has also migrated 6 cm proximally to initial placement. Anal stenosis was identified and then dilated via balloon. The J-pouch was visualized and appeared intact and healthy. Clogged stent removal was uneventful, with both distal and proximal clips remaining intact. Placement of the new stent was completed without difficulty and placed perfectly according to the methods stated above. The patient was discharged home following the procedure. The patient's stent was replaced once again 5 months later due to food debris blockage. In total, the patient has had a stent in place for 10 years, during which period it has been replaced 17 times. After overcoming the initial learning curve, we have found that average, uneventful stent-bearing duration is 15 months (ranging from 4 months to 3 years) over the past 5 years.

Conclusions/Discussion: The Borsuk-Park method for endoscopic endoluminal stent replacement in a J-pouch patient with anastomotic stricture is a viable technique providing excellent outcomes following prolonged, repeated reimplementation in the same patient.

ROBOTIC EXCISION OF A LOW TAIL GUT CYST.

VR38

M. Brady, A. Pigazzi
Orange, CA

Purpose/Background: Retrorectal cystic lesions are rarely encountered in practice. Most require excision due to local compressive symptoms and potential for malignant degeneration. Classically, low lying lesions have been addressed through posterior approach with coccygectomy. Many have described the fourth sacral bone (S4) as a marker to help guide the decision for choosing either a transabdominal or posterior approach. For larger cysts that extend above and below S4, a combined transabdominal and posterior approach have also been advocated. These recommendations do not reflect the advantages of a modern robotic platform which provides excellent exposure of the retrorectal space, even in low lying lesions. We present a case of a robotic transabdominal resection of a low lying tail gut cyst extending from S5 to the anal canal.

Methods/Interventions: The patient presented with an incidentally found retrorectal cystic lesion on a computed tomography (CT) scan. The cyst was 3.8cm x 3.3cm x 4.3cm in size. It was adjacent to the left posterior wall of the rectum and extended from the S5 vertebrate to the pelvic floor. In the operating room the patient was positioned in lithotomy. Ports were placed in our usual arrangement for pelvic dissection. The uterus was suspended to the abdominal wall using a monofilament suture to improve exposure. The peritoneum was incised over the total mesorectal excision plane along the left side of the rectum. The mesorectum was dissected free posteriorly and laterally on the left. Once adequately exposed, the cyst was circumferentially dissected free. Feeding vessels were controlled with bipolar cautery. The peritoneal defect was closed with an absorbable suture. The cyst was then placed in a specimen bag and removed from the 12mm port.

Results/Outcome(s): The patient was discharged home the morning following surgery. She and had no postoperative complications. Final pathology revealed a multilocular cyst lined by squamous and ciliated epithelium with smooth muscle proliferation consistent with a tailgut cyst.

Conclusions/Discussion: This case presents further evidence that retrorectal cysts, regardless of the level, can be removed safely and efficiently using an anterior approach with a robotic surgery platform. Using the same dissection planes as employed in total mesorectal excision, the dissection to expose these lesions is reliable

and reproducible. This technique offers excellent visualization, exposure, and dexterity within the confines of the pelvis. Articulating instruments aid with resection and facilitate cyst excision without rupture. This techhnique avoids posterior incision and the associated wound morbidity. Prior recommendations of excising low lying retrorectal cystic lesions through a posterior incision with coccygectomy do not reflect modern advances in surgical technology.

LAPAROSCOPIC TOTAL PROCTOCOLECTOMY WITH TRANSANAL ILEAL POUCH ANAL ANASTOMOSIS CREATION AND NATURAL ORIFICE SPECIMEN EXTRACTION.

VR39

K. Kajohnwongsatit[1], J. Ng[2]
[1]*Khon kaen, Thailand;* [2]*Singapore, Singapore*

Purpose/Background: Video presentation of laparoscopic total proctocolectomy with transanal ileal pouch anal anastomosis (IPAA) creation and natural orifice specimen extraction (NOSE). This technique avoids an additional Pfannenstiel or low abdominal incision for ileal J-pouch creation and specimen extraction in patients with suitable body habitus.

Methods/Interventions: After total colorectal mobilisation by laparoscopy, inter-sphincteric rectal dissection from the dentate line was performed trans-anally to join to previous abdominal dissection plane. The specimen was extracted transanally, and the ileum brought down to the anus in a J configuration to perform a trans-anal tension-free IPAA.

Results/Outcome(s): The final histology was pT3N2, well-differentiated adenocarcinoma with clear margins, and multiple tubular adenoma throughout colon. The patient had an excellent postoperative recovery. This is a potentially useful strategy for minimally-invasive surgery.

Conclusions/Discussion: This minimally-invasive approach for laparoscopic total proctocolectomy with transanal IPAA and NOSE is a safe and excellent alternative to conventional laparoscopic methods. Long-term results are awaited.

ROBOTIC TRANSABDOMINAL REPAIR OF A COCCYGEAL HERNIA.

VR40

A. Uppal, M. Brady
Orange, CA

Purpose/Background: Coccygeal hernias are a type of posterior perineal hernia. Though rare, these hernias are known complication following coccygectomy. Both anterior and posterior approaches to repair have been described in the literature. Posterior approaches, through the prior operative field, risk wound related complications such as infection, breakdown, and delayed healing. These risks are mitigated with a trans-abdominal approach. A robotic surgery platform offers excellent visualization and dexterity in the tight confines of the pelvis. This approach is well suited for repairing these hernia defects. To our knowledge, this technique has not been previously demonstrated in the literature.

Methods/Interventions: We present a 56 year old woman who had undergone coccygectomy one year prior for chronic coccydynia. Postoperatively she developed a symptomatic hernia at the operative site that caused discomfort with prolonged standing and defecation. On exam there was an obvious protrusion, which worsened with Valsalva, at her coccygectomy incision. The rectum was seen herniating at that site on cinedefecography. The patient underwent a robotic repair of the hernia. The peritoneum at the sacral promontory was incised and retrorectal space was developed to the pelvic floor while avoiding division of the lateral stalks. The hernia defect was exposed by dissecting the mesorectum off the pelvic floor. The pelvic floor was widely exposed to provide adequate space for mesh overlay. The levator ani were then re-approximated in the midline with running monofilament sutures to close the hernia defect. A macroporous polyester mesh was selected and placed to cover the entire pelvic floor This mesh was secured in place with monofilament sutures. The peritoneum was then re-approximated with a running absorbable suture.

Results/Outcome(s): The patient recovered well and was discharged the following day. On follow-up she reports minimal pain and resolution of her hernia symptoms.

Conclusions/Discussion: An anterior, trans-abdominal approach, using a robotic platform is a useful technique for repairing posterior perineal hernias. This approach confers excellent exposure, allows for maximal mesh overlay of the defect, and avoids wound complications associated with posterior incisions.

THE "2 SPACES AND 3 SEGMENTS" FORMATION IN THE INTERSPHINCTERIC SPACE: A CLINICAL-ANATOMICAL STUDY BASED ON 28 CADAVERS RELATED TO INTERSPHINCTERIC RESECTION FOR ULTRALOW RECTAL CANCER.

P1021

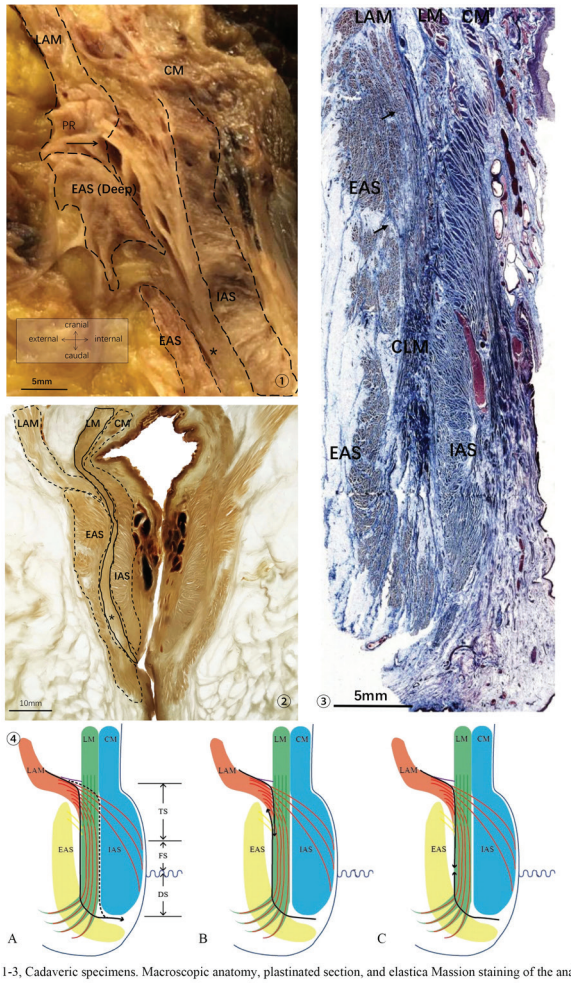
Y. Zang, M. Zhou, Z. Li, D. Tan, X. Gu, Z. Chen, Y. Zhou, J. Xiang
Shanghai, China

Purpose/Background: Intersphincteric resection (ISR) has been proposed to offer sphincter-sparing solution for patients with ultralow rectal cancer. However, lack of complete and accurate concept of the intersphincteric space-related anatomy makes the optimal surgical plane unclear. The aim of this study is to describe the anatomy of the intersphincteric space-related structures in detail.

Methods/Interventions: 28 donated cadavers with average age of 76 were examined. Gross anatomy, plastinated sections and histologic staining were conducted.

Results/Outcome(s): The intersphincteric space (ISS) is the area between the internal anal sphincter(IAS)and external anal sphincter(EAS), which begins at the levator hiatus and ends at the white line. On the lateral and posterior sides of the rectum, the muscular fibers of LAM partially overlapped EAS. Elastic fibers derived from LAM and EAS were observed inserting into the conjoint longitudinal muscle (CLM) (Figure1-3). We defined the area between the levator hiatus and the endpoint of LAM as "the transition segment", where CLM was gradually forming; Area between the endpoint of LAM and the dentate line as "the formed segment", where the converged muscular and elastic fibers were fused together to form the main portion of CLM; Area from the dentate line to the white line, where CLM dispersed and terminated, as "the densified segment", because the mixture of fibers was densified. The CLM partitioned the ISS into two potential spaces, the inner one between IAS and CLM, and the outer one between CLM and EAS.

Conclusions/Discussion: CLM is the combination of rectal smooth muscle and tendinous tissues from the striated muscles, which integrates the anal canal as a complex. Previous literatures had never described the resection extension of the CLM during ISR procedure. Based on anatomic measurements, we thought it necessary to excise dissect along the outer ISS to fully remove CLM for T2 tumors to acquire a negative CRM (Figure4A, the full line). However, a simple IAS excision might be enough to acquire adequate CRM for T1 tumors since the average thickness of IAS was 2mm (Figure4A, the dashed line), which we presumed helpful for function preservation. In the third segment, the inner ISS was too dense to dissect, making it easier to get into the outer ISS and go dorsum of LAM while dissecting transanally. So we may have to cut off the attach part of LAM to meet the transabdominal surgical plane, which may jeopardize the anal function (Figure4B). The only way to preserve LAM is to dissect transabdominally to the dentate line as distal as possible and meet the transanal plane at the endpoint of LAM (Figure4C). The 2-spaces-3-segments formation in the ISS could be instructive during ISR procedures nonetheless further practice and clinical trials are necessary to testify this hypothesis.



1-3, Cadaveric specimens. Macroscopic anatomy, plastinated section, and elastica Massion staining of the anal canal from the coronal orientation.(the lateral walls of the anal canal). 4, Schematic diagram of the anal canal. Different color lumps represent for different muscles, and the colorful lines stood for the elastic fibers. LAM = levator ani muscle; PR = puborectalis; CM = circular muscle of the rectum; IAS = internal anal sphincter; EAS = external anal sphincter; CLM/* = conjoint longitudinal muscle; ISS = intersphincteric space; TS = transitional segment; FS = formed segment; DS = densified segment; Arrow: Elastic fibers derived from LAM and EAS.

DEVELOPMENT AND VALIDATION OF A NOVEL EPIGENETIC REGULATION RELATED SIGNATURE PREDICTING RELAPSE-FREE SURVIVAL IN COLON CANCER.

P1022

X. Li
Shanghai, China

Purpose/Background: Epigenetic factors play a critical role in carcinogenesis by imparting a distinct feature on chromatin architecture. Although great advancement has been made to reveal relationships between epigenetic

changes and colon cancer, less studies make an integrated analysis linking epigenetic factors to prognosis of colon cancer patients. The aim of our study was to develop a novel epigenetic regulation gene signature for evaluating the relapse-free survival (RFS) of colon cancer patients.

Methods/Interventions: Public microarray datasets of colon cancer patients were acquired from the Gene Expression Omnibus (GEO) database which consisted of GSE39582 set (N=557), GSE17538 set (N=200), GSE33113 set (N=89) and GSE37892 set (N=73). Patients from GSE39582 set were randomized 1:1 to train series and internal validation series. Univariate Cox proportional regression model and LASSO model were conducted for the selection of epigenetic factors corresponding genes which were associated with relapse-free survival.

Results/Outcome(s): A set of eleven epigenetic regulation gene was identified to classify patients into those at high risk of relapse (high-risk group) and those at low risk of relapse (low-risk group) with significant RFS in train series [hazard ratio (HR): 4.831, 95% confidence interval (CI): 2.911–8.018, P<0.001]. Good reproducibility for the prognostic value of our epigenetic regulation gene signature was confirmed in the internal validation series (HR: 2.503, 95% CI: 1.624–3.859, P<0.001), external validation series (combination of GSE17538 set, GSE33113 set and GSE37892 set, HR: 1.760, 95% CI: 1.104–2.808, P=0.018) and entire series (HR: 2.621, 95% CI: 1.624–3.859, P < 0.001). Furthermore, a nomogram which integrated our epigenetic regulation gene signature, tumor stage and adjuvant chemotherapy was developed to predict RFS of colon cancer patients based on GSE39582 set. Time-dependent receiver operating curve at 1 year demonstrated that the comprehensive signature [area under curve (AUC = 0.751)] presented superior prognostic value than American Joint Committee on Cancer TNM stage (AUC = 0.678).

Conclusions/Discussion: In conclusion, we established an innovative epigenetic biomarker panel which could be utilized to classify colon cancer patients into groups with low and high risks of relapse. This biomarker would contribute to identify patients who require more intensive follow-up and aggressive therapeutic intervention.

INFLAMMATION-DEPENDENT OVEREXPRESSION OF C-MYC ENHANCES $CRL4^{DCAF4}$ E3 LIGASE ACTIVITY AND PROMOTES UBIQUITINATION OF ST7 IN COLITIS-ASSOCIATED CANCER.

P1023

H. Liu
Chengdu, China

Purpose/Background: Inflammation is well known as an important driver of the initiation of colitis-associated cancer (CAC). Some cytokines, such as interleukin 6 (IL-6) and tumour necrosis factor alpha (TNF-a) can activate expression of the oncogene *c-Myc* (*MYC*) and regulate its downstream effects. Cullin-RING E3 Ligases (CRLs) are emerging as master regulators controlling tumorigenesis.

Methods/Interventions: Venous blood samples were collected from 48 healthy volunteers and 48 CAC patients with different tumour node metastasis (TNM) stages (0-III, n=9 in each grade; IV, n=12). we investigated the molecular regulatory mechanisms of CUL4A and CUL4B in CAC tumorigenesis.

Results/Outcome(s): we demonstrate that two cullin genes, *CUL4A* and *CUL4B*, but not other members, are specifically overexpressed in CAC tumour samples and positively correlate with levels of the proinflammatory cytokines IL-1b and IL-6. *In vitro* experiments revealed that the transcription factor c-Myc can specifically activate the expression of *CUL4A* and *CUL4B* by binding to a conserved site (CACGTG) located in their promoters. Additionally, we found that both CUL4A and CUL4B can form an E3 complex with DNA damage–binding protein 1 (DDB1) and DDB1-CUL4-associated factor 4 (DCAF4). *In vitro* and *in vivo* ubiquitination analyses indicate that $CRL4^{DCAF4}$ E3 ligase specifically directs degradation of ST7 (suppression of tumorigenicity 7). Overexpression of *c-Myc* in human colon epithelial cells resulted in the accumulation of CUL4A, CUL4B, and DCAF4, but degradation of ST7. In contrast, knockdown of *c-Myc*, *CUL4A*, or *CUL4B* in the colon adenocarcinoma cell line HT29 caused accumulation of ST7 and inhibition of cell proliferation, colony formation ability, and *in vivo* tumour growth. Collectively, our results provide *in vitro* and *in vivo* evidence that c-Myc regulates $CRL4^{DCAF4}$ E3 ligase activity to mediate ubiquitination of ST7, whose presence is physiologically essential for CAC tumorigenesis.

Conclusions/Discussion: Overexpression of CRL4A and CRL4B E3 ligases and down-regulation of their substrates occur in a variety of cancer cell types. CUL4A is also found to be highly expressed in CRC cells and can promote cell proliferation and metastasis by regulating H3K4 trimethylation during epithelial–mesenchymal transition, it is still unknown (1) whether CUL4A is specifically overexpressed and how it is regulated, (2) which proteins can associate with CUL4A to form a CRL4 complex, and (3) what the substrate of CRL4A E3 ligase is in this process.

LONG-TERM ONCOLOGIC OUTCOME AND RISK FACTORS AFTER CONVERSION IN LAPAROSCOPIC SURGERY FOR COLON CANCER.

P1024

J. Huh, S. Yun, H. Kim, W. Lee
Seoul, Korea (the Republic of)

Purpose/Background: The oncologic outcome of conversion from laparoscopic to open surgery is still controversial. The goal of this study was to evaluate the

long-term oncologic outcomes in converted operations. The study aims were to detect factors affecting the survival rate in converted operations and to identify ways to prevent them.

Methods/Interventions: Retrospective database of consecutive curativeintent laparoscopic-assisted surgery for primary stage I-III colon cancer was reviewed from 2000 to 2013. The patients were divided into nonconversion and conversion groups. The patient characters, operative features, perioperative parameters, pathologic features, and oncologic outcomes were compared.

Results/Outcome(s): Total of 4,010 patients was included : 3,929 in non-conversion group and 81 (2%) in conversion group. Median survival was 40 months. There were significant differences in age, preoperative clinical T-stage, and tumor size between the groups. In operative details between the two groups, there were also significant differences in access to surgery, tumor location, cancer obstruction, cancer perforation, and estimated blood loss ($P < 0.001$). The two most common reasons for conversion were adhesion (n=37, 46%) and bleeding (n=21, 26%). Multivariate analysis showed that conversion was an independent predictor of both overall survival(OS) ($P = 0.001$) and disease-free survival ($P = 0.003$). The fiveyear OS rate of the conversion group was 79.6%, and the non-conversion group was 96.2% ($P=0.000$). The multivariate predictors of conversion were age, type of surgery, cancer obstruction, cancer perforation, and clinical T-stage.

Conclusions/Discussion: Conversion to open surgery may affect patient survival and recurrence after laparoscopic-assisted surgery for colon cancer. If careful selection of patients for laparoscopic surgery includes evaluation of preoperative cancer obstruction, cancer perforation, and advanced T-stage, the possibility of conversion may be reduced.

ROBOTIC ASSISTED SURGERY FOR RECTAL ADENOCARCINOMA SHOWS PROMISING OUTCOMES COMPARED TO LAPAROSCOPY AND LAPAROTOMY: A NATIONAL CANCER DATABASE PROPENSITY SCORE MATCHED ANALYSIS.

P1025

S. Parascandola[1], S. Hota[2], M. Tampo[3], V. Obias[1]
[1]Washington, DC; [2]Norfolk, VA; [3]Manilla, Philippines

Purpose/Background: The purpose of this study is to examine the oncologic and survival outcomes for the management of rectal adenocarcinoma by robotic, laparoscopic, and open approaches within a large population database.

Methods/Interventions: The National Cancer Database from 2010 to 2016 was reviewed for all cases of invasive adenocarcinoma of the rectum or rectosigmoid junction (SEER Histology Codes 8140) who underwent surgical resection. Groups were separated based on approach (open, laparoscopic, or robotic). One to one nearest neighbor propensity score matching (PSM) ± 1% caliper was performed across surgical approach cohorts to balance potential confounding covariates. Kaplan-Meier estimation and Cox-Proportional Hazards regression were used to analyze primary outcome of survival. Secondary outcomes were analyzed by way of logistic regression.

Results/Outcome(s): Inclusion criteria and PSM identified 8526 cases per treatment approach (n=25578). PSM provided adequate discrimination between treatment cohorts ($0.6<AUC<0.7$) and potential confounding covariates did not significantly differ between cohorts (all respective $P>0.05$). Cox-Proportional Hazards regression indicated decreased mortality hazards associated with robotic relative to open ($P<0.01$), laparoscopic relative to open ($P<0.01$), and no difference between robotic and laparoscopic ($P=0.70$). Five year Overall Survival rates were higher in robotic and laparoscopic (71.3% and 72.4%) versus open (67%). Conversion to open was significantly more common in laparoscopic cases relative to robotic cases (15.5% vs 7.1%; $P<0.01$). Relative to open and laparoscopic approaches, robotic approach was significantly associated with increased odds of having 12 or more regional nodes examined. Relative to open, a minimally invasive approach was significantly associated with increased odds of 12 or more regional nodes examined, decreased odds of positive margins, increased odds of negative circumferential resection margin, and decreased odds of 30-day and 90-day mortality (all respective $P<0.05$). Combined MIS approaches were associated with shorter time from surgery to chemo relative to open approach ($P=0.05$).

Conclusions/Discussion: In the management of rectal cancer, this propensity score matched analysis demonstrated that the robotic approach confers a lower conversion to open rate than the laparoscopic approach and that a minimally invasive approach is associated with increased 5 year Overall Survival rates. Relative to open and laparoscopic approaches, robotic approach was significantly associated with increased odds of completed lymphadenectomy. Additionally, in those who received adjuvant chemotherapy, a minimally invasive approach was associated with a shorter time to receipt of chemotherapy.

CIRCUMFERENTIAL RADIAL MARGIN STATUS WITH ROBOTIC RECTAL CANCER SURGERY IN THE OBESE POPULATION.

P1026

M. Kabbani, Y. Kostenko, Q. Ogbogu, E. Stroumpi, S. Tsoraides
Peoria, IL

Purpose/Background: The purpose of the study is to evaluate the oncologic outcomes for robotic-assisted Rectal Cancer Surgery in the obese compared to non-obese

population. Primary outcome is to evaluate the rate of circumferential radial margin (CRM) involvement stratified by BMI. Secondary outcome is to evaluate the conversion to open rate by BMI groups.

Methods/Interventions: A retrospective chart review of patients that underwent robotic-assisted surgery for rectal cancer between 5/2015 – 3/2017 under a single surgeon at an academic affiliated medical center. Procedures included were Robotic Low Anterior Resection, Robotic Total Proctectomy, and Robotic Abdominoperineal resections. Patient BMI was recorded and stratified into BMI groups. BMI ≤ 29.9 labeled as underweight, normal, or overweight; BMI ≥ 30-34.9 labeled as class I obesity; BMI ≥ 35-39.9 labeled as class II obesity; BMI ≥ 40-44.9 labeled class 3 obesity; and BMI ≥ 45. Statistical analysis between groups was done using Chi-square test and Fischer's exact test.

Results/Outcome(s): 114 patients were studied and categorized by BMI group. No statistically significant difference was seen in the rate of CRM involvement between the obese and non-obese population (5.4% vs 10%, p 0.610), rates of CRM positive rates with nonobese patients, or conversion to open between the obese and non-obese population (5.4% vs 1.4%). At significance level of 0.05, the class 1 obesity was associated with 2.24 times higher odds of getting a 30-day post-operative complication compared with non-obese, underweight, normal or overweight patients (p value = 0.030).

Conclusions/Discussion: Robotic Surgery offers the ability to complete rectal cancer surgery on obese patients, including those with class 3 obesity and BMI ≥ 45, in a minimally invasive fashion without statistical difference in R0 oncologic resection. Patients with class 1 obesity have higher odds of 30-day morbidity.

TIME INTERVAL OF LAPAROSCOPIC ENDOSCOPIC COOPERATIVE SURGERY AFTER STENT IMPLANTATION IN LEFT-SIDED MALIGNANT COLONIC OBSTRUCTION: A PROSPECTIVE COHORT STUDY.

P1027

C. Huang, Z. Luo, K. Huang, Z. Qiu
Shanghai, China

Purpose/Background: Time interval of laparoscopic endoscopic cooperative surgery after stent implantation in left-sided malignant colonic obstruction remains controversial.

Methods/Interventions: We conducted a prospective cohort study to compare the short-term outcomes of different time intervals of laparoscopic endoscopic cooperative surgery after stent implantation in left-sided malignant colonic obstruction. In this study, 45 patients were eligible for inclusion. They were randomly assigned to three groups. Time intervals were 3 days, 7 days and 14 days between stent implantation and laparoscopic endoscopic cooperative surgery in Group A, Group B and Group C, respectively.

Results/Outcome(s): Patients in Group C had better short-term outcomes than Group A ($p<0.05$) including significantly shorter operation time ($p<0.05$), less surgical bleeding ($p<0.05$), reduced postoperative hospitalization ($p<0.05$) and less postoperative anastomotic leakage ($p<0.05$). Patients in Group C had less postoperative anastomotic leakage than Group B ($p<0.05$).

Conclusions/Discussion: To our knowledge, this study was the first prospective cohort study to investigate the time interval in between stent implantation and laparoscopic endoscopic cooperative surgery. The study indicated that when time interval was 14 days for laparoscopic endoscopic cooperative surgery after stent implantation, patients could get more short-term benefits than other time intervals. And long-term survival rate is still under follow-up.

ANGIOGENIN REGULATES TUMOR GROWTH IN A MOUSE MODEL OF COLITIS-ASSOCIATED CANCER.

P1000

J. Luo, T. Liu, J. Yoo
Boston, MA

Purpose/Background: The myofibroblast is a gastrointestinal stroma cell that regulates epithelial proliferation and mucosal repair through paracrine signaling, and has been implicated in the pathophysiology of colitis-associated cancer. The myofibroblast is the predominant nonmalignant stromal cell of the tumor microenvironment and a major reservoir of cyclo-oxygenase-2 (COX-2), the rate-limiting enzyme in the production of prostaglandins and thromboxanes. Angiogenin, a secreted 14-kDa member of the ribonuclease superfamily, was the first tumor-derived angiogenesis protein and is known to enhance cell growth and survival. We have recently reported that angiogenin regulates pro-inflammatory mediator signaling within the myofibroblast, directly regulating COX-2 production via protein kinase D signaling. However, the physiologic impact of angiogenin signaling on colitis-associated cancer has not been previously studied.

Methods/Interventions: Angiogenin knock-out (ANG-KO) C57BL/6 mice (n=8), a whole-body homozygous knockout strain, along with wild-type mice (n=8) were given azoxymethane (AOM, 5mg/kg I.P.), a colon carcinogen, 2 days in advance of three cycles of 3% dextran sodium sulfate (DSS). Each cycle consisted of 5 days of 3% DSS in the drinking water, followed by 16 days of regular water. This AOM-DSS colitis model leads to predictable and reproducible dysplasia/cancer. Disease activity index (DAI) was recorded during the "colitis" phase of each cycle. A colonoscopy was performed 1 week after each

DSS treatment, and mice were euthanized 1 week after the 3rd DSS cycle. Gross pathology was analyzed.

Results/Outcome(s): Of the 16 mice, 1 ANG-KO mouse died during AOM-DSS treatment. Of the remaining mice, there were no differences between WT and ANG-KO C57BL/6 mice in terms of disease activity index (weight loss, stool consistency, rectal bleeding) or colon length following AOM-DSS treatment. ANG-KO mice developed significantly fewer and smaller tumors compared to WT mice. In 7 ANG-KO mice only 3 distal tumors formed (0.4 tumors/mice) and all were <2mm in diameter. In comparison, 23 tumors formed in 8 WT mice (2.8 tumors/mouse). 11 tumors were >2mm and 12 were <2mm in diameter. 13 of the 23 tumors that formed in WT mice were in the mid-colon.

Conclusions/Discussion: In a mouse model of colitis-associated cancer, the absence of angiogenin (ANG-KO mice) leads to significantly diminished tumor growth with no apparent impact on the severity of colitis. Angiogenin regulates COX-2 expression in the colonic myofibroblast, a process that may account for the reduction of AOM-DSS-induced tumor growth in ANG-KO mice. These results suggest that local inhibition of stroma-derived COX-2 via angiogenin may be a novel therapeutic strategy for the treatment of colitis-associated cancer.

MSI AND IMMUNOSCORE COMBINED UTILIZATION FOR THE EVALUATION OF ANTI-TUMOR IMMUNITY IN CRC.

P1001

T. Sudo, H. Nakane, T. Shigaki, K. Fujiyoshi, S. Ogata, T. Ochi, T. Mizobe, F. Fujita, T. Kinugasa, J. Akiba, Y. Akagi
Kurume, Japan

Purpose/Background: The aim of this study is to explore the possibility of a universal screening that combine MSI/dMMR and immunoscore analysis for determining immune checkpoint inhibitor indication for colorectal cancer patients. KEYNOTE-164 trial indicated that immune checkpoint inhibitor (ICI) was effective for microsatellite instability high/mismatch repair deficiency (MSI-H/dMMR) colorectal cancer (CRC) patients so that ICI was approved for those patients. However, even in MSI-H/dMMR tumor the ICI response ratio is around 30%-50%. Thus far, we reported that clinical importance of immunoscore (IS) that evaluate subset of tumor infiltrating lymphocyte (TIL) in CRC and considered that combining of these tools could more precisely determine the ICI's indication.

Methods/Interventions: A total of 132 patients surgically resected with colorectal cancer from 2009 to 2010 in our institution were enrolled in this study. Tissue specimens were constructed and immunohistochemical (IHC) stained with dMMR markers for MSI status (MLH1, MSH2, MSH6 and PMS2) and CD3 and CD8 for IS by utilizing auto stainner. The cases with lack of one or more dMMR expression were diagnosed as dMMR by two independent pathologists. For evaluation of IS, all stained specimens were digitally scanned. The number of CD3/CD8 positive cells were counted within both center and perimeter of each tumor using computer software ImageJ. then IS was categorized into five ordinal categories (I0-I4). The status of dMMR, IS and clinicopathological characteristics were statistically compared and a correlation of dMMR and Immunoscore was analyzed. Tumor mutational burden (TMB) was compared within representative cases of MSI/IS-high or low cases.

Results/Outcome(s): A total of 7 of 132 cases (5.3%) were identified dMMR. All of these cases were loss of both MHL1 and PMS2 expression. Compared to pMMR cases, dMMR tumor was significantly associated with right sided location (p=0.0014) and poorly differentiated (p<0.0001). Overall survival (OS) and recurrence free survival (RFS) was analyzed, however no significant difference was shown according to MSI status. From the immunoscore analysis, I0-I2 were assigned as immunoscore low (IS-L) and I3-I4 were as immunoscore high (IS-H) groups. Clinicopathological variables were compared between IM-L and IM-H groups but there was no variable that showed significant difference between the two groups however, the prognosis of IS-H group was significantly better than that of IS-L group. TMB was significantly higher in dMMR cases (p=0.042) but not in IS-H cases(p=0.5691). However, there was a case showing very high TMB even in MSS/IM-H group.

Conclusions/Discussion: From the perspective of TMB, indication for ICI administration prefered to be determined by dMMR status rather than IM however some cases showed discordance of the dMMR result, thus both markers should be used in combination.

EXPRESSION OF TN ANTIGEN IN TUMORS AND TRANSITIONAL MARGINS OF COLORECTAL CANCER.

P1004

G. Dombek[1], Y. Matsumoto[1], A. Fleishman[1], J. Glickman[1], V. Poylin[2], T. Cataldo[1], E. Messaris[1], R. Cummings[1]
[1]*Jamaica Plain, MA;* [2]*Chicago, IL*

Purpose/Background: Over 50,000 patients in the U.S. die annually from colorectal cancer (CRC); this underscores the need for better biomarkers for reliable early CRC detection. Glycosylation is a ubiquitous post-translational modification, and aberrant glycosylation is established in many carcinomas. Alterations in O-linked glycans in CRC and expression of the tumor antigen Tn antigen have

been reported in CRCs but seldom in normal colorectal tissue. Tn antigen expression has been correlated with tumor progression, metastasis, and poor prognosis, though detailed immunohistochemical (IHC) analysis of Tn expression using well-defined monoclonal antibodies has not been reported. The potential for using Tn-bearing glycoproteins as biomarkers to identify new cases of CRC remains underexplored.

Methods/Interventions: IHC staining using ReBaGs6, a recombinant murine IgM produced in our lab with high specificity for clustered Tn structures, was performed to explore Tn-expression patterns in human tissues obtained from discarded surgical specimens. Samples were obtained from CRC, tumor-adjacent tissue, and normal tissue >3cm away. Transitional margin was defined as histologically normal tissue located less than 1 millimeter away from the malignant lesion. Histopathologic evaluation (H scoring) was carried out by a collaborating board-certified pathologist. Immunoprecipitation and LC-MS/MSn were used to characterize the specific proteins on which Tn is expressed. Pairwise comparisons were performed across the intracellular H scores in all three categories of cell type, using paired samples Wilcoxon rank sum tests. All tests were two-sided, and p-values less than 0.05 were considered statistically significant.

Results/Outcome(s): IHC results (Figure 1) reveal low intracellular Tn staining in distant normal mucosa but relatively high expression in both transitional margin mucosa ($p < 0.001$) and CRC tissue ($p < 0.001$). Transitional margin mucosa demonstrates a Tn expression level significantly elevated relative to CRC ($p = 0.019$). We have used ReBaGs6 in immunoprecipitation studies to explore Tn-bearing glycoproteins in tumor specimens. Using such immunoprecipitation coupled with LC-MS/MS^n proteomic analysis of tissue homogenates from 6 patients, we have identified the following Tn-expressing glycoproteins in either CRC or transitional margin tissue but not in distant normal tissue: Histone cluster 1 H1 family member b, Myoferlin, Vesicle amine transport 1, and Chaperonin containing TCP1 subunit 3.

Conclusions/Discussion: We have consistently observed Tn antigen in CRC mucosa as well as transitional margin mucosa using our highly specific recombinant ReBaGs6. Our results demonstrate that the expression of Tn antigen in the transitional margin exceeds that of the CRC lesion itself, a novel finding. Our results suggest that CRC transitional margin mucosa, in addition to CRC itself, represents a source of glycoproteins rich in Tn that may offer future biomarker targets.

Figure 1

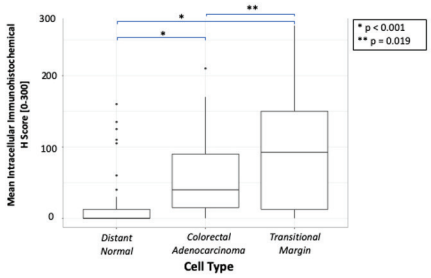


Figure 1. Box plot diagram showing mean intracellular immunohistochemical H scores [0-300] in specimens among patients with CRC, by cell type, including adenocarcinoma (n=43; median 40, range 0-210), transitional margin (n=39; median 92.5, range 0-270), and distant normal (n=43; median 0, range 0-160).

MUCINOUS ADENOCARCINOMA OF THE COLON AND RECTUM: LOOKING BEYOND THE MICROSCOPE AND INTO THE GENOME.

P1005

I. Reynolds[1], E. O'Connell[1], M. Fichtner[2], D. McNamara[1], E. Kay[3], J. Prehn[2], S. Furney[2], J. Burke[1]
[1]*Dublin, Ireland;* [2]*Dublin 2, Ireland;* [3]*Dublin 9, Ireland*

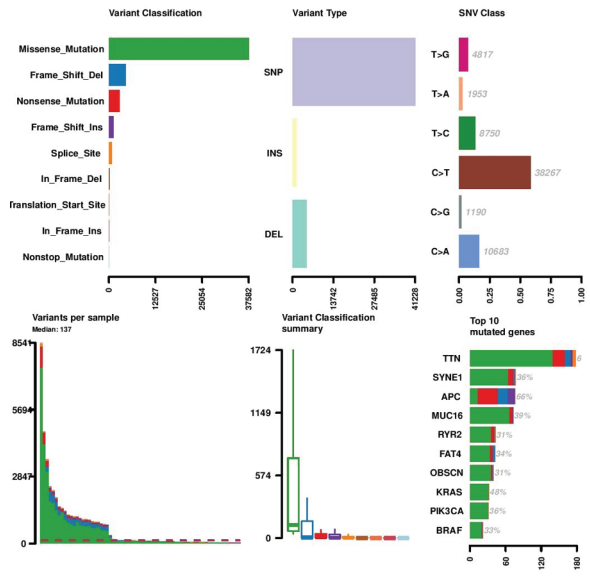
Purpose/Background: Mucinous colorectal cancer (mCRC) is a distinct histological subtype accounting for 5-15% of all CRCs. This subtype has an impaired response to treatment with chemotherapy and radiotherapy. While some evidence exists regarding *KRAS*, *BRAF* and microsatellite instability (MSI) status little else is known about the genetic mechanisms underpinning mCRC. The aim of this study was to perform an in-depth genomic analysis of mCRC and compare it to non-mucinous colorectal cancer (nmCRC).

Methods/Interventions: The Cancer Genome Atlas was interrogated to identify cases of mCRC and nmCRC with available sequencing data. MSI status for each case was determined using MSIPred. Mutational burden was compared between the cohorts as were the most commonly mutated genes. Mutations in mucin glycoproteins and mismatch repair genes were identified and compared. A comparison of copy number variation (CNV) drivers and pathway analyses were undertaken. Statistical analysis was carried out using GraphPad PRISM® version 5.00 while image and mutational frequency analyses were conducted using Maftools.

Results/Outcome(s): A total of 67 mCRC and 463 nmCRC were eligible for inclusion in the study. The MSI-High (MSI-H) rate was 32.84% in the mCRC cohort vs 11.23% in the nmCRC cohort ($p<0.0001$). The single nucleotide variation and insertion-deletion mutation rate was higher in the mCRC cohort overall ($p=0.0042$), however, this finding did not remain statistically significant when the analysis was performed according to MSI status. The mCRC cohort was more likely to have *KRAS* ($p=0.0023$), *BRAF* ($p<0.0001$) and *SMAD4* ($p=0.0007$) mutations while the nmCRC cohort were more likely to have *TP53* ($p<0.0001$) mutations. *MSH6* mutations were more common in the mCRC cohort ($p=0.045$) as were mutations in several of the mucin glycoprotein genes.

Alterations in several important oncogenic signalling pathways were more common in the mCRC cohort; the cell cycle pathway (70.45% vs 51.45%, p=0.0230), the RTK-RAS pathway (91.80% vs 70.84%, p=0.0003), and the TGF-β pathway (52.46% vs 25.06%, p<0.0001). CNV analysis identified important differences in driver genes between the cohorts.

Conclusions/Discussion: Mucinous CRC has many genomic differences in comparison to nmCRC. A significant proportion of these differences can be explained by the higher frequency of MSI-H tumors in the mCRC cohort. These tumors are hypermutated and are more likely to harbor SSMs in important oncogenes and tumor suppressor genes. Mucinous tumors are also more likely to have SSMs in the genes coding for several of the mucin glycoproteins which may contribute to the mucinous phenotype. These genomic differences may play a part in prognosis and the sensitivity to cytotoxic chemotherapy and targeted treatments. As we move towards a more personalized approach to cancer care a thorough understanding of the relevance of SSMs in a wide variety of genes will become increasingly important.



Summary mutational data for mucinous colorectal cancer

INTESTINAL MUCOSA STAPLE LINE INTEGRITY AND ANASTOMOTIC LEAK PRESSURE IN A PORCINE MODEL.

P1006

D. Naoi, H. Horie, K. Koinuma, Y. Kumagai, M. Tojo, G. Ota, A. Lefor, N. Sata
Shimotsuke, Japan

Purpose/Background: Incomplete stapling may result in an anastomotic leak after gastrointestinal anastomoses. Mucosal staple integrity is not usually evaluated clinically. The purpose of this study is to analyze mucosal integrity using two different size staples, and determine whether incomplete mucosal closure affects healing of the anastomosis intraoperatively and postoperatively.

Methods/Interventions: Porcine ileum was stapled *in-vivo* (Powered Echelon Flex GST System) with 0.75mm (gray, group G) and 1.5mm (blue, group B) cartridges, 10 times each. Staple lines were oriented vertically on the anti-mesenteric side. The ileum was immediately harvested and mucosal integrity evaluated. Subsequently, we used 3 animals with 5 staple lines in each group, and the animals recovered after surgery. The ileum was harvested postoperatively on days 0, 2 and 7. Each staple line was evaluated to determine the pressure needed to cause a visually apparent leak.

Results/Outcome(s): All staple lines harvested immediately in Group G had mucosal defects (incomplete mucosal capture) while all in Group B had complete mucosal closure. Serosal integrity was maintained in both groups. Delayed evaluation for postoperative leaks on day 0 showed a leak pressure for group B (188.7±51.2mmHg) significantly higher than group G (81.3±31.4) (P<0.01). On days 2 and 7, there was no significant difference in leak pressure for groups G and B (165.5±19.3 and 164.4±45.4 on day 2, p>.05, and 189.2±27.9 and 166.7±33.9 on day 7, p>.05). Leak pressure in Group B was not significantly different (p>.05) at all three time points, while in Group G the pressure was significantly higher (p<.05) on day 2 compared to day 0.

Conclusions/Discussion: The staple size used and resulting mucosal integrity at the staple line may be associated with an immediate postoperative leak. If an incomplete mucosal anastomosis is protected until day 2, the pressure needed to cause a leak is higher when 0.75mm staples are used, indicating greater strength. This result may have an impact on gastrointestinal surgical practice.

THE IMPACT OF TRADITIONAL VERSUS VALVELESS TROCAR USE ON INTRAOPERATIVE RESPIRATORY MECHANICS DURING ROBOTIC COLORECTAL SURGERY: A CASE-MATCHED ANALYSIS.

P1063

S. Parascandola[1], S. Hota[2], M. Tampo[3], V. Obias[1]
[1]*Washington, DC;* [2]*Norfolk, VA;* [3]*Manilla, Philippines*

Purpose/Background: Valveless trocars are being increasingly used in the field of colorectal surgery. Theoretical advantages over traditional trocar systems include improved visualization through more rapid smoke evacuation, preservation of pneumoperitoneum during suctioning, and decreased camera smudging. While current literature cites improved respiratory mechanics during urologic surgery using the valveless trocar system, few have examined its effects in colorectal surgery. The purpose of this study is the examine the use of a valveless trocar and

its impact on respiratory mechanics and intraoperative complications in patients undergoing robotic colorectal surgery.

Methods/Interventions: A retrospective review of 525 consecutive robotic procedures performed at a single institution between 2009 and 2018 was conducted. Patients who underwent surgery with the traditional trocar (TT) system were clinically matched to those who underwent surgery with the valveless trocar (VT) system by procedure performed (low anterior resection and sigmoidectomy), BMI, and operative time. For all patients, insufflation was set at 15mmHg. Intraoperative respiratory data including end-tidal CO_2 ($EtCO_2$), oxygen saturation ($Sp0_2$), minute volume (MV) and peak inspiratory pressure (PIP) were collected at the following intervals: 30 minutes after anesthesia induction (T1), 60 minutes (T2), 90 minutes (T3), 120 minutes (T4), and immediately prior to anesthetic reversal (T5). Chart review was conducted to examine the incidence of major intraoperative complications such as CO2 embolus.

Results/Outcome(s): Following 2:1 matching, the analysis included 84 patients (56 in the TT cohort, 28 in the VT cohort) and included 38 men and 46 women. Mean age for TT and VT groups were 57.7 ± 13.0 and 59.2 ± 11.5 years (p=0.70), respectively. Mean BMI between the TT and VT groups were 28.5± 6.7 and 28.2± 8.9 kg/m2 (p = 0.88), respectively. The mean operative time was 234.3± 54.8 and 227.4 ± 50.7 min (p = 0.58), for the TT and VT groups, respectively. Intraoperatively, there was no significant difference in mean $EtCO_2$ (37 ± 4.54 vs 37 ± 4.51 mmHg, p = 0.14), $Sp0_2$ (99 ± 1.53 vs 98 ± 7.67 $\%O_2$, p = 0.11) minute volume (6.0 ± 1.84 vs 6.1 ± 4.01 L min^{-1}, p = 0.75), or peak inspiratory pressure (24 ± 7.36vs 23 ± 7.20 cm H_20, p = 0.14) between the two cohorts across each time point. No patient experienced CO2 embolus.

Conclusions/Discussion: Our analysis demonstrated that in patients who undergo robotic low anterior resection and sigmoidectomy, use of the valveless trocar system did not impact intraoperative respiratory mechanics. In these operations, which require Trendelenburg positioning and are often longer than other colorectal procedures, no significant hemodynamic or respiratory alterations were seen. Additionally, no major intraoperative complications, including pneumothorax or CO2 embolus, were seen across either cohort.

THE ROBOTIC COLORECTAL EXPERIENCE: AN OUTCOMES AND LEARNING CURVE ANALYSIS OF 527 PATIENTS.

P1064

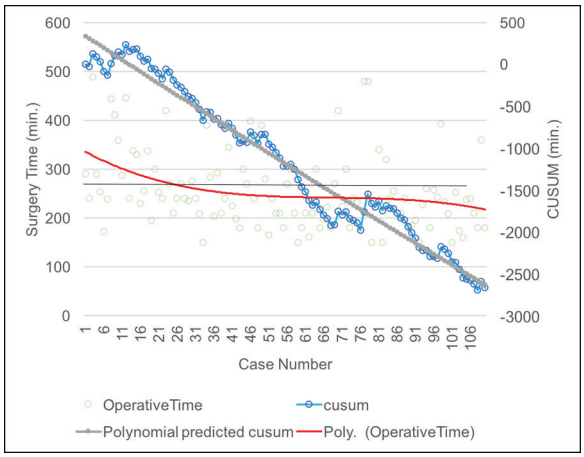
S. Parascandola[1], S. Hota[2], J. Paull[1], A. Graham[1], N. Pudalov[1], S. Smith[1], M. Tampo[3], R. Amdur[1], V. Obias[1]
[1]*Washington, DC;* [2]*Norfolk, VA;* [3]*Manilla, Philippines*

Purpose/Background: This study aimed to present our experience with robotic colorectal surgery since its establishment at our institution in 2009. By examining intraoperative and postoperative outcomes of over 500 patients, our experience provides a basis for the assessment of the role of a robotic platform in a colorectal practice. This is the largest single surgeon robotic database analyzed to date.

Methods/Interventions: A prospectively maintained database of robotic-assisted colorectal surgery performed by a single surgeon at the George Washington University Hospital was retrospectively reviewed to identify patients who underwent robotic-assisted surgery October 2009 – December 2018. Demographic data, preoperative and intraoperative parameters, and postoperative outcomes were assessed.

Results/Outcome(s): A total of 527 patients with a mean age of 58 and a body mass index of 28.4 kg/m^2 underwent robotic colorectal surgery between October 2009 and December 2018. The most common indications for surgery was diverticulitis in approximately 22%, colon adenocarcinoma in 22% and rectal cancer in 18% of patients. The most common operation was low anterior resection (32%) followed by right hemicolectomy and ileocecectomy (24%), left hemicolectomy and sigmoidectomy (21%), subtotal/total colectomy (3%), and abdominoperineal resection (2%). The mean total operative time was 223 (range, 30-972) minutes. The rates of conversion to laparoscopic and open were 2.8% and 4.6%, respectively. The median length of stay was 4 days. Twenty-five (4.7%) patients experienced surgical site infections, 16 patients (3.0%) developed intraabdominal abscesses requiring drainage, 4 patients (0.8%) developed pneumonia, 6 patients (1.1%) developed a UTI, and 25 patients (4.7%) required readmission within 30 days. The operative time learning curve for low anterior resection and left hemicolectomy/sigmoidectomy was achieved after 65 cases and 45 cases, respectively. A clear learning curve was not seen in right hemicolectomies.

Conclusions/Discussion: Robotic-assisted surgery can be performed in a diverse colorectal practice with low rates of conversion and post-operative complications. Plateau performance was achieved after 65 low anterior resections and 45 left hemicolectomies/sigmoidectomies.



Surgical Learning Curve and CUSUM for Left Hemicolectomy/sigmoidectomy

DOMAINS OF FOUR-STEP-TECHNIQUE TRAINING PROGRAM FOR LAPAROSCOPIC COLORECTAL SURGERY.

P1065

Y. Chern
Taoyuan City, Taiwan

Purpose/Background: Many young trainee surgeon start learning colorectal surgery from laparoscopy instead of open. Our institute designed the domains of four-step-technique (DOF) training program for laparoscopic colorectal surgery since 2011. In this study, we aimed to compare the short-term outcome between training's cases and trainer's cases and discuss about the trainee's learning achievement.

Methods/Interventions: Our institute has established the four standard surgical domains for laparoscopic surgery mainly in right hemicolectomy, left hemicolectomy, and anterior resection. We proposed that the trainee will gain proficiency for laparoscopic colorectal surgery after completing at least 25 steps for each domain, which means equal to or more than 100 steps. From January 2013 to April 2019, 8 trainees had completed the passport of DOF in Chang Gung Memorial Hospital, Linkou branch. To analyze the post-operative outcomes and learning results, we had enrolled 2604 non-training cases and 478 training cases.

Results/Outcome(s): As training cases under DOF, there were no higher rate of postoperative morbidity and mortality compared with non-training cases. The operation time was much longer in the training cases. We had conducted the proficient point (completing 100 steps, PP) in DOF which indicated that once trainee passed the PP, the trainee could performed a entire laparoscopic colorectal surgery under supervision safely without additional adverse effect on patients.

Conclusions/Discussion: As a newly founded learning program, Domains of four-step-technique training program for laparoscopic colorectal surgery was proved as a safe method to ensure patient's safety compared with non-training cases. DOF also was proved that under this program, trainee could performed entire laparoscopic colorectal resection safely under supervision. DOF could be a useful learning program for young colorectal surgeon to be familiar with laparoscopy colorectal surgical techniques.

Learning Passport I (case registration)

	Date	Chart No	OP type	Step 1	Step 2	Step 3	Step 4	Supervisor
1	5/13	3XX2590	LAR	✓	✓			7832,0110
2	5/14	3XX25277	LAR	✓				0110
3	5/8	1XX7804	HAR	✓	✓	✓		3368
4	5/8	2XX15284	HAR		✓			3368
5	6/19	2XX46400	LH	✓	✓	✓		0110,7832
6	6/17	2XX57466	HAR	✓	✓			0110
7	6/20	3XX6482	APR	✓	✓	✓		3368

Learning Passport II (Sum of completed steps)

Step	Right Hemicolectomy	Left Hemicolectomy	Anterior Resection
1	12	8	13
2	10	6	10
3	7	4	7
4	2	3	4

Passport completed: Accumulated number of each cell (step 1-4) should be at least ≥ 8

Learning passport for Domains of four-step-technique training program for laparoscopic colorectal surgery

THE INFLUENCE OF COLORECTAL SURGEON PERSONALITY ON PATIENT CARE: RESULTS FROM A PATIENT AND PUBLIC INVOLVEMENT STUDY.

P1066

C. Bisset[1], N. Dames[2], R. Oliphant[3], A. Alasadi[1], D. Anderson[1], S. Moug[1]
[1]*Paisley, United Kingdom;* [2]*Glasgow, United Kingdom;* [3]*Inverness, United Kingdom*

Purpose/Background: In rectal cancer surgery, there is not necessarily a 'right answer', regarding temporary stoma formation or permanence; or anastomosis or permanent diversion. Despite similar training, no two surgeons would necessarily make the same operative decisions, despite being presented with the same patient information. Defining the factors influencing stoma formation has been identified by ACPGBI as a research priority. Wide variation in stoma formation practice (observed from the UK National Bowel Cancer Audit) leads us to consider that internal surgeon-specific factors such as personality may account for differences in peri-operative decision making and thus post-operative outcomes for patients. This study

aimed to determine if colorectal surgeon personality bears importance to patients, and if so, which specific aspects.

Methods/Interventions: A multimodal patient and public involvement (PPI) exercise was performed using a Modified Delphi approach. Part 1 (online survey using SurveyMonkey) included information on demographics, details of surgery and views on surgeon personality and traits. The survey was disseminated via social media, with more than 95% of responses completed within 48 hours of the survey going live. For Part 2: a structured face-to-face PPI discussion (n = 12: 7 patients, 5 faculty) was undertaken, that focused upon surgeon-patient interactions and post-operative outcomes.

Results/Outcome(s): Part 1 yielded 296 responses. 72% were female; 75.3% were based in UK and 13.2% from the USA. Most participants (55.1%) were aged 40-59 years. Cancer (40.2%) and IBD (45.3%) were the main indications. 84.1% of responders felt surgeons were good listeners, with 81.8% reporting good rapport. Rapport was considered imperative to patient care by 95.6% of responders and all PPI participants. Unfortunately, only 78.7% of responders felt that they had a say in decision making regarding their care, suggesting that although shared decision making is considered the 'gold standard', this is not universal. 8.8% of responders described their surgeons as "risk-takers". However, only 16.2% felt risk-taking was advantageous. All PPI participants felt "calm, emotionally stable" traits were preferable.

Conclusions/Discussion: Consensus was that patients believe surgeon personality influences their healthcare experience, particularly agreeableness and emotional stability. The public are interested in how surgeon personality could affect post-operative outcomes, and if patient personality also influences this. Good rapport is essential, as is risk-aversion. Understanding the potential role of surgeon personality on post-operative patient outcomes is a research priority. It was unclear to patients if surgeon personality could influence post-operative outcomes, however their personality would affect their response to complication management.

PATIENT EDUCATION IN COLORECTAL SURGERY THROUGH VIRTUAL REALITY.

P1067

S. Hota[1], S. Parascandola[2], A. Graham[3], M. Tampo[4], S. Boulos[3], A. Herur-Raman[5], A. Srivastava[5], V. Obias[3]
[1]Norfolk, VA; [2]Bethesda, MD; [3]Washington, DC; [4]Manila, Philippines; [5]Cleveland, OH

Purpose/Background: Patient literacy in surgical disease and management is in constant need of improvement. In the field of colorectal surgery, there is a widespread lack of education on basic anatomy as well as common disease processes such as colon polyps and anal fistulas. This disconnect fosters misconceptions about treatment strategies and is disadvantageous to the patient. There are several options that the clinician can use to educate patients such as models and diagrams. With recent advances, the virtual reality interface opens up the option to create a personalized and interactive demonstration in a time efficient manner that can be utilized in an office-based setting.

Methods/Interventions: This is a prospective study based out of a single colorectal surgeon's clinical practice. A total of 61 patients were included in the study from March to November 2019. Virtual reality software was applied to each patient's CT or MRI and the disease process of interest was isolated based on density and highlighted in color. The patients were able to appreciate nearby anatomy and have a 3-dimensional view of their pathology from a user-friendly version of their personal radiologic imaging. The patients completed a brief survey regarding their experience at the conclusion of the visit.

Results/Outcome(s): Patients ages ranged from 24 to 82 years with an average age of 54 years. On a 10-point scale (10 being the highest), the average self-reported experience with using 3D technology was 4.6. The average understanding of the individual's disease process prior to this intervention was 6.3 out of 10. The average understanding of one's anatomy prior to seeing the imaging was reported to be 5.5 out of 10. After working with the software, the patients reported an overall increase in understanding regarding their disease process and anatomy, averaging 1.8 and 2.6 points higher than their pre-intervention scores, respectively.

Conclusions/Discussion: Virtual reality software can be applied to patient imaging to improve patient literacy on their disease process and anatomy. This can be implemented in a clinic-based setting and is a personalized approach to patient education.

PICTURING LIFE WITH A TEMPORARY DIVERTING LOOP ILEOSTOMY – A PHOTOELICITATION STUDY.

P1069

A. De Roo, S. Regenbogen, M. Byrnes
Ann Arbor, MI

Purpose/Background: In the few studies using surveys and patient-reported outcomes, we have learned that patients with ostomies report difficulty with adjustment and quality of life, and those with temporary ostomies do not recover life satisfaction as well as those with permanent ostomies. Accordingly, we know little about detailed and modifiable aspects of living with a temporary ostomy that may be targets to improve patients' quality of life in this unique time period. In this pilot study, we sought to evaluate whether a novel technique in medicine, photoelicitation interviewing, could effectively elicit patients' lived experiences with temporary diverting loop

ileostomies in a patient-controlled, open-ended fashion, and identify challenges or topics that unsupervised recall or structured surveys cannot provide.

Methods/Interventions: In this pilot study, we used photoelicitation interviewing, a qualitative methodology. We enrolled patients approximately 4 weeks after creation of a temporary diverting loop ileostomy and provided participants with a disposable camera. Participants were instructed to take 27 photos following the prompt "show what life is like with a temporary ostomy". We then conducted in-person, in-depth, hour-long interviews with participants about the photos and their experiences. We focus coded the photos for content and also focus coded the interview transcripts in which the patients describe the meaning behind their photos.

Results/Outcome(s): We have enrolled 3 patients so far and analyzed their interviews around 81 photos. Their indications for surgery were cancer (2) or inflammatory bowel disease (1). Two participants were female and one was male, with ages from 20-49 years. In the photographs, we identified themes of "normal life", "sickness", and "materials". In interviews, participants discussed "normal life", "being overwhelmed with information", "changes to body/clothing". For example, participants photographed and discussed the challenges that they faced postoperatively. For participants in our study, access to an "egg-shaped" toiled rather than "a smaller rounder toilet" would have made the frequent task of emptying the bag less taxing. For other participants in our study who lived in communal living spaces like dormitories, changing the appliance was an "awkward" and "uncomfortable" challenge. Another participant highlighted the confusion of multiple ostomy product suppliers (**Figure**).

Conclusions/Discussion: In this pilot study using a novel methodology in medicine, patients offered intimate details of their lived experiences with temporary diverting loop ileostomies, providing far richer insights than what is seen in survey research. With simple resources that could be employed in routine post-operative care, we were able to elicit rich, nuanced, and actionable day-to-day life topics for patient and provider education that could help address the difficulties in coping with a temporary ostomy.

DOUBLY COMMUNICATING RECTAL DUPLICATION.

P01069

J. Ray, E. Esen, B. Dane, A. Erkan, H. Kirat, F. Remzi
New York, NY

Purpose/Background: Colon and rectal duplications are a rare form of enteric duplication with less than 100 case reports in the literature. Two thirds of these cases present before age two. Duplications may be communicating or non-communicating with the main bowel lumen and can present in a variety of ways including bleeding, obstruction, prolapse, and fistula. Here we describe an unusual case of a 42 year old man presenting with constipation who was found to have a rectal duplication communicating to the main rectal lumen and then joining the sigmoid proximally.

Methods/Interventions: The patient presented with complaints of fecal impaction and incomplete rectal emptying. Work up included colonoscopy which revealed two lumens diverging in the rectum (Figure 1a). The main lumen was followed into the sigmoid and the scope was withdrawn to pass into the second lumen, which appeared as healthy colonic mucosa. This rejoined the sigmoid proximally. An MRI was obtained showing the duplication cyst located anterior to the rectum merging with the rectum inferiorly at 4.5cm to anal verge (Figure 1b) and again with the sigmoid (Figure 1c). Retrograde contrast filled both lumens (Figure 1d).

Results/Outcome(s): The patient had no polyps or findings concerning for malignancy or obstruction. He will be followed with routine surveillance and a bowel regimen.

Conclusions/Discussion: While colorectal duplications usually present in childhood, those without significant symptoms of bleeding or obstruction may result in delayed diagnosis. In patients with asymptomatic duplications in continuity with the bowel, surveillance is feasible.

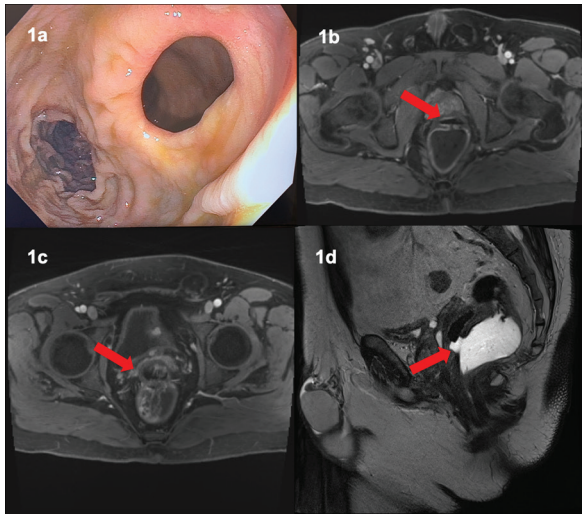


Figure 1: Endoscopic and MRI images of rectal duplication. a) Two lumens seen endoscopically. b) Duplication cyst anterior to the rectum merging with the rectum inferiorly at 4.5cm from anal verge. c) Duplication communicating to sigmoid. d) Retrograde contrast filled both lumens.

ENTERO-URACHAL FISTULA: AN UNUSUAL PRESENTATION OF CROHN'S DISEASE.

P1070

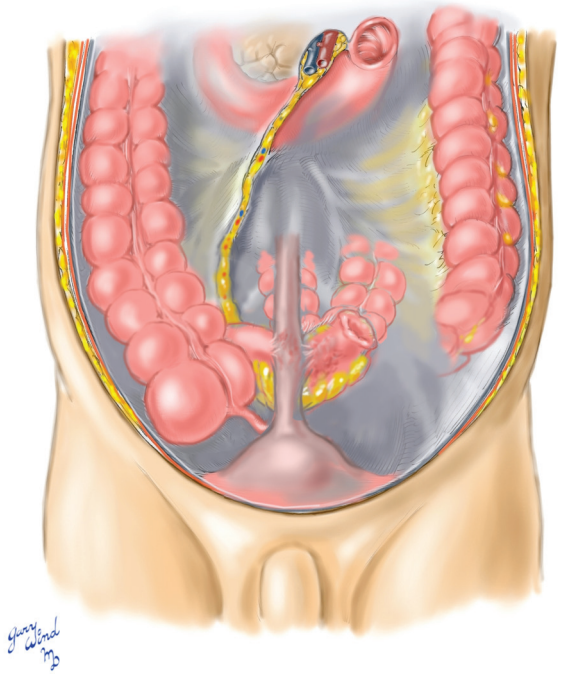
W. Kucera[1], T. Gerald[2], H. Altamar[2], M. O'Donnell[1]
[1]*Washington, DC;* [2]*Bethesda, MD*

Purpose/Background: Crohn's Disease (CD) is a transmural inflammatory process of the gastrointestinal (GI) tract that can present as fistulizing, stricturing, or inflammatory disease. Approximately 20% of patients with CD will develop fistulas over the course of their disease, with fistulas typically between the terminal ileum and another loop of bowel or to the urinary bladder. While entero-enteric fistulas can be asymptomatic, fistulas between the GI and genitourinary (GU) systems often can lead to persistent infections and often require surgery. Urachal anomalies are present in 1% of the general population, with 1.5% of those patients having a patent urachus. We present a patient with a fistula between his terminal ileum (TI) and a patent urachus to demonstrate an unusual presentation of fistulizing CD.

Methods/Interventions: We present our experience at Walter Reed National Military Medical Center in caring for a patient with fistulizing CD between his TI and patent urachus.

Results/Outcome(s): The patient is a 30-year-old male who was evacuated from deployed theater due to continuous foul-smelling drainage from his umbilicus that did not improve with antibiotics. He denied having any changes to his bowel habits, bloody bowel movements, or other symptoms, but did report having a single urinary tract infection (UTI) approximately 1 year prior. A CT performed at time of presentation demonstrated a urachal remnant with thickening of the dome of the bladder, terminal ileum, and jejunum with associated lymphadenopathy. Cystoscopy demonstrated nodular thickening at the bladder dome with a patent urachus, but no evidence of an overt urachal malignancy. Voided urine cytology and bladder wash cytology from the dome were negative for malignancy. A colonoscopy demonstrated scarring, ulcerations, and inflammatory changes of the TI consistent with CD. Subsequent magnetic resonance enterography (MRE) demonstrated a fistulous connection between his terminal ileum and a patent urachus, as well as a short segment of transverse colon. Given his continued drainage from his umbilicus, he was taken to the operating room in conjunction with the urology service for a robotic urachal excision with partial cystectomy in combination with a laparoscopic ileocectomy. Intraoperatively, he was discovered to also have involvement of the transverse colon with the inflammatory mass around the entero-urachal fistula, which required a partial transverse colectomy (Figure 1). Given the inflammatory changes around his umbilicus from the fistula, his umbilicus was completely excised and reconstructed with the assistance of the Plastic Surgery Service. He recovered well post-operatively and was discharged on post-operative day 4.

Conclusions/Discussion: This case demonstrates an unusual presentation of fistulizing Crohn's Disease as the patient's only symptom was drainage from the umbilicus with a remote history of a UTI. Following surgical intervention, he recovered well and is in remission for his CD.



AUTOLOGOUS ADIPOSE-DERIVED STEM CELLS FOR THE TREATMENT OF CROHN'S FISTULA-IN-ANO: AN OPEN-LABEL, CONTROLLED CLINICAL TRIAL.

P1071

C. Zhou, Y. Zhang, M. Li, M. Ni, Y. Wang, D. Xu, Y. Shi, S. Zhang, H. Shi, B. Jiang
Nanjing, China

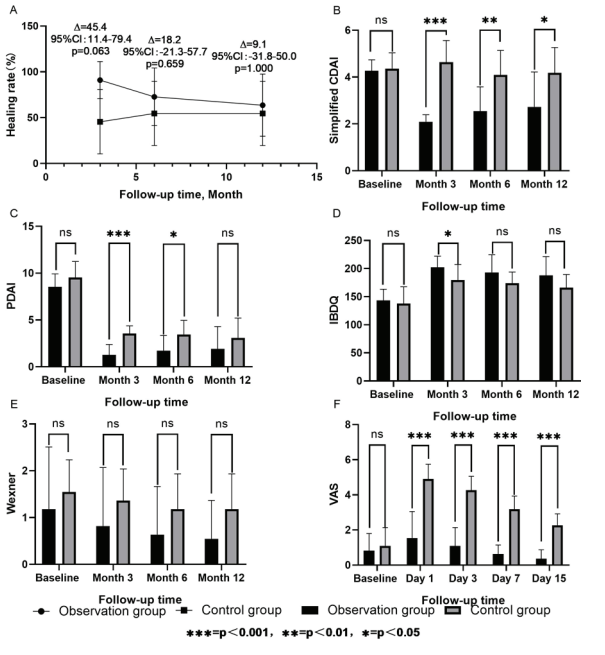
Purpose/Background: Crohn's fistula-in-ano is a refractory disease in colorectal and anal surgery. Autologous adipose-derived stem cell (ADSC) has been used in the treatment of Crohn's fistula-in-ano. However, it hasn't been used in China. This is is the first trail to evaluate the safety and efficacy of autologous adipose-derived stem cells (ADSCs) for the treatment of Crohn's fistula-in-ano in China.

Methods/Interventions: 22 patients with Crohn's fistula-in-ano were enrolled in this study from January 2018 to October 2018 in Colorectal Disease Center of Nanjing Hospital of Chinese Medicine Affiliated to Nanjing University of Chinese Medicine. Patients were divided (1:1) into observation group (ADSC) and control group (incision-thread-drawing procedure). Primary efficacy

endpoint evaluated at month 3, 6 and 12 was closure of fistulas (closure of all treated fistulas at baseline, confirmed by doctor's clinical assessment and magnetic resonance imaging or transrectal ultrasonography). In addition, the patients should complete some scoring scales at each follow-up including simplified Crohn's Disease Activity Index (CDAI), Perianal Disease Activity Index (PDAI), Inflammatory Bowel Disease Questionnaire (IBDQ), Pain scores with Visual Analogue Score (VAS), and Wexner score.

Results/Outcome(s): The healing rates of the observation group and the control group at month 3, 6 and 12 were as follows: 10/11(90.9%) vs 5/11(45.5%), 8/11(72.7%) vs 6/11(54.5%), and 7/11(63.6%) vs 6/11(54.5%), respectively. And there was no statistical difference between the two groups. In addition, the improvement in simplified CDAI, PDAI, IBDQ, VAS, and Wexner score of the observation group was better than that of the control group at each follow-up. At last, safety was maintained throughout month 12, adverse events occurred in 63.6% of patients in the observation group and 100% patients in the control group. And no adverse events associated with ADSCs injection were observed in the study.

Conclusions/Discussion: ADSC is an effective and feasible treatment for Crohn's fistula-in-ano, compared with traditional incision and thread-drawing. It can protect the anal function of patients, relieve pain, recover quickly, have good tolerance and repeatability, and improve the quality of life during perioperative period.



PYLORIC STENOSIS AS AN INITIAL SYMPTOM IN CHRON'S DISEASE: A RARE CASE REPORT.

P1073

T. Kurokawa, G. Tsurita, Y. Azuma, Y. Kanemoto, K. Yazawa
Tokyo, Japan

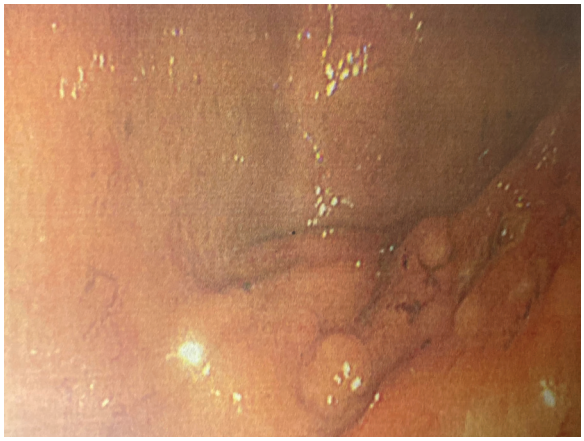
Purpose/Background: Crohn's disease(CD) affects the entire digestive tract from the mouth to the anus, mainly targeting the terminal ileum; however, reported cases of stenosis caused by gastric or duodenal lesions are very few. We report our experience with a case of pyloric stenosis that led to the diagnosis of CD.

Methods/Interventions: A 27-year-old male, at 9 months before diagnosis, complained of epigastric pain and consulted a physician at a nearby hospital. He was diagnosed with gastritis and was prescribed oral medications. At 4 months before diagnosis, in another hospital, upper gastrointestinal endoscopy was performed; based on the findings, he was diagnosed with gastric ulcer and reflux esophagitis. In the absence of improvement after treatment, he visited our hospital. There was marked gastric distension due to pyloric stenosis; retrograde double-balloon endoscopy revealed stenosis and ulcerations in the small intestine, which were therefore diagnosed as extraintestinal lesions associated with CD of the small intestine.

Results/Outcome(s): The symptoms improved once the patient was treated with a proton pump inhibitor (PPI), mesalazine granules, and prednisolone. At 5 months after diagnosis, he was admitted for restenosis. Treatment using infliximab(IFX) was started. Subsequently, IFX was administered at a dose of 5 mg/kg at 8-week intervals. PPI, mesalazine granules and elemental diet were administered. C-reactive protein levels started to increase at 1 year and 5 months after diagnosis. At 2 years and 3 months after diagnosis, he had an emergency hospitalization because of upper abdominal bloating. His condition improved after fasting and treatment using IFX. At 3 years after diagnosis: To alleviate the sensation of abdominal bloating, endoscopic balloon dilatation was performed twice but no improvement was achieved. Therefore, a gastrojejunal bypass was performed. Since then, the condition has been under control using IFX, mesalazine granules, and PPI.

Conclusions/Discussion: CD with gastroduodenal lesions was first reported by Ross in 1949, and ever since, more than 200 cases have been reported and are considered to account for 0.5 to 5% of all CD. However, the frequency of gastric and duodenal lesion occurrence varies greatly depending on whether microlesions are counted in the establishment of the diagnosis. CD cases with pyloric stenosis are very rare, Moreover, cases of CD diagnosed on the occasion of gastroduodenal stenosis are extremely rare. The patient's condition improved temporarily with drug therapy, but later, no further improvement was observed even after endoscopic balloon dilatation, and ultimately gastrojejunostomy was performed. 10 years have passed

since the surgery, and there have been no apparent postoperative complications, but strict follow-up still needs to be continued. The findings from our case suggested that CD should be included in the differential diagnosis when a patient presents with pyloric stenosis.



DISTURBANCE OF FATTY ACID DESATURATION MEDIATED BY FADS2 IN MESENTERIC ADIPOCYTES CONTRIBUTES TO CHRONIC INFLAMMATION OF CROHN'S DISEASE.

P1074

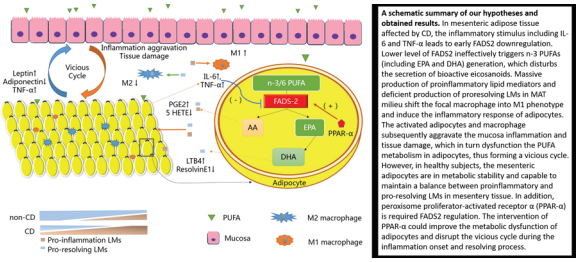
R. Liu, Y. Li, J. Gong, W. Zhu
Nanjing, China

Purpose/Background: Mesenteric fat accumulation is associated with the chronic gut inflammation observed in Crohn's disease (CD). The aim of this study was to investigate the metabolic profile of mesenteric adipocytes and the correlations between key metabolic changes and local inflammation in the context of CD.

Methods/Interventions: Metabolic dysfunction was shown to be regulated by fatty acid desaturase-2 (FADS2) through metabolomics and functional analyses of mesenteric adipose tissue biopsies and primary mesenteric adipocytes isolated from surgical specimens collected from CD patients and control subjects. FADS2 was overexpressed in vitro and in vivo using a lentiviral vector and an adeno-associated virus (AAV), respectively. The interaction between mesenteric adipocytes and inflammation responses was evaluated by establishing a cell coculture system and an FADS2-AAV treated animal model. 3T3-L1 cells were used to elucidate the mechanism underlying FADS2 deregulation.

Results/Outcome(s): We observed significant changes in the levels of metabolites involved in the multi-step synthesis of long-chain polyunsaturated fatty acids (PUFAs). Gas chromatography analysis revealed impaired desaturation fluxes towards the n-6 and n-3 pathways, which are associated with reduced FADS2 activity in human mesentery tissue. Decreased FADS2 expression at both mRNA and protein levels was confirmed in surgical specimens. The restoration of FADS2 expression, which allows for the endogenous conversion of n-3 fatty acids into proresolving lipid mediators, resulted in a significant reduction in proinflammatory macrophage infiltration and attenuated expression of inflammatory cytokines or adipokines.

Conclusions/Discussion: These findings indicate that impaired fatty acid desaturation and lipid mediator imbalance within mesenteric adipose tissue contributes to chronic inflammation in CD. The therapeutic role of FADS2 may lead to improved CD treatment.



A schematic summary of our hypotheses and obtained results. In mesenteric adipose tissue affected by CD, the inflammatory stimulus including IL-6 and TNF-α leads to early FADS2 downregulation. Lower level of FADS2 ineffectively triggers n-3 PUFAs (including EPA and DHA) generation, which disturbs the secretion of bioactive eicosanoids. Massive production of proinflammatory lipid mediators and deficient production of proresolving LMs in MAT milieu shift the focal macrophage into M1 phenotype and induce the inflammatory response of adipocytes. The activated adipocytes and macrophage subsequently aggravate the mucosa inflammation and tissue damage, which in turn dysfunction the PUFA metabolism in adipocytes, thus forming a vicious cycle. However, in healthy subjects, the mesenteric adipocytes are in metabolic stability and capable to maintain a balance between proinflammatory and pro-resolving LMs in mesentery tissue. In addition, peroxisome proliferator-activated receptor α (PPAR-α) is required FADS2 regulation. The intervention of PPAR-α could improve the metabolic dysfunction of adipocytes and disrupt the vicious cycle during the inflammation onset and resolving process.

ANAL SQUAMOUS CELL CARCINOMA IN ULCERATIVE COLITIS: CAN POUCHES WITHSTAND TRADITIONAL TREATMENT PROTOCOLS?

P1075

P. Vaidya, J. McMichael, M. Regueiro, S. Steele, T. Hull, A. Lightner
Cleveland, OH

Purpose/Background: Anal squamous cell carcinoma (ASCC) has been reported in the setting of long-standing perianal Crohn's disease but is rarely reported in ulcerative colitis (UC). Reports of UC have been mixed with Crohn's disease as ASCC in inflammatory bowel disease (IBD). We aimed to understand the treatment patterns and prognosis of anal dysplasia and/or ASCC in the setting of UC alone.

Methods/Interventions: A retrospective chart review using ICD-9/10 codes for UC (556.9/K51.9) and ASCC (154.3/C44.520) between January 1, 2000, to August 1, 2019, was conducted. Adult patients with both UC and ASCC were included for data analysis. Data collected included patient demographics, UC disease status and surgical history, diagnosis and treatment of ASCC, complications related to ASCC treatment, and survival

Results/Outcome(s): A total of 17 adult patients with UC and anal dysplasia and/or ASCC were included for data analysis out of 13,499 UC patients treated; 9 had a diagnosis of ASCC, 8 a diagnosis of high-grade intraepithelial lesions (HSIL), and 3 with low-grade intraepithelial lesions (LSIL). The study cohort included 4 males (23%) and median age of 55 years (range, 41-69) years. At the time of diagnosis, 6 had an ileal pouch-anal anastomosis (IPAA) of which 5 had active pouchitis, 1 had an ileorectal

anastomosis with active proctitis, 1 had a Hartman's stump with disuse proctitis, 5 had pancolitis, and 4 had left-sided colitis. Five patients were exposed to corticosteroids (5 mg – 40 mg daily), four were exposed to immunomodulators, (one 6-mercaptopurine and 3 on azathioprine), and one exposed to biologic therapy (vedolizumab). Eight patients were diagnosed at annual surveillance colonoscopy. All six patients with ASCC received 5-FU and mitomycin C with external beam radiation therapy. Of those six, four patients had an IPAA in situ at the time of treatment, all of whom required intestinal diversion or pouch excision due to treatment intolerance or locally advanced disease. At a median follow-up of 60 months, none had local residual disease, although three patients experienced mortality: one at 0 months (treatment-related myocardial infarction), one at 60 months (metastatic ASCC), and one at 129 months (malignant peripheral nerve sheath tumor).

Conclusions/Discussion: Our data suggest that ASCC in the setting of ulcerative colitis is extremely rare. In the setting of IPAA, permanent fecal diversion may be necessary to prevent radiation intolerance. Careful examination of the perianal region should be performed at the time of surveillance endoscopy.

ADIPOSE-DERIVED STEM CELL TREATMENT FOR PERSISTENT OR RECURRENT COMPLEX CROHN'S PERIANAL FISTULAS AFTER CONVENTIONAL SURGERY.

P1076

Y. Kwon[1], K. Park[1], H. Lim[1], S. Ryoo[1], E. Han[2], E. Choe[1]
[1]Seoul, Korea (the Republic of); [2]Busan, Korea (the Republic of)

Purpose/Background: Perianal fistulas occur frequently in Crohn's disease(CD) and are characterized by high recurrence rate and repeated cycles of remission–exacerbation. This study evaluated the long-term outcome of adipose-derived stem cells(ASCs) for the treatment of recurrent or persistent complex perianal and rectovaginal fistulas in CD patients after failure of conventional surgery.

Methods/Interventions: We prospectively collected 28 patients who underwent ASC treatment after failed conventional surgery for complex perianal/rectovaginal fistulas in CD between 2009-2019. These patients had undergone a mean of 3.1±1.4(range,1-6) previous operations, including fistulotomies, fistulectomies and seton drainage. Sixteen patients were male(57.1%) and the mean age of the patients was 27.1±7.1 years(range,17-40). The median follow-up duration was 82.0±37.0 months(range,3-384). Subcutaneous adipose tissue was obtained by fat tissue extraction from the abdomen of patients and ASCs isolated from such fat tissue were expanded and packaged in single-use vials. After controlling sepsis with long-term seton drainage, we injected 1-4x10^7 cells/mL ASCs into the wound wall and sealed off the wound with fibrin glue+ASCs. In 24 patients(85.7%,28 fistulas), autologous ASCs were used and in the remaining 4(14.3%, 4 fistulas) patients, allogeneic ASCs were used. The primary endpoint was the complete healing of fistulas after injection defined as complete re-epithelialization of the external wounds without evidence of purulent discharge.

Results/Outcome(s): A total of 33 ASC injection procedures(31 perianal and 2 rectovaginal fistulas) were performed. All patients were receiving medical treatment, including anti-TNF treatment in 8 patients at the time of ASC injection. Initially 28 patients(28 fistulas) were treated and 25(89.3%) achieved complete wound healing with a mean healing time of 33.4±71.6 weeks(range,4.1–379.1). Interestingly, in 3 of the healed patients, fistula closure was achieved over 1 year after ASC treatment and maintained healing without recurrence. During follow-up, 3 fistulas(12%) recurred after achieving complete healing, and 5 new fistulas were identified at sites which were separate from the previous ASC-treated fistulas. Additional ASC treatments were performed on these 5 newly developed fistulas, and 3(60%) achieved complete healing without recurrence. There were no serious adverse events after ASC injection in all patients. When initial healing was achieved(n=28 fistulas), the overall 3-year recurrence-free rate was 88.0% with none of the followed up for over 3 years having recurrence.

Conclusions/Discussion: Overall, the success rate after ASC treatment was 76%(25/33) and recurrence after initial healing was 12%(3/25). Our results indicate that ASC injection is a good treatment option in selected cases of complex CD perianal fistulas where healing cannot be achieved by conventional operative procedures.

TAILGUT CYST PRESENTING AS SEVERE RECTOSIGMOID STRICTURE AND FISTULIZING PELVIC ACTINOMYCOSIS.

P1077

E. Adams, A. Parrish, J. Zhai, L. Ross, M. Chithriki, P. Johnson, D. Magner
Los Angeles, CA

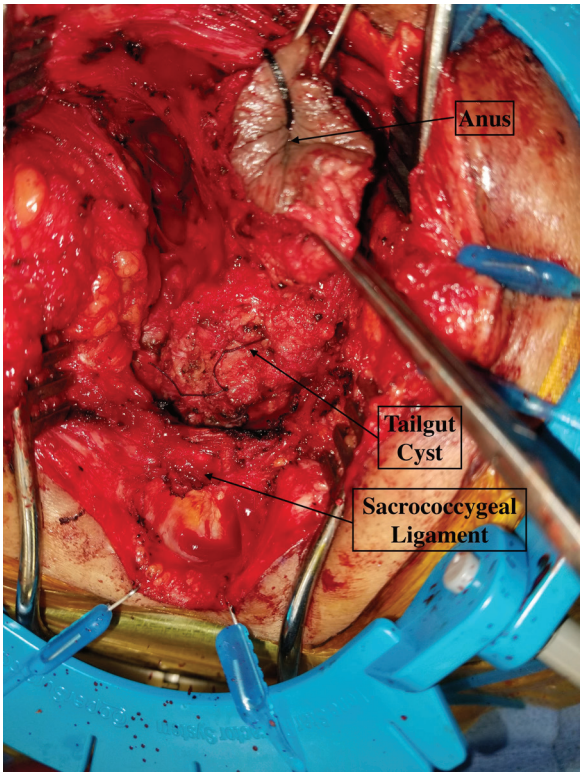
Purpose/Background: A 35 year-old female presented with abdominal pain and constipation with past medical history of multiple interventions for a presacral tumor. Previous treatments included transabdominal, transrectal and transvaginal drainage. Exam demonstrated a stricture 4 cm from the anal verge. Imaging and endoscopy revealed inflammation and stenosis of the rectum ranging from 4 to 14cm proximal to anal verge and fistula leading to a loculated pelvic fluid collection.

Methods/Interventions: The decision was made to proceed with surgery. En-bloc resection of an extensive phlegmonous mass required LAR with end colostomy, ileocecectomy, TAH BSO, and left to right ureterouretrostomy. Pathology demonstrated significant fibrosis and

fistulous tracts extending to cecum, uterus, left ureter and fallopian tube.; however, no malignancy was found. One month post operatively she developed a pelvic abscesses, which was treated with CT guided drainage and cultures grew out actinomycosis. Long-term penicillin treatment was initiated. However, she required multiple interventions for recurrent abscesses. Repeat MRI demonstrated a persistent fistula from the rectal stump to a 6cm x 2.5cm x 4.6cm presacral fluid collection and adjacent presacral tumor closely associated with coccyx and left internal iliac artery. With multidisciplinary involvement of colorectal, vascular and spine surgical teams, the patient underwent resection of presacral tumor (Image), coccygectomy, and completion proctectomy.

Results/Outcome(s): Final pathology and clinical context were ultimately consistent with an infected tailgut cyst. The patient has not required any further treatment and is doing well one year after surgery.

Conclusions/Discussion: While tailgut cysts have been reported as a perianal fistula and pelvic abscess, this is the first case of a tailgut cyst complicated by pelvic actinomycosis and subsequent fistulous involvement requiring extensive pelvic resection. Tailgut cysts, remnants of the postnatal hindgut, often present in women age 30-60. Presacral masses, even if asymptomatic, should be excised due to the 15% risk of malignancy, which includes adenocarcinoma, carcinoid, and neuroendocrine tumors reported. Histologic features of tailgut cyst include the presence of a variety of epithelia, often in combination, with the presence of glandular epithelium. Actinomycosis is a fistulizing disease most frequently associated with disruption of the GI or GU system, either via perforated IUDs or iatrogenic seeding from procedures. This case demonstrates the importance of avoiding approaches to a presacral mass via the rectum and vagina to mitigate the sequelae of iatrogenic seeding, such as infection, fistula, and need for organ removal. Additionally, it highlights the difficulty in recognizing a surgical "red herring", as the presence of pelvic actinomycosis masked the underlying pathology of a persistent tailgut cyst serving as the nidus of recurrent abscesses.



A RARE FINDING OF PLASMACYTOMA WITHIN A DIVERTICULAR MASS.

P1078

S. Carr, J. Wernberg
Marshfield, WI

Purpose/Background: Plasma cell neoplasms are caused by the proliferation of plasma cells. Presentations including a single lesion (plasmacytoma) or disseminated disease (multiple myeloma). Plasmacytoma is an uncommon malignancy consisting of a single focus of plasma cells. Bone is the most common location of a solitary plasmacytoma, but extramedullary plasmacytomas (soft tissue) are also possible with most arising in the head and neck. Extramedullary plasmacytoma is difficult to diagnose and disseminated disease must be ruled out. We present a case of plasmacytoma arising in a colonic mass and discuss optimal management of the disease.

Methods/Interventions: A case of extramedullary plasmacytoma within the setting of a colonic mass in a patient with a history of melanoma is presented. Diagnosis and treatment of plasmacytoma is reviewed.

Results/Outcome(s): An asymptomatic 74-year-old male with a history of a $T_2N_0M_0$ melanoma of the left foot presented for routine melanoma surveillance and was found to have a palpable left lower quadrant abdominal mass. A CT scan of the abdomen and pelvis demonstrated an 8cm mass at the sigmoid colon as well as extensive

diverticulosis. Ultrasound guided biopsy was performed and pathology revealed a plasma cell proliferative neoplasm, concerning for plasmacytoma. The mass was moderately active on PET CT scan with no evidence of disseminated disease and a bone marrow biopsy did not identify any abnormal plasma cells, ruling out multiple myeloma. Although the standard treatment is radiation, excision of the mass was recommended due to diagnostic uncertainty with a history of melanoma and the unusual location of the plasma cells. The patient was taken to the operating room for excision of the mass with en bloc sigmoid colectomy and colorectal anastomosis. The mass was found to be invading the sigmoid mesentery, but no metastatic disease was identified. Surgical pathology revealed a 5mm focus of plasmacytoma within an inflammatory mass consistent with perforated diverticulitis. Radiation therapy was not pursued as an R0 resection was achieved.

Conclusions/Discussion: Extramedullary plasmacytoma represents only 3% of plasma cell neoplasms and is most commonly found within the head and neck. Diagnosis requires biopsy proven plasma cells, negative bone marrow biopsy, and a normal skeletal survey to rule out multiple myeloma. Disseminated disease must be ruled out to begin definitive treatment. Half of patients will have a monoclonal protein in the serum or urine, which will be decreased or eliminated following treatment. Radiation with 4000-5000 cGy is the standard treatment of plasmacytoma with a 5% risk of local recurrence. There is no role for chemotherapy. Although most patients can be cured of local disease, approximately 30% will develop multiple myeloma. Although radiation treatment is most often utilized as definitive therapy, surgical resection was favored in this case due to diagnostic uncertainty in the setting of a previous melanoma.

CT scan of the abdomen demonstrating an 8cm mass adjacent to the sigmoid colon.

PERFORATED APPENDICEAL ADENOCARCINOMA WITH INVOLVEMENT OF CECUM, SMALL BOWEL AND RECTOSIGMOID JUNCTION.

P1079

S. Patel, B. Shanker, J. Eggenberger, R. Cleary
Ypsilanti, MI

Purpose/Background: Appendiceal neoplasms are rare - 1.2 cases per 100,000 per year in the United States. Nomenclature and proposed classifications of appendiceal neoplasms are inconsistent and lack standardization. Management of appendiceal neoplasms is challenging partly due to classification complexity. We present a patient with perforated appendiceal adenocarcinoma with no signs of peritoneal, solid organ or nodal metastases and without evidence of pseudomyxoma peritonei.

Methods/Interventions: A 58-year-old gentleman presented with a 6-month history of abdominal pain, weight loss, and pencil-thin bowel movements. His medical, surgical, and social history is unremarkable. There is no relevant family history. Colonoscopy showed a rectosigmoid stricture, biopsy of which was unremarkable, and a normal appendiceal orifice. CT imaging of the abdomen and pelvis demonstrated an irregular rim-enhancing heterogeneous lesion measuring 6.7cm x 2.8cm originating from the base of the cecum and extending across the midline to tether the rectosigmoid junction. Pre-operative CEA was elevated at 5.9 ng/mL.

Results/Outcome(s): Laparotomy showed abscess cavity involving the terminal ileum, distal sigmoid and the proximal rectum. En-bloc resection of the right colon, sigmoid and proximal rectum was completed with two primary anastomoses (ileocolic and colorectal) without stomas. Pelvic fluid cultures grew Streptococcus viridians. Pathology showed perforated appendiceal moderately differentiated adenocarcinoma with abscess formation and direct invasion of the rectum without lymph node involvement. This was a T4bN0Mx and AJCC Stage IIC lesion.

Conclusions/Discussion: This case demonstrates the challenge of diagnosing appendiceal cancer even after comprehensive investigation.

LARGE BOWEL OBSTRUCTION AS FIRST PRESENTATION OF PANCREATIC MALIGNANCY AND THE USE OF THREE DIMENSIONAL VISUALIZATION TO AID DIAGNOSIS.

P1080

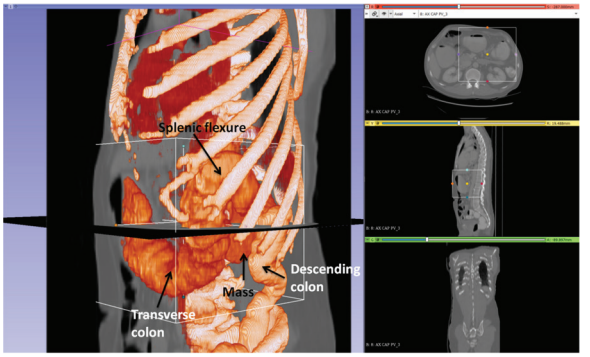
E. Yeap, T. Suhardja, H. Chouhan, T. Nguyen, W. Teoh
Dandenong, VIC, Australia

Purpose/Background: Large bowel obstruction is a rare first presentation of pancreatic cancer, with only six previous cases in the literature. A pancreatic tail mass may cause extrinsic compression of the splenic flexure, mimicking colorectal malignancy. We present the case of a 63-year-old man who presented with partial large bowel obstruction from extrinsic splenic flexure compression. Innovative free open-source software (3D Slicer) that can transform two dimensional computed tomography (CT) images into three dimensional visualisation has been used to review the case.

Methods/Interventions: A 63-year-old man was referred in by his general practitioner to the emergency department with two weeks of upper abdominal pain, nausea and vomiting. He last opened his bowels the day prior to presentation but was passing flatus. His only past history was epilepsy on carbamazepine. On examination, he was mildly tender in the epigastrium and left upper quadrant. Blood tests showed an elevated carbohydrate antigen (CA) 19-9 level (141 kilounits/litre) and a normal carcinoembryonic antigen (CEA) level. His general practitioner had organised a CT scan which demonstrated a partial large bowel obstruction at the splenic flexure with a mass in the left upper quadrant which was of unclear origin. A repeat CT scan with rectal contrast was not able to demonstrate if the mass originated from the pancreas or colon.

Results/Outcome(s): A colonoscopy was performed. At the splenic flexure, the mucosa was grossly oedematous and further passage of the scope was not possible. A biopsy of the splenic flexure mucosa showed benign changes. He then proceeded to diagnostic laparoscopy which demonstrated multiple peritoneal lesions suspicious for metastases. The largest lesion was biopsied and consistent with metastatic pancreatic carcinoma. A loop ileostomy was formed and he was referred to oncology for palliative chemotherapy. In retrospect, 3D Slicer was used to visualise the area of interest (see Figure). With the benefit of this technology, the mass appears separate to the colon and is consistent with the diagnosis of pancreatic cancer. If this had been used at the time of presentation, investigations could have been better targeted and delays to diagnosis and appropriate management avoided.

Conclusions/Discussion: Pancreatic cancer presenting as an acute abdomen with large bowel obstruction is rare. Colorectal cancer remains the most common and important cause of large bowel obstruction. However, it is important to consider pancreatic malignancy amongst other diagnoses especially with unusual radiological findings. Innovative software such as 3D Slicer can be used to assist management especially in diagnostic dilemmas and assist surgeons with preoperative planning.



Three dimensional visualisation of mass in the left upper quadrant using CT data and the computer program 3D Slicer, demonstrating it is separate to the colon causing extrinsic compression of the splenic flexure.

INCIDENCE OF ANAL DYSPLASIA IN WOMEN WITH HIGH RISK HPV ASSOCIATED PATHOLOGY.

P1081

E. Bevier-Rawls, E. King-Mullins, R. Czuprynski
Sandy Springs, GA

Purpose/Background: A current literature review demonstrates a dearth of information regarding immunocompetent women and the incidence of anal HPV. There are several studies looking at the risk of immunocompromised patients, especially HIV-positive men who have sex with men, and their associated risk of anal HPV, however current literature is lacking in data on immunocompetent women. The purpose of our study is to determine the incidence of HPV in anal canal, anal dysplasia (low grade intraepithelial lesion [LSIL] or High grade intraepithelial lesion [HSIL]) or anal cancer in women referred for an anorectal exam with diagnosis of HPV 16/18, cervical dysplasia/cancer, vulvar dysplasia/cancer, vaginal dysplasia/cancer, or history of genital condylomas. We also intended to look at the rates of high resolution anoscopy and need for surgical intervention in these patients.

Methods/Interventions: Data was collected via a retrospective chart review of prospective collected data using ICD-10 diagnosis codes. The study population included women over the age of 18 with any of the following diagnoses HPV 16/18, cervical dysplasia (LGSIL or HGSIL), cervical cancer, Vulvar dysplasia, vulvar cancer, and/or genital condylomata referred for anorectal exam from December 2019 – March 2020. Women under age 18 or who were pregnant were excluded.

Results/Outcome(s): The goal of the study is to review the charts of 30 women. We will allow a biostatistician to review the data to garner a sample of the population and

evaluate demographics, various high risk HPV associated pathology. This will provide further background information to formulate future larger cohort and randomized studies. We will also look at the rates of high resolution anoscopy and need for surgical intervention in these patients.

Conclusions/Discussion: The aim of our study is a better understanding of the incidence of HPV related pathology of the anal canal in immunocompetent women at high risk for anal involvement. By having a better idea of the incidence, we hope to be able to generate future studies to formulate a screening algorithm for women who may be at high risk.

TRANSANAL RESECTION OF RECTAL LEIOMYOSARCOMA.

P1082

J. Ray, E. Esen, P. Venkatesh, M. Grieco, M. Bernstein
New York, NY

Purpose/Background: Anorectal leiomyosarcoma (AL) is a rare and aggressive malignancy. Although the optimal treatment modality of AL is not known, surgical resection with negative margins is the mainstay of management. AL's rate of recurrence and metastasis is high regardless whether local or radical resection is performed. There is no consensus regarding the role of neoadjuvant/adjuvant therapy in AL management. Here we describe the case of a 72 y/o woman with a six centimeter rectal leiomyosarcoma who underwent R0 resection via transanal approach.

Methods/Interventions: Our patient initially presented 3 months prior to an outside hospital (OSH) with blood per rectum and underwent a colonoscopy that only noted benign polyps. She went on to develop progressively worsening constipation over 2 months, and upon presentation to OSH was found to have a large fungating mass protruding from the anus. She underwent examination under anesthesia (EUA) with biopsy; pathology was positive for sarcomatoid carcinoma. She went on to have a diverting colostomy with a plan for radiation. Before starting radiation, she came to our institution for second opinion for her intractable pain and bleeding. MRI was obtained and she was taken for repeat examination under anesthesia for surgical planning.

Results/Outcome(s): MRI pelvis with contrast revealed a 7x7.3 mass prolapsing through the anal canal into the perineum without extraluminal extension and no pathologic lymph nodes. An EUA for surgical planning was performed and showed that the mass was reducible and attached to one third of the anterior wall of the rectum. The decision was made to proceed with a transanal resection. Pathology showed a 6cm high grade sarcoma consistent with leiomyosarcoma. Margins were negative.

Conclusions/Discussion: Optimal management of AL is patient-specific. Local excision with negative margins is a valuable approach if the tumor can be accessed transanally. Evidence regarding the best adjuvant treatment strategy is lacking.

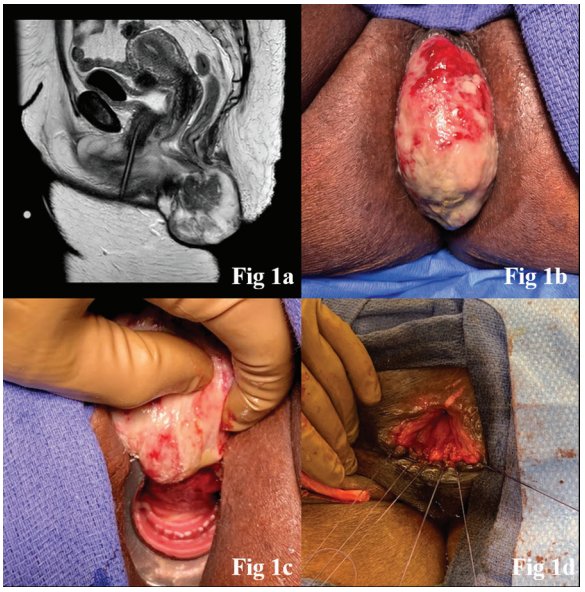


Figure 1: a) Sagittal view of rectal mass on MRI; b) Prolapsing rectal mass; c) EUA with patient in lithotomy position showing non-obstructing mass originating from anterior third of rectal wall; d) Patient in prone position status post closure after transanal excision.

INTUSSUSCEPTION OF A SIGMOID COLON LIPOMA MASQUERADING AS RECTAL PROLAPSE.

P1083

J. Cruz, R. Lewis, A. Raissis
West Hartford, CT

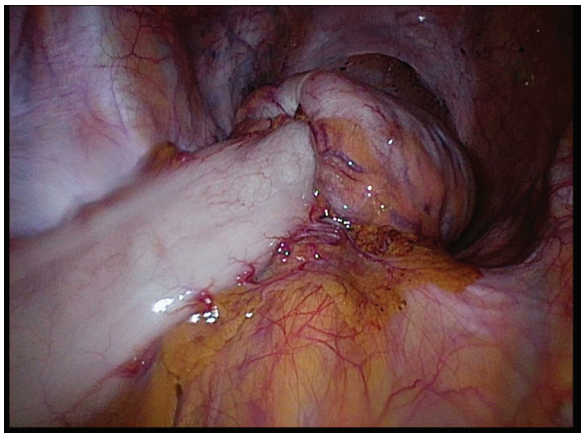
Purpose/Background: Lipomas in the gastrointestinal tract are most commonly found in the colon and most commonly diagnosed in elderly women. Rectal prolapse is also most commonly seen in elderly women with risk factors including multi-parity and long standing constipation. Intussusception is an uncommon condition in adults and should always prompt an investigation for malignancy. In our case of a previously healthy young male, we elucidate the importance of initiating further work up for rectal prolapse in a patient with no pre-existing risk factors.

Methods/Interventions: The patient is a 35-year old male who initially presented with acute constipation followed by an episode of rectal prolapse which spontaneously reduced. He presented to an outside hospital emergency department. Physical exam was normal at that time and he was then referred colorectal surgery clinic for further care. Given his age and concern for malignancy, a colonoscopy was performed. He was found to have a benign

appearing, well-circumscribed mass in the colon approximately 25 cm from the anal verge. A biopsy of the mass was performed. There were no findings consistent with rectal prolapse. After colonoscopy the patient developed intermittent abdominal pain and bloody bowel movements and recurrence of prolapsed tissue. He presented to emergency room and underwent a CT scan of his abdomen and pelvis. The CT scan demonstrated a 14cm long segment of internal prolapse/intussusception of the sigmoid colon into the rectum along with 3.2cm fat density structure at the distal point of the intussusception.

Results/Outcome(s): The patient was taken urgently for laparoscopic hand assisted reduction of intussusception, and a sigmoid colectomy. No rectopexy was performed as the patient's prolapse and intussusception was secondary to his lipoma. Final pathology revealed a 4.5 x 3.3 x 3.2cm submucosal mass of mature adipose tissue with focal mild inflammation and reactive changes consistent with a lipoma.

Conclusions/Discussion: Colon and rectal lipomas are often small and asymptomatic. They are usually located with in the submucosa, benign, and do not cause symptoms if they are smaller than two centimeters. Despite being a benign mass, in rare cases these lipomas can continue to grow and produce symptoms. Large bowel lipomas are less commonly found in the rectum than in the colon. Concerning causes of need for surgical intervention of lipomas include intussusception, obstruction, bleeding, and prolapse. Our case was a rare presentation of a pedunculated lipoma in the sigmoid colon causing a rectal prolapse in a young male with no pre-existing symptoms prior to his prolapse. The findings of intussusception and possible rectal prolapse in an otherwise healthy young patient should prompt further workup.



Intussusception of sigmoid colon lipoma

THE EFFICACY OF SACRAL NEUROMODULATION IN THE TREATMENT OF LOW ANTERIOR RESECTION SYNDROME: A SYSTEMATIC REVIEW AND META-ANALYSIS.

P1084

N. Horesh[1], R. Meyer[2], D. Carter[2], M. Gutman[1], D. Rosin[1], E. Ram[1]
[1]*Givat Shmuel, Israel;* [2]*Ramat Gan, Israel*

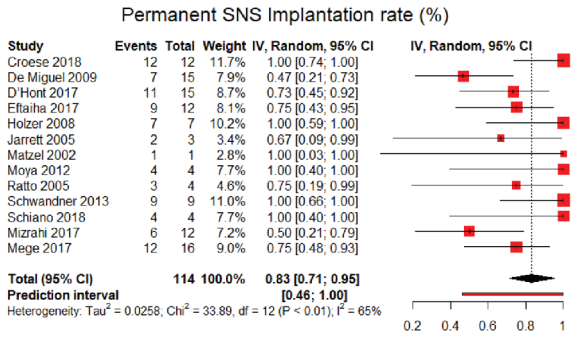
Purpose/Background: Low Anterior Resection Syndrome is commonly seen following rectal resection. Sacral neuromodulation (SNM) has become one of the main treatment options in patients with fecal incontinence.

Methods/Interventions: A systematic review was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines. Search was conducted using the Pubmed, Embase, Ovid, and Cochrane databases, published before or by June 2019.

Results/Outcome(s): 434 articles on efficacy of sacral neuromodulation in the treatment of low anterior resection syndrome were retrieved. Thirteen studies were included in the final analysis, including 114 patients treated with SNM for LARS syndrome. Overall success rate excluding study heterogeneity stood at 83.30% (95% CI[71.33%-95.25%]. Improvement in anal continence was seen in several clinical and functional parameters, including the Wexner Score (10.78 points (95% CI[8.55-13.02], p<0.0001), manometric maximum resting pressure (mean improvement of 6.37 mm/Hg (95% CI[2.67-10.07], p=0.0007), Maximum Squeeze pressure (mean improvement of 17.99 mm/Hg (95% CI[17.42-18.56], p<0.0001) and maximum tolerated volume (mean improvement of 22.74 ml (95% CI[10.65-34.83], p=0.0002)). Finally, we evaluated possible factors related to SNM success, including type of test lead (p=0.7571), duration of symptoms (p=0.8261) and type of rectal anastomosis (p=0.4629), showing no significant relationship with surgical outcomes.

Conclusions/Discussion: Sacral neuromodulation significantly improves symptoms and quality of life in patients suffering from fecal incontinence following low anterior resection.

Figure 2. Overall permanent SNM implantation success rate (all studies)



DESCRIBE A NEW DYNAMIC ECHODEFECOGRAPHY(EDF) ESTABILISHED BY USING BK ULTRASOUND 8838 TRANSDUCER COMPARED THE RESULTS WITH X-RAY DEFECOGRAPHY.

P1085

C. Zhang, H. Jin
Nanjing, China

Purpose/Background: Describe a new dynamic echodefecography(EDF) estabilished by using BK ultrasound 8838 transducer compared the results with X-ray defecography.

Methods/Interventions: The BK 8838 ultrasound probe is used to evaluate the static 3D scan, dynamic 3D scan and dynamic 2D scan of pelvic floor and compared the results with X-ray defecography and defined its clinical significant. Insert120-150 ml and 50 ml of ultrasound gel into the rectal ampulla and the vagina respectively, to achieve contrast and get better images. Three-dimensional(3D) scanning is performed to observe the structure of the rectal and anal canal, the ano-rectal angle at rest (the angle between the puborectal and external sphincter lines and the vertical line of the anal canal), the position of the puborectalis and anal sphincters, the pelvic floor muscles, the prostate, the uterus and the Douglas pouch. Dynamic 3D scanning, the patients were asked to rest for 6s and then maximum defecation strain for over12s and then rest for 24s. This scan identified and quantified the depth of rectocele as well as intussusception, sigmoidocele/enterocele, cystocele and puborectalis descent.

Results/Outcome(s): Fifty-seven patients were studied with twenty four male and thirty three female. Among them, fourty-four patients were clinical diagnosed with obstructive constipation, eight suffered anal pain and 5 patients undergo fecal incontinence. Fourty seven patients were diagnosed as Anismus by EDF and 46 patients were diagnosed as Anismus by X-ray defecography. Sixteen patients were digonosed as rectal rectocele by X-ray defecography, among which eight were classified as mild(6-15mm), 4 were moderate(16-30mm) and 4 were severe(over 30mm). According to X-ray defecography criteria, the mild one in EDF was 4.0-7.9mm, the moderate one was 7.9-14.2mm and the severe one was over 14.2mm. Fourteen patients with constipation and 2 patients with anal pain were diagnosed as intussusception by EDF, but only 3 patients were diagnosed as intussusception by X-ray defecography. Two patients with constipation were diagnosed as perineal descent by EDF and none by X-ray defecography. Two patients were diagnosed as enterocele by EDF as well as X-ray defecography.

Conclusions/Discussion: the EDF established by BK 8838 ultrasound probe is an accurate, reliable and reproducible method for evaluating the pelvic floor diease. It can show clear anatomy and real time movement of plevic floor muscle. The EDF is more sensitive to the diagnosis of intussusception, perineal descent(PD) and anal spincter defectt by the EDF than X-ray defecograpgy and it was comparable for the diagnosis of Anismus, rectocele and enterocele beteween EDF and X-ray defecography. Further study is needed to determine its clinical value.

RESULTS OF (TST ™) STARR FOR OBSTRUCTIVE DEFECATION DISORDERS SUCH AS RECTOCELE AND INTERNAL RECTAL PROLAPSUS.

P1086

A. Yildiz, S. Leventoglu, A. Yildiz, B. Mentes, Y. Oner
Ankara, Turkey

Purpose/Background: For obstructive defecation disorders (ODS), such as rectocele and internal rectal prolapsed (IRP), STARR technique is used as an innovative method. In this case series, it is aimed to share the results of (TST™) STARR, in this selected patient group.

Methods/Interventions: 18 patients (15 women) who underwent TST STARR for ODS were analyzed from 2014 to 2018. Standard pre-prepared forms including demographic information, ODS symptom score, Wexner constipation score (WCS), Cleveland Clinic incontinence score (CCIS), and patient satisfaction were evaluated.

Results/Outcome(s): Average follow-up was 26.6 +/- 1.69 (range, 7-51) months and almost all of the patients fulfilled 6 months of monitoring. 15 patients were operated on due to IRP and 3 patients for rectocele. All patients underwent MR defecography. Enterocele was not observed in any of them. The average extracted specimen height was 4.9 +/-0.68 cm, and average tissue volume 10.1-15.2 cm3. In one patient, postoperative urinary retention was observed, but no major complications were noted. Regarding patient satisfaction, 8 (44.4%) patients graded excellent and 6 (33.3%) patients good. 79.2% mitigation in postoperative ODS symptoms (15.27 +/- 2.02 and 3.16 +/- 1.46, respectively, p=0.026), postoperative WCS 68.8% decrease (23.77+/-3.50, 7.44+/-3.41, respectively; p=0.01) were observed. No postoperative degradation in incontinence scores occurred.

Conclusions/Discussion: For obstructive defecation disorders, such as rectocele or IRP without enterocele, TST STARR, may be used as an efficient and new option.

PUDENDAL NEURALGIA - A CASE SERIES IN MANAGING PELVIC FLOOR PAIN.

P1087

V. Pricolo
North Dartmouth, MA

Purpose/Background: Chronic pelvic floor pain syndromes are variably identified as “proctalgia fugax”, “levator ani syndrome”, “coccygodynia”, or “pudendal neuralgia”, descriptive terms for pain in the areas

innervated by the inferior and perineal branches of the pudendal nerve. "Anorectal pain" is a common reason for referral to colorectal specialists for definitive treatment of suspected anorectal conditions. This case series describes a systematic approach to diagnosis and management of pudendal neuralgia (PN).

Methods/Interventions: A single surgeon's electronic database review on "pudendal neuralgia" was conducted. Between 2015 and 2019, 36 consecutive cases of "anorectal pain" were diagnosed as due to PN. Data collected and analyzed included: gender and age at diagnosis; location, duration and type of pain, triggering or exacerbating factors, and association with other musculoskeletal or neurologic symptoms; medications history; physical exam and diagnostic imaging findings. Physical Therapy (PT) and Pain Management (PM) interventions were collected and outcomes evaluated.

Results/Outcome(s): There were 20 females and 16 males, with an age range of 22-80 years (mean: 57). 18 patients (50%) had been managed by PCP with topical measures for "hemorrhoids" and expected to undergo surgery. All 36 patients described the pain as "positional", triggered or exacerbated by sitting, not by defecating. The pain was described as either 'burning" or "pressure". It was unilateral in 20 (56%) and bilateral/central in 16 (44%). All patients had pain also in other areas (buttock, groin, thigh, leg), and 10 (28%) had symptoms in GU or Gyn areas (vulva, prostate, penis), attributable to dorsal pudendal branch involvement. Anorectal exam was normal in 25 patients (69%). Associated GI conditions were present in 18 patients (50%), (IBS: 4, ulcerative colitis: 2, rectal prolapse: 1, hemorrhoids: 5, fistula-in-ano: 1, chronic fissure: 2, rectal cancer: 1, S/P IPAA: 2), but deemed not responsible for symptoms. Pain duration ranged from 1 month (two youngest patients after athletic injuries) to decades in older patients with chronic LS spine disease (34 cases), all documented by LS spine MRI. All patients took NSAIDs, and/or GABA analogs, narcotics, anti-anxiety/depression medications. After referral to PM, 8 patients (22%) had PT (massage, biofeedback), and 24 (67%) had image-guided percutaneous nerve or ganglion blocks. At last follow-up, all patients accepted PN diagnosis, had symptomatic improvement, but remained on oral pain medications.

Conclusions/Discussion: Pudendal Neuralgia may be a unifying term for a common underlying pathogenesis of chronic pelvic floor pain syndromes. Presence of concomitant anorectal conditions is not uncommon in such patients. However, after appropriate diagnostic evaluation, a combined strategy of redirecting patients' expectations, oral medications, PT sessions, and percutaneous interventions by PM specialists can offer acceptable symptomatic control.

WHICH RADIOGRAPHIC OR CLINICAL FINDINGS BEST PREDICT OUTCOME FOLLOWING VENTRAL RECTOPEXY FOR OBSTRUCTED DEFECATION SYNDROME?

P1088

K. Kelley, J. Ogilvie
Grand Rapids, MI

Purpose/Background: While there are optimistic reports that ventral rectopexy may significantly aid patients with obstructed defecation syndrome (ODS), it is not clear which patients are the best candidates for surgery. Given the wide range of symptoms and anatomical findings related to ODS, our aim was to review outcomes after minimally invasive ventral rectopexy and identify any preoperative symptoms, physical exam findings or radiographic abnormalities that are associated with clinical improvement.

Methods/Interventions: This study is a retrospective review of a prospectively maintained database from 2015–19 at a single institution. Twenty-four patients who underwent ventral rectopexy for obstructive defecation were included. Data included patient demographics, prior pelvic floor physical therapy, physical exam findings, Cleveland Clinic fecal incontinence scores (CCF-FIS), Altomare ODS scores and overall patient satisfaction. All patients underwent a pre-operative cine-defecography. Defecography results included grade of intussusception, presence of enterocele, rectocele, and measure of perineal descent. Basic statistical analysis was performed.

Results/Outcome(s): Of the 24 patients, all were female with an average age of 59 years. Fifty percent reported some degree of incontinence (median score 9/20). The median preoperative ODS score was 12 (range 6-18). On defecography, 46% showed an enterocele, the mean size of rectoceles was 3.3cm, and the mean degree of perineal descent was 4.1cm. Anoscopy was performed in all cases to verify internal prolapse, with 12% Oxford grade 1-2 and 83% with Oxford grade 3-4 reported. Ventral rectopexy was completed laparoscopically (75%) or robotically (25%). Mean OR time was 189 minutes and median follow-up time was 6.2 months (range 1-54). Sixteen patients (67%) had complete symptom resolution on latest follow-up. There was no difference in age, BMI, the degree of perineal descent, preoperative incontinence, presence of enterocele, or presence of intra-anal prolapse between successes and failures. Among patients with ongoing symptoms, they were more likely to have reported manual extraction of stools (50% vs. 13%, $p=0.05$) and had preoperatively completed pelvic floor physical therapy (50% vs. 25%, $p= 0.22$). Patients who failed also had a larger measured rectocele (4.1 vs. 2.9 cm, $p=0.01$), higher preoperative ODS scores (14.1 vs. 11.7, $p=0.05$) and reported stool consistency as frequently hard (75% vs. 25%, $p=0.02$)

Conclusions/Discussion: This small, descriptive study suggests that those with pelvic floor discoordination (previous physical therapy and manual extraction of stools) and uncontrolled stool consistency may have less success after ventral rectopexy for ODS. Other possible predictors of poor outcome, such as larger rectoceles, require further investigation but may be point toward a combined transvaginal approach.

	Success (n = 16)	Recurrence/Failure (n=8)
Patient Characteristics		
Mean Age, years (range)	59 (42-74)	60 (33-83)
Mean BMI (range)	28.3 (18-35)	25.9 (23-32)
Prior Pelvic PT	25% (4)	50% (4)
Manual Stool Extraction	12% (2)	25% (2)
Stool Consistency - Hard	25% (4)	75% (6)
ODS Score	12 (6-18)	13 (10-18)
CC-FIS Score	3 (0-19)	5 (0-16)
Follow-up, months (range)	7 (1-40)	27 (5-54)
Preoperative Defecography		
Rectal Intussusception % (n)	94% (15)	100% (8)
Oxford 1-2	6% (1)	25% (2)
Oxford 3-4	88% (14)	75% (6)
Enterocele present % (N)	44% (7)	50% (4)
Rectocele (cm)	2.9 (0-5)	4.1 (2-6)
Pelvic floor descent (mm)	39.5 (31-81)	42.1 (19-97)
Operative Data		
Laparoscopic % (N)	62% (10)	100% (8)
Mean operative time (minutes)	202 (143-340)	174 (143-233)

ARE WOMEN COLORECTAL SURGEONS OVERREPRESENTED IN TREATMENT OF PELVIC FLOOR DISORDERS?

P1089

V. Baratta, V. Kurbatov, H. Einarsdottir, H. Pantel
New Haven, CT

Purpose/Background: Graduating medical school classes consist of approximately half women, yet women remain underrepresented in surgical fields. A multitude of contributing factors have been examined, some involving overt gender bias while, some involving a more implicit bias. The purpose of this study was to examine if within the field of colorectal surgery, there is a gender bias towards women surgeons preferentially treating pelvic floor disorders. We hypothesized that women are overrepresented in treatment of pelvic floor diseases compared to other colorectal conditions.

Methods/Interventions: We compared the percent of women colorectal surgeons in the United States to the percent of women performing pelvic floor research. As a control group, we examined the percent of women performing research in benign colorectal diseases, a field we hypothesized would have no potential gender bias. The gender distribution of Colorectal Surgeons in the United States was calculated utilizing name to gender inference analysis software on the current American Society of Colon and Rectal Surgeons (ASCRS) membership directory. The gender distribution of surgeons participating in the treatment of pelvic floor disorders and benign colorectal disease was calculated through a retrospective review of the ASCRS Annual Scientific Meeting Program from 2016 to 2019. Name to gender inference analysis software was used to assign a gender to each cited author's name in abstracts for pelvic floor podium and poster presentations. This same method was employed for the benign colorectal disease control group, but only for the 2019 annual meeting. Using a Chi squared test, statistical comparisons were made between observed representation of women based on ASCRS Annual Scientific Meeting abstracts, compared to expected representation of women based from ASCRS membership.

Results/Outcome(s): A total of 2,568 names were analyzed from the current ASCRS directory with 30% women. Review of abstracts in the pelvic floor section from 2016 to 2019 yielded 247 cited names, 53% women. A chi-square test was significant with women more likely to be involved in pelvic floor care compared to men, X^2 (1, N = 2815) = 52.5, $p < 0.00001$. As a control, abstracts for benign colorectal podium and poster presentations from the 2019 annual meeting yielded 254 authors of which 35 % were women. A chi-square test did not demonstrate any difference between men and women being involved in benign disease, X^2 (1, N = 2822) = 1.9, p = 0.2.

Conclusions/Discussion: Women are involved in the treatment of pelvic floor disorders at a higher rate compared to the gender distribution of colorectal surgeons in the United States. Additional work is needed to determine why this disproportionate representation exists, as it may be due to bias within our field towards women participating in certain aspects of care or may be due to patient and medical legal factors.

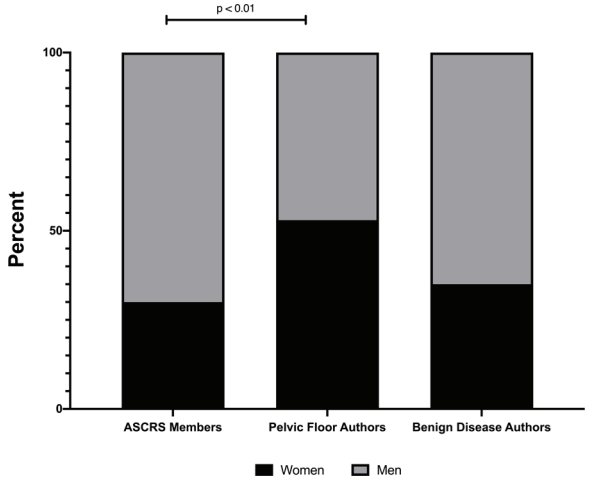


Figure 1. Gender distribution of current colorectal surgeons and those participating in pelvic floor and benign disease.

EFFICACY OF DAIKENCHUTO IN MANAGING FECAL INCONTINENCE.

P1090

K. Shimazutsu, H. Ohge
Hiroshima, Japan

Purpose/Background: Background : Fecal incontinence (FI) can be treated via surgery and various other methods, and the mainstay of drug therapy is antidiarrheal agents to control stool consistency. Conservative measures remain important particularly in geriatric patients where invasive procedures are difficult to implement. Purpose : To determine the efficacy and safety of daikenchuto (DKT), a traditional Japanese herbal medicine, in elderly patients with FI.

Methods/Interventions: Methods : A single-arm pre/post pilot study was conducted between December 2017 and March 2019 at Gion-Ushida Hospital and an affiliated nursing home in Hiroshima, Japan. Patients with at least two episodes of FI per 4 weeks in the last 6 months, Mini-Mental State Examination (MMSE) score of 11 points or higher, and those capable of oral intake were enrolled in the study. Patients received DKT 15 g/d p.o. for 28 days and were evaluated for abdominal pain and bloating, Wexner Score, Quality of Life in Fecal Incontinence (FIQLS), and anal pressure (maximum resting pressure and voluntary squeeze pressure). Patients were also instructed to complete and record the Bristol Stool Scale (BSS), stool frequency, and FI frequency in their diary.

Results/Outcome(s): Results : Of the 21 enrolled patients, one patient withdrew from the study at his/her own request. Medication adherence was 95.24% with no reported serious side effects. Abdominal bloating and pain scores significantly improved at 2 weeks ($p<0.01$). The "total score", "leakage of solid stool" and "leakage of liquid stool" of the Wexner Score improved significantly at 2 weeks ($p<0.01$), while "pad use" and "lifestyle alternation" markedly improved at 4 weeks ($p<0.05$). Improvement in FIQLS was also observed at 2 weeks ($p<0.01$). Of anal pressure, maximum resting pressure significantly improved at 2 weeks ($p<0.01$). Maximum voluntary squeeze pressure did not differ significantly before and after treatment, but a trend toward improvement was noted ($p=0.058$). Further, 11 patients (52.3%) had one or no episode of FI during the study, in which 6 patients (28.6%) had no episodes. No correlations were found among those efficacy measures.

Conclusions/Discussion: Conclusions : Our findings suggest that DKT is a viable therapy for FI by improving anal pressure and maximum resting pressure. DKT also improved abdominal symptoms and other measures of QOL, thus geriatric patients with FI may benefit from DKT when other conservative therapies prove ineffective.

DOES FELLOWSHIP MATTER? A COMPARISON OF OVERALL SURVIVAL AND LYMPH NODE SAMPLING IN COLON CANCER RESECTIONS AMONGST COLORECTAL FELLOWSHIP TRAINED SURGEONS VS. NON-COLORECTAL SPECIALTY TRAINED SURGEONS.

P1091

M. Pahlkotter, J. Snyder, J. Gygi, W. Sause, H. Kim
Salt Lake City, UT

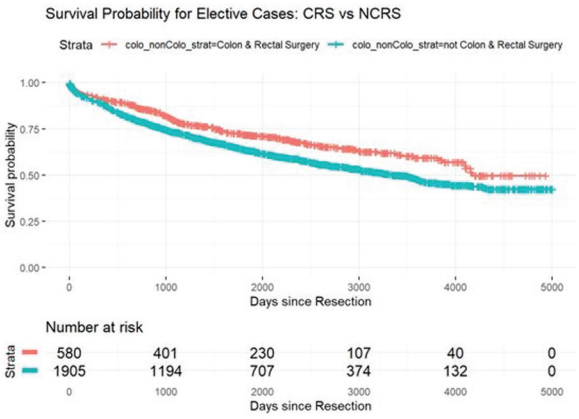
Purpose/Background: Approximately 1:23 people will be diagnosed with colorectal cancer (CRC) at some point in their lives resulting in nearly 50,000 CRC related deaths per year in the US alone. An effective surgical resection plays an integral role in the success or failure of these patients' oncologic treatment. In 1934 the American Board of Colon and Rectal Surgery was first organized which has subsequently led to the creation of 55 colorectal residency training programs creating a significant increase in the number of fellowship trained colorectal surgeons (CRS). This study was designed to look at lymph node sampling and survival of patients undergoing resections for colon cancer to determine if additional training does in fact lead to better outcomes.

Methods/Interventions: This study is based on a retrospective review from 2006-2017 looking at patients that presented to 1 of 23 hospitals within the Intermountain Healthcare System in Utah and Southern Idaho. Inclusion criteria consisted of all patients undergoing a resection for colon cancer. Most of the patients included underwent elective resections. Patients who presented through the emergency room were separated into emergent if their surgery was performed within 1 day of admission or urgent if done 2-3 days after admission. This study included a total of 135 surgeons with 13 being colorectal trained. Analysis was performed using the Kruskal-Wallis and log rank test as appropriate.

Results/Outcome(s): 2828 patients met our inclusion criteria. 599 cases were performed by colorectal surgeons with the remaining 2229 cases performed by non-CRS (NCRS) trained surgeons. Of the total resections, only 330 were considered non-elective based on our criteria. We found that in the elective population, survival probability was greater for patients receiving their resection by CRS than by NCRS ($p= 9e-05$). Lymph node sampling in elective resections by CRS was significantly higher as well (p-value $< 2.2e-16$), with the mean being 23.8 for CRS and 19.1 for NCRS. There was insufficient evidence to conclude any difference in outcomes when looking at the non-elective patient population alone given a low number of these operations being performed by colorectal surgeons.

Conclusions/Discussion: Based on this study we found that colorectal trained surgeons have significantly better outcomes when looking at overall survival rates and number of lymph nodes sampled for elective resections. Further studies need to be done to determine if these

results hold true for non-elective resections. Subset analysis and more detailed evaluation will be done to better define this affirmative observation.



THE ACS-NSQIP SURGICAL RISK CALCULATOR IS ONLY A FAIR PREDICTOR OF COMPLICATIONS IN COLORECTAL SURGERY PATIENTS AT A COMPREHENSIVE CANCER CENTER.

P1092

A. Nguyen, C. Chen, K. McNeese, K. Melstrom, Z. Eftekhari, L. Lai
Duarte, CA

Purpose/Background: Input of 21 patient-specific factors into the American College of Surgeons Surgical Risk Calculator (SRC) results in an estimated risk of complications in patients who underwent colorectal operations. However, the SRC's accuracy in only colorectal surgery patients at a Comprehensive Cancer Center has yet to be fully validated. We sought to determine the performance accuracy of the SRC when applied to these patients.

Methods/Interventions: We performed a retrospective study of consecutive cancer patients who underwent an elective inpatient operation involving the colon or the rectum at a Comprehensive Cancer Center from January 2018 to September 2019. Complications were identified through administrative data and surgeon self-reporting and then were reviewed by the research team. For each patient who underwent an operation, the 21 SRC patient-specific factors were entered in the online SRC and a risk level and outcome probability were generated. The predictions from the online SRC were compared to the actual patient outcomes to assess the predictive performance of SRC in our study population.

P1092 Table 1. Operation Category and Operative Approach of Colorectal Surgery Cohort

Operation Category	Percentage
Colon	40.2
Rectum	33.6
Ostomy	24.9
Other	1.3
Operative Approach	Percentage
Open	45.7
MIS	34.7
Other	19.6

Results/Outcome(s): Three hundred and seventy-eight patient encounters were included. Most patients (58.7%) were under the age of 65, 27.6% were between 65 and 74 years old, and the remaining 15.7% were older than 74 years old. 176 (46.6%) patients were male. 67.4% of patients were ASA Class 3 and 25.6% were ASA Class 4. 149 (39.4%) patients had disseminated cancer. Table 1 describes the distribution of operations and operative approaches in our cohort. At least one of the SRC defined complications was identified in 77 of the operations (20.3%). Overall, the SRC had an Area Under Receiver Operating Curve (AUROC) of 0.67 in predicting any complication when using outcome probabilities. The SRC had an AUROC of 0.53 in predicting any complication when using categorized risk levels of "Average," "Above Average," or "Below Average."

Conclusions/Discussion: The SRC performs fairly in predicting risk of complications after colorectal operations among cancer patients treated at a Comprehensive Cancer Center. Further refinement in the SRC is needed to improve the predictive performance of this tool in risk assessment and counseling of the cancer patient before a colorectal surgery.

CHOOSING WISELY: LIMITING UNNECESSARY COLONOSCOPIES FOR PATIENTS PRESENTING WITH PRIMARY CRYPTOGLANDULAR ANAL FISTULA IN A LARGE COUNTY HOSPITAL.

P1093

M. Abdulhai, J. Martinolich, A. Perez-Tamayo, V. Chaudhry, J. Harrison, A. Abcarian, N. Mantilla, S. Rangarajan
Chicago, IL

Purpose/Background: Anal fistula is one of the most common clinical problems managed by colorectal surgeons. Most of them are cryptoglandular in origin. However, about 3% are secondary to inflammatory bowel disease (IBD). It has been our group's practice to perform preoperative colonoscopy on all patients undergoing operative repair of anal fistula to assess for possible underlying IBD. This has lead to a large number of unnecessary colonoscopies which contribute tremendously to healthcare costs. We aimed to specify the indications for preoperative colonoscopy for fistula patients in order to limit unnecessary investigations and subsequent cost.

Methods/Interventions: The division of colorectal surgery at a large county hospital agreed on the following indications that would prompt preoperative colonoscopy for patients presenting with presumed primary cryptoglandular fistula: Age ≥ 40, history of hematochezia, history of abdominal pain or diarrhea, complex, high or multiple fistula openings, family history of Crohn's disease or history of HIV. In this single institution IRB approved study, we conducted a retrospective review of all patients who underwent a procedure for anal fistula from Jan 2016 to Sept 2017. We reviewed the patients' charts looking at age, presenting complaints and whether they met the above criteria for preoperative colonoscopy. All colonoscopy results were reviewed and analyzed looking for any unexpected findings that would have changed management, those included: presence of coloproctitis, stigmata of IBD, adenomatous polyps or tumors

Results/Outcome(s): There were 189 patients who underwent a procedure for anal fistula between Jan 2016 to Sept 2017. Of those, 115 met our inclusion criteria. Colonoscopy was indicated in 70 (60.9%). A total of 96 (83.5%) patients however underwent a colonoscopy preop. 31 (27%) patients were not indicated to undergo a preop colonoscopy but still got one given the group's practice. None of them had any significant finding. The most common indication for preop colonoscopy was age ≥40 (49, 70%), hematochezia (14, 20%), complex fistula (8, 11.4%), HIV (7, 10%) and abdominal pain or diarrhea (7, 10%). Of the 96 colonoscopies done 74 (77%) were normal, 13 (13.5%) showed adenomatous polyps and 3 (3.1%) coloproctitis. With billing of colonoscopy at our hospital at $2,990, this totaled $92,690 in cost of colonoscopies that were not indicated and had no relevant findings.

Conclusions/Discussion: Performing a preoperative colonoscopy on all patients presenting with primary cryptoglandular fistula has a low yield and is costly. Specific criteria should be used to guide the indication for colonoscopy in fistula patients. This is crucial in avoiding a burden on a large county health system serving a vulnerable population. This retrospective review changed the group's practice and triggered a prospective study to evaluate actual cost savings going forward

A SYSTEMIC REVIEW OF THE BENEFIT OF ALVIMOPAN USE IN LAPAROSCOPIC COLORECTAL SURGERY WITHIN ENHANCED RECOVERY ERA.

P1094

S. Berkey, B. Houlihan, T. Holleran, T. Stahl, J. Fitzgerald, J. Ayscue, M. Bayasi, B. Bello
Washington, DC

Purpose/Background: The use of alvimopan and enhanced recovery pathways (ERP) improve outcomes in colorectal surgery. The aim of this review is to examine the benefit of their use together specifically in laparoscopic colorectal surgery.

Methods/Interventions: A systematic literature review of MEDLINE, PUBMED, and the Cochrane library was performed, searching for alvimopan use in laparoscopic colorectal surgery within ERP. The main outcomes evaluated were post-operative ileus (POI), the length of stay (LOS), and hospital cost.

Results/Outcome(s): Six studies, conducted between 2011 and 2019, evaluating the outcomes of alvimopan use within ERP in laparoscopic colorectal surgery were reviewed. LOS was included in all the studies, while POI and cost were each reported in only four. Two studies reviewed found that alvimopan decreased the incidence POI (4% vs 12%, $p < 0.04$; 10.8% vs 16.2%, $p = 0.05$). Three concluded that there was about a day decrease in LOS (3.5 vs 4.5 days, $p = 0.02$; 3.0 vs 4.0 days, $p < 0.01$; 4.9 vs 6.2 days, $p = 0.003$). In three studies, there was no difference in hospital cost ($14,932.47 vs $14,846.56, $p = 0.90$).

Conclusions/Discussion: In half of studies reviewed, the use of alvimopan within ERP in laparoscopic colorectal surgery decreased the incidence of POI and LOS. However, it did not change the cost of the hospital stay. The data is limited due to single institution retrospective studies. The results remain mixed regarding the benefit of alvimopan use with ERP for minimally invasive colorectal surgery. Accordingly, there is an opportunity for future prospective studies.

PERIOPERATIVE HYPERGLYCEMIA IN NON-DIABETIC PATIENTS UNDERGOING ELECTIVE COLORECTAL RESECTIONS ASSOCIATED WITH INCREASED ORGAN/SPACE SSI RATES.

P1095

C. Anderson[1], M. Gachabayov[2], S. Amrani[2], R. Bergamaschi[2]
[1]*East Brunswick, NJ;* [2]*Valhalla, NY*

Purpose/Background: The incremental impact of perioperative stress-induced hyperglycemia on the clinical outcomes is becoming increasingly recognized but rarely discussed in enhanced recovery protocols. The aim of this

study was to evaluate the rates of stress hyperglycemia and its impact upon postoperative adverse event rates while implementing a surgical site infection (SSI) bundle.

Methods/Interventions: This was a retrospective cohort study of patients who underwent elective colorectal resection in a single institution. SSI bundle included ten evidence-based interventions at all management stages: pre-hospital, pre-, intra-, and postoperative. The preoperative 8-hour nil per os strategy as well as hyperglycemia management were not changed. Hyperglycemia was defined as blood glucose >140 mg/dL. The primary endpoint was SSI as defined by the Centers for Disease Control National Nosocomial Infections Surveillance. T-test was utilized to compare continuous variables and Chi-squared test for categorical variables.

Results/Outcome(s): There were overall 311 patients: 54 (17.4%) with preexisting diabetes mellitus and 257 non-diabetic. 145 (56.2%) non-diabetic patients developed perioperative hyperglycemia. Hyperglycemic patients were comparable to their normoglycemic counterparts in terms of age (p=0.07), gender (p=0.64), BMI (p=0.32), and ASA score (p=0.83). 14/145 (9%) hyperglycemic and 9/112 (8%) normoglycemic patients developed superficial incisional SSI (p=0.71). 3/145 (2%) hyperglycemic and 4/112 (3.6%) normoglycemic patients developed deep incisional SSI (p=0.23). The organ/space SSI rate was significantly higher in hyperglycemic patients (17/145 vs. 3/112; p=0.04).

Conclusions/Discussion: This study found that despite the implementation of an SSI bundle, 56% of non-diabetic patients developed perioperative hyperglycemia, which was associated with significantly increased organ/space SSI rates.

EXTENDED VENOUS THROMBOEMBOLISM PROPHYLAXIS WITH RIVAROXABAN DOES NOT INCREASE BLEEDING COMPLICATIONS AFTER MAJOR ABDOMINAL AND PELVIC SURGERY.

P1096

A. Kebkalo[3], V. Tyselskyi[3], A. Reiti[3], D. Wong[2], V. Poylin[1]
[1]Chicago, IL; [2]Boston, MA; [3]Kyiv, Ukraine

Purpose/Background: An increased risk of venous thromboembolism (VTE) after major abdominal and pelvic surgery is well documented and extended post discharge prophylaxis is generally recommended. Low molecular weight heparin is the most commonly used agent, but requires daily injections. Rivaroxaban, a factor Xa inhibitor, is a daily tablet approved treatment of VTE and prophylaxis after orthopedic surgery. The safety of Rivaroxaban, as it relates to postoperative complications after colon and rectal surgery, is not well known or understood. The purpose of this study is to evaluate the safety of rivaroxaban for extended prophylaxis after major abdominal and pelvic surgery

Methods/Interventions: This is a retrospective review of patients undergoing major colorectal surgery at a regional hospital in Kiev, Ukraine. Patients received peri-operative VTE prophylaxis with subcutaneous heparin and were transitioned to rivaroxaban once started on regular diet. Postoperatively, patients stayed on rivaroxaban for a total of 42 days (individual patient packs are available in 42 tablet quantities). Chances of major or minor bleeding, readmission, blood transfusion, need for re-intervention were noted. Phone surveys were administered on post operative day 42 to assess patients' compliance and satisfaction with the regimen.

Results/Outcome(s): A total of 42 patients were included in the study with an average age of 64 years old. Cancer was the most common indication for surgery with 38 patients (90%). Most had ASA II (75%) and Charles Comorbidity index of 2. 71% of the cases were abdominal cases, 29% were pelvic cases and 54% of all cases were done laparoscopically. An average length of stay was 5 days (4-12). No major bleeding episodes or readmissions were noted by chart review or patient survey. There was one episode of postoperative bleeding prior to the patient being started on rivaroxaban and there was one case of postoperative subcutaneous hematoma following initiation of rivaroxaban; both cases were self limited and there were no other complications reported. There were no VTE events in the group. The phone survey response rate was 100%. All but one patient reported finishing the full course of prophylaxis.

Conclusions/Discussion: Extended prophylaxis with rivaroxaban is safe and does not increase rates of post operative bleeding. Larger studies are needed to access efficacy of rivaroxaban for VTE prophylaxis and studies comparing patient tolerance of oral versus subcutaneous formulation are needed

CLINICOPATHOLOGIC OUTCOMES OF COLORECTAL CANCER PATIENTS ENROLLED IN A COMPREHENSIVE BENEFITS PROGRAM OF THE NATIONAL INSURANCE SYSTEM (PHILHEALTH Z-PACKAGE) IN THE PHILIPPINES.

P1097

M. Villanueva, M. Tampo, M. Lopez, M. Parreno-Sacdalan, H. Monroy
Manila, Philippines

Purpose/Background: An estimate of at least 8,000 new cases of colorectal cancer are predicted to occur among Filipinos annually. Understandably, the management of colorectal malignancies poses a significant financial burden. The Department of Health (DOH) created the Z-Package Colorectal Cancer Benefit Program (Z-Package) –

a health insurance system designed to cover the expense of treatment for patients with colorectal cancers diagnosed at early to locally-advanced stages (Stages I-III) of the disease. The goal of the program is to achieve better health outcomes through a comprehensive management plan. The Philippine General Hospital (PGH) is the pilot site for the program

Methods/Interventions: Three-year data of patients enrolled under the Z-Package from 2016 to 2018 was gathered prospectively and reviewed by the UP-PGH Colorectal Cancer and Polyp Study Group, a multidisciplinary team composed of representatives from Colorectal Surgery, Medical Oncology, and Radiation Oncology. The team holds weekly conferences to discuss treatment plans and assess outcomes of colorectal cancer patients.

Results/Outcome(s): A total of 251 patients were enrolled inZ-package from 2016 to 2018. The mean age was 57 years (range 44-69 years), and majority (66%) were males. Majority (78%) of patients had rectal cancer. Sixty-one percent of patients with colon cancer, and eighty-seven percent of patients with rectal cancer were seen already with Stage 3 disease. For colon cancer, overall recurrence rate was 11%, all of which were metastatic. Rectal cancer had a recurrence rate of 16%; 90% of which were metastatic. Thirty-day morbidity for colon and rectal cancer was 5% and 8% respectively. Morbidity beyond 30 days was 17%, many were chemotherapy-related (8%). This study showed an all-cause mortality rate of 19%, where majority (89%) were directly related to the cancer, or its treatment. No surgical mortalities were noted. Out of the 48 deaths, 23 patients died due to complications during chemotherapy (mostly severe febrile neutropenia). Patients in this program had a 2-year disease free survival of 70% and an overall 2-year survival rate of 74%. For rectal cancer, the quality of total mesorectal excision was evaluated and 71.1% and 22.3% had complete and partially complete circumferential resection margin respectively. Using Cox proportional hazards regression analysis, the statistically significant predictors of poorer survival were cancer stage, presence of poorly differentiated adenocarcinoma, and <12 lymph nodes (LNs) harvested at the time of resection.

Conclusions/Discussion: The results of this study show that optimal outcomes are achieved through a multidisciplinary team approach and a national health program, both ensuring that colorectal cancer patients receive the standard of care despite steep economic constraints.

Table 1. Clinical outcomes of colorectal cancer patients enrolled under the Philhealth Z-Package Benefit Program at the UP-PGH (2016-2018).

	COLON	RECTAL	OVERALL
	N=56	N=195	N=251
30-day Morbidity	**3 (5.4%)**	**16 (8.2%)**	**19 (7.4%)**
Medical comorbidities	0	7 (3.6%)	7 (2.8%)
Surgery related	3 (5.4%)	9 (4.6%)	12 (4.8%)
30-day Mortality	**0**	**0**	**0**
>30 day Morbidity	**9 (16%)**	**33 (16.9%)**	**42 (16.7%)**
Chemotherapy related	5 (8.9%)	14 (7.2%)	19 (7.6%)
Radiation therapy related	N/A	2 (1%)	2 (0.8%)
Worsening of medical comorbidities	2 (3.6%)	6 (3.1%)	8 (3.2%)
Cancer progression	2 (3.6%)	11 (5.6%)	13 (5.2%)
Mortality rate	**7 (13%)**	**41 (21%)**	**48 (19%)**
Surgery related	0	0	0
Chemotherapy related	1	22	23
Metastatic progression	6	9	15
Medical comorbidities	0	9	9
Neoadjuvant chemoradiotherapy-related	0	1	1
Overall recurrence rate	**6 (10.7%)**	**32(16.4%)**	**38 (15.1%)**
Local recurrence	0	3 (1.5%)	3 (1.2%)
Metastatic recurrence	6 (10.7%)	29 (14.9%)	35 (13.9%)
Overall 2 year survival	**81.76%**	**71.97%**	**73.92%**
2 year Disease free survival	**78.6 %**	**67.4%**	**69.7%**

Table 2. Significant predictors of time to mortality among patients enrolled in the Philhealth Z-Package Benefit Program at the UP-PGH (2016-2018). n=251

		95% C.I.		
Factors	Haz. Ratio	LL	UL	p-value
Stage				
1-2	1.00	-	-	-
3	4.73	1.15	19.50	0.032
Poorly differentiated				
No	1.00	-	-	-
Yes	1.78	1.00	3.16	0.049
<12 Lymph Nodes harvested				
No	1.00	-	-	-
Yes	24.38	2.87	206.83	0.003

SHORT TERM OUTCOMES OF OPEN AND MINIMALLY INVASIVE APPROACHES TO SEGMENTAL COLECTOMY FOR BENIGN COLOVESICAL FISTULA.

P1007

Z. Moghadamyeghaneh[1], M. Stamos[2], H. Talus[1]
[1]*Brooklyn, NY;* [2]*Irvine, CA*

Purpose/Background: We speculated that a minimally invasive approach (MIS) to segmental colectomy with anastomosis for benign colovesical fistula would be associated with less morbidity compared to open colectomy. We compared outcomes of MIS and open partial colectomy for benign colovesical fistula using data from the National Surgical Quality Improvement Program (NSQIP) database for the period of 2012 – 2017.

Methods/Interventions: Multivariate analysis was used to compare outcomes of MIS and open partial colectomy for benign colovesical fistula from NSQIP database 2012 to 2017.

Results/Outcome(s): In NSQIP hospitals, 748 patients underwent partial colectomy with anastomosis for benign colovesical fistula during the period of 2012-2017. Surgeons used MIS in 72.7% of operations with a conversion rate of 13.1%. There was a significant increase in utilization of the MIS approach over time from 64.3% in 2012 to 79.2% in 2017. The NSQIP data demonstrated the MIS approach was associated with lower morbidity (27.4% vs. 43.1%, AOR: 0.46, P=0.02), and shorter length of hospital stay (6 days vs. 10 days, mean difference: 4 days,

P<0.01) compared to an open approach. However, the mean operation duration was longer in MIS operations compared to open operations (225 min vs. 201 min, P<0.01). Robotic approach was used in only 13.6% of MIS operations. Robotic approach to colectomy showed no significant difference in morbidity (28.4% vs. 27.2%, P) but a decrease in conversion rate (8.1% vs. 13.8%, P<001) but with an increase in operation length (249 min vs. 222 min, mean difference: 27 min, P<0.01) compared to a laparoscopic approach. There was no significant difference in the anastomotic leak rate between laparoscopic and robotic approaches (2.8% vs. 3.8%, P=0.99). In the sub-group treated with MIS approach 53.4% of anastomosis were done with the Intracorporeal technique. There was no significant difference in the anastomotic leak rate of Intracorporeal versus extracorporeal anastomosis (4.2% vs. 3.8%, AOR: 1.44, P=0.70).

Conclusions/Discussion: Currently, the majority of segmental colectomies for benign colovesical fistula in the NSQIP hospitals are performed utilizing a MIS approach (72.7%) with a 13.6% conversion rate. During the time period of this national study the sub-group of patients who were treated with MIS approaches had significantly lower morbidity compared to open approach. In the majority of the cases colonic anastomosis in MIS approaches is done with the Intracorporeal technique (53.4%) without a significant change in the risk of anastomotic leak compared to extracorporeal anastomosis. Most of the MIS performed partial colectomies for benign colovesical fistula are done laparoscopically (86.4%) with a utilization rate of robotic approach of 13.6%. A robotic approach to partial colectomy for colovesical fistula has the same morbidity risk with a modestly decreased conversion rate compared to laparoscopic approach.

PROPHYLACTIC PLACEMENT OF HYBRID PTFE BIOMATERIAL MESH AT THE TIME OF OSTOMY REVERSAL FOR THE PREVENTION OF OSTOMY SITE HERNIATION- A RETROSPECTIVE STUDY.

P1008

J. Smith, E. Mallico
Salisbury, NC

Purpose/Background: A common sequela to stomal closure is incisional herniation, often requiring additional surgical intervention. This exposes the patient to further risk from surgical complication and creates an additional financial burden on the patient and healthcare system. We propose prophylactic placement of a hybrid PTFE mesh at the time of ostomy reversal as an effort to prevent incisional hernias at the stoma site. There is significant debate over the safety of mesh placement during ostomy reversal due to the contaminated nature of the procedure leading to potential subsequent risk of mesh infection with additional complications.

Methods/Interventions: A retrospective study of laparoscopic placement of intraperitoneal hybrid PTFE mesh over primarily closed fascial defect during ostomy reversal was conducted on 6 patients undergoing colostomy or ileostomy reversal. In all cases, following copious irrigation, the abdominal wall defect from the ostomy was closed in a layered fashion of the anterior and posterior fascia using PDS suture followed by laparoscopic placement with IPOM technique of 12 cm circular hybrid PTFE mesh with absorbable tack fixation. A negative pressure wound VAC was placed within the wound for subcutaneous tissue closure. Our primary objective was to evaluate for abdominal wall herniation at the former ostomy site. Our secondary objective was to identify complications related to the mesh following placement, specifically incidence of infection.

Results/Outcome(s): Of the 6 patients who had mesh placed at the time of their ostomy reversal, none of the patients developed a hernia during the follow up period. Follow up ranges from 13-31 months. None of the patients developed complications related to mesh infection or the need for explant of mesh. One patient developed a peri-anastomotic abscess which was managed conservatively with IR abscess drainage. Patient follow up for reassessment is ongoing.

Conclusions/Discussion: To our knowledge, prophylactic utilization of hybrid PTFE permanent mesh placement combined with primary layered closure at the time of stoma reversal is rare due to the concern of complications. Though we have a small sample size, early outcomes of this relatively novel technique are promising in reduction of incisional hernia following ostomy reversal without infectious complications relating to the mesh.

RECURRENCE OF ACUTE RIGHT COLON DIVERTICULITIS FOLLOWING NON-OPERATIVE MANAGEMENT: A SYSTEMATIC REVIEW AND META-ANALYSIS.

P1009

Y. Lee, D. Tang, S. Patel, M. Battaglia, B. Shanker, R. Cleary
Ann Arbor, MI

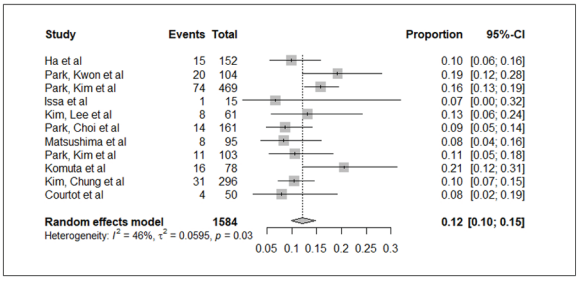
Purpose/Background: There are currently no guidelines on the management of right colon diverticulitis. Appropriate selection of patients for elective right colectomy following resolution of acute diverticulitis is challenging. Integral to weighing the benefit of surgery is knowledge of the risk of diverticulitis recurrence. The purpose of this systematic review and meta-analysis is to summarize the recurrence rate and the morbidity of recurrence of Hinchey classification I/II, right-sided diverticulitis following non-operative management.

Methods/Interventions: A literature search of PubMed, EMBASE, and Cochrane Database of Collected Reviews was performed up to June 2019. "Right-sided" laterality was defined as diverticulitis involving the cecum, ascending colon or proximal transverse colon. "Hinchey classification I" was defined as acute diverticulitis with confined pericolonic phlegmon or abscess. "Hinchey classification II" was defined as acute diverticulitis with intra-abdominal, pelvic or retroperitoneal abscess. "Non-operative management" was defined as administration of intravenous antibiotics with or without percutaneous abscess drainage. The statistical heterogeneity was assessed using the χ^2 and I^2 tests. The rates of recurrence were pooled using a random effects model. A sensitivity analysis was performed with exclusion of studies that considered percutaneous drainage as a non-operative treatment strategy.

Results/Outcome(s): Our search strategy yielded 1,503 potentially eligible studies. After screening and review, a total of eleven studies (nine retrospective cohort and two prospective cohort studies) met inclusion criteria. 1,584 participants with mean age ranging from 34.9 to 54 years were included in the analysis. The pooled recurrence rate was 12% (95% CI: 10%, 15%) with a range of 7% to 21%, as shown in Figure 1. The median follow-up period was 34.2 months with a range of 21 to 61 months. Twenty of 202 patients (9.9%) required urgent surgery at the time of first recurrence. There was no mortality at first recurrence. The statistical heterogeneity was moderate (I^2 = 46%). After excluding three studies that considered percutaneous drainage as a non-operative adjunct, the overall recurrence remained at 12% (95% CI: 9%, 15%), with heterogeneity also unchanged (I2= 46%).

Conclusions/Discussion: Non-operative management of Hinchey I/II right-sided diverticulitis is safe and feasible. Recurrence rate is relatively low and complications for recurrence that require urgent operation are unlikely. Additional studies are needed to further clarify the morbidity and mortality of successive recurrence.

Figure 1. Proportion of right diverticulitis that recur.



CI = Confidence interval

WHAT IS THE REAL INCIDENCE RATE OF COSTRIDIUM DIFFICILE AFTER ILEOSTOMY CLOSURE?

P1010

A. Legault-Dupuis
Québec, QC, Canada

Purpose/Background: Return of bowel function after ileostomy closure is often associated with frequent bowel movements, loose stool and diarrhea. This usual step toward the return of bowel function often trigger the nursing protocol for patient isolation suspecting an infectious diarrhea such as clostridium difficile infection (CDI). This results in unnecessary isolation of the patient leading to increased hospital cost, patient's worries and often increased length of stay. We decided to investigate the rate of CDI after elective ileostomy closure in our center.

Methods/Interventions: We identified all patients having had an elective ileostomy closure between January 2012 and July 2018 in our center. A standardized retrospective chart review was performed. Main outcome was the rate of CDI. The rate of patient isolation for increased loose bowel movements suspecting infectious diarrhea was also recorded. Furthermore, we look at data regarding time to ileostomy closure, length of hospital stay and post-operative complications.

Results/Outcome(s): A total of 401 patients underwent ileostomy closure during the study period. There were 188 women and 213 men. A total of 73 (73/401; 18.2%) patients were isolated in their postoperative period for liquid stools and suspicion of CDI. CDI was identified and confirmed in 7 (7/401; 1,7%) patients inside 60 days after surgery. Among all patients with CDI, only 2 tested positive within their initial post-operative period (post-operative day 3 and 7), when first bowel movements begin after ileostomy closure. 2 were diagnosed after prolonged hospitalisation (at post-operative day 18 and 23) and 3 after discharge (at post-operative day 8, 30, 57). It means that when we isolate patients at return of bowel function who had a confirmed CDI during first 60 days after surgery, we only successfully target 2/7 (28%) of them. To achieve it, 71/401 (73 – 2) were isolated and tested for what is an expected post-operative evolution with more liquid and frequent stools. For 328 non-isolated patients, length of hospital stay was shorter than 73 isolated patients, with a median of respectively 4 days compared 7 days. The 7 patients in the CDI group stayed for a median of 4 days. Defunctioning time was a median of 161 days compared to 159 in CDI group. There was no mortality in CDI group. There were 3 recurrences and 1 patient required a total colectomy for severe infection. Most frequent complication among CDI patients was post-operative ileus.

Conclusions/Discussion: Post-operative diarrheas after ileostomy closure is frequent. The incidence rate of

post-operative CDI remains low. The actual isolation protocol appears to be too strict in this patient's population were some postoperative diarrhea is expected. Hospital protocol should be adapted to this reality.

FAR FROM BLACK AND WHITE: IS RACE A CONTRIBUTING FACTOR TO DISPARITY IN PRESENTATION OF ACUTE DIVERTICULITIS?

P1011

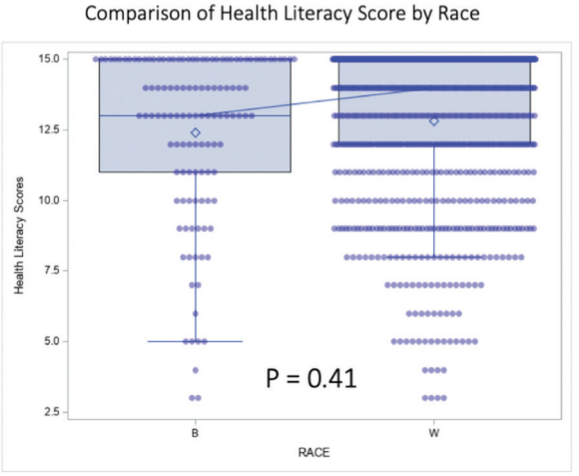
S. Hamdan[1], S. Kripalani[2], T. Geiger[2], B. Dennis[2], M. Ford[2], A. Hawkins[2]
[1]*Brentwood, TN;* [2]*Nashville, TN*

Purpose/Background: Prior investigations have observed racial discrepancies in treatment and outcomes among patients with acute diverticulitis, yet underlying factors that contribute to this disparity are poorly understood. We hypothesize that among patients hospitalized with acute diverticulitis, racial inequalities in health literacy exist and that these differences are associated with more severe presentation.

Methods/Interventions: A retrospective cohort analysis of all patients admitted with acute diverticulitis was performed from January 2012 to September 2019. Patients with self-reported race other than Black or White or with incomplete health literacy assessments were excluded. Health literacy was determined by the Brief Health Literacy Screening, a validated 3-item survey, and inadequate health literacy was defined by BHLS scores ≤ 9. The primary outcome was severity of disease presentation as represented by SIRS criteria. The secondary outcome was intervention (surgery or percutaneous drainage). Multivariable logistic regression was used to determine the association of race, health literacy, and area median income on presentation while controlling for patient demographics.

Results/Outcome(s): A total of 961 patients met inclusion criteria. Of these, 122 (12.7%) were Black and 839 (87.3%) were non-Hispanic White, and the median age was 62 years. Overall, 143 (14.9%) patients of all those admitted with acute diverticulitis had inadequate health literacy. In an adjusted analysis, old age (95% CI, 1.903-4.067) and low area median income (95% CI, 0.234-0.662) were the only measures significantly associated with inadequate health literacy; there was no association with race (95% CI, 0.698-2.062). A total of 344 (35.8%) patients met SIRS criteria upon admission and 89 (9.3%) underwent an intervention. Neither race, health literacy, nor area median income were significantly associated with either measures of severity of presentation.

Conclusions/Discussion: Among patients with acute diverticulitis, there was no difference in severity of presentation associated with race, health literacy, or area-based socioeconomic measures. As this contradicts prior evidence within different disease groups, these findings suggest that differences in presentation of acute diverticulitis may be driven by the biology of the disease rather than social measures. Further evaluation of the unique clinical characteristics of acute diverticulitis, such as the role of access and underuse of health care resources, must be considered.



ASSESSMENT OF ANASTOMOTIC VIABILITY WITH SPECTROSCOPIC REAL-TIME OXYGEN SATURATION MEASUREMENT: AN IN-VIVO PILOT STUDY.

P1012

T. Khosrawipour, S. Li, H. Chaudhry, V. Khosrawipour, M. Jafari, A. Pigazzi
Orange, CA

Purpose/Background: Anastomotic leak (AL) is a dreaded complication after GI surgery. Intra.Ox™ by ViOptix Inc. (Newark, CA, USA) is a novel, FDA-approved spectroscopic device which enables fast, real-time measurement of mixed tissue oxygen saturation (StO_2). This study aims to investigate the applicability of Intra.Ox™ in a porcine intestinal anastomotic model and to explore the correlation between StO_2 measurements and AL.

Methods/Interventions: Eleven female swine were divided into 3 different groups to explore AL in different ischemic conditions. Group 1: 100% mesenteric ligation, n=3; Group 2: 50% mesenteric ligation, n=5; Group 3: NO mesenteric ligation, n=3. Side-to-side stapled anastomoses were performed. StO_2 at the anastomotic line was measured before and after vessel ligation and anastomosis. Measurements were taken at 6 distinct locations along afferent and efferent loops. AL was evaluated on postoperative day 5 by re-laparotomy.

Results/Outcome(s): AL rate was 100%, 60% and 0% in group 1, 2 and 3, respectively. No differences in StO2 values were detected before mesenteric ligation. Post-anastomotic StO_2 in group 1 (22.9±18.5%) and 2 (39.2±15.5%) were significantly lower than in group 3

(53.1±9.2%) (P<0.05). Post-anastomotic StO_2 readings ≤35% indicated potential for AL with 100% sensitivity, 80% specificity, positive predictive value of 85.7% and negative predictive value of 100%.

Conclusions/Discussion: This study is the first to assess anastomotic viability via spectroscopic mixed tissue oxygen levels. Intra.Ox™ enables non-invasive, reliable real-time tissue StO_2 measurements which appear useful in predicting anastomotic failure. Further studies are required to validate our findings.

LAPAROSCOPIC CECECTOMY FOR DISEASES OF THE APPENDIX AND CECUM.

P1013

M. Oner[1], M. Abbas[1], H. Darr[1], T. Tejirian[2]
[1]*Dubai, United Arab Emirates;* [2]*Los Angeles, CA*

Purpose/Background: Some benign conditions affecting the appendix and the cecum are overtreated with ileocolic resection or right hemicolectomy. Cecal resection is a sufficient alternative for such patients and carries several advantages over segmental resection. The goal of this study was to review our experience with laparoscopic cecectomy.

Methods/Interventions: We conducted a retrospective chart review of patients who underwent laparoscopic cecectomy between 2006 and 2019. All operations were performed laparoscopically using a 3-trocar technique [2 x 5 mm (left lower quadrant and lower midline) and 1 x 12 mm (supraumbilical)]. The cecum was transected with 1 to 2 firings of a 60 mm linear stapler, preserving the ileocecal valve and ascending colon.

Results/Outcome(s): A total of 18 patients were identified including 11 females (61.1%). Median age was 42 years (range 16-84). Indication for surgery included appendiceal pathology in 11 patients (61.1%) and cecal abnormality in 7 (38.9%). There was no conversion to open surgery. Mean intraoperative blood loss was 24 ml (range 0-150 ml) and no patient received a blood transfusion. No intraoperative or postoperative complication was noted. The median length stay was 1 day (range 0-6). Readmission rate was 0%. Final appendiceal histopathology revealed acute/chronic appendicitis 5, mucinous cystadenoma 3, fibrous obliteration of the appendix (from past perforated appendicitis) 2, and carcinoid tumor 1. Cecal histopathology revealed tubulovillous adenoma 2, tubular adenoma 2, intramucosal carcinoma 1, perforated diverticulum 1, and submucosal lipoma 1. All specimen had negative margins. Median follow-up was 16 months (range 4-53). No patient required subsequent segmental bowel resection.

Conclusions/Discussion: Laparoscopic cecectomy carries minimal morbidity and short length of stay. It should be considered as an alternative to segmental bowel resection in select patients with benign pathology of the appendix and cecum.

ANALYSIS OF PROGNOSTIC FACTORS OF SURVIVAL IN RECTAL ADENOCARCINOMA PATIENTS TREATED WITH PREOPERATIVE CHEMORADIOTHERAPY.

P1014

S. Saad
São Paulo, Brazil

Purpose/Background: Rectal cancer (RC) has high prevalence. Treatment of RC is based on surgery, and pelvic recurrence has significant morbidity and decreased quality of life. Neoadjuvant chemoradiation(NCR) has resulted in significant tumor downstaging, reducing the risk of recurrence tumor. Oncologic outcomes according to clinical and pathological factors have not yet fully understood. OBJECTIVE: To identify prognostic factors that affect survival of patients operated on for RC with NCR.

Methods/Interventions: From 2000 to 2011, 70 patients with stage II or III rectal cancer in the AJCC classification, located within 10 cm from the anal verge and with preoperative chemoradiotherapy and curative resection (R0) with follow-up at least 12 months are included in this research. The radiation dose was 45 Gy initially, then increased to 50.4 Gy. Re-clinical stage was done 4 to 6 weeks after the end of neoadjuvant treatment to characterize the degree of clinical regression of the tumor. Surgery by laparotomy or laparoscopy video was made after 6 to 12 weeks of neoadjuvant therapy. The primary outcomes were: overall survival (OS), disease free survival (DFS), metastasis-free survival (MFS) and cancer-specific survival (DSS). These outcomes were compared with gender, age, serum carcinoembryonic antigen (CEA), tumor distance from the anal verge, radiation dose, interval radiation therapy - surgery, clinical regression grade, type of surgery, pT, pN, TNM stage, size tumor, number of nodes, tumor regression grade, circumferential resection margin and pathologic complete response. Survival was evaluated by Kaplan-Meier curves and log-rank test. Univariate and multivariate Cox were performed to identify factors associated with survival outcomes.

Results/Outcome(s): The mean follow-up was 62 months and complete pathological response rate was 18.6%. Survival curves of Kaplan-Meier curves showed that CEA greater than or equal to 4 ng / mL had worse SLD (p=0,02) and SLM (p=0,009). Pathologic stage pT3/pT4 had shorter SLD (p=0,002), SLM (p=0,005) and DSS (p=0,01). Lymph node involvement were significantly associated with OS (p=0,04), SLD (p=0,001), SLM (p=0,007) and DSS (p=0,009). Stage II and III had lower SLD (p=0,04) and SLM (p=0,008). In the univariate Cox analysis, CEA equal to or greater than 4 ng / mL was significantly associated with SLD and SLM, staging pT3/pT4 with SLD, SLM and DSS, the pN1/N2 with SLD, SLM and DSS and stage II and III with SLD and SLM. Multivariate regression showed that CEA, pT and

pN staging were independent prognostic factors affecting SLD, SLM and DSS.

Conclusions/Discussion: The level of carcinoembryonic antigen prior to radiotherapy, staging pT and pN are independent prognostic factors for survival in patients with adenocarcinoma of the rectum that are treated with preoperative chemoradiotherapy.

LAPAROSCOPIC COMPARED WITH OPEN RESECTION FOR COLORECTAL CANCER AND LONG-TERM INCIDENCE OF ADHESIONAL INTESTINAL OBSTRUCTION AND INCISIONAL HERNIA: A SYSTEMATIC REVIEW AND META-ANALYSIS.

P1015

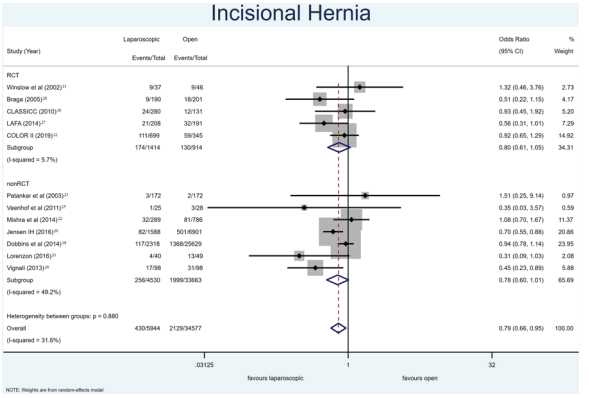
D. Udayasiri[1], A. Skandarajah[2], I. Hayes[1]
[1]Ivanhoe, VIC, Australia; [2]Parkville, VIC, Australia

Purpose/Background: Incisional hernia and adhesional intestinal obstruction are important complications of laparoscopic and open resection for colorectal cancer. This is the largest systematic review of comparative studies on this topic.

Methods/Interventions: The objective of this study was to investigate whether laparoscopic surgery decreases the incidence of incisional hernia and adhesional intestinal obstruction compared to open surgery for colorectal cancer. Online databases searched in the systematic review were PubMed, EMBASE and the Cochrane Library. Abstracts from the annual meetings of the American Society of Colon and Rectal Surgeons and the European Society of Coloproctology were performed to cover grey literature. We included both randomised and non-randomised comparative studies. The intervention was laparoscopic resection and the comparison open resection for patients with colorectal cancer. The outcomes measured were Incisional hernia and adhesional intestinal obstruction.

Results/Outcome(s): Fifteen studies met inclusion criteria (6 RCTs/9 non-RCTs); 84172 patients. Meta-analysis showed decreased odds of developing incisional hernia in the laparoscopic cohort (OR 0.79, 95%CI 0.66 to 0.95, P = 0.01) but no difference in requirement for surgery (OR 1.07: 95% CI; 0.64 to 1.79, P = 0.79). Similarly, there were decreased odds of developing adhesional intestinal obstruction in the laparoscopic cohort (OR 0.81: 95%CI; 0.72 to 0.92, P = 0.001) but no difference in requirement for surgery (OR 0.84, 95%CI: 0.53 to 1.35, P = 0.48).

Conclusions/Discussion: The main limitation of this study was that Incisional hernia and adhesional intestinal obstruction were poorly defined in many studies. In conclusion, Laparoscopic surgery is associated with decreased odds of incisional hernias and adhesional intestinal obstructions compared with open surgery for colorectal cancer.



RECTAL MOBILIZATION USING SENHANCE DIGITAL LAPAROSCOPIC SYSTEM.

P1017

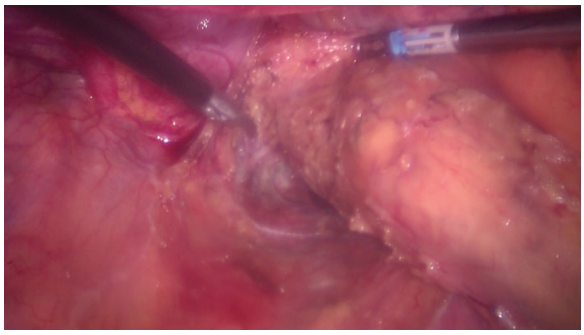
S. Yamaguchi, Y. Hirano, T. Ishii, H. Kondo, M. Asari, S. Sakuramoto
Hidaka, Japan

Purpose/Background: New digital laparoscopic surgery by Senhance surgical system was introduced. This system has several new functions of haptic sensing, eye tracking camera control, and reusable instruments. In conventional laparoscopic surgery, generally surgeon stands right side of the patient and only uses right side ports. Each instrument control of the Senhance system is same as laparoscopic one. However surgeon can use the left side port in this system. Also surgeon can switch right and left hand of console, if the left port instrument control precisely.

Methods/Interventions: Eleven colorectal cancer patients were operated using Senhance system including 1 rectosigmoid and 1 upper rectum.

Results/Outcome(s): Two patients were 63 and 58 year old females. Procedures were high anterior resection (HAR) by totally Senhance system and low anterior resection (LAR) by partially Senhance system for rectal mobilization. Operating time was 367 minutes in HAR and 284 minutes in LAR. Blood loss was 30 g and 10g, respectively. Postoperative hospital stay was 7 days in both patients. Actual hand switching was used at the dissection between the left pelvic plexus and the mesorectum.

Conclusions/Discussion: Laparoscopic colectomy using Senhance surgical system is safe and feasible. Different approach of pelvic dissection is possible by precise control with the Senhance surgical system.



OUTCOMES OF DEFINITIVE TREATMENT OF SIGNET RING CELL CARCINOMA OF THE RECTUM: IS MINIMAL INVASIVE SURGERY DETRIMENTAL IN SIGNET RING RECTAL CANCERS?

P1018

S. Raghavan, A. Saklani
Thane, India

Purpose/Background: Outcome of surgery for signet ring adenocarcinoma of rectum is suboptimal with high predilection for locoregional and peritoneal metastases. Lack of intercellular adhesion due to focal loss of epithelial cell adhesion molecule (EpCAM) may account for this. In such patients, whether minimal invasive surgery carries a high risk of dissemination by pneumoperitoneum and tumor implantation remains uncertain. The aim of this study was to compare the outcomes of patients undergoing minimally invasive surgery (MIS) versus open surgery in patients with signet ring cell adenocarcinoma of rectum.

Methods/Interventions: A retrospective study was conducted at a tertiary care center over 3 years on 39 patients undergoing open surgery and 40 patients undergoing MIS diagnosed with signet ring cell carcinoma (SRCC) identified from our surgical database. Patient characteristics in terms of demographics, clinicoradiological staging, neoadjuvant therapy, and type of surgery with morbidity were compared in the two groups. Data on patients undergoing adjuvant therapy and 3 years disease-free survival (DFS) and overall survival (OS) were analyzed. Recurrence patterns in both groups were separately identified as locoregional, peritoneal, or systemic

Results/Outcome(s): The number of patients undergoing surgery in the two arms was 40 (MIS) and 39 (open). In the MIS arm, mean DFS was 29 months whereas in the open arm, it was 25.8 months. The mean OS was 33.65 months for the MIS arm and that for the open arm was 36.34 months

Conclusions/Discussion: This retrospective study reveals no significant difference in outcomes of surgery for signet ring cell rectal cancers with either MIS or open approach.

SAFETY AND FUNCTIONAL OUTCOMES OF ROUTINE RESECTION OF VISCERAL BRANCHES OF HYPOGASTRIC VESSELS IN LATERAL LYMPH NODE DISSECTION FOR MID-LOW RECTAL CANCER: A MODIFIED LATERAL APPROACH WITH PRE-SEPARATION OF UROGENITAL AND VESICOHYPOGASTRIC FASCIA.

P1019

Z. Wang, X. Zhang, X. Deng, C. Gu, Q. Wu
Chengdu, China

Purpose/Background: this study aimed to prospectively explore the safety and feasibility of routinely resection of visceral branches of hypogastric vessels in lateral lymph node dissection (LLND) for mid-low rectal cancer with a modified lateral approach with pre-separation of urogenital and vesicohypogastric fascia.

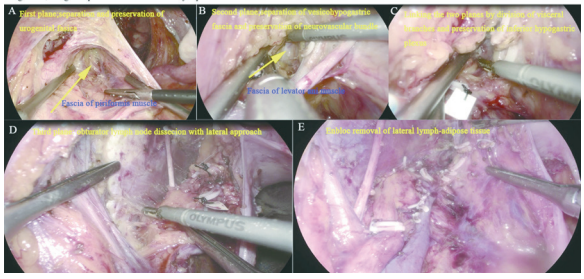
Methods/Interventions: patients with mid-low rectal adenocarcinoma and suspected lateral lymph node metastasis were enrolled. LLND procedure was performed as following steps: a)Separation and preservation of urogenital fasica; b)Separation of vesicohypogastric fascia and preservation of neurovascular bundle; c)Division of visceral branches and preservation of inferior hypogastric plexus; d)Enbloc removal of lateral lymph-adipose tissue by a lateral approach;

Results/Outcome(s): From October 2018 to September 2019, 29 patients (male 20; female 9, aged 58.0(39-74) years old) were enrolled in our study prospectively. 23 patients received neoadjuvant therapy before surgery. Unilateral LLND was performed in 23 patients (11 left; 12 right). The remaining 6 patients received bilateral LLND. Internal iliac vessels resection including common trunk of internal iliac artery (IIA) resection (n=1), anterior trunk of IIA dissection (n=16), only superior vesicle artery (SVA) preserved (n=9), 0nly SVA dissected (n=2), only inferior gluteal artery (IGA) preserved (n=2), only IPA and IGA preserved (n=2) and only uterine preserved (n=3). Autonomic nerve was completely preserved in 30 sides, partially dissected in 1 side and totally dissected in 4 sides. Internal iliac vein injury with bleeding occurred in one patient and no blood transfusion was given. Four patients developed major complication (Clavien III-IV) including anastomotic leakage (n=1), pelvic abscess (n=1), and pelvic fluid (seroma, n=2) and all the four patients were well managed. Urinary dysfunction occured in 14 patiens and 5 patients needed re-catheterization. No perioperative mortality happened. The median number of LLN harvested was 11(1-22) in each lateral department. 13 LLNs in 9 patients were pathologically proved as metastasis. With a median follow-up time of 9 (3-12) months, 3 of 6 male patients who had normal sexual function (IIEF-5 score ≥22) before surgery recovered sexual activity with normal erection. All female patients had

sexual dysfunction with different degrees (FSFI≤ 26.55) before surgery and 3 recovered normal sexual function in our last visit.

Conclusions/Discussion: this modified technique for LLND with a lateral approach is feasible, safe, and more likely leading to a complete removal of lymphatic and adipose tissue in the lateral region. Routine resection of visceral branches of internal iliac vessels for patients underwent LLND seems to result in un-compromised functional outcomes.

Figure 1, surgical procedure for lateral lymph node dissection



CASE SERIES REPORT: PREOPERATIVE TUMOR LOCALIZATION WITH AUTOLOGOUS BLOOD TATTOOING IN EARLY COLORECTAL CANCER.

P1020

R. Yoo[1], B. Kye[1], H. Kim[2], W. Kang[2], H. Cho[1], H. An[1], H. Kim[1]
[1]Suwon, Korea (the Republic of); [2]Seoul, Korea (the Republic of)

Purpose/Background: Minimally invasive surgery has become the standard in colorectal cancer surgery. In early colon cancer, however, it is often difficult to localize a tumor location intraoperatively. Preoperative tumor localization is often performed with colonoscopic peritumoral tattooing. Various agents, including indigo carmine, indocyanine green, or methylene blue, are widely used. However, their use is controversial for adverse effects, such as local inflammatory reaction, dye spillage, colonic perforation, abscess formation, or even peritonitis. These case series report the effectiveness of the autologous blood tattooing for preoperative colonoscopic localization.

Methods/Interventions: From June 2019 to Nov. 2019, eight patients diagnosed with early colorectal cancer. They were apt to undergo preoperative colonoscopic localization with autologous blood tattooing. All patients took 8 liters of Colyte for bowel preparation in the morning on the day before the surgery. 10cc of the blood sample was drawn from each patient for tattooing just before the localization. Colonoscopic localization was performed in the afternoon on the day before the surgery. Peritumoral injection of autologous blood was done for the localization.

Results/Outcome(s): Among the eight patients, six patients were diagnosed with colon cancer in the sigmoid colon, one in the ascending colon, and one in the transverse colon. Two patients were visible in the CT scan, but the tumor was not localized in the CT scan. Intraoperatively, ascending colon, and T colon cancer was well visualized with blood tattooing. Five patients with sigmoid colon cancer coincided with the initial colonoscopic diagnosis. One patient showed the tumor located at the RS junction. In all patients, tumor location was easily identified with bloodstains. There was no acute inflammatory reaction or peritonitis around the injection site.

Conclusions/Discussion: Autologous blood tattooing can be an alternative method for preoperative colonoscopic localization.

RACIAL DISPARITIES AFTER SEGMENTAL COLECTOMY FOR INFLAMMATORY COLORECTAL DISEASES USING A LARGE NATIONWIDE DATABASE.

P1028

S. Sharp[2], H. Gilshtein[2], A. Ata[1], A. Webber[1], C. Jahansouz[2], S. Stain[1], B. Valerian[1], E. Lee[1], S. Wexner[2]
[1]Albany, NY; [2]Weston, FL

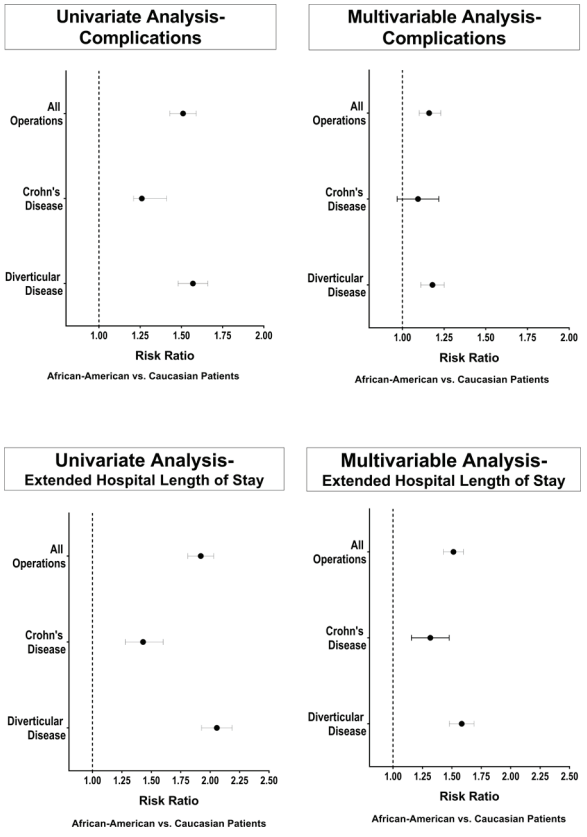
Purpose/Background: Racial disparities and poor access to care have been shown to be common among African American patients and may adversely affect surgical outcomes in inflammatory bowel disorders. This study is the first to examine the effect of race on outcomes in patients undergoing a partial colectomy for inflammatory disease in colorectal surgery. Using a large nationwide surgical database, we sought to determine the impact of race on outcomes for operations requiring segmental colectomy for Crohn's disease or diverticular disease. Using bivariate and multivariable analysis, we sought to determine surgical outcomes in African American patients.

Methods/Interventions: The American College of Surgeons NSQIP database from 2012-2018 was used to select ileocolic resections, segmental colectomies, and anterior resections performed for either Crohn's or diverticular disease. After stratifying by race, unadjusted bivariate and adjusted multivariable analysis models were established. Primary outcomes of interest were overall complications, mortality, and hospital length of stay. Chi-square and two sample t-tests were used to evaluate association between various risk factors and outcomes. STATA 15.1 was used for analysis and statistical significance was set at 0.05.

Results/Outcome(s): A total of 68,254 admissions were analyzed of which African American patients constituted 7% of the overall cohort. African American and Caucasian patients were similar in age, gender, functional status, and ASA class (p >0.05). Diagnoses included Crohn's disease in 17% and diverticular disease in 83%. On bivariate analysis, African American patients with diverticular disease had the highest risk of complications compared to Caucasian patients (RR = 1.57; 95% CI, 1.48 – 1.66) and the highest risk of extended hospital length of stay (RR = 2.05;

95% CI, 1.93 – 2.19). After multivariable analysis, African American patients with diverticular disease still had the highest risk of complications (RR = 1.18; 95% CI, 1.11 – 1.25) and the highest risk of extended hospital length of stay (RR = 1.58; 95% CI, 1.48 – 1.69). On bivariate analysis, there was not a significant difference in mortality rates between African American and Caucasian patients.

Conclusions/Discussion: African American patients who undergo colorectal surgery requiring a segmental colectomy for inflammatory diseases experience a significantly higher rate of postoperative complications and longer hospital length of stay, even after comorbidity adjustment. This finding was highest in African American patients with diverticular disease. Preoperative access to care, socioeconomic and cultural factors, and comorbid disease management are all important factors in racial disparities for patients who undergo colorectal surgery for inflammatory diseases requiring a segmental colectomy.



TREATING ACUTE UNCOMPLICATED DIVERTICULITIS WITHOUT ANTIBIOTICS: OUTCOMES AND COMPLIANCE.

P1029

N. Azhar, H. Aref, F. Jörgren, P. Buchwald
Malmö, Sweden

Purpose/Background: Recent randomized clinical trials (RCT) suggest that antibiotic treatment may be omitted when treating patients with acute uncomplicated diverticulitis (AUD) since it does not accelerate recovery nor prevent complications or recurrences. Many guidelines recommend omitting antibiotics in AUD but the change has been difficult to implement. This study aimed to compare compliance to a non-antibiotic treatment protocol and treatment outcomes at two different hospitals in southern Sweden.

Methods/Interventions: This retrospective cohort study included consecutive patients hospitalized between 2015 and 2017 at Helsingborg Hospital (HH) and Skåne University Hospital (SUS) Sweden with ICD-code K57.3. HH had implemented a non-antibiotic treatment protocol in 2014 and SUS did not have a protocol. All AUD cases were followed for at least a year. Main outcomes were compliance with the treatment protocol, complications, recurrences, and adherence to colonic evaluation after the AUD episode.

Results/Outcome(s): After exclusions, a total of 583 patients were enrolled. 23.5% (n=137) of the included patients did not receive antibiotics, and 76.5% (n=446) did. There was a statistically significant difference in antibiotic use between the hospitals HH 52% (n=101) and SUS 89% (n=345) $p<0.001$ despite all patients fulfilling non-antibiotics treatment criteria. There was nosignificant difference in recurrences (22.0% vs. 22.6%, $p = 0.871$) and complications (2.5% vs. 2.9%, $p = 0.769$) between antibiotic and non-antibiotic groups, respectively. There were significant differences in CT-verification, p-CRP, and days hospitalized, which was higher in the antibiotics group.

Conclusions/Discussion: There was a significant difference between SUS and HH in the usage of antibiotics where HH that had implemented a treatment protocol used less antibiotics. Management of AUD without antibiotic showed no significant difference in adverse events. Overall, the treatment protocol led to a higher standard of care in terms of CT-verification and post AUD colonic investigation. Physicians' incompliance to treatment protocols warrants further studies.

IDENTIFYING DISPARITIES IN DIVERTICULAR DISEASE USING NSQIP: AN EPIDEMIOLOGIC ASSESSMENT OF SURGICAL OUTCOMES.

P1030

K. Kelly-Schuette, N. Winkler, M. Luchtefeld, J. Ogilvie
Grand Rapids, MI

Purpose/Background: Diverticulitis is a common disease in the United States, encompassing more than 2.7 million outpatient visits and 200,000 inpatient admissions annually. There is conflicting literature correlating surgical outcomes and differences in surgical technique with race and ethnicity. Over the past two decades, inpatient admissions for diverticulitis have increased significantly among certain age groups (younger patients 18-39) and races (Black and Hispanic). However, it is not known if the rates of elective or emergent surgery are also increasing or if there are identifiable disparities in outcomes across racial and ethnic minorities.

Methods/Interventions: This is a retrospective study using the ACS National Surgical Quality Improvement Program database (NSQIP) from 2005-2017. We identified patients undergoing colectomy for diverticulitis using CPT codes and ICD 9/10 codes. The database Participant Use Files (PUFs) were analyzed to identify demographics, ethnicity, race, type/acuity of procedure, morbidity and mortality. Our aim was to identify trends and potential disparities in the surgical management of diverticulitis.

Results/Outcome(s): From a total of 407,003 surgeries for diverticulitis, 375,311 were included in the final analysis. There was no significant change in the average age of patients undergoing surgery for diverticulitis over the time frame of the study (62 years), although the percentage of younger patients (18-39) rose slightly from 7.8% in 2008 to 8.6% in 2017. The percentage of surgical patients with Hispanic ethnicity were more common in later years encompassing only 3.7% of patients in 2008 but 6.6% of patients in 2017. The mean age was 62 years ± 15 for non-Hispanic patients and 57 years ± 16 for Hispanic patients. The proportion of patients identified as Black remained similar (9.1% in 2008 vs. 9.3% in 2017). With the rising number of Hispanic patients undergoing surgery there were no major differences in the proportion of laparoscopic cases (51% vs 49%), elective cases (64% vs. 69%) or rate of postoperative mortality (2.8% vs. 3.4%) compared to non-Hispanic patients. Using a logistic model with age, BMI, diabetes, hypertension, smoking status, COPD, steroid use, albumin levels, operative time, emergency status, laparoscopy, ASA status and wound class, Hispanic ethnicity was not found to be a significant predictor for worse for morbidity and mortality.

Conclusions/Discussion: Despite a growing rate of inpatient admissions due to diverticulitis for both Black and Hispanic patients, only the latter was found to have an increasing number of surgeries performed over the past decade. While Hispanic patients were younger than others to undergo surgery, they were not found to have more emergent surgery, open surgery or increased rates or postoperative complications.

CAN AN ENHANCED RECOVERY PROTOCOL IMPACT POSTOPERATIVE PRESCRIPTION IN GENERAL SURGERY?

P1031

M. Zipple, D. Barbat, J. D'John, A. Kieninger, R. Robinson
Keego Harbor, MI

Purpose/Background: We sought to evaluate postoperative prescription practices following the implementation of an enhanced recovery protocol (ERP) for common minimally invasive general surgical procedures.

Methods/Interventions: This is a prospective review of the effects of implementation of an ERP for opioid naïve adult surgical patients undergoing three common outpatient, minimally invasive general surgical procedures: cholecystectomy, inguinal hernia repair and appendectomy. A postoperative patient survey was completed to evaluate patient satisfaction.

Results/Outcome(s): There were 99 subjects in the pre-ERP cohort and 135 subjects in the post-ERP cohort. The two cohorts were similar in age, gender, and race. The majority of patients in post-ERP cohort were treated without opioids (70.4%, n=95), the average oral morphine equivalent prescribed decreased from 71.5 (±23.4) to 19.4 (±32.5, $p < 0.005$). The prescription of nonopioid pain medications increased from 34.3% (n=34) to 73.3% (n=99, $p < 0.005$). There were 54 survey respondents (40.0% of cohort). Most patients were very satisfied with their postoperative pain medication regimen (n=38, 70.4%), and reported satisfaction level did not differ by OME prescribed (ANOVA, p=0.8). Of those prescribed opioid medications, the majority of patients used 25% or less of the prescription (66.7%, n=6). None of the patients reported using opioids obtained from alternative sources.

Conclusions/Discussion: An enhanced recovery protocol implemented for minimally invasive general surgery procedures significantly decreased opioid prescribing and increased multimodal pain management. Patients were satisfied with postoperative pain management and reported minimal use when prescribed opioid medications. Similar protocols could be applied to other postoperative populations.

ROBOTIC AND LAPAROSCOPIC VENTRAL MESH RECTOPEXY WITH LEFT COLECTOMY FOR OBSTRUCTED DEFECATION SYNDROME ASSOCIATED WITH HIGH-GRADE INTERNAL RECTAL PROLAPSE: A PRELIMINARY STUDY.

P1032

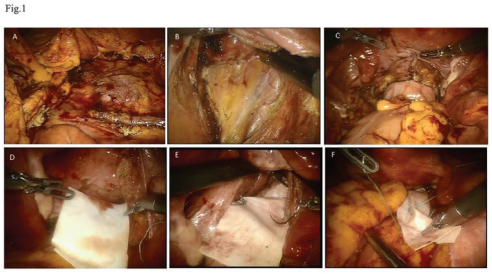
L. Wang[1], Y. Tian[1], J. Ye[1], J. Li[2], F. Li[1], V. Tong[1]
[1]*Chongqing, China;* [2]*Beijing, China*

Purpose/Background: Abdominal ventral rectopexy (AVR) with an additional colon resection is controversial in the treatment for obstructed defecation syndrome (ODS) associated with rectal prolapse (RP). The literature data is very limited. The purpose of this study is to evaluate the efficacy and safety of robotic and laparoscopic ventral mesh rectopexy with left colectomy for ODS associated with high-grade internal rectal prolapse (HIRP).

Methods/Interventions: A series of 5 consecutive patients from 2016 to 2017 underwent robotic and laparoscopic ventral mesh rectopexy with left colectomy for ODS associated with HIRP in our department. Perioperative data were prospectively recorded, and functional outcomes were evaluated according to the ODS score, Wexner Constipation Score (WCS) and Patients Assessment of Constipation Quality of Life Score (PAC-QoL). Demographics of patients, surgical complications, preoperative and postoperative follow-up data were collected and analyzed.

Results/Outcome(s): All patients who had underwent robotic and laparoscopic ventral mesh rectopexy with left colectomy exceeded 24 months consecutive postoperative follow-up. Four patients were performed with robotic-assisted surgery and one was laparoscopic procedure. The mean operating time was 260 minutes. Conversion to laparotomy was never needed. Postoperative hospital stay ranged between 5-8 days. No mortality was recorded. One patient appeared mesh related complication which manifested anorectal pendant expansion and pelvic pain in the15 months after surgery. And these symptoms alleviated after the mesh was removed according to the transanal approach. No other complications happened. Every patient had no regrets and satisfied about the surgical treatment at each postoperative follow-up. Five patients showed significant improvement in ODS symptoms after surgery. The data of WCS, ODS score, PAC-QoL in each postoperative follow-up were reduced compared with preoperative scores ($p < 0.05$).

Conclusions/Discussion: Robotic and laparoscopic ventral mesh rectopexy with left colectomy is effective and safe for ODS associated with HIRP. It should be selected individually to the patient who could possibly profit from this procedure.



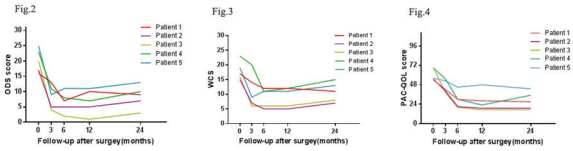


Fig.1 A. Mobilization of the left hemi-colon mesentery. B. Ventral rectum was separated from the posterior vagina down to the perineal body. C. Anastomosis between transverse colon and rectum. D. The shorter side of tailored rectangular biologic mesh was positioned the lowest point of rectovaginalgap. E. The fixation between the anterior wall of rectum and mesh. F. The mesh was sutured on the sacral promontory.

Fig.2 The functional assessment after surgery using the Wexner Constipation Score (WCS)

Fig.3 The functional assessment after surgery using the obstructive defecation syndrome (ODS) score

Fig.4 The functional assessment after surgery using the Patients Assessment of Constipation Quality of Life (PAC-QoL) score

COLONOSCOPIC PERFORATION FROM BAROTRAUMA PRESENTING AS SUBCUTANEOUS EMPHYSEMA.

P1034

J. Koury, J. Trangucci
Hummelstown, PA

Purpose/Background: Colon perforation during colonoscopy is a rare event occurring in 0.03% of patients. Barotrauma is the second most common cause of colonoscopic perforation and most commonly affects the cecum. It is thought to account for up to 35% of colonoscopic perforations. Barotrauma is believed to result from over insufflation of the colon with carbon dioxide during the colonoscopy. We present the case of a patient who had a unique presentation for baratrauma after an attempted colonoscopy.

Methods/Interventions: The patient is a 63 year old female who was 3 months status post sigmoid colectomy, primary anastomosis, and diverting loop ileostomy for a diverticular colocutaneous fistula. Prior to her ileostomy reversal, she underwent an attempted colonoscopy to evaluate her anastamosis. The colonoscope could only be passed to 60 cm at which point significant tortuosity was noted and further attempts to reach the cecum were abandoned.

Results/Outcome(s): Immediately after her attempted colonoscopy, just prior to discharge, her surgeon noted a change in her voice along with new facial swelling.

Physical examination revealed subcutaneous emphysema in the head and neck and a benign abdominal exam. An emergent computed tomography of the neck, chest, abdomen and pelvis revealed free intraperitoneal and retroperitoneal air. She denied any abdominal pain and was hemodynamically and clinically stable. She was admitted for observation, treated conservatively with intravenous antibiotics, and discharged the following day on oral antibiotics. A water soluble contrast enema was performed 6 weeks after the attempted colonoscopy and was normal. She subsequently had an uneventful loop ileostomy reversal and is well.

Conclusions/Discussion: Subcutaneous emphysema secondary to colonoscopic perforation, although rare, has been described in the literature. Both operative and non-operative management have been used successfully to treat barotrauma induced colon perforations. Based on the imaging, our patient likely had a cecal perforation which, in the absence of pain, may have gone unnoticed if not for the subcutaneous emphysema. Fortunately, our patient had a diverting ileostomy making sepsis from a colonoscopic perforation unlikely. Consequently, non-operative management was indicated and successful. This patient demonstrates a rare and unique presentation of barotrauma due to colonoscopy. It is important to be aware of and recognize this unusual presentation of colonoscopic perforation since it can be the key to diagnosing a life threatening condition.

LOSS IN EXPECTATION OF LIFE DUE TO COLON OR RECTAL CANCER: A POPULATION-BASED STUDY.

P1035

S. Qaderi[1], T. Andersson[2], P. Dickman[2], H. de Wilt[1], R. Verhoeven[3]
[1]Nijmegen, Netherlands; [2]Stockholm, Sweden; [3]Utrecht, Netherlands

Purpose/Background: The increasing number of colorectal cancer (CRC) survivors need specific and understandable survival information that account for the time survived. The aim of this study was to determine (conditional) loss in expectation of life (LEL) due to CRC. Moreover, the total life-years that can be saved if gender differences in CRC survival could be eliminated were examined.

Methods/Interventions: All endoscopically or surgically treated patients with CRC diagnosed and registered in the Netherlands Cancer Registry with pathological stage I-III between 1990 and 2016 aged 18-99 years were included. Age, sex, site, and stage-specific estimates of (conditional) LEL were predicted using flexible parametric models. Moreover, the total life years that would be lost due to cancer was estimated for selected ages and years.

Results/Outcome(s): A total of 203.216 patients with CRC were included having pathological stage I (25%), stage II (39%), stage disease III (36%). LEL decreased with older age and patients with rectal cancer or advanced disease stage had higher LEL. Also, LEL decreased over time for all stage CRC. In 1990, LEL of stage I-III colon cancer was respectively 5, 10, 16 years and that of rectal cancer 7, 12, 18 years. In 2016, this was 3, 5, 9 years for colon cancer and 4, 7, 11 years for rectal cancer, respectively. Female patients with stage III CRC in 2010 had higher LEL compared to male patients with stage III. For instance, 50-year-old male and female patients with colon cancer lost 9.9 and 10.1 years and those with rectal cancer 12.1 and 12.5 years. Likewise, 80-year-old patients with colon cancer lost 2.0-2.5 and those with rectal cancer lost 2.1-2.6 years. Patients with stage I-III colon cancer, aged 50 and having survived 5 years had lost respectively 2.4-2.5, 3.6-3.7, or 4.4-4.8 (male vs. female) years. Similarly, patients aged 80 and surviving 5 years lost 0.1, 0.2, and 0.2 years due to stage I, II, or III colon cancer. Patients with stage I-III rectal cancer, aged 50 and having survived 5 years had lost respectively 3.5-3.6, 5.4-5.5, and 7.3-7.4 years depending on sex. Similarly, patients aged 80 and surviving 5 years lost 0.2, 0.3-0.4, and 0.4-0.5 years due to stage I, II, or III rectal cancer. Male patients with stage I-III with colon cancer in 2016 lost an estimated total of 10.215 life years. If males would have the same colon cancer mortality as females, the total years lost would have been 9.294 years, yielding 2.346 years in life expectancy. Likewise, 1.510 years in life expectancy of male stage I-III patients with rectal cancer could be saved in 2016.

Conclusions/Discussion: This study presented individual and patient group-specific estimates of loss in expectation of life due to CRC. The results demonstrate a continuous improvement of colorectal cancer care with a persisting difference in gender. These data provide clinically relevant and up-to-date survival information for patients, clinicians, and policy makers.

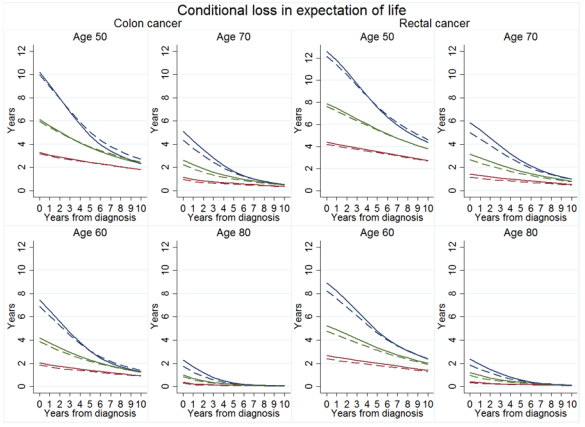


Figure: Loss in expectation of life conditional on time from diagnosis for male (dashed line) **and female** (continuous line) **patients with stage I** (red), **stage II** (green), **and stage III** (blue) **colon or rectal cancer diagnosed in 2010.**

A PREDICTIVE MODEL FOR RESIDUAL TUMOR AND LYMPH NODE METASTASIS IN PATIENTS WITH ENDOSCOPICALLY RESECTED MALIGNANT COLORECTAL POLYPS.

P1036

K. Levic Souzani[1], O. Bulut[1], T. Plato Kuhlmann[1], I. Gögenur[2], T. Bisgaard[1]
[1]*Copenhagen, Denmark;* [2]*Køge, Denmark*

Purpose/Background: Colorectal cancer is one of the most common cancers worldwide. Due to a more advanced technology for endoscopic resection of polyps and colorectal cancer screening programs, the incidence of malignant colorectal polyps is rising. Malignant polyps are defined as macroscopically appearing benign polyps with incidental histological evidence of adenocarcinoma. The malignant diagnosis is often unexpected and the possibility of residual tumor and/or lymph node metastasis following endoscopic polypectomy presents a decision-making challenge. The dilemma lies in whether these patients should be managed with surveillance alone, with the risk of untreated residual disease, or whether a segmental resection with risk of morbidity and mortality should be performed. Most patients undergoing segmental resection have no residual disease following histological examination of the resected specimen. Furthermore, some large population-based studies have shown little or no significant difference in overall survival between a surveillance strategy and segmental resection. The aim of this study was to develop a predictive model for residual tumor and lymph node metastasis in patients with malignant colorectal polyps based on histological parameters.

Methods/Interventions: This is a nationwide study conducted based on re-evaluation of histological parameters of all patients with endoscopically resected malignant colorectal polyps in Denmark in a ten-year period (2001-2011). The patients were identified through the Danish Colorectal Cancer Group (DCCG) database (>99% completeness). All patients' charts and histological reports were individually reviewed. Due to the large number of missing histological parameters from the pathology reports, a re-evaluation of all specimen was performed. Specimen from the included patients were retrieved from the respective hospitals. The following histological parameters were re-analyzed: tumor level, width of invasion, tumor differentiation, resection margin, venous invasion, lymphatic invasion, and tumor budding. These parameters, along with tumor morphology (sessile or pedunculated) were entered in a statistical predictive model. The outcome was lymph node metastasis in patients with segmental resection or recurrence with lymph node metastasis in patients with surveillance strategy, and residual tumor in patients with segmental resection.

Results/Outcome(s): A total of 692 patients were identified and included from the DCCG database. Specimen could not be retrieved in 59 patients. A histological re-analysis was conducted in the remaining 643 patients. The mean follow-up was 7.5 years (3–188 months). The results are currently being analyzed and will be ready for presentation at the ASCRS Annual Scientific Meeting in June, 2020.

Conclusions/Discussion: The results are currently being analyzed and will be ready for presentation at the ASCRS Annual Scientific Meeting in June, 2020.

EFFICACY, QUALITY OF LIFE AND COST EFFECTIVENESS OF SHORT-COURSE RADIOTHERAPY FOLLOWED BY CAPECITABINE PLUS OXALIPLATIN CHEMOTHERAPY AND TME FOR HIGH-RISK RECTAL CANCER (ESCORT TRIAL: NCT03676517): SHORT-TERM INTERIM RESULTS.

P1037

M. Cho, H. Kim, S. Yang, S. Shin, J. Lim, J. Chang, Y. Han, B. Min, H. Hur, J. Nam, T. Kim, S. Chu, K. Lee, N. Kim
Seoul, Korea (the Republic of)

Purpose/Background: Recent short-coure radiotherapy (SCRT) with delayed surgery showed comparable tumor regression and oncologic outcome as well as reducing postoperative complication. This prospective single-arm phase 2 trial was designed to validate the efficacy, quality of life and cost effectiveness of preoperative SCRT plus consolidation chemotherapy followed by delayed surgery for high-risk rectal cancer patient. We report our interim results of short-term outcomes including complications, TME completeness, toxicities and tumor response were investigated.

Methods/Interventions: This study is a single-arm phase II prospective clinical trial and supported by a faculty grant of Yonsei University College of Medicine. The high-risk patients group was defined as follows: more than T3b, positive circumferential resection margin (CRM), positive regional lymph node, extramural vascular invasion (EMVI), low lying tumor less than 1.0cm below from puborectalis muscle, and lateral pelvic lymph node metastasis. MRI-based risk stratification system was used to identify high risk rectal cancer patients. A total of 31 patients with eligible criteria were estimated enrollment between June 2018 and May 2020. Study protocol consisted of 1-week short-course radiation (5 Gy x 5) plus 2 cycles of XELOX (capecitabine 1,000mg/m2 and oxaliplatin 130mg/m2 every 3 weeks) chemotherapy before total mesorectal excision (TME). TME was performed at 4 weeks after completion of chemoradiation.

Results/Outcome(s): 18 patients completed the planned preoperative chemoradiation and 17 of them underwent surgery (14 low anterior resection and 3 coloanal anastomosis). Median interval between TME and

initiation of radiation was 12.5 weeks (range 12.3 – 12.9). There were two clinical (c) T2, 14 cT3, and one cT4 tumor. CRM and EMVI positivity from baseline MRI were observed in 5 (29.4%) and 7 (41.2%) patients, respectively. Median tumor distance form anal verge was 7.8cm (range 6.9 – 9.2). The complete TME rate was 94.1% (16/17). Sphincter preserving surgery was performed in all patients. Pathologic complete response was achieved in 2 (11.8%) patients. Pathologic CRM positivity was observed in 1 (5.9%) patients. T downstaging and N downstaging were observed in 10 (58.8%) and 13 (76.5%) patients, respectively. Postoperative Clavien-Dindo complications (more than grade 2) within 30 days of TME were identified in 6 patients (35.3%). Median length of hospital stay was 7.0 days (range 6.5 – 8.5 days). The rate of grade 2 acute gastrointestinal toxicity including proctitis was 47.1%. There were no grades 3 and 4 subacute hematologic and non-hematologic (gastrointestinal and peripheral neuropathy) toxicities.

Conclusions/Discussion: SCRT plus consolidation chemotherapy followed by delayed surgery was well-tolerated and achieved favorable short-term outcomes.

NUMBER OF LYMPH NODE METASTASES IS THE PREDICTIVE FACTOR OF LUNG METASTASIS IN COLORECTAL CANCER.

P1038

Y. Kato[1], K. Shigeta[1], K. Okabayashi[1], M. Tsuruta[1], R. Seishima[1], T. Sasaki[1], Y. Koseki[1], H. Hasegawa[2], Y. Kitagawa[1]
[1]Shinjyuku, Japan; [2]Chiba, Japan

Purpose/Background: Colorectal cancer is well known to develop the liver or lung metastasis via portal vein or inferior vena cava. Furthermore, the number of lymph node metastasis is the strong predictive factor for the recurrence and the status of lymph node metastasis is included in the TNM classification. However, it is still not well known how the lymph node metastasis would affect the site of recurrence. Aim of this study was to evaluate the relationship between the number of lymph node metastases and its recurrence patterns.

Methods/Interventions: A total of 348 colorectal cancer patients who underwent radical resection and had lymph node metastasis from the pathological evaluation at our hospital from January 2003 to December 2016 were enrolled to this study. We examined the relevance among clinicopathological background factors and recurrence patterns using logistic regression analysis.

Results/Outcome(s): Regarding 348 subject patients, 188 were male and 160 were female, the average age was 66.9±12.3 years old, 75 cases were of rectal cancer, and the average observation period was 57.3±36.0 months. Final stage of these patients was; 207 stage IIIa, 82 stage IIIb, and 59 stage IIIc. During the observation period, 42 showed lung metastasis and 26 liver metastasis. Multivariate analysis revealed that the rectal cancer (Odds ratio(OR) 2.33[1.13-4.80], p=0.02), T3/4 tumor (OR 2.13[1.02-4.47], p<0.05), and the status of lymph node metastasis (N2a: OR 3.48[1.26-9.61], p=0.02; N2b: OR 4.43[1.54-12.6], p<0.01) were significantly associated with lung metastasis recurrence. On the other hand, no significant relationship between the status of lymph node metastasis and liver metastasis recurrence was detected from the multivariate analysis. According to the ROC analysis by number of lymph node metastasis, area under curve was 0.663 in lung metastasis, whereas 0.579 in liver metastasis.

Conclusions/Discussion: [Discussion] Lymphatic flow are still not well known how they return to the blood circulation. Considering the result of our study, lymphatic flow from the mesenteric lymph nodes seem to return to the blood circulation directly and they do not go through the portal vein or liver. This finding would be important to understand the lymphatic flow and to investigate the recurrence after surgery with high lymph node metastasis. [Conclusion] The number of lymph node metastasis is strongly related with lung metastasis and not with liver metastasis.

Patient Background

	Total n = 348
Sex(♂/♀)	188/160
Age (year)	66.9 ± 12.3
Stage IIIa/IIIb/IIIc	207/82/59
Location(Colon/Rectum)	273/75
CEA	22.6 ± 138
Patho (tub./other)	317/31
Depth(-SS/SE-)	275/73
Count of LN dissection	27.3 ± 15
N 1a/1b/2a/2b/3	135/118/48/28/19
Ly(-−2+/3+)	322/26
V(-−2+/3+)	325/23
Lung metastasis(RFS:mo)	47(20mo)

lung metastasis

	Univariate analysis		Multivariate analysis	
	HR (95% CI)	P value	HR (95% CI)	P value
Age	0.98(0.96-1.01)	0.211		
Sex	0.87(0.45-1.66)	0.665		
Location	2.58(1.30-5.11)	0.007	2.33(1.13-4.80)	0.022
Pathology	1.00(0.36-2.82)	0.993		
Depth(-SS/SE-)	2.38(1.19-4.75)	0.014	2.13(1.02-4.47)	0.045
LN meta Grade				
N 1a	-	-	-	-
N 1b	2.18(0.88-5.39)	0.092	2.08(0.83-5.21)	0.116
N 2a	3.93(1.46-10.6)	0.007	3.48(1.26-9.61)	0.016
N 2b	6.35(2.29-17.6)	0.000	4.43(1.54-12.6)	0.006
Ly(0/1-)	1.83(0.65-5.16)	0.250		
V(0/1-)	2.83(1.05-7.65)	0.040	1.96(0.68-5.68)	0.213

liver metastasis

	Univariate analysis		Multivariate analysis	
	HR (95% CI)	P value	HR (95% CI)	P value
Age	1.01(0.98-1.05)	0.479		
Sex	0.72(0.32-1.63)	0.426		
Location	0.86(0.31-2.35)	0.765		
Pathology	4.05(1.73-9.46)	0.001	3.44(1.40-8.46)	0.007
Depth(-SS/SE-)	2.13(0.91-5.01)	0.082		
LN meta Grade				
N 1a	-	-	-	-
N 1b	1.92(0.72-5.11)	0.193	1.64(0.60-4.50)	0.337
N 2a	1.16(0.29-4.68)	0.831	1.05(0.25-4.36)	0.944
N 2b	3.06(0.91-10.3)	0.070	1.54(0.40-5.92)	0.528
Ly(0/1-)	1.70(0.47-6.07)	0.417		
V(0/1-)	4.02(1.36-11.9)	0.012	3.61(1.13-11.6)	0.030

FOLLOW-UP PRACTICE AND HEALTH CARE CONSUMPTION DURING SURVEILLANCE OF COLORECTAL CANCER SURVIVORS.

P1039

S. Qaderi[1], N. Ezendam[3], R. Verhoeven[2], J. Custers[1], H. de Wilt[1], F. Mols[3]
[1]Nijmegen, Netherlands; [2]Utrecht, Netherlands; [3]Tilburg, Netherlands

Purpose/Background: Colorectal cancer (CRC) is the third most common cancer in both men and women. This study aims to investigate when, and which health care professionals were consulted during CRC follow-up. Also, of importance was defining adherence to national follow-up guidelines since previous studies showed that there is large variation in adherence. Furthermore, factors correlated with increased (cancer-related) care consumption of CRC survivors were identified.

Methods/Interventions: Data of a Dutch prospective population-based survey among CRC survivors diagnosed between 2000-2009 were used. A total of 2.450 out of 3.025 stage I-III CRC survivors completed the Hospital Anxiety and Depression Scale, SF-12, EORTC QLQ-CR38, and Fatigue Assessment Score, in December 2010. Follow-up overconsumption was defined as ≥2 visit than guideline recommendations per year. Multivariable regression analysis was used to analyze the relationship between follow-up overconsumption and sociodemographics, treatment-related, and patient-reported outcomes.

Results/Outcome(s): In the first follow-up year, the average number of cancer-related visits to the general practitioner and medical specialist were 1.7 and 4.2, respectively. More than 80% of the CRC survivors was comfortable with their follow-up schedule, irrespective of follow-up year, and 49-71% of them received follow-up according to the guidelines, depending on follow-up year. Around 29-47% received more follow-up than recommended. Survivors of stage III disease treated with chemotherapy received most follow-up care. In addition, low socio-economic status, the presence of a stoma, and patients reported severe fatigue were associated with overconsumption of follow-up care.

Conclusions/Discussion: CRC survivors were predominantly followed according to national guidelines, but with a substantial percentage of overconsumption. Follow-up overconsumption was associated with advanced disease stage, receipt of adjuvant chemotherapy, low socioeconomic status, the presence of a stoma, and fatigue. Future studies should investigate how overconsumption can be reduced, while addressing patients' needs.

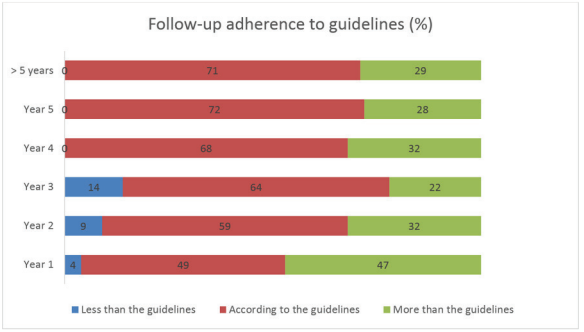


Figure: Follow-up care for every year compared to the Dutch CRC guidelines (less, according, or more than). Numbers represent percentages. For this comparison an upper and lower margin of 1 visit per year was used, meaning 1 visit more than the guidelines was still seen as according to guidelines.

EVALUATION OF FIVE YEARS OF COLORECTAL SCREENING IN SINGAPORE USING FAECAL IMMUNOCHEMICAL TEST – AN UPDATE AFTER 10 YEARS.

P1040

H. Lim, H. Ng, P. Lazatin, C. Chua, C. Koo, R. Mathew
Singapore, Singapore

Purpose/Background: Colorectal cancer (CRC) has the highest incidence amongst cancers in Singapore for both genders combined and has been steadily rising over past decades. This is in contrast to majority of the rest of the world where CRC incidence is third to fourth most common amongst all cancers. In Singapore, CRC screening is recommended from 50 to detect precursor lesions and diagnose early asymptomatic cancer with aim of improving survival outcomes. However, longitudinal local data for CRC screening uptake is yet to be evaluated. With this background of high CRC incidence, an evaluation of national screening using the Faecal Immunochemical Test

P1040 Outcomes of Colonoscopic Evaluation

	Year					
	2008	2014	2015	2016	2017	2018
Positive FIT	808	3235	3428	4665	8165	8899
Negative FIT	-	52158	90292	96706	164930	179528
			Diagnosis			
Normal findings	221	589	917	990	944	1362
Diverticular disease	30	131	108	121	245	503
Haemorrhoids	67	242	210	231	361	663
Inflammation	8	8	1	4	8	16
Polyps	135	249	253	279	539	930
Cancer	33	4	5	2	8	17
Others	-	208	303	378	496	605

*The above breakdown reflects multiple (more than 1) findings for each patient. The findings reflect individuals with definitive outcomes.

(FIT) in Singapore is useful to understand uptake, diagnostic yield and cancer trends.

Methods/Interventions: Patients aged 50 and above were eligible for FIT screening where a positive test would prompt referral to a specialist for further evaluation by colonoscopy. The results of this voluntary opt-in screening programme from 2014 to 2018 were analysed and compared to previous published data on Singapore CRC screening in 2008. Numeric data are expressed as median with range and categorical data are shown as number and proportion.

Results/Outcome(s): A total of 309806 participants were included in this study. The median age was 60.5 years (range 50-104). 55.8% of participants were female while 44.2% were male. A total of 612006 FIT kits were obtained where 4.6% returned as positive. Notably, uptake of FIT screening demonstrated an uptrend of more than threefold increase from 2014 to 2018 from 28583 to 93596 patients respectively. Likewise, there has been a significant increase in participants compared to published data from 2008 where 20989 individuals were involved. The outcomes of colonoscopic evaluation are shown in Table 1. A total of 36 cases of CRC were detected where majority were found in sigmoid colon followed by rectum at 52.8% and 19.4% respectively. These results are in line with data from 2008 study where 78.8% had left-sided cancers. Polyps were the predominant abnormal finding on colonoscopy (22.6%) with the most common polyp sites being sigmoid colon (32.8%), transverse colon (16.7%) and ascending colon (13.8%). The median size of the polyps was 4.5mm (range 1-99). Among the remaining participants, 4802 (48.3%) had no pathology found on evaluation, 1108 (11.1%) had diverticular disease, 1707 (17.2%) had haemorrhoids and 37 (0.3%) had inflammatory/ infective colitis.

Conclusions/Discussion: CRC is the most common cancer in Singapore where screening is paramount for early detection and appropriate management. The last decade has witnessed important modifications of screening strategies where there has been an encouraging increase in uptake of screening with early detection of precursor lesions and CRC. Moving forward, examination into potential barriers to CRC screening in the public would be helpful to address misperceptions that the community may hold.

PARA-AORTIC LYMPH NODE DISSECTION AS A TREATMENT FOR COLORECTAL CANCER LYMPH NODE METASTASIS.

P1041

H. Park, G. Piozzi, S. Kim, J. Kim, J. Kwak, S. Baek, H. Choi, J. Kim
Seoul, Korea (the Republic of)

Purpose/Background: Para-aortic lymph nodes metastasis (PALNM) from colorectal cancer (CRC) are rare (2%), associated with a poor prognosis, and staged as a systemic disease according to the American Joint Committee on Cancer. The development of chemotherapy and the optimization in surgery with a curative aim has improved the survival in patients with distant resectable metastasis such as those in the liver or lung. It is still controversial whether patients with PALNM could benefit from an extended lymphadenectomy if technically possible. This study aimed to provide insight into the treatment and prognosis of PALNM from CRC in our unit.

Methods/Interventions: All patients with a diagnosis of synchronous or metachronous PALNM from CRC between January 2006 and December 2019 were retrospectively reviewed from the prospectively maintained institutional database.

Results/Outcome(s): In total, 131 patients with evidence of visible PALN on imaging (111 with synchronous and 20 with metachronous disease) were enrolled. All patients with synchronous PALN underwent primary tumor and PALN dissection (PALND). Curative intent was undertaken in 57% of cases. Mean operative time was 247 minutes (60-685). Solitary PALN metastases were present in 24% of cases and those associated with liver and lung metastasis were detected in 52% and 23% respectively. Complication rates at 30 days was 40%; ileus (17%), leakage/abdominal abscess (6.9%) and non-surgical complications (6.1%) were the most detected. Five patients (4.5%) died within the 30-day post-operative period. A total of 79% of patients received adjuvant chemotherapy, and 4.6% received adjuvant radiotherapy as well specifically to the PALN area. There were 16% systemic and 0.8% locoregional recurrences in those who had a curative resection. The median overall survival (OS) for all patients who had undergone PALND for synchronous PALN, was 34 months [95% confidence interval (CI) 5.1–63.0 months].

Conclusions/Discussion: PALN metastasis in CRC is associated with a poor prognosis with published 5 year survivals of 0-12%. Even with its high surgical morbidity, when in expert hands, PALND could be an effective surgical tool in improving prognosis for those patients who do not have any other systemic metastasis, and

therefore treating the presence of PALN as disease in a distant lymph node rather than a systemic disease. Our data compares with other already published series of isolated PALN dissections with acceptable complication and survival rates.

CRITERIA FOR DIVERTING STOMA CREATION IN LAPAROSCOPIC LOW ANTERIOR RESECTION FOR RECTAL CANCER.

P1042

A. Sadatomo, K. Koinuma, H. Horie, Y. Kono, M. Tahara, D. Naoi, A. Lefor, N. Sata
Shimotuske, Japan

Purpose/Background: Diverting stoma (DS) is created to reduce morbidity and mortality associated with anastomotic leakage (AL) in patients undergoing laparoscopic low anterior resection (Lap-LAR) for rectal cancer. There are no evidence-based guidelines for the creation of DS in Lap-LAR. The aim of this study is to evaluate original criteria for DS construction in Lap-LAR.

Methods/Interventions: One hundred forty-nine patients who underwent Lap-LAR with total mesorectal excision from January 2013 to June 2019 were enrolled in a retrospective cohort study at Jichi Medical University hospital. DS was constructed based on locally derived criteria including preoperative chemo-radiotherapy or chemotherapy, anastomosis within the anal canal, multiple-stage stapled rectal resection, incomplete anastomosis ring, positive air leak test (intra-operative colonoscopy) and male gender with a large tumor. Postoperative rectal contrast study for clinically stable patients was not routinely performed.

Results/Outcome(s): Fifty-nine patients (40%) underwent DS creation in Lap-LAR. The overall symptomatic AL rate was 5.1% (3/59) in patients with DS (DS+ group) and 2.2% (2/90) in patients without DS (DS- group) (p>.05). All patients with AL in the DS- group required therapeutic interventions or re-laparotomy. Patients with AL in the DS+ group did not undergo reoperation. One patient in the DS+ group underwent CT-guided drainage for AL. The DS+ group had a significantly higher incidence of post-operative ileus and longer post-operative hospital stay.

Conclusions/Discussion: The AL rates in the DS+ group was slightly higher than the DS- groups, although not statistically significantly higher. Several patients with asymptomatic AL may be in the DS+ group. The original criteria for DS creation are useful to select patients at higher risk of AL. This study also shows that applying criteria for DS creation may reduce the impact of therapeutic interventions in patients with AL. Additional studies are needed to further refine the criteria for DS creation.

ENDOLUMINAL VACUUM THERAPY FOR RECTAL ANASTOMOTIC LEAKAGE: A SYSTEMATIC REVIEW AND META-ANALYSIS.

P1044

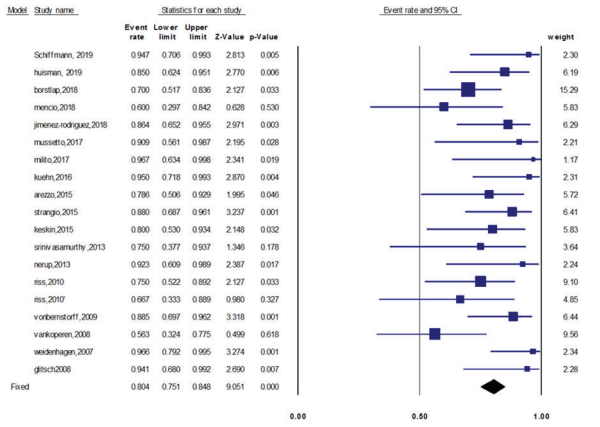
S. Choi, G. Chae
Chuncheon, Korea (the Republic of)

Purpose/Background: Management of anastomotic leaks complicating rectal surgery is challenging and often results in a permanent stoma. Endoluminal vacuum therapy (EVT) is a promising approach showing good success rates in patients with anastomotic leakage after rectal surgery. We performed meta-analysis to summarize the strength of the current evidence obtained through the systematic review.

Methods/Interventions: We performed an electronic literature search of the PubMed, EMBASE, and Cochrane Library database to identify studies published until October 2019 that used EVT to treat patients with anastomotic leakage after rectal surgery. Each article was evaluated for the EVT success rate, the stoma reversal rate, duration of treatment until complete healing, and the procedure-related complication and mortality rates. Subgroup analysis and meta-regression were performed to identify confounders affecting success rates. Potential publication bias was assessed via visual inspection of a funnel plot and the Orwin's fail-safe N.

Results/Outcome(s): Of the 261 articles identified, 19 studies, that investigated 338 patients, were included in the meta-analysis. There were no comparative studies found, and all the studies had a single-arm design. The overall EVT success rate in patients with anastomotic leakage after rectal surgery was 80.4% (95% confidence interval [CI] 75.1–84.8, I^2=33.9%). The overall stoma reversal rate in patients who underwent EVT was 71.7% (95% CI 64.6–77.9, I^2=31.5%). Meta-regression analysis showed that preoperative radiotherapy and prior diverting stoma were not associated with the success rate (ß 0.003, standard error [SE] 0.009, P=0.772 and ß -0.010, SE 0.011, P=0.380, respectively); however, male sex showed a positive association (ß 3.25, SE 1.13, P=0.004). Of the pooled 338 patients in the study, 35 (10.36%) developed procedure-related complications (some of which were indistinguishable from anastomotic leakage-induced adverse events). No EVT-induced mortality was observed.

Conclusions/Discussion: EVT is a safe and effective treatment option for anastomotic leakage after rectal surgery with an acceptable stoma reversal rate. However, further large-scale randomized controlled trials are required for additional supportive evidence in this context.



Forest plot showing the success rate of endoluminal vacuum therapy for anastomotic leakage following rectal surgery.

COMPARISON OF OPEN AND MINIMALLY INVASIVE APPROACHES TO COLON CANCER RESECTION IN COMPLIANCE WITH 12 REGIONAL LYMPH NODE HARVEST.

P1045

A. Williams[1], T. Sun[1], S. Kakade[2], S. Wong[3], D. McKellar[4], L. Shulman[5], N. Carp[1]
[1]Wynnewood, PA; [2]Media, PA; [3]Lebanon, NH; [4]Dayton, OH; [5]Philadelphia, PA

Purpose/Background: In recent decades there has been a growing trend toward minimally invasive surgery (MIS) for performing colectomies for colon cancer, and much has been discussed regarding efficacy compared to the traditional open approach. Retrieval of a minimum of 12 lymph nodes (LNs) is a benchmark for adequacy of resection for these cases. Here we compare the compliance of various surgical approaches in achieving a full oncologic resection, including the requisite 12 LNs and the impact of demographic and tumor characteristics on meeting this benchmark over time.

Methods/Interventions: From the National Cancer Database, we identified adult patients treated surgically for stage I-III invasive colon cancer (2010-2016). We stratified cases by the type of surgical approach: open (O) including cases converted to open, or MIS [laparoscopic (L) or robotic (R)]. We assessed trends of surgical approach over time and demographic and clinical factors associated with each surgical approach. We then stratified each case by whether the 12 LN benchmark was met. We assessed these trends over time, stratified by demographic and clinical factors, including the surgical approach. Finally, we performed uni- and multi-variate Cox regression to assess the impact of these factors on overall survival (OS).

Results/Outcome(s): A total of 290,776 colon resections were analyzed; 45.8% of cases were performed with MIS. MIS increased from 32.8% to 57.2% of all cases over the study period (p<0.001), with notable growth in R cases (3.8% to 16.5%, p<0.001). Overall, community hospitals performed the smallest proportion of their cases with MIS (34.6%, p<0.001). An overall median of 18 LNs were harvested in both O and MIS cases. Compliance with the 12 LN benchmark increased significantly over the study period from 84.6% to 91.6% overall (p<0.001). When comparing O and MIS, both modalities had increased compliance over the study period, and there were no differences in the number of LNs harvested or compliance with the 12 LN benchmark over time (p= 0.63 and 0.52, respectively). There were also no differences in the LN compliance when comparing MIS modalities (p=0.44). A subset analysis comparing hospital type revealed that regardless of surgical approach, 12 LN compliance was lower at all time points at community hospitals (p<0.001), and this difference persisted on multivariate analysis adjusting for demographic and cancer variables, including surgery type (p<0.001). OS was longer on both univariate and multivariate analysis for patients treated at academic or NCI centers, those undergoing MIS and in those for whom the 12 LN benchmark was met (all p≤0.002).

Conclusions/Discussion: As the proportion of MIS colon resections continues to increase, we demonstrate that there is no difference in the ability to achieve the 12 LN retrieval quality benchmark between O and MIS (including laparoscopic and robotic) approaches.

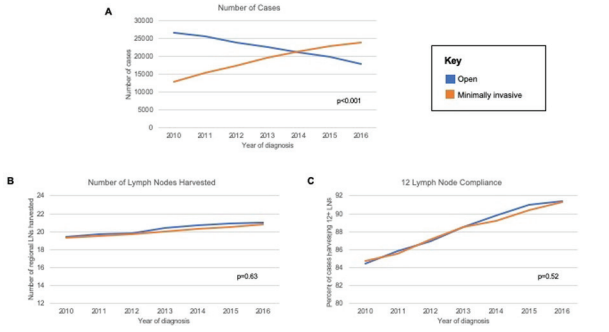


Figure 1. Open and minimally invasive trends for colon cancer resections 2010-2016 in the number of cases (A), number of regional lymph nodes harvested (B), and percent compliance with the 12 lymph node harvest quality benchmark (C).

TAMIS: LEAVING THE SURGICAL DEFECT OPEN AND WITH SPINAL ANESTHESIA.

P1046

D. Naiderman, D. Cano, F. Rossi, C. Mendez, L. Trinchero, M. Dolan, R. Gonzalo, R. Lopez Fagalde
Mar del Plata, Argentina

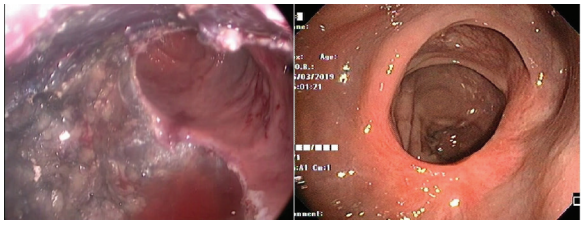
Purpose/Background: Transanal minimally invasive surgery (TAMIS) is a technique that has been increasingly used since its initial description in 2009 even though there are some aspects of the intervention that have not been standardized yet and are controversial. The aim of this study is to evaluate the safety of leaving the surgical defect open, since suturing in such a small cavity is very difficult

and may even require more time than the resection itself. Also, we will assess the use of spinal anesthesia for TAMIS.

Methods/Interventions: Between August 2013 and June 2019, there were prospectively included all patients with extraperitoneal rectum lesions from 4 to 11 cm from the anal margin with ≥ 3 centimeters benign lesions, neuroendocrine tumors ≤ 2 cm, T1N0 and T2N0 adenocarcinomas with a high surgical risk or those who refused radical surgery, as well as patients with certain doubts regarding the complete remission after neoadjuvant. All cases were performed by the same surgeon who left the surgical defect open regardless the size of the lesion. At the beginning of the series, general anesthesia was used; then a combination of general and spinal anesthesia was applied; finishing by using exclusively spinal anesthesia.

Results/Outcome(s): In 6 years, 35 patients were resected with TAMIS. 13 were adenocarcinomas from which 5 received neoadjuvant 19 adenomas and 3 carcinoids. The average size of the lesions was 3.68 cm (0.7 to 9), with an average distance from the anal margin of 5.7 cm. The mean operating time was 39.2 min (17-90), and an average hospitalization time of 33 hours (24 to 168). The first 4 cases were performed with general anesthesia, then 9 with general + spinal anesthesia and the last 22 cases with only spinal anesthesia. The morbidity was 17.1%. 3 had post-operative bleeding (8.5%), 1 grade I, 1 grade II and 1 grade IIIb from theClaiven-Dindo classification. 2 rehospitalizations due to pain (grade II) in patients who received neoadjuvant therapy and 1 postoperative headache (grade I). There was no mortality in the series.

Conclusions/Discussion: We obtained a reduced surgical time and a lower morbidity in comparison with the series that close the defect. We had no abscesses or postoperative stenosis. There were rehospitalizations as a result of pain in 2 out of 5 patients with neoadjuvant therapy, so it does not seem to be related to the closure or not of the defect. In the last 22 patients, we used exclusively spinal anesthesia. This allowed us to make a simpler insertion of the devices due to a greater relaxation and less collapse of the operative field with a great improvement in the visualization during the intervention. Finally, we had a minor complication referred to anesthesia which was a post-puncture headache. Although this is a report of a series of cases, in our experience, it was safer to leave the surgical defect open as well as the use of spinal anesthesia like our anesthesia of choice.



SAFETY AND EFFICACY OF PREOPERATIVE MELOXICAM IV IN COLORECTAL SURGERY.

P1047

C. Delaney[2], J. Silinsky[3], S. McCallum[1], R. Mack[1], A. Freyer[1], L. Black[1], T. Galas[1], W. Du[4]
[1]Malvern, PA; [2]Cleveland, OH; [3]New Orleans, LA; [4]Blue Bell, PA

Purpose/Background: To date, clinical studies of Meloxicam IV have evaluated dosing following surgery after the onset of moderate to severe pain, to quantify reductions in pain after administration. In this study, perioperative dosing was evaluated to replicate conditions consistent with current clinical practice, utilizing a standardized Enhanced Recovery After Surgery (ERAS) protocol incorporating multimodal analgesia.

Methods/Interventions: This was a Phase 3b, randomized, double-blind, placebo-controlled trial in subjects undergoing open or laparoscopic colorectal surgeries that included bowel resection and/or anastomosis. Subjects followed a standardized pre-, peri-, and postoperative ERAS protocol defining diet, medication use, and other surgical and recovery activities. Subjects were randomized 1:1 to meloxicam IV 30 mg or placebo, with the first dose of study drug administered 30 minutes prior to surgery, then every 24 hours thereafter. Subjects could utilize opioids postoperatively for analgesia as required. Safety and tolerability were evaluated on laboratory tests, wound healing, and the incidence of adverse events (AEs), serious AEs (SAEs), or anastomotic leaks. Efficacy parameters included opioid consumption, length and cost of hospital stay, pain control, return of bowel function, mobilization, and subject satisfaction.

Results/Outcome(s): The study randomized and treated 55 subjects. Treatment with meloxicam IV was well tolerated with no deaths or discontinuations due to an AE, and a low incidence of SAEs. Most subjects experienced an AE, though events were primarily mild or moderate in intensity and not related to study treatment. The most frequently reported AEs included nausea, vomiting, hypokalemia, hypophosphatemia, ileus, and hypertension. There was a low incidence of SAEs that was similar between treatments, with all events assessed as not related to study treatment. Additional safety endpoints showed no meaningful differences between treatments, and no events of anastomotic leak were reported in this study. Significant differences were identified in multiple efficacy endpoints in this study. Subjects receiving meloxicam IV 30 mg utilized lower total opioid rescue overall ($p=0.0339$), had a shorter time to return of bowel function ($p\leq0.0267$), and shorter duration of hospitalization ($p\leq0.0321$) compared with placebo. Despite a reduction in opioid use in the meloxicam IV group, patient reported outcomes were generally comparable between treatments.

Conclusions/Discussion: This study demonstrated a favorable safety profile for meloxicam IV 30 mg compared with placebo when administered prior to colorectal surgery. Additionally, significant reductions in postoperative opioid use, time to return of bowel function, and duration of hospitalization were observed favoring the meloxicam IV 30 mg group. This study supports the safety of meloxicam IV 30 mg administered once daily, beginning prior to surgery, in subjects undergoing colorectal surgery.

IT'S TOUGH TO MAKE PREDICTIONS ABOUT THE FUTURE…OF A POUCH. CAN PATHOLOGICAL EVALUATION OF THE COLECTOMY SPECIMEN HELP?

P1049

K. Skowron, A. Olivas, D. Rubin, N. Hyman, C. Weber, K. Umanskiy
Chicago, IL

Purpose/Background: Ileal pouch-anal anastomosis (IPAA) performed for ulcerative colitis (UC) fails in up to 15% of patients. Crohn's disease (CD) is the most common etiology of pouch failure, and failures are frequently reclassified as CD according to histologic findings in the pouch. We hypothesized that certain features in the colectomy specimen of UC patients can be indicative of future IPAA failure. The aim of this study, therefore, was to identify histologic features in the colectomy specimen which may be associated with long-term pouch outcomes.

Methods/Interventions: Patients who underwent IPAA for inflammatory bowel disease (IBD) at a single institution between 2000 and 2010 were included in a prospectively-maintained, IRB-approved database. Age, sex, number of operative stages, disease duration, preoperative diagnosis, indication for colectomy (including presence of fulminant colitis), use of biologics, preoperative *C. difficile* colitis, and length of follow-up were noted. Pouch failure was defined as pouch excision or permanent diversion. To assess histologic characteristics, patients with pouch failure were matched for sex, age, and number of stages with patients who had satisfactory pouch function with at least 24 months of follow-up. H&E sections of the colectomy specimen were reviewed in a blinded fashion for histologic "non-UC" features (knife-like ulcers, granulomas, ileal involvement, patchy colonic involvement, right-sided disease, deep inflammatory infiltrate), and average disease severity. Pathologic findings along with *preoperative* patient factors were correlated with clinical outcome using multivariate analysis.

Results/Outcome(s): 417 patients underwent IPAA during the study period; pouch failure occurred in 39 patients (9.3%). Clinical diagnosis of CD of the pouch was significantly associated with failure (OR 5.70, p< 0.0001) and was diagnosed in 21/39 (54%) of failure patients. When assessing only *preoperative* characteristics, requiring colectomy for fulminant colitis was associated with failure after pouch creation (OR 2.84; $p=0.026$). In the case-control cohort, histologic review revealed at least one "non-UC" histologic feature in 69% of failure patients and 21% of non-failure patients; this finding was predictive of pouch failure (OR >10, p< 0.05; ~80% concordance rate).

Conclusions/Discussion: Most colectomy specimens of patients who went on to develop pouch failure demonstrated pathologic features making the diagnosis of UC versus CD equivocal. The data support reporting such cases as "suspicious/concerning for Crohn's disease" and further highlighting such histological features in the pathology report. Furthermore, providing standard histologic diagnostic criteria for IBD colectomy specimens may improve diagnostic accuracy and better inform the decision to proceed with IPAA. Prospective studies are necessary to validate these findings as a risk prediction tool.

IS SOCIAL MEDIA (SM) RECRUITMENT OF PATIENTS WITH ULCERATIVE COLITIS (UC) FOR SURVEY STUDIES FEASIBLE AND REPRESENTATIVE OF PATIENT POPULATION AT LARGE? A PILOT STUDY.

P1050

P. Cavallaro[1], G. Lee[1], C. Hunt[1], I. Bissett[2], N. Fearnhead[3], S. Wexner[4], L. Bordeianou[1], C. PROPS Scientific Committee[1]
[1]Boston, MA; [2]Auckland, New Zealand; [3]Cambridge, United Kingdom; [4]Weston, FL

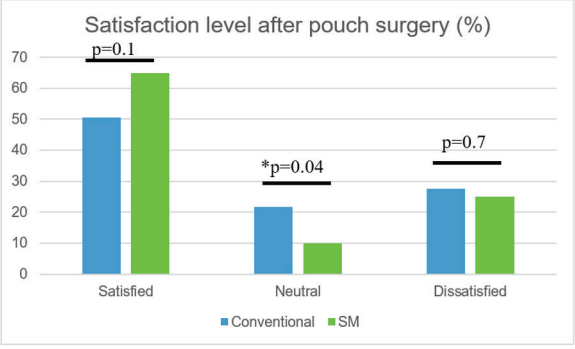
Purpose/Background: Social media (SM) has increasingly become a tool for both patient and clinician communication, with robust patient support communities for a variety of diseases, including UC. While these platforms act as a centralized forum for patient communication, it is unclear if the potential of facilitating clinical trial recruitment can be realized. The aim of this study was to evaluate whether SM platforms can recruit representative IBD patients for surveys.

Methods/Interventions: In collaboration with the social media platforms of two different patient advocacy organizations a brief message was posted on Facebook and Twitter inviting patient participation in a survey study of patients who have undergone an IPAA for UC. Patients were surveyed on basic demographic data and general satisfaction with their J-pouch. Their responses were compared to answers generated by a recent survey study of IPAA patients at the senior author's institution. That prior index study had used traditional methods of querying the institutional record and mailing patient recruitment letters and thus formed the control group.

Results/Outcome(s): SM posting recruited 262 patients with IPAAs in 3 months whereas conventional methods had recruited 372 patients over a period of 12 months. Although the median age was similar in both studies,

(39 IQR 31-50 vs 34 IQR 22-46, respectively), the SM population was more skewed toward females than was the control recruitment group (72% vs 44.5%, respectively; p<0.01). SM recruitment include a wider geographic representation with 85% USA citizens and 15% from outside the US. 95% of registered patients had a diagnosis of UC at the time of surgery, and 1/3rd of these patients reported receiving a diagnosis of Crohn's after their IPAA. When asked about general satisfaction with their pouch, one quarter of patients were somewhat or very dissatisfied with their decision to have surgery and the distribution of answers was similar to those obtained via traditional methods (Figure).

Conclusions/Discussion: This pilot highlights the feasibility of harnessing the powers of SM to recruit patients for survey studies. While the SM population was skewed towards females, it appears that they may be similar to cohorts recruited using control methods. Nearly all patients met the intended inclusion criteria, and there was a spectrum of experiences without overwhelming positive or negative voices dominating the cohort. Potential advantages include the ability to recruit from a broad geographic area. Importantly, this distribution is similar to answers provided by traditional data collection methods, thus supporting the assertion that social medial recruitment for survey studies is a valid method of performing clinical surveys.



Satisfaction with pouch surgery in SM vs. control recruitment groups

COMPARING STAGED APPROACHES TO RESTORATIVE PROCTOCOLECTOMY USING THE NSQIP-IBD DATABASE.

P1051

W. Luo[1], S. Holubar[2], X. Jai[2], T. Hull[2], N. Hyman[3], R. Steinhagen[4], W. Koltun[5], L. Bordeianou[6], H. Kunitake[6], E. Lee[7], E. Messaris[6], M. Mutch[8], S. Ramamoorthy[1], S. Eisenstein[1]
[1]San Diego, CA; [2]Cleveland, OH; [3]Chicago, IL; [4]New York, NY; [5]Hershey, PA; [6]Boston, MA; [7]Albany, NY; [8]St. Louis, MO

Purpose/Background: Restorative proctocolectomy with ileal pouch anal anastomosis (RPC-IPAA) is performed to remove the diseased colon while preserving continence in ulcerative colitis (UC). Debate surrounds how many stages to perform an RPC-IPAA, and whether a loop ileostomy is needed to protect the IPAA. We present data from a validated multicenter NSQIP-based inflammatory bowel disease (IBD) surgery database comparing postoperative complication severity among patients receiving their index surgeries and IPAAs for 1, classic 2, modified 2, and 3 stage RPC-IPAA.

Methods/Interventions: Retrospective query of the NSQIP IBD Collaborative database was performed for RPC-IPAA cases (stratified into index vs IPAA cases) performed for UC from March 2017 to March 2019. The Collaborative is a working group of 11 centers in the US who employed custom variables through NSQIP to obtain a better understanding of outcomes in IBD surgery. The NSQIP-IBD dataset allow us to determine how a IPAA was staged, which was not possible using standard NSQIP proctectomy data. Pre- and intraoperative data were collected. Clavien-Dindo (C-D) grades were calculated using 22 postoperative complication variables in NSQIP. Secondary outcomes for IPAA cases were anastomotic leak and infection rates. Univariable analysis was performed for all predictors. Predictors with main effects p<0.2 were entered in a multivariable model for outcomes.

Results/Outcome(s): 1751 IBD cases were found. We captured 934 (53%) ileostomies, compared to 62 (3.5%) from NSQIP. 760 cases were for UC; 178 were completed IPAAs: 11 (6.2%) were 1 stage, 40 (22.5%) were classic 2 stage, 12 (6.7%) were modified 2 stage, and 115 (64.6%) were 3 stage. 279 cases were index subtotal colectomies (STC) for modified 2 or 3 stage approaches. IPAAs had no deaths; STCs had 1 death. STC for modified 2 or 3 stage cases had more preoperative steroid or biologic use than index cases for 1 or classic 2 stage approaches; IPAAs for modified 2 or 3 stage approaches were less likely to have preoperative steroid or biologic use. For IPAAs, ASA class was the only significant predictor of C-D grade (p=0.011); staging was not a significant predictor. (Table 1) There were no significant predictors for anastomotic leak or infection rates among completed IPAAs. For STCs, higher ASA class predicted worse C-D grades (p<0.001).

Conclusions/Discussion: RPC-IPAA staging was not a significant predictor of postoperative morbidity. Patients receiving STC were more likely to be taking steroids or biologics but had been weaned off by the time of their IPA. This suggests that patients were similarly optimized across cohorts. Collection of ileostomy data was also significantly more accurate than what is available in NSQIP. Data such as biologic use is not present in standard NSQIP. We collect IBD-specific variables in greater detail than what is currently available in NSQIP as a foundation for future quality improvement initiatives for IBD surgery.

Clavien-Dindo Classification

Variable	Univariable			p, Between-subjects effects	Multivariable			
		95% CI				95% CI		
	Parameter estimate	Lower	Upper		Parameter estimate	Lower	Upper	p
RPC-IPAA staged approach								
1 stage	0.35	-0.779	1.48	0.599	-0.107	-1.299	1.085	0.86
Classic 2 stage	0.321	-0.336	0.977		-0.155	-0.941	0.63	0.697
Modified 2 stage	0.562	-0.523	1.648		0.31	-0.843	1.463	0.596
3 stage		Reference				Reference		
Age, per year	0.006	-0.014	0.025	0.559				
BMI, per kg/m^2	-0.009	-0.063	0.044	0.725				
Female sex	0.093	-0.448	0.635	0.734				
Non-white race	-0.192	-1.248	0.864	0.72				
ASA Classification, per class	0.644	0.116	1.172	0.017	**0.703**	**0.275**	**2.556**	**0.011**
Current smoker within 1 year of surgery	-0.64	-1.914	0.635	0.329				
10% weight loss in 6 mo prior to surgery	0.621	-0.489	1.73	0.271				
Steroid use for chronic condition	0.411	-0.207	1.03	0.191	0.095	-0.172	0.361	0.483
Biologic agent within 60 days prior to surgery	0.295	-0.43	1.019	0.423				
Immunomodulation within 60 days prior to surgery	-0.232	-1.451	0.986	0.289				
Colonic dysplasia								
Colorectal cancer	2.952	-0.605	6.509		1.835	-1.825	5.495	0.324
High grade dysplasia	0.552	-1.064	2.168		0.165	-1.553	1.883	0.85
Low grade dysplasia	0.73	-0.493	1.953	0.178	0.859	-0.441	2.16	0.194
No dysplasia		Reference				Reference		
Unable to determine/not applicable	0.557	-0.099	1.214		0.601	-0.125	1.328	0.104
Low albumin <3.5 g/dL	0.103	-0.925	1.131	0.92				
HCT, per %	-0.019	-0.071	0.033	0.476				
WBC, per 1000	0.026	-0.082	0.133	0.64				
UC cases performed at institution				0.717				
<100	0.101	-0.449	0.651					
100+		Reference						
Wound classification								
Clean		Reference		0.918				
Clean/contaminated	1.224	-2.384	4.832					
Contaminated	1.276	-2.347	4.899					
Dirty	1.333	-2.815	5.481					
Operative approach								
Open		Reference						
True laparoscopy	0.172	-0.535	0.88	0.989				
MIS w/ open assist	0.042	-0.683	0.766					
Robotic	0.26	-1.198	1.688					
Other	0.069	-0.826	0.965					
Anastomotic technique								
Double staple		Reference						
Mucosectomy with hand sew	-0.191	-1.994	1.612	0.297				
Other	-1.191	-3.266	0.885					
Missing/not entered	0.651	-0.215	1.517					
Procedure time, per hour	0.166	-0.024	0.356	0.087	0.119	-0.09	0.328	0.264

Table 1: Univariable and multivariable analysis of variance of Clavien-Dindo classification for UC patients who underwent RPC-IPAA. Model selection for multivariable analysis was done via backward selection for effects p<0.2. Significant effects in the multivariable model are **bold**.

LESS INVASIVE TOTAL PROCTOCOLECTOMY FOR ULCERATIVE COLITIS WITH taTME AND NEEDLESCOPIC SURGERY.

P1052

K. Shigeta[1], K. Okabayashi[1], M. Tsuruta[1], R. Seishima[1], H. Hasegawa[2], Y. Kitagawa[1]
[1]Tokyo, Japan; [2]Ichikawa, Japan

Purpose/Background: Laparoscopic proctocolectomy with ileal pouch-anal anastomosis for ulcerative colitis (UC) is known to have several advantages compared to the open approach. Furthermore, there are some studies report that single-incision laparoscopic surgery (SILS) is also a useful method with complete scarless. In our institution, we choose the needlescopic surgery (NS) as less invasive and scarless treatment with fewer technical difficulties than SILS. On the other hand, taTME procedure is now well known that it would be a safe procedure to approach from the anal side. Recently, we introduced the taTME method to the needlescopic surgery of proctocolectomy. From this dual surgery, it would be possible to approach from the both abdominal and anal side at the same time. In this study, we would like to compare the surgery with or without the taTME method and investigate the feasibility of NS with taTME for total proctocolectomy (TP) in UC.

Methods/Interventions: A total of 50 consecutive patients with UC who underwent a laparoscopic TP between 2013 and 2019 were enrolled in this study, retrospectively. All patients were diagnosed as UC by the gastroenterologist and had medical therapy with corticosteroids or immunosuppressors. The whole operation was performed with one 5mm port in the lower left abdomen, two 3mm needle port with 2mm diameter shaft instrument, and the access to the abdominal cavity, placed at the ostomy site marked preoperatively. At the same time, the second laparoscopic team would approach from the anal side to perform taTME. The anastomosis of the anal canal or anal to the J-pouch would be performed by the single-staple technique in the taTME surgery.

Results/Outcome(s): Of the 50 patients, 25 had NS without taTME (NS group) and 25 had NS with taTME (NS/taTME group). Patients with the diagnosis of dysplasia or cancer were 4 in NS and 10 in NS/taTME (p=0.065), female were 15 in NS and 6 in NS/taTME (p=0.01). Mean operating time was 423 ± 80 min in NS and 452 ± 70 min in NS/taTME (p=0.190), with an estimated blood loss of 126 ± 198 ml in NS and 143 ± 175 ml in NS/taTME. One patient had a conversion to open surgery in the NS group. There was no significant difference between the two groups for postoperative complications.

Conclusions/Discussion: In our experience, a needlescopic approach with/without taTME to total proctocolectomy for UC has been shown to be safe and feasible.

THE EFFECT OF AN ENHANCED RECOVERY PROGRAM ON ELECTIVE RIGHT HEMICOLECTOMIES FOR CROHN'S DISEASE VERSUS COLON CANCER: A RETROSPECTIVE COHORT ANALYSIS.

P1053

D. Croasdale[1], E. Su[1], O. Olutola[1], C. Polito[2], A. Ata[1], B. Valerian[1], D. Chismark[1], J. Canete[1], E. Lee[1]
[1]*Albany, NY;* [2]*Stony Brook, NY*

Purpose/Background: Enhanced Recovery After Surgery (ERAS) protocols are widely employed in colorectal surgery and have been successful in reducing post-operative morbidities and hospital length of stay. Crohns disease has been associated with increased risk of postoperative complications including prolonged ileus possibly due to pre-operative inflammatory states, steroid use, or malnutrition. This study examines the post-operative course of both Crohns and colon cancer patients after elective right hemicolectomies and compare the effectiveness of ERAS protocol.

Methods/Interventions: A retrospective analysis was performed on patients with Crohns and colon cancer undergoing elective right hemicolectomies and ileocectomies from 1/2014 through 6/2016 (pre-ERAS cohort) and 1/2017 through 4/2019 (post-ERAS cohort) from a single tertiary care center. Patient demographics and peri-operative morbidities were examined. The primary outcomes investigated include prolonged post-operative ileus (PPOI), hospital length of stay (LOS), and 30-day re-admission. This analysis was simple comparison of proportions and means using chi-square, Fisher's exact test, and two sample t-tests as appropriate.

Results/Outcome(s): 114 colon cancer patients and 102 Crohns patients met the inclusion criteria. The colon cancer pre-ERAS (47) and post-ERAS (67) cohorts were significantly different: post-ERAS had less patients with CHF diagnosis, lower pre-operative WBC, and higher albumin. The Crohns pre-ERAS (41) and post-ERAS (61) cohorts had no statistically significant differences. Both patients with colon cancer and Crohns had a reduction in LOS with implementation of ERAS; decreasing by 1.98 days ($p=0.004$) and 1.61 days ($p=0.008$), respectively. Crohns patients had trend towards higher rate of PPOI with ERAS (pre-ERAS 0.098, post-ERAS 0.230, $p=0.087$). There was no clinical difference of PPOI rates for colon cancer (pre-ERAS 0.213, post-ERAS 0.164, $p=0.510$). Rates of post-operative deep organ space infection in Crohns patients were improved with ERAS (pre-ERAS 0.122, post-ERAS 0.000, $p=0.005$). There was a trend towards an increased rate of anastomotic leak with colon cancer patients under ERAS (pre-ERAS 0.000, post-ERAS 0.060, $p=0.088$). There were no further differences in peri-operative morbidities with either group, including 30-day readmission.

Conclusions/Discussion: The ERAS protocol significantly reduced LOS for both groups. Crohns patients may have an increased rate of prolonged ileus under ERAS, without differences in pre-operative steroid use or nutritional status. However, this increased rate of PPOI was not associated with higher readmission rates or other morbidities. Limitations of this study include small sample sizes, retrospective design, and differences in procedures.

EFFECTS OF COMBINED TRADITIONAL CHINESE MEDICINE THERAPY WITH SURGICAL PROCEDURE FOR COMPLEX ANAL FISTULA IN PATIENTS WITH CROHN'S DISEASE: INITIAL CLINICAL OBSERVATIONS FROM A CHINESE TERTIARY ANORECTAL DISEASE CENTER.

P1054

Z. Mei, H. Zhou, Y. Li, S. Liu, Q. Wang, W. Yang
Shanghai, China

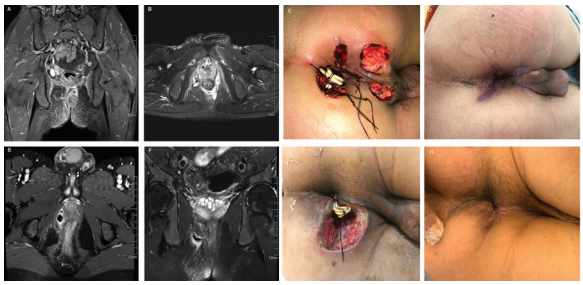
Purpose/Background: Perianal fistula occurs in 10%–50% of all patients with Crohn's disease, and has been recognized as one of the most challenging features for Crohn's disease. Relieving perianal symptoms, controlling infections, and preserving anal function are the primary tasks for the treatment of fistulising perianal Crohn's disease. However, controversies exist over the efficacy of current management strategies. Nowadays, the traditional Chinese medicine (TCM) therapy has been widely applied in the management of perianal fistula in Crohn's disease, mainly theoretically based on TCM external and internal therapy. In this study, we present our initial experience and assess the effects of combined TCM therapy with surgical procedure for Crohn's disease-related anal fistula from a Chinese tertiary anorectal disease center.

Methods/Interventions: All patients diagnosed with Crohn's disease who received combined TCM therapy with surgical procedure for complex anal fistula were included in this study. Patient records were retrospectively reviewed from a prospectively collected database. Patient demographic features, MR imaging findings, perioperative TCM usage and duration, postoperative complications and functional outcomes including the Quality of Life in Patients with Anal Fistula Questionnaire (QoLAFQ) score and the Wexner incontinence score before and after surgery (Figure 1) were collected.

Results/Outcome(s): Seven patients (5 male, 2 female; median age at time of surgery 33 years, range 19-40) underwent TCM therapy combined with surgical procedures between December 2016 and August 2019. Patients had a median body mass index (BMI) of 16.9 (range 15.4-22.2) and a median McMaster Perianal Crohn's Disease Activity Index (PCDAI) score of 47 (range 40-57). Prior to this admission, 11 procedures with 6 abscess drainages, 3 seton drainages and 2 fistulotomies were performed in 6 patients.

On this admission, 6 patients had fistulectomy and one had seton placement. All the patients had TCM treatment during perioperative period, which were administered in the forms of oral preparations, topical poultice on wounds, sitz baths and fumigation, with a median treatment duration of 7 months (range 2-25). During the follow-up, 85.7% (6/7) of the patients had a clinical cure; one patient developed a recurrent perianal abscess. Postoperative QoLAFQ and Wexner incontinence score were significantly improved compared to those of the preoperative score (QoLAFQ score 26.8±9.2 vs.45.0±11.1, P= 0.012; Wexner incontinence score 4.5 ±2.2 vs.8.0±3.3, P= 0.06).

Conclusions/Discussion: Treatment of Crohn's related fistula-in-ano with combined TCM therapy and surgical procedures may be a safe and effective approach in selected cases.



ISOLATED ANAL CANAL STENOSIS IN CROHN'S DISEASE – CAN PROCTECTOMY BE AVOIDED?

P1055

A. Adams, M. Regueiro, B. Click, J. McMichael, A. Lightner
Location:NE6-212, OH

Purpose/Background: Isolated anal stenosis without concurrent perianal fistulizing disease is a morbid phenotype of Crohn's disease (CD). Optimal management with immunosuppressive therapy, anal dilation, and fecal diversion remain poorly described. We sought to determine the natural progression of anal canal stenosis, efficacy of non-surgical management, and ultimate need for fecal diversion.

Methods/Interventions: Following IRB approval a retrospective review of all adult patients with a diagnosis of CD (ICD 9/10: 555.9/K50.9) with isolated anal canal stenosis/stricture (ICD 9/10: K62.4/K62.6) between 2014 to 2019 was conducted. Patients were included if they had evidence of anal stenosis or stricture on physical exam. Exclusion criteria included the presence of an anal anastomosis, presence of anal or rectal fistula, anal or rectal abscess, prior radiation to the rectum or anus, or history of anal surgery (i.e. hemorrhoidectomy). Data collected included patient demographics (age, sex, body mass index, smoking history), disease characteristics (duration of CD, phenotype, intestinal disease, immunosuppressive medications), and treatment for anal canal stenosis.

Results/Outcome(s): 21 patients were included (57% female) with a median age of 50 years (range, 23-78 years). Median duration of disease prior to anal canal stenosis was 16 years (range, 1.5-46 years). The median duration of follow-up from diagnosis of anal canal stenosis was 4.9 years, ranging from 48 days to 15.6 years. 19 (90%) patients had concurrent luminal symptoms (small bowel (n=8; 42%), small bowel and colon (n=6; 32%), colorectal alone (n=5; 26%), of which 18 (95% of patients with luminal symptoms) had undergone prior intestinal resection for their luminal disease (ileocecal resection (n=12; 67%); colectomy (n=5; 28%), other (n=1; 6%)). Medical therapy for anal canal stenosis included corticosteroids in 67% (n=14), immunomodulators (6-MP, azathioprine, methotrexate) in 57% (n=12), biologics (infliximab, adalimumab, certolizumab, vedolizumab, ustekinumab) in 71% (n=15), and suppositories (mesalamine or steroid) in 43% (n=9). 16 patients (76%) attempted non operative intervention: 14 patients had intra-operative anal dilation with sedation, 3 also performed self anal dilation; and two patients underwent endoscopy needle knife therapy. Six patients (29%) had temporary fecal diversion for anal stenosis; none had successful restoration of intestinal continuity. Proctectomy was recommended in five patients (22%) and three underwent the recommended proctectomy at our institution.

Conclusions/Discussion: Isolated anal canal stenosis is notoriously difficult to treat with our current non-surgical options including medical therapy and repeat anal dilation. One third of our cohort required fecal diversion or proctectomy recommended to treat anal canal stenosis due to medically refractory disease, regardless of repeated anal dilation.

CULTURAL DIVERSITY AND LIMITED ENGLISH PROFICIENCY: EVALUATION OF POST-SURGICAL OUTCOMES AFTER ELECTIVE COLECTOMY.

P1056

A. Ore, A. Storino, A. Fabrizio, T. Cataldo, E. Messaris
Boston, MA

Purpose/Background: One of the biggest barriers to optimal and equitable health care is accurate communication and understanding by patients from diverse cultural and linguistic backgrounds. Multiple studies have identified factors contributing to disparities in health care and outcomes between ethnic and linguistic groups. Little data exists evaluating outcomes of patients after surgery and the impact of language and ethnicity in their recovery. The aim of our study is to describe characteristics and compare postoperative outcomes between ethnically diverse patients and patients facing limited English proficiency that underwent elective surgery.

Methods/Interventions: A single center retrospective review of all patients who underwent colectomies for benign and malignant disease was performed between 2014-2018. Patients were identified into three groups: Non culturally diverse with English as primary language, culturally diverse (CDi) with English as primary language and CDi with limited English proficiency (LEP). Primary outcome was index length of stay, secondary outcomes included readmission rate, complication rates, discharge disposition and surgical approach.

Results/Outcome(s): A total of 1519 patients were included in our analysis. 1265 (83.2%) patients were classified as non-CDi with English as primary language, 148 (9.8%) patients were classified as CDi with English as primary language and 106 (7.0%) patients were classified as CDi with LEP. Patients in the CDi with LEP group were found to be older (median 67 years, p<0.001, with similar baseline characteristics (BMI, ASA category and comorbidities). Surgical approach differed between groups with no statistically significant difference: 18.4% of the non-CDi group underwent robotic resection, compared to 14.2% of patients in the CDi with LEP group. Median length of stay was found to be 3 days for both the non-CDi group and the CDi group with English as primary language, compared to a median of 4 days for the CDi & LEP group (p=0.363). Anastomotic leak rate was found to be 2.7% for the non-CDi group compared to 6.0% for the CDi with English as primary language group and 8.5% for the CDi & LEP group (p<0.001). Readmission rate was found to be 8.3% for the non-CDi group with English as primary language compared to 12.3% for the CDi & LEP group (p=0.205).

Conclusions/Discussion: CDi with LEP patients were found to have a statistically significant higher anastomotic leak rate. We found a median additional day of length of stay compared to CDi patients with English as primary language and non-CDi patients, with no statistically significant difference. Trends also favor robotic approach for non-CDi patients We believe there are differences to be identified in much larger populations and we support the addition of variables to describe ethnicity and language in large databases in order to further identify barriers to improve healthcare in ethnically diverse populations.

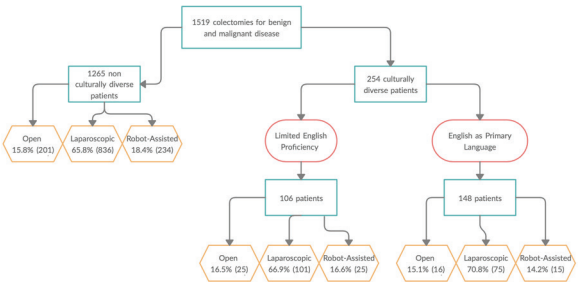


Figure 1. Study Flowchart - Colectomies for Benign and Malignant Disease

INSURANCE STATUS IMPACT ON TIMING TO SURGERY IN PATIENTS WITH COLON CANCER.

P1057

L. Bridges, A. Montgomery, J. Collier, M. Honaker
Macon, GA

Purpose/Background: Colorectal cancer remains the second leading cause of cancer deaths in the United States despite advances in screening modalities. For tumors amenable to resection, surgery remains the mainstay of treatment. However, healthcare disparities may result in unequal treatment or delays in treatment. The aim of this study was to determine if insurance status lead to a delay in treatment of colon cancers that were appropriate for resection

Methods/Interventions: A retrospective, single institution cancer database review was performed for colon cancers stages I-III that underwent resection from 2011 to 2018. Age, gender, insurance status, mortality, tumor grade and time to surgery was analyzed. Continuous variables were reported as means and standard deviations for parametric data, or medians and interquartile ranges for non-parametric data and were analyzed with the unpaired t-test or Mann-Whitney U test. Categorical variables were reported as frequencies and percentages and were analyzed with the Fisher's exact test. A p<0.05 was considered statistical significance. Analyses were conducted using SPSS version 26 (IBM SPSS).

Results/Outcome(s): 277 patients were eligible for inclusion in the study. The average age at diagnosis was 66 +/-12.5 years. Gender was not significantly different between the two groups (p=0.208). Of the 277, 93% (n=211) had insurance while 7% were uninsured (n=16). There was a longer time to surgery in patients that were insured compared to those that did not have any type of insurance (median 29 days vs median 23 days; p=0.022). Insured patients were also significantly older (mean 67.35, SD=12.07) at the time of diagnosis compared with uninsured patients (67.35+/- 12.07 vs 52.9+/- 10.63; p<0.001). Mortality did not appear to be associated with insurance status (p=0.370). There was alo no association with tumor grade(p=0.710) or surgical approach (p=0.312) approach between the two groups.

Conclusions/Discussion: While some studies have indicated uninsured patients have longer wait times to surgery, our study found the opposite to be true. Despite this, it appears that uninsured patients were diagnosed with colon cancer at a younger ages than insured patients. This is likely multifactorial; however, several studies have shown that low socioeconomic status is associated with higher risk of colon cancer due to environmental factors.

EFFECT OF ENHANCED RECOVERY PROTOCOL ON COLORECTAL SURGICAL SITE INFECTIONS.

P1058

H. Wady, K. Krautsak, P. Denoya
Stony Brook, NY

Purpose/Background: A consensus statement issued by the American Society for Enhanced Recovery and the Perioperative Quality Initiative recommended both oral antibiotics (OAB) and mechanical bowel prep (MBP) for elective colorectal cases(CRS) as a prophylactic measure to decrease the incidence of surgical site infections(SSIs). Despite this, there has been a lack of consensus internationally, with data in Europe showing colorectal surgeons are hesitant to add OABs to their elective cases. For elective CRS cases at our institution prior to 2017, MBP was used as standard protocol. After the adoption of Enhanced Recovery After Surgery(ERAS) guidelines, OABs were added to the pre-operative regimen along with MBP. This study seeks to determine if the addition of OAB to MBP as part of the ERAS bundle of care for elective colectomies has an effect on the incidence of SSIs compared with MBP alone.

Methods/Interventions: Four years (2015-2019) of de-identified patient data from our institution's National Surgical Quality Improvement Program(NSQIP) for elective colectomies was obtained. The study was divided into two groups: pre and post ERAS implementation. Patient demographics, co-morbidities, wound classification, and ASA class were evaluated to ensure comparable groups and in order to provide risk adjusted outcome measures. The primary endpoint was SSI incidence post-operatively after elective colectomy. Secondary endpoints included length of hospital stay(LOS) as well as 30 day readmission rate. Excluded cases included minors, those who underwent multiple simultaneous surgeries, urgent or emergent cases, and cases performed by non-colorectal surgeons.

Results/Outcome(s): Total SSI rates pre and post ERAS [0.20 and 0.11, p = 0.07] and deep organ space infection rates pre and post ERAS [0.13 and 0.06, p =0.09] both trended towards a decrease in the post ERAS group. LOS was shorter in the post ERAS group [5.4 vs 7.49, p <0.01]. Hospital 30 day readmission rates were not significantly different between the two groups [0.08 vs 0.11, p = 0.47]. Patient demographics were similar in both groups other than patients in the post ERAS group were younger [59.3 vs 64.5, p = 0.01].

Conclusions/Discussion: Analysis showed a trend towards less overall and organ space SSIs with the addition of OABs as part of the ERAS protocol for elective colectomies, which is in agreement with previously published literature. The LOS was shorter in the post ERAS group. Limitations include lack of statistical significance of the findings, likely related to case numbers, and use of deidentified database data.

ENHANCED RECOVERY AFTER SURGERY PROTOCOLS IN FRAIL PATIENTS - IS THERE A LIMIT?

P1059

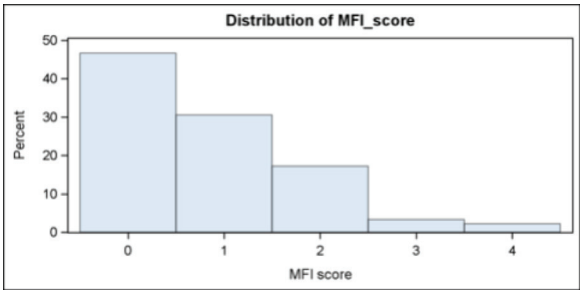
A. Studniarek[1], D. Borsuk[2], S. Marecik[2], J. Park[2], K. Kochar[2]
[1]*Chicago, IL;* [2]*Park Ridge, IL*

Purpose/Background: The five-item modified frailty index (5-mFI) has been established as a valid predictor of 30-day mortality after surgery. With the introduction and wide implementation of enhanced recovery after surgery (ERAS) protocols in all colorectal patients including the elderly, the predictive power of frailty and its contribution to overall morbidity and length of stay can be underestimated.

Methods/Interventions: We conducted a retrospective review of prospectively maintained database of all colectomy patients undergoing ERAS protocol at a single, tertiary care institution between January 2016 and January 2019. The 5-mFI score was calculated based on the presence of five comorbidities: congestive heart failure (CHF), diabetes mellitus, chronic obstructive pulmonary disease, functional status and hypertension (HTN) requiring medication. Multivariate analysis was used to assess the impact of 5-mFI score on postoperative morbidity, emergency department visits, readmissions and length of stay.

Results/Outcome(s): A total of 360 patients were evaluated. 46.7% of patients had a score of 0 and 2.2% of patients had a score of 4 (Figure 1). On univariate analysis, frailer patients had a higher rate of ED visits ($p=0.024$), readmissions ($p=0.029$) and length of stay ($p<0.001$). Patients with CHF had a higher chance of prolonged LOS [OR-1.48, 95% CI 1.22-1.79] whereas patients with HTN had a higher chance of ED visits [OR-2.7, 95% CI 1.11-6.58] when controlled for other variables. Additionally, patients with mFI score of 3 or 4 were likely to have longer LOS ($p=0.02$). Patients with mFI score of 4 were thirteen times more likely to visit ED than patients with mFI score of 0 [OR-13.16, 95% CI 1.65-104.95].

Conclusions/Discussion: Increasing 5-mFI score significantly affects ED visits, readmission rates and increased length of stay in patients undergoing colorectal procedures. This validated instrument should be implemented in assessment of frail patients undergoing colorectal procedures.



FECAL MANAGEMENT SYSTEMS: COMPLICATIONS AND COMPLIANCE WITH RECOMMENDATIONS.

P1060

A. Studniarek, J. Pan, A. Khurshudyan, A. Mellgren, J. Nordenstam, G. Gantt
Chicago, IL

Purpose/Background: Fecal management systems (FMS) are used for management of diarrhea and fecal incontinence in debilitated patients. General recommendations for use include digital rectal exam prior to insertion, no coagulopathy, and placement of FMS for less than 29 days. Colorectal surgeons often face the complications associated with these systems including rectal ulceration, necrosis, and hemorrhage. We aimed to determine the incidence of complications and compliance with recommendations of patients with FMS.

Methods/Interventions: We conducted a retrospective review of patients with a FMS inserted during a hospitalization at a tertiary care center between September 2010 and April 2019. Variables collected included demographics, history of cirrhosis, anticoagulation, indications for insertion, complications, and diagnostic or therapeutic interventions. Univariate and multivariate analyses were used to evaluate predictive factors.

Results/Outcome(s): A total of 202 patients (103 male) were identified and included in the study. Median age was 63 [range, 24-96] years. Fifty-six patients (28%) had a history of liver cirrhosis, 13 patients (6%) were receiving therapeutic anticoagulation, 47 patients (23%) were on immunosuppression therapy and eight patients (4%) had a documented digital rectal exam prior to insertion. Of the 202 patients, seven (3.5%) developed significant rectal bleeding. Four of these patients had concomitant rectal ulcerations and five required blood transfusion. One patient required operative intervention. Among the seven patients with complications, none had a documented digital rectal exam prior to insertion and one had the FMS for >29 days. The median length of time the FMS was in place for patients without complications was 6 days versus 11 days for patients with complications ($p=0.056$). On multivariate analysis, patients with catheters in place for longer than 11 days were more likely to have a complication ($p=0.047$). History of cirrhosis or use of therapeutic anticoagulation were not associated with complications ($p=0.79$ *and* $p=0.57$ respectively).

Conclusions/Discussion: FMS can be used to manage loose stools in debilitated patients, but they have the potential to lead to significant complications. Our review demonstrates that a majority of patients were not managed according to recommendations and improved education of staff is recommended. Prolonged use, even within the current guidelines, is associated with increased risk of complications; therefore, duration of use should be minimized. Further research should be done to determine the safest duration of use for FMS.

INTRAURETERAL INDOCYANINE GREEN INJECTION IS A SAFE AND EFFECTIVE ADJUNCT FOR URETERAL IDENTIFICATION IN COLORECTAL SURGERY.

P1061

J. Roy, A. Stevens, M. Mulekar, L. Grimm, P. Rider, J. Hunter
Mobile, AL

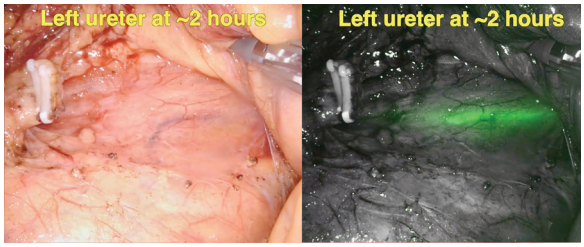
Purpose/Background: Iatrogenic ureteral injury is a rare but serious complication in colon and rectal surgery. Prophylactic ureteral stent placement (PUSP) can facilitate ureteral identification in difficult colorectal cases and has been shown to help with identification of ureteral injury. However, prophylactic ureteral stenting carries its own risk profile including acute kidney injury, renal parenchymal injury, reflux anuria, hematuria, obstructing ureteral clots, obstructing ureteral spasm, and iatrogenic ureteral injury. A novel approach to ureteral visualization in minimally invasive procedures is intraureteral (IU) injection of indocyanine green (ICG) used in conjunction with a near infrared light equipped camera. This technique has not been reported for colorectal surgery. We seek to compare the safety and efficacy of IU ICG to traditional ureteral stent placement in minimally invasive colon and rectal surgery.

Methods/Interventions: Our technique begins with cystoscopy with a rigid cystoscope. The ureteral orifice (UO) is identified, a wire is passed to 5cm and a 5F, 70cm Leur-lock open ended ureteral catheter is inserted over the wire 3cm into the UO opening. 2-3cc of ICG dye is injected, followed by 5cc of normal saline. This is repeated on the contralateral ureter if desired. All patients who underwent minimally invasive colon or rectal procedures with prophylactic ureteral stenting or ICG injection were identified via retrospective chart review. We compared the IU ICG cohort with the ureteral stent cohort to assess the safety and efficacy. Statistical analysis was performed.

Results/Outcome(s): Over twenty-months, 140 patients were identified who met inclusion criteria. 11 patients underwent IU ICG administration and 129 underwent PUSP. In the ICG group there were no postoperative AKIs, no adverse reaction related to the ICG dye, and complications related to the cystoscopy and dye injection procedure itself. The mean POD of catheter removal was 1.72. In the PUSP group, there was a 14.4% rate of AKI, the mean POD of catheter removal was 2.83, and there were 11 complications directly related to ureteral stenting. On statistical analysis, our primary endpoint of ureteral stent/ICG complication did not reach significance ($p=0.6010$). Mean POD of catheter removal was statistically improved in the ICG group ($p=0.0042$).

Conclusions/Discussion: The safety and efficacy of IU ICG injection has never been evaluated in colorectal surgery. Intraureteral dye injection avoids the complications of stent placement while allowing for enhanced

ureteral visualization in the minimally invasive setting. Our results, limited by a small cohort of ICG dye only patients, indicates that intraureteral ICG dye for intra-operative ureteral visualization is a safe alternative to ureteral stenting and may be less morbid than PUSP.



View of Left Ureter with ICG Dye Injection at Two Hours

CAN DEEP ORGAN SPACE INFECTIONS BE USED AS A PREDICTOR FOR ANASTOMOTIC LEAKS AFTER COLECTOMY? A NSQIP STUDY.

P1062

E. Wood, A. Tang, A. Stefanou
Detroit, MI

Purpose/Background: The American College of Surgeons National Surgical Quality Improvement Program (NSQIP) database contains information specific to colon resections with targeted variable collection beginning in 2012. Previous studies have examined the correlation between deep organ space infection (OSI) and anastomotic leaks within state-based datasets and deemed OSI alone was insufficient to predict anastomotic leaks. This has not been investigated in NSQIP since targeted colectomy data collection began. The purpose of the study is to evaluate if a diagnosis of organ space infection can act as a predictor for anastomotic leaks after colon surgery within the NSQIP dataset.

Methods/Interventions: NSQIP targeted colectomy participant user files from 2012-2016 were queried to identify patients diagnosed with anastomotic leaks and/or organ space infections. Using univariate analyses, we examined patient characteristics within each subgroup to determine if there was any population overlap. Sensitivity, specificity, negative and positive predictive values were calculated to evaluate the diagnostic accuracy of OSI for anastomotic leaks. Multivariable logistic regression models were then used to further evaluate association between OSI and anastomotic leaks.

Results/Outcome(s): Patients were separated into three groups: those with anastomotic leaks only (n=1318), those with OSI only (n=183), and those with both OSI and anastomotic leaks (n=3002). Patient demographics, medical comorbidities, operative time, and total length of hospital stay were similar across all groups, however surgical outcomes differed. Emergent surgery (20.3%, p<0.001) and inpatient mortality (9.2%, p<0.001) were more common in the leak only group. Patients diagnosed with both OSI and a leak were more likely to return to the operating room (62.0%, p<0.001). Patients with leak only were more likely to have wound complications including dehiscence (7.5%, p<0.001) and deep incisional surgical site infections (15.8%, p<0.001). The sensitivity of OSI as a surrogate for anastomotic leak was 0.695 and the specificity was 0.987. Positive predictive value was 0.943. Negative predictive value was 0.912. On univariate analysis, OSI was found to be highly associated with leak (OR 170.1; CI: 145.0-199.6). After controlling for additional variables that may also be associated with a leak, multivariate analysis showed that patients with OSI continued to have a significantly higher rate of having an anastomotic leak (OR 54.6; CI: 17.7-168.7).

Conclusions/Discussion: Organ space infections are closely associated with anastomotic leaks. The population of patients diagnosed with OSI only, leak only, or both varied significantly in terms of post-operative outcomes and complications. While it is important to consider an anastomotic leak in the setting of an OSI, they are not synonymous. Further analysis can be conducted to determine if OSI can be used to predict subclinical leaks.

	All patients (n=4503)	Leak and OSI (n=3002)	Leak Only (n=1318)	OSI Only (n=183)	P-value
Mean Age (years)	61.2	60.8	62.3	59.4	<0.001
Female	2027 (45.0%)	1312 (43.7%)	621 (47.1%)	94 (51.4%)	0.024
Race					0.15
White	3214 (71.4%)	2134 (71.1%)	939 (71.2%)	141 (77.0%)	
Black	404 (9.0%)	261 (8.7%)	124 (9.4%)	19 (10.4%)	
Asian	128 (2.8%)	82 (2.7%)	40 (3.0%)	6 (3.3%)	
Other	757 (16.8%)	525 (17.5%)	215 (16.3%)	17 (9.3%)	
Discharge Destination					<.0001
Expired	274 (6.1%)	147 (4.9%)	121 (9.2%)	6 (3.3%)	
Home	3260 (72.4%)	2177 (72.5%)	934 (70.9%)	149 (81.4%)	
Skilled Nursing Facility	514 (11.4%)	354 (11.8%)	139 (10.5%)	21 (11.5%)	
Inpatient Rehab	305 (6.8%)	219 (7.3%)	80 (6.1%)	6 (3.3%)	
Operative Time (Mean±SD min)	196.7 ± 112.8	198.7 ± 112.5	190.1 ± 110.1	210.8 ± 133.7	0.0052
LOS (days)	16.7	16.9	16.3	17.8	0.27
Emergency Surgery	621 (13.8%)	329 (11.0%)	267 (20.3%)	25 (13.7%)	
ASA Class					<0.001
1	74 (1.6%)	54 (1.8%)	17 (1.3%)	3 (1.6%)	
2	1585 (35.2%)	1088 (36.2%)	424 (32.2%)	73 (39.9%)	
3	2396 (53.2%)	1613 (53.7%)	688 (52.2%)	95 (51.9%)	
4	420 (9.3%)	236 (7.9%)	172 (13.1%)	12 (6.6%)	
5	28 (0.6%)	11 (0.4%)	17 (1.3%)	0 (0.0%)	
Post-op Complications					
Superficial incisional SSI	28 (0.6%)	11 (0.4%)	17 (1.3%)	0 (0.0%)	0.012
Deep incisional SSI	266 (5.9%)	56 (1.9%)	208 (15.8%)	2 (1.1%)	<0.001
Wound Disruption	272 (6.0%)	167 (5.6%)	99 (7.5%)	6 (3.3%)	0.013
Transfusions (Intraop & Postop)	867 (19.3%)	516 (17.2%)	304 (23.1%)	47 (25.7%)	<0.001
Sepsis	1415 (31.4%)	1121 (37.3%)	235 (17.8%)	59 (32.2%)	<0.001
Return to the OR	2526 (56.1%)	1860 (62.0%)	626 (47.5%)	40 (21.9%)	<0.001

Table 1. Comparison of patient populations diagnosed with organ space infection only, anastomotic leak only, or both after colectomy.

DOES SPEED MATTER IN ROBOTIC SURGERY? THE IMPACT OF OPERATIVE TIME ON OUTCOMES IN ROBOTIC SURGERY FOR RECTAL CANCER.

P1098

F. Ali, R. Jimenez-Rodriguez, E. Pappou, J. Guillem, M. Weiser, J. Smith, P. Paty, J. Garcia-Aguilar
New York, NY

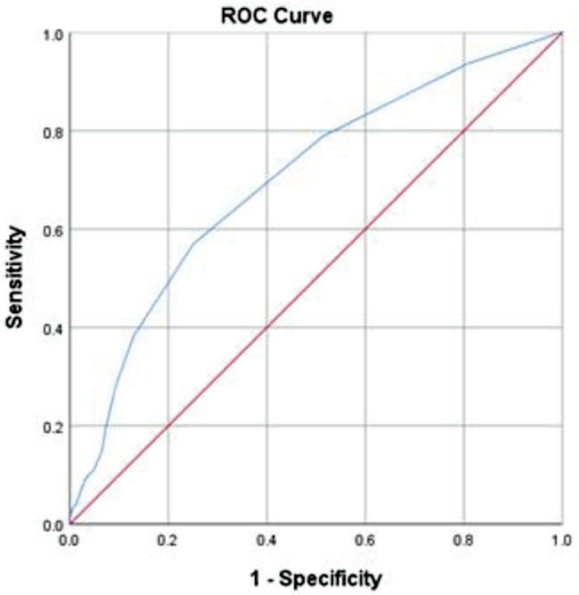
Purpose/Background: The use of minimally invasive surgery consisting of laparoscopic and robotic techniques in rectal cancer has established benefits including reduction in post-operative pain, faster return of bowel function and decreased length of stay. With recent advancement in technology, the robotic technique has emerged more

advantageous due to superior visualization, ergonomics/dexterity and depth perception leading to more precise dissection especially in narrow spaces such as the bony pelvis despite the drawback of potential longer operative time. We aim to study the impact of operative time on length of stay and complication rate in patients who undergo robotic low anterior resection for rectal cancer.

Methods/Interventions: We performed a retrospective analysis of a prospectively-maintained database at a single institution. We included patients with rectal cancer with tumors at or less than 12 cm from the anal verge. We only included patients who underwent a robotic low anterior resection with a diverting loop ileostomy. Patients who underwent an abdominoperineal resection were excluded from the study. Our main outcome measure was correlation between operative time and length of hospital stay. Our secondary outcome measure was correlation between operative time and 30-day complications.

Results/Outcome(s): 375 patients with rectal cancer underwent robotic low anterior resection with diverting loop ileostomy during the study period. A total of 48 (39.5%) of the patients were women. The average BMI was 28.33±5.74. The average distance of tumor from anal verge was 7.5 cm ±2.6 cm. The average duration of surgery was 328.87 ±110.30 min. The average length of stay was 5.67 ±3.35 days. The overall complication rate was 29.9%. Complications include infectious problems, urinary retention, ileus and dehydration due to high ileostomy output. 9 (2.4%) patients required conversion to open technique. The 30-day readmission rate was 12%. Longer operative time was associated with increase in length of stay ($P< 0.05$), more estimated blood loss ($P< 0.05$), and more complications ($P< 0.05$). We conducted a ROC analysis to predict the effect of operative time on length of stay using a 6 hour cut off for the operative time. The AUC was signficiant for operative time greater than 6 hours (AUC = 0.7, P= 0.029, 95% CI [0.644-0.756].

Conclusions/Discussion: In patients with rectal cancer who undergo robotic low anterior resection with a diverting loop ileostomy, increase in operative time is associated with an increase in length of hospital stay and complications. Some of the benefits of a minimally invasive approach may be lost if the operative time exceeds 6 hours. More efforts should focus on improving efficiency of the robotic technique in rectal cancer surgery, and/or identifying the benefit of early conversion to open technique.



DISPARITIES IN ROBOTIC COLORECTAL SURGERY: DO ALL PATIENTS HAVE EQUAL ACCESS?

P1099

S. Jochum[1], E. King-Mullins[2], L. DeCesare[1], E. Ritz[1], H. Govekar[1], A. Bhama[1], T. Saclarides[1], D. Hayden[1]
[1]*Chicago, IL;* [2]*Atlanta, GA*

Purpose/Background: Robotics in colorectal surgery continues to expand in adoption and indication. However, it remains unclear if accessibility to robotic surgery is mirroring this growth in all patient populations. This study aims to identify differences in access to robotic colorectal surgery using a national population database.

Methods/Interventions: The HealthCare Utilization Program National Inpatient Sample (HCUP-NIS) database was used to identify patients who had undergone colectomy or proctectomy from years 2012-2016. Univariate and multivariable analyses were performed comparing patient characteristics between patients who underwent robotic and non-robotic surgery.

Results/Outcome(s): A total of 113,404 patients underwent colectomy or proctectomy. 46.4% (n=52,651) were male. 79.4% (n=84,792) were white, 8.9% (n=9,488) were black, 6.9% (n=7,339) were Hispanic, 2.0% (n=2,108) were Asian, and 0.4% (n=468) were Native American. 53,939 (47.5%) operations were performed open, 50,999 (45.0%) laparoscopically, and 8466 (7.5%) were performed robotically. In multivariable analysis, black (p=0.0065) and Native American patients (p=0.031) were less likely to undergo robotic surgery. When examining income quartiles, patients comprising the lowest quartile were the least likely to have a robotic approach compared to all other quartiles (p<0.05). Patients with Medicare (p=0.0026) and Medicaid (0.041) were less likely to receive robotic

surgery when compared to those with private insurance. Patients being treated at rural hospitals were also less likely to undergo robotic surgery compared to urban teaching ($p<0.0001$) and urban non-teaching hospitals ($p<0.0001$). In sub-analysis comparing robotic to laparoscopic approach, black patients were still less likely to receive robotic surgery ($p=0.007$). Insurance and income levels were not associated with type of minimally invasive surgery performed, though rural hospitals remained least likely to offer robotic surgery ($p<0.001$).

Conclusions/Discussion: Robotics continues to advance in adoption and indication, but unfortunately, blacks and underserved populations are less likely to receive robotic surgery, even when compared to laparoscopic surgery alone. Reasons for these disparities remain unclear; access to technology at certain hospitals, more advanced disease at presentation or implicit biases are possibilities that we plan to investigate with future studies. However, as technology advances, it is imperative to strive to increase access to patients of all racial, ethnic and socioeconomic backgrounds.

QUADRATUS LUMBORUM BLOCK FOR PATIENTS UNDERGOING MINIMALLY INVASIVE COLON RESECTION IS ASSOCIATED WITH INCREASED PRE-OPERATIVE TIME AND NO DIFFERENCE IN LOS OR POST-OPERATIVE OPIOID REQUIREMENT.

P1100

A. Kangas-Dick, C. Prien, D. Nekola, J. Ramjist, A. Mongiu, R. Rhee
Brooklyn, NY

Purpose/Background: Quadratus lumborum (QL) block is increasing in popularity as an option for regional anesthesia in minimally invasive colorectal surgery. The potential advantages of this technique include reported superior pain control to TAP block, a longer duration of action, and absence of an indwelling epidural catheter. While there have been several direct comparisons between TAP and QL blocks, there is limited data comparing clinical outcomes of QL block in the setting of a standardized enhanced recovery after surgery (ERAS) program in patients undergoing colorectal resections.

P1100 Patient Characteristics

		QL Block	Control Group	p-value
	N	44	45	
Patient Demographics	Age	63.20	62.04	0.683
	BMI	28.94	28.10	0.564
	Pre-Operative Time*, Minutes	66.72	38.61	<0.001
	Case Duration, Minutes	299.14	204.21	<0.001
	Hospital Length of Stay, Days	5.2	4.36	0.363
	Oral Morphine Milligram Equivalents	32.92	40.94	0.392
	Oral Morphine Milligram Equivalents per Day	6.11	9.31	0.162
Post-Operative Complications	Total	10	6	0.390
Clavien-Dindo Classification	I	2	1	0.982
	II	5	2	0.225
	IIIA	3	2	0.627
	IIIB	0	1	0.320
	IV	0	0	n/a
Surgical Approach	Robotic/Robot Assisted	39	25	<0.001
	Laparoscopic/Laparoscopic Assisted	2	16	<0.001
	Open	2	6	0.250
Type of Resection	Right/Extended Right Hemicolectomy	12	18	0.204
	Transverse Colectomy	1	1	0.987
	Left/Extended Left Hemicolectomy	7	3	0.167
	Sigmoidectomy	9	11	0.652
	Low Anterior Resection	6	9	0.423
	Abdominoperineal Resection	1	0	0.309
	Other	8	3	0.099

*: Room Start to Surgical Start

Methods/Interventions: An institutional database maintained by the department of anesthesiology was queried for QL blocks performed between 2018-2019. This search returned 44 minimally invasive colon procedures. For comparison, 45 patients were reviewed who underwent elective minimally invasive colon resection between 2016-2017 using local peri-incisional anesthesia alone with liposomal bupivacaine and were managed in an established ERAS pathway. The average time between patient entering room and incision time was taken as a proxy for the additional time needed to perform QL block. An independent samples t-test was performed for continuous variables and chi-square test was performed for categorical values using SPSS v26.

Results/Outcome(s): Mean age (63.20 versus 62.04 years) and BMI (28.93 versus 28.09) was similar between the QL and control groups. QL block was performed for 44 patients. Pre-operative time was increased by an average of 28.11 minutes ($p<0.001$). Time of operation was higher in QL block patients (299.14 minutes vs 204.21 minutes, $p<0.001$). Total complications were higher in the QL block group (22.7% vs 16%, $p=0.390$). In the QL group 6.8% ($n=3$) had Grade IIIA complications compared to 4.1% ($n=2$) in the control group($p=0.627$). The QL block group required less breakthrough pain medications 6.1MME/day compared to the non QL block group 9.31MME/day in the postoperative period, however this was not statistically significant($p=0.162$).

Conclusions/Discussion: In our small series, QL block was associated with no significant difference in length of stay. There was a statistically significant increased pre-operative time secondary to the time for QL block procedure, and a small increase in clavien-dindo grade I and II post-operative complications. Increase in overall surgical time was likely accounted for by an increase in laparoscopic resections in the control group (16 vs 2). QL block is associated with a trend towards decreased requirement for breakthrough opioid pain medications (6.1MME/day vs 9.3). Larger series are necessary to draw practice changing conclusions concerning the use of QL block prior to elective colon resection.

CAN OSTEOPATHIC RIB RAISING DECREASE POST-OPERATIVE ILEUS AFTER MAJOR ABDOMINAL SURGERY?

P1101

M. Fiorentino[1], D. Palange[1], J. Annunziato[2], A. Tufariello[1], J. Wisener[1], P. Yonclass[1], A. Fox[1], D. Livingston[1], N. Glass[1]
[1]*Newark, NJ;* [2]*Morristown, NJ*

Purpose/Background: Post-operative ileus (POI) following major abdominal surgery prolongs hospital length of stay and increases risk of complications. Rib Raising (RR) is a non-invasive osteopathic manipulative treatment that has been shown to decrease sympathetic tone at the spinal level. In retrospective studies and small preliminary reports RR has been shown to decrease POI. We performed a single blinded randomized controlled trial of RR in patients following major abdominal surgery to assess time to return of bowel function.

Methods/Interventions: We approached all patients undergoing major abdominal surgery and those who consented were randomized to receive RR (treatment) or a Sham procedure (placebo). Patients received treatment or placebo within 48 hours after surgery and daily until discharge. Patients were unaware of which treatment they received. We compared time to first post-operative passage of flatus and bowel movement between placebo and treatment groups. Because of significant variability in type of surgery performed, we completed subgroup analysis on patients that had bowel manipulation, a bowel resection, and colorectal procedures. Time to endpoints were compared between groups using the log rank test.

Results/Outcome(s): We enrolled 100 patients (50 in each group) who underwent major abdominal surgery. Groups were equivalent with respect to age, gender, and admitting surgical service. Median times to first post-operative passage of flatus and first bowel movement were similar between the treatment and placebo groups. (Table) There was no difference in major complications between the two groups (8% vs 12% $p=0.74$). 40% of patients were included in the subgroup analysis for bowel resection and 23% of patients were included in the subgroup analysis for colorectal procedure. Median times to end points was similar between treatment and placebo in subgroups. (Table)

Conclusions/Discussion: Early RR does not reduce POI following major abdominal surgery. Lack of effectiveness may be due to a number of factors including the heterogeneity of major abdominal operations included in the analysis. Further consideration of this possible intervention should be considered specifically in colorectal patients as post-operative ileus continues to prolong hospital stays and increase complications.

Median Time (Hours)	Rib Raising (Treatment)	Sham (Placebo)	P value
Full Cohort			
To Flatus (n=91)	39	38	0.76
To Bowel Movement (n=65)	62	65	0.79
Bowel Manipulation			
To Flatus (n=72)	39	37	0.79
To Bowel Movement (n=55)	63	68	0.69
Bowel Resection			
To Flatus (n=38)	39	47	0.21
To Bowel Movement (n=33)	63	86	0.52
Colorectal			
To Flatus (n=22)	39	36	0.16
To Bowel Movement (n=20)	62	68	0.60

The numbers are not consistent between groups due to the fact that flatus and bowel movement were not required prior to discharge and only patients who had documented flatus or bowel movement prior to discharge were included in these median times.

ANALYSIS OF PROCEDURE CANCELLATIONS IN AN ACADEMIC COLORECTAL PRACTICE.

P1102

D. Meyer, S. Hill, P. Monahan, P. Sturrock, J. Maykel, K. Alavi, J. Davids
Worcester, MA

Purpose/Background: Approximately 4-16% of scheduled elective procedures are cancelled in the United States, and it is estimated that greater than 60% are potentially

avoidable. Last-minute procedure cancellation is particularly problematic because it leaves gaps in both clinician and facility productivity and thus wastes resources. The purpose of this study was to evaluate the reasons for late cancellation of elective procedures in a single colorectal surgery practice at a major urban academic medical center and to determine the proportion of potentially avoidable cancellations.

Methods/Interventions: All scheduled colonoscopies or surgeries among five full-time colon and rectal surgeons over 15 months (October 2017 - May 2019) were included. Late case cancellations were defined as cancellations within 2 business days prior to the day of scheduled procedure. Medical records were reviewed and reasons for cancellation were coded. Cancellation reasons were classified as "potentially avoidable" or "unavoidable" by consensus among the study team.

Results/Outcome(s): Late cancellations accounted for 62 of 1,861 colonoscopies (3.3%) and 55 of 1,299 surgical cases (4.2%). Overall, the most common reason was patient no-show (25%). The most common unavoidable reason was unrelated outpatient illness (14%). Only two cancellations occurred for failure to maintain NPO status and one for failure to appropriately hold anticoagulation. A higher proportion of cancellations were potentially avoidable for colonoscopy compared to surgery (85% vs. 69%, p=0.04). Failure of bowel preparation was responsible for 16% of cancelled cases and 79% of these failures were potentially avoidable (not performed or inadequate preparation). Notably, patients were in the holding area at the time of cancellation 41% of the time, with a higher proportion for surgery than colonoscopy (55% vs. 28%, p=0.003). Over a median follow-up time of 399 days (range 59 – 647), 85% of the canceled cases were eventually performed at a median interval of 29 days (range 1-345) after the originally scheduled date.

Conclusions/Discussion: At a single institution, the rate of late cancellation for colorectal procedures was low; however, the majority of these cancellations were potentially avoidable. The top three potentially avoidable reasons for cancellation were patient no-show, patient decision, and additional studies needed. Targeted interventions including improved communication and patient education may minimize the burden of late cancellations to maximize productivity and utilization of health care resources.

DIFFERENCES BETWEEN MORNING AND AFTERNOON COLONOSCOPIES: FROM SURGEONS' PERSPECTIVE.

P1103

S. Modi, C. Fiser, A. Kateregga, O. Picado, N. Paluvoi
Miami, FL

Purpose/Background: Colonoscopy is a commonly used modality for screening, diagnostics, and surveillance of various colorectal diseases. Previous studies done mostly

P1102 Cancellation reason by procedure type

Factors		Total N=116	Colonoscopy N=61	Surgery N=55	p-value
Patient					
	No show [a]	29 (25.0%)	19 (31.1%)	10 (18.2%)	0.11
	Patient Decision [a]	16 (13.8%)	10 (16.4%)	6 (10.9%)	0.43
	Transportation [a]	3 (2.6%)	1 (1.6%)	2 (3.6%)	0.60
	Unrelated outpatient illness [u]	16 (13.8%)	6 (9.8%)	10 (18.2%)	0.28
	Combined patient related	**64 (55.2%)**	**36 (59.0%)**	**28 (50.9%)**	**0.46**
Bowel-Preparation					
	Did not perform [a]	9 (7.8%)	7 (11.5%)	2 (3.6%)	0.12
	Inadequate [a]	6 (5.2%)	4 (6.6%)	2 (3.6%)	0.68
	Unable to complete [u]	4 (3.4%)	2 (3.3%)	2 (3.6%)	1.00
	Combined bowel-prep related	**19 (16.4%)**	**13 (21.3%)**	**6 (10.9%)**	**0.14**
Pre-Anesthesia					
	Additional studies needed [a]	13 (11.2%)	3 (4.9%)	10 (18.2%)	0.04
	Change in clinical status [u]	6 (5.2%)	1 (1.6%)	5 (9.1%)	0.10
	Failed NPO status [a]	2 (1.7%)	1 (1.6%)	1 (1.8%)	1.00
	Failed to stop anticoagulant [a]	1 (0.9%)	0 (0.0%)	1 (1.8%)	0.47
	Combined pre-anesthesia related	**22 (19.0%)**	**5 (8.2%)**	**17 (30.9%)**	**0.002**
Facility					
	Insurance related [a]	6 (5.2%)	3 (4.9%)	3 (5.5%)	1.00
	OR/staff availability [a]	2 (1.7%)	1 (1.6%)	1 (1.8%)	1.00
	Combined facility related	**8 (6.9%)**	**4 (6.6%)**	**4 (7.3%)**	**1.00**

a = Potentially avoidable;
u = Unavoidable

by gastroenterologists have shown that colonoscopies performed in the afternoon (PM) have been shown to have lower adenoma detection rates (ADR) compared to those in the morning (AM). We studied the colonoscopies performed by colorectal surgeons to evaluate the differences between the AM and PM shifts.

Methods/Interventions: We retrospectively reviewed colonoscopies performed for screening or diagnosis or surveillance in our center from April 2014 to May 2019. Complete colonoscopies with documented withdrawal and total times were included. All patients with a history of colorectal cancer or colonic resection, or incomplete data were excluded. Patients' characteristics and significant past medical, surgical, family and smoking history were obtained from the EMR.

Results/Outcome(s): A total of 378 patients (197 females) were included. 48% of colonoscopies were performed in the afternoon shift. Overall, the polyp detection rate (PDR) and adenoma detection rate (ADR) was 53.9% and 33.3% which were higher than the national average. The proportion of screening colonoscopies was higher in AM (58.6%) vs PM (47%) scopes. PM scopes had a significantly prolonged intubation time (13.14 mins vs 10.86 mins, p=0.004) and a longer total procedure time (31 mins vs 27 mins, p=0.002). The quality of bowel preparation good or above was significantly higher in AM scopes (61.2% vs 47.8%, p=0.009). There was no significant difference in the ADR between the two shifts as significantly increased numbers of diagnostic and surveillance scopes were performed during PM shifts automatically selecting for higher ADR.

Conclusions/Discussion: The difference in ADR between AM and PM procedures doesn't seem to apply to colonoscopies performed by colorectal surgeons as they perform a significantly higher number of colonoscopies for diagnostics and surveillance purposes. However, PM shift had significantly inferior bowel preps accounting for increased cecal intubation and total procedure time in PM scopes.

PERINEAL WOUND COMPLICATIONS AFTER ABDOMINOPERINEAL RESECTION.

P1104

F. Grass, W. Perry, V. Sudhindran, S. Kelley, D. Larson, K. Mathis
Rochester, MN

Purpose/Background: Perineal closure after abdominoperineal resection (APR) for rectal cancer may be challenging and often result in post-operative wound complications. Several techniques can be employed in an attempt to mitigate complications such as anatomical flap reconstructions to cover the perineal defect. This study aimed to assess the rate, type, management and risk factors for perineal wound complications after APR.

Methods/Interventions: Retrospective single-institution series of consecutive patients undergoing APR for rectal adenocarcinoma between January 1, 2000 and June 30, 2016. Demographic, surgical and pathological items were assessed. The main outcome of interest was occurrence of a perineal wound complication, defined as any (Clavien grade I-V) and major (Clavien grade IIIb-V) infectious and non-infectious complication related to the perineal closure within 30 days of surgery. Descriptive analysis was undertaken with the chi square test used for comparison of wound complication rates.

Results/Outcome(s): In total, 670 patients (218 women, 32.5%) with a median age of 62 (IQR 52-72) years were included. Pathologic tumor stages were 0 (11.3%), I (26.3%), II (24.2%), III (28.1%) and IV (10.1%). 398 patients (59.4%) underwent neoadjuvant chemoradiation and 36 patients (5.4%) intraoperative radiotherapy. Some 258 patients (38.5%) underwent additional procedures, consisting of synchronous liver resections in 52 cases (7.7%). Perineal flap reconstructions were performed in 139 procedures (20.7%). These were predmoninantly omental flaps (113 cases, 81.3% of all flaps) and vertical rectus abdominus myocutaneous flaps (19 cases, 13.7%). Seventy-six patients (11.3%) presented with perineal wound complications, of which 44 (57.9%) were infected wounds with the remaining (42.1%) related to wound dehiscence or non-healing chronic wounds without evidence of infection. Surgical management under general anesthesia was necessary in 39/76 (51.3%) for perineal wound control. Perineal wound complications were associated with older age (> 62 years: 13.8% vs. <62 years: 8.7%, p=0.039), but not with neoadjuvant therapy (12.1% vs. 10.3%, p=0.477), flap reconstruction (10.8% vs. 11.5%, p=0.817) or pathological tumor stage (p=0.121).

Conclusions/Discussion: Perineal wound complications after APR are common and require surgical management in over half of cases. Neoadjuvant therapy does not seem to negatively affect wound dehiscence rates and perineal flaps do not seem to be protective.

AUGMENTATION OF AN ENHANCED RECOVERY AFTER SURGERY (ERAS) PROTOCOL FOR COLON AND RECTAL SURGERY: OPIOID-SPARING ANESTHESIA.

P1105

G. Woodruff, S. Bing, C. Yap, A. Dakwar
Jacksonville, FL

Purpose/Background: Enhanced recovery after surgery is a multidisciplinary approach to improve surgical outcomes and reduce post-operative complications. With most emphasis on pre and post-operative details, few protocols have stressed the role of intra-operative anesthesia regimens. In this study, we evaluated if an opioid-sparing

intra-operative anesthesia regimen is feasible, safe, and can augment the outcomes of a standardized enhanced recovery protocol.

Methods/Interventions: A single-center prospective pilot study was performed at an academic hospital for patients undergoing elective colorectal surgery that used an opioid-sparing regimen for intra-operative anesthesia which consisted of a ketamine or magnesium infusion, in addition to a lidocaine infusion. Adjunctive intra-operative medications for pain control including intravenous methocarbamol, ibuprofen, and acetaminophen were given prior to emergence. Propofol, H1/H2 blockers, haloperidol, and promethazine infusions were used in patients with high risk of post-operative nausea and vomiting. The pre-operative analgesia components consisted of pre-operative oral gabapentin and acetaminophen. Post-operative pain control regimen consisted of scheduled dosing of oral acetaminophen, gabapentin, and ibuprofen. Breakthrough pain was treated with intravenous ketorolac, and oral tramadol. The main outcome observed was post-operative pain control and need for breakthrough opioid pain medications based on their *Numerical Rating Scale Pain Score* (0-10) and

P1105 Outcomes and Demographics of Patient Groups

Patient	Age (yrs)	BMI (kg/m^2)	ASA Class	Indication	Approach	LOS (Days)	POD Flatus	POD BM	PONV	NRS Pain Scale POD0	NRS Pain Scale POD1	NRS Pain Scale POD2	NRS Pain Scale POD3	POD Ambulation	Breakthrough Medications
A	32	19	2	IBD	Laparoscopic	4	1	1	POD 0 - Ondansetron x1 POD 1 - Ondansetron x3	7	5.6	6	6	2	POD 0 - Ketorolac x2 POD 1 - Ketorolac x3
B	64	21	2	Malignancy	Open	6	1	1	-	8	0	0	0	1	POD 0 - Ketorolac x1
C	69	18.8	2	Malignancy	Robotic	3	0	0	-	1	0	2	-	1	POD 0 - Ketorolac x1 POD 1 - Ketorolac x3 POD 3 - Ketorolac x2
D	72	32	3	Diverticulosis	Robotic	4	1	1	POD 0 - Promethazine x1	4	2.75	3	2	1	None
E	74	17.7	3	Diverticulosis	Robotic	3	1	1	POD 0 - Ondansetron x1 POD 1 - Ondansetron x1	0	5	8	3.5	1	None
F	32	30.3	2	Malignancy	Robotic	3	1	1	-	5.7	4.25	6.17	7	1	POD 0 - Ketorolac x1; Tramadol x1 POD 1 - Ketorolac x3 POD 2 - Ketorolac x4 POD 3 - Ketorolac x1
G	65	32.6	3	Malignancy	Robotic	3	1	1	-	1.6	4.5	1.25	0	1	POD 0 - Ketorolac x1

LOS - Length of Stay

POD - Post-operative Day

PONV - Post-operative nausea and vomiting

NRS Pain Scale - Numerical Rating Scale (0-10 averaged throughout the day)

Visual Analogue Scale. Post-operative surgical outcomes measured included return of bowel function, post-operative nausea and vomiting, time to ambulation, length of hospital stay, and surgical site infection.

Results/Outcome(s): The study (*n*=7) included seven patients who underwent elective colorectal surgery with the described ERAS protocol. The average pain scale on post-operative day 0, 1, 2, and 3 were 3.9, 3.2, 3.8, and 3.1 respectively. Six out of seven patients (86%) were ambulatory on post-operative day 1, with three of seven patients (42%) experiencing post-operative nausea and vomiting treated with anti-emetics. Five out of seven (71%) patients required breakthrough pain medication, all treated with IV ketorolac, except for one patient (14%) treated with a single dose of tramadol on post-operative day zero. All patients had recorded flatus and bowel movement by post-operative day 1. Average length of stay was 3.7 days.

Conclusions/Discussion: Implementation of intra-operative opioid-sparing anesthesia regimen is safe and feasible. In addition, it is an effective method for reducing post-operative opioid requirements for pain control. In conclusion, an opioid sparing anesthesia regimen is safe and can augment the effects of an enhanced recovery protocol for patients undergoing elective colorectal surgery.

ASSOCIATION OF PENICILLIN ALLERGY WITH SURGICAL SITE INFECTION AMONG COLORECTAL SURGERY PATIENTS.

P1106

A. Khan, S. Stringfield, P. Daher-Tobia, D. Wolford, A. Waddimba, W. Lichliter, W. Peters, A. Fichera, J. Fleshman, K. Wells
Dallas, TX

Purpose/Background: Surgical site infections (SSI) represent a major preventable source of morbidity, mortality and increased healthcare costs following colorectal surgery. Patients with penicillin allergy may not receive the recommended perioperative antibiotics, putting them at risk of developing SSI. Here, we aimed to evaluate the impact of penicillin allergy on SSI among patients undergoing major colorectal procedures.

Methods/Interventions: Patients undergoing colon and rectal procedures at Baylor University Medical Center from July 2015 through July 2019 were identified using specific current procedural terminology codes. Emergency procedures and patients with open wounds, ASA class V, and sepsis were excluded. Data on patient demographics, comorbidities, operative details, postoperative length of stay, readmission, and SSI was collected from NSQIP. Penicillin allergy status was determined through individual patient chart review. SSI were reported as superficial SSI, deep SSI, and organ space SSI. Multivariable logistic regression was used to compare the association between patient's penicillin allergy status and SSI.

Results/Outcome(s): Among 1618 patients included in the study, 14.5% (n=234) reported a penicillin allergy. Patients with penicillin allergy were more likely to be white (90.6%) and female (62.8%) (p<0.5). Other baseline characteristics including age, BMI, comorbidities, and ASA class were similar between the two groups. Of the patients with penicillin allergy, only 12 (3.9%) had a serious reaction, including anaphylaxis, respiratory distress or throat or tongue swelling, noted in chart. Overall, there were 90 (5.6%) patients with SSIs. After Adjusting for age, sex, race, ethnicity, BMI, diabetes, COPD, CHF, smoking history, ASA class, operation time, and intra/post-operative transfusion, patients with reported penicillin allergy had increased odds (adjusted odds ratio (AOR) 1.90; 95% confidence interval, 1.00-3.63) of organ space SSI than patients without. Rates of superficial SSI (AOR 0.65; 95% confidence interval 0.19- 2.20) and deep SSI (AOR1.32; 95% confidence interval 0.27-6.38) failed to reach a statistically significant difference between the two groups. Patients with penicillin allergy were also more likely to have higher 30-day readmission rates (AOR 1.58; 95% confidence interval 1.01-2.47). (Table 1).

Conclusions/Discussion: Penicillin allergy is not uncommon. It is associated with an increased risk of organ space SSI even after controlling for other clear risk factors for this outcome. The mechanism of this association remains unclear. Nevertheless, providers need to be aware of this association and avoid second-line antibiotic prophylaxis unless a contraindication to first line agents is present.

	Adjusted odds ratio with 95% CI	P Value
Superficial surgical site infection	0.65 (0.19,2.20)	0.49
Deep surgical site infection	1.32 (0.27, 6.38)	0.73
Organ space surgical site infection	1.90 (1.00, 3.63)	0.05
Unplanned readmission	1.58 (1.01, 2.47)	0.04
Return to OR	1.61 (0.87, 2.97)	0.13
Length of stay (days)	0.04 (0.34) §	0.89

Adjusted for age, sex, race, ethnicity, BMI, diabetes, COPD, CHF, smoking history, ASA, operation time, transfusion intraop/postop.
§Regression estimate and standard error

Table 1. Adjusted impact of penicillin allergy on SSI and surgical outcomes.

QUALITY IMPROVEMENT OF A RECTAL CANCER MULTIDISCIPLINARY CLINIC—THE PATIENT PERSPECTIVE.

P1107

G. Nisly, T. Warczynski, E. Paredes, B. Safar, S. Gearhart, C. Atallah, J. Efron, S. Fang
Baltimore, MD

Purpose/Background: In 2017, the American College of Surgeons (ACS) and the Commission on Cancer (COC) implemented the National Accreditation Program for Rectal Cancer (NAPRC), which followed practice guidelines to establish multidisciplinary rectal cancer centers of excellence. While multiple aspects of cancer treatment have been studied, there is no literature that describes how this affects patients' perspectives on their quality of care.

Methods/Interventions: This is a single site prospective study at an academic tertiary care referral institution that evaluates adult patients who are treated in a rectal cancer multidisciplinary clinic (RC MDC). The interventions including the following: 1. Pre-clinic survey evaluating expectations for the RC MDC. 2. Post-clinic survey evaluating the RC MDC. Descriptive statistical analyses were performed.

Results/Outcome(s): Pre-and post-clinic surveys were completed by 31 patients seen from November 2018-August 2019 with a 33% response rate. Male patients comprised 64% (N = 20) of the population with an age range of 32-88 years. Eight percent (N = 2) of patients presented with stage I rectal cancer, 28% (N = 7) stage II cancer, 56% (N = 14) stage III cancer, and 8% (N = 2) stage IV cancer. Of these patients, 26.7% (N = 8) had recurrent cancer. The main reasons for choosing to have cancer treatment through the RC MDC were provider referral (N = 11, 39.3%), academic center reputation (N = 10, 35.7%), and to seek a second opinion (N = 6, 21.4%). Seventy-one percent (N = 22) of patients presented for a second opinion. The most helpful aspect of the RC MDC was identified as the clinic coordinator by 96% of patients (N = 28/29). Post-clinic, 23 patients were contacted within 5 business days after their RC MDC appointment and asked for feedback. The RC MDC was identified as a positive experience by 96% (N = 22) of patients. Information provided before and during the RC MDC appointment helped to decrease the anxiety of 74% of patients (N = 17), while 13% of patients (N = 3) felt more anxious post-clinic visit. Ninety percent (N= 22) of patients felt that they had spent enough time with the physicians during their appointment. Seventy-eight percent (N = 18) of patients felt that adequate support services (such as psychology, social work, etc.) were offered. Eighty-three percent (N= 19) of patients planned to continue their treatment through the RC MDC, and 91% (N= 21) of patients would recommend the clinic to other patients. The most outstanding aspect of the experience was most commonly identified as the ability to discuss cancer care plans with all the specialists involved.

Conclusions/Discussion: There is abundant literature verifying that a RC MDC that follows standard guidelines set by NAPRC improves patient outcomes. It is also important to assess the patient perspective regarding this process to improve upon patient experience in the treatment of rectal cancer.

ASSOCIATION OF POSTOPERATIVE VENOUS THROMBOEMBOLISM WITH MISSED INPATIENT CHEMOPROPHYLAXIS DOSES IN COLORECTAL SURGERY PATIENTS.

P1108

P. Najjar, M. Pimentel, N. Melnitchouk, J. Goldberg, R. Bleday, J. Irani
Boston, MA

Purpose/Background: Prophylactic anticoagulation is routinely ordered in the inpatient setting for colorectal surgery patients to minimize the risk of venous thromboembolism (VTE). However, several studies have shown that not all ordered chemoprophylaxis doses are actually administered to patients. The most common reasons for missed inpatient chemoprophylaxis doses include patient refusal and subjective nursing assessment of low VTE risk – both of which have been shown to be modifiable with systemic educational interventions. At least one study has shown significantly elevated risk of VTE in trauma/general surgery patients missing even a single dose of chemoprophylaxis. It is not known if missed chemoprophylaxis doses are similarly predictive of VTE in colorectal surgery patients. The purpose of this study is to assess the association of missed inpatient VTE chemoprophylaxis doses on 30 day VTE in patients undergoing colorectal surgery.

Methods/Interventions: We performed a single institution retrospective cohort analysis of the association between missed inpatient chemoprophylaxis doses and the primary outcome, postoperative VTE requiring therapy. Patients undergoing colorectal surgery over a three year period (1/1/2016-12/31/2018) were identified and assessed for VTE using an institutional American College of Surgeons National Surgical Quality Improvement Program dataset. This dataset was additionally populated with the administration status (administered vs. held/missed) of all ordered inpatient chemoprophylaxis doses during the index hospitalization. The association of postoperative VTE with at least one missed inpatient chemoprophylaxis dose was assessed with Fisher's exact test.

Results/Outcome(s): Among 1032 patients who underwent colorectal surgery during the study period, 20 (1.94%) experienced VTE. 584 patients, or 56.6%, received all ordered inpatient chemoprophylaxis doses; 428 patients, or 41.5%, missed at least one dose of ordered inpatient

chemoprophylaxis. There was no significant difference in VTE rates between patients receiving all chemoprophylaxis doses and those who missed at least one dose ((1.71%, n=10 events vs. 2.33%, n=10 events, p=0.502).

Conclusions/Discussion: Missing at least one dose of ordered inpatient VTE chemoprophylaxis is common in colorectal surgery patients; there is no significant association between missed inpatient VTE chemoprophylaxis doses and 30 day postoperative VTE.

Table 1	Received All Doses (n = 594)	Missed At Least One Dose (n = 438)	*P* Value
Age, mean (SD), years	60.1 (15.4)	58.5 (15.9)	0.09
Male Sex, %	46.3	45.4	0.8
BMI, mean (SD)	27.9 (6.2)	27.4 (6.2)	0.19
Race, % (n)			0.91
White	90.9 (540)	91.3 (400)	
Black or African American	3.9 (23)	4.1 (18)	
Asian	2.5 (15)	2.3 (10)	
American Indian or Alaska Native	0.3 (2)	0 (0)	
Unknown/Not Reported	2.4 (14)	2.3 (10)	
ASA Score, % (n)			0.06
1	0.7 (4)	0.5 (2)	
2	40.1 (238)	36.5 (160)	
3	56.7 (337)	57.3 (251)	
4	2.5 (15)	5.3 (23)	
5	0 (0)	0.5 (2)	
Bleeding Disorder, % (n)	4.6 (27)	4.8 (21)	0.88
Elective Surgery, % (n)	86.0 (511)	68.7 (301)	< 0.01
Hospital Length of Stay, mean (SD), days	4.7 (4.1)	7.8 (8.1)	< 0.01
30 day VTE, % (n)	1.71 (10)	2.33 (10)	0.5

DOES OPERATIVE APPROACH AFFECT OUTCOMES AFTER EMERGENCY COLECTOMY: AN ANALYSIS OF ACS-NSQIP USING MAHALANOBIS DISTANCE MATCHING.

P1109

J. Ray, Z. Gajic, F. Bozal, J. Chesler, M. Bernstein, M. Grieco, F. Remzi
New York, NY

Purpose/Background: As technique, experience, and equipment evolve, surgeons are increasingly opting to perform emergency colectomy through minimally invasive surgery (MIS). Compared to open procedures, MIS has both theoretical and evidence-based reductions in surgical complications. However, it is difficult to discern whether MIS affects outcomes in emergent cases, as there are inherent biases in determining patient stability and suitability for a chosen technique. The aim of this study is to account for these confounding variables using Mahalanobis distance matching in order to evaluate the effect of operative technique on outcomes after emergent colectomy.

Methods/Interventions: Emergency colectomies performed between 2012-2017 captured in the ACS-NSQIP targeted colectomy database were included for analysis. Cases were classified as "open," "MIS", or "unplanned conversion" (UPC). "MIS" included laparoscopic, robotic, single incision laparoscopic surgery, and hand assisted approaches. Cases with unknown technique or unknown emergency status were excluded. MIS patients were matched one-to-one with open or UPC patients using Mahalanobis distance calculated from patients' age, sex, pre-operative albumin, pre-operative steroid use, and surgical indication. The outcomes of prolonged ileus, anastomotic leak, 30-day mortality, and length of stay (LOS) were compared between the three cohorts.

Results/Outcome(s): 2894 MIS emergency colectomies with documented operative technique were matched to an equal number of open cases; these were then matched to 449 UPC cases using a reasonable Mahalanobis distance. Colon cancer (23.2%) was the primary indication for emergency surgery, followed by acute diverticulitis (18.5%). Mechanical, oral, and combined preparation were used more frequently in MIS vs open (p<0.001). There was a statistically significant decrease in ileus in MIS vs open (17.3% vs 34%, p<0.001) (Fig 1a). There was no difference in anastomotic leak between the 3 groups, and the leak rate was less than 5% (Fig 1b). As expected, there was a significantly shorter LOS (10.3 vs 13.0, p<0.001) (Fig 1c) and 30-day mortality (3.2% vs 9.8%, p<0.001) in MIS vs open (Fig 1d).

Conclusions/Discussion: Our case-matched analysis demonstrates that MIS is associated with improved outcomes including decreased ileus, LOS, and mortality after emergency colectomy without increased risk of anastomotic leak. However, despite advances and accessibility in MIS techniques, emergency colectomies are still primarily performed as open procedures. We found that bowel preparation is more frequently used in MIS and UPC; this supports the hypothesis that these patients are deemed more stable prior to surgery—even when matched on pre-operative characteristics. In conclusion, MIS is a viable alternative in emergency colectomy and should be considered by surgeons with commensurate experience.

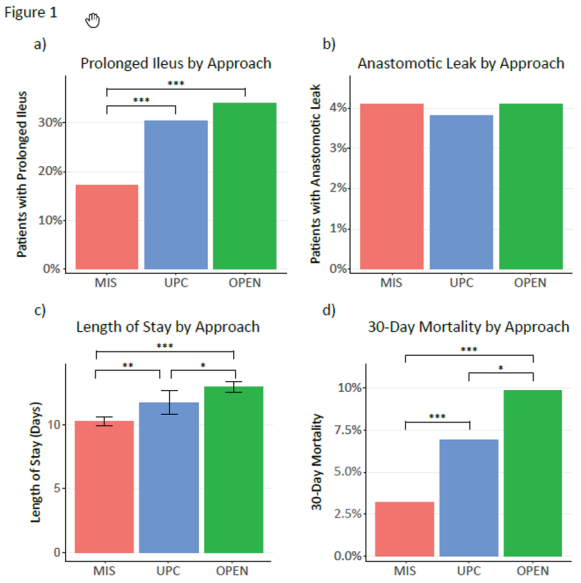


Figure 1: Outcomes by Cohort. a) Prolonged Ileus; b) Anastomotic Leak; c) Length of Stay; d) 30-day Mortality

DEEP IMMUNE PROFILE OF PATIENTS WITH INFLAMMATORY BOWEL DISEASE UNDERGOING MAJOR ABDOMINAL SURGERY.

P1230

K. Rumer, E. Ganio, E. Tsai, A. Shelton, A. Morris, N. Aghaeepour, C. Kin, B. Gaudilliere
Stanford, CA

Purpose/Background: The chronic inflammatory state that characterizes inflammatory bowel disease (IBD) superimposed on the profound inflammatory response to surgical trauma is critically implicated in the pathogenesis of postoperative complications. Our goal is to generate a comprehensive atlas of immune response to surgery for patients with IBD. We employed a deep immune profiling approach using high-dimensional mass cytometry on both peripheral blood and intestinal tissue to characterize the immune response to surgery among patients with IBD.

Methods/Interventions: Blood was collected from patients with Crohn's disease (n=21), ulcerative colitis (n=11), and controls without cancer or infection/inflammation at the time of surgery (n=11). Blood was collected just before surgery and the day after major abdominal surgery. For blood, we used single cell suspension mass cytometry; 25 phenotypic markers isolated 21 major immune cell subsets: 12 adaptive and 9 innate subsets. Fourteen additional makers were used to assess immune cell function at baseline, in response to surgery, and in response to stimulation with 6 different cytokine conditions. Functional measures were proliferation, gut homing, exhaustion, and phosphorylation of STAT, MAPK, NFkB and PI3K pathway proteins. A subset of patients had local tissue immune responses evaluated by imaging mass cytometry on intestinal tissue collected during surgery.

Results/Outcome(s): Preliminary analysis of blood from six patients in each group has revealed changes in both frequency and function of innate immune cells in response to surgery. For example, the proportion of classical monocytes increases after surgery, and levels of phospho-STAT-3 increase in response to surgery in both IBD and control patients. In the adaptive immune compartment, subset frequency and function at baseline and in response to surgery was different between Crohn's disease, ulcerative colitis, and controls. These adaptive compartment differences were most pronounced in patients with Crohn's disease. For example, in CD4+ naive T-Cells, STAT-3 phosphorylation response to surgery was blunted in Crohn's disease whereas levels of phospho-STAT-3 increased in both ulcerative colitis and control patients.

Conclusions/Discussion: Immune response to surgery is markedly different in Crohn's disease, ulcerative colitis and control patients. Patients with Crohn's disease and ulcerative colitis enter surgery with immune perturbations and have altered functional responses to surgery that are distinct from one another and from controls. Using mass cytometry, we are developing a high-resolution cellular atlas of peripheral (blood) and local (tissue) surgical immune responses in patients with IBD. This work is the first step toward a deeper understanding behind the biology of surgical recovery in patients with IBD with the goal of informing how we can better treat patients both medically and surgically.

A HOST-GUEST SELF-ASSEMBLY NANOCARRIERS FOR CO-DELIVERY OF 5-FU AND MIRNA-34A MIMICS IN TARGETED THERAPY AGAINST COLORECTAL CANCER.

P1215

J. Xu, G. Zhang, X. Luo, W. Zhou, Z. Song
Hangzhou, China

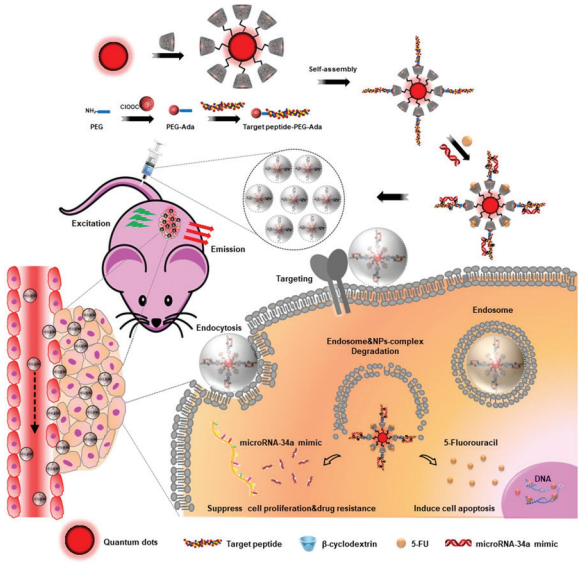
Purpose/Background: Colorectal cancer (CRC) is one of the human severe diseases and causes increasing morbidity and mortality every year in the world. In clinic, postsurgical chemotherapy is used to prevent or treat the recurrence and metastasis. Unfortunately, chemotherapy is associated with severe side effects, which restricts the intensity of chemotherapy. Furthermore, due to the widespread distribution and rapid elimination of chemotherapy agents, large dosage is required to maintain the therapeutic concentration. Hence there is an urgent need to develop new drug agents with high concentration at tumor sites and reduced side effects for CRC-targeted therapy. In our study, a co-delivery system that can transport chemotherapeutic drugs and nucleotide drugs to the distinct targets in tumors is an attractive strategy to CRC therapy.

Methods/Interventions: A targeted well-defined quantum dots (QDs)-based multi-functional nanocarriers were developed through self-assembly driven by host-guest interactions. Multiple β-cyclodextrins (CD) attached QDs nanoparticles were used as host molecule. Adamantane (Ada)-modified TCP-1 peptide targeting ligand (TCP1) was used as guest molecules. TCP-1 peptide was commonly used to target the vasculature of orthotropic colorectal cancer patients and specifically targets colorectal cancer cells (CRCs). And then 5-Fluorouracil (5-FU, a chemotherapeutic drug) and miRNA-34a mimics (an endogenous microRNA-34a mimic) were loaded into the host-guest self-assembly TCP1-CD-QDs nanocarriers which were used to treat CRC *in vitro*, *in vivo* and in PDX (Patient-Derived tumor Xenograft) model.

Results/Outcome(s): A low cytotoxicity of the nanocarriers was observed *in vitro* and *in vivo* analyses, indicating a good compatibility of TCP1-CD-QDs for therapy. The results further demonstrated that TCP1-CD-QDs nanocarriers enhanced the cellular uptake via the targeting of TCP1 peptide for CRCs. The studies showed that 5-FU and miR-34a mimics can be efficiently encapsulated into TCP1-CD-QDs nanocarriers and delivered into CRC

tumor cells or tumor tissues, which in turn led to inhibition of proliferation, migration and increased apoptosis of CRCs. Furthermore, the obtained data suggested that co-delivery of 5-FU and miRNA-34a mimics could achieve synergistic effects on CRC therapy. At the same time, the treatment effects of PDX model further support our results.

Conclusions/Discussion: These studies strongly indicate that such nanocarriers-based co-delivery agents is a promising combined therapeutic strategy for enhance anti-colorectal cancer therapy (**Scheme 1**).



β-SITOSTEROL TREATED DSS-INDUCED ULCERATIVE COLITIS VIA RAISING SHORT-CHAIN FATTY ACIDS AND PROMOTING T CELL DIFFERENTIATION.

P1216

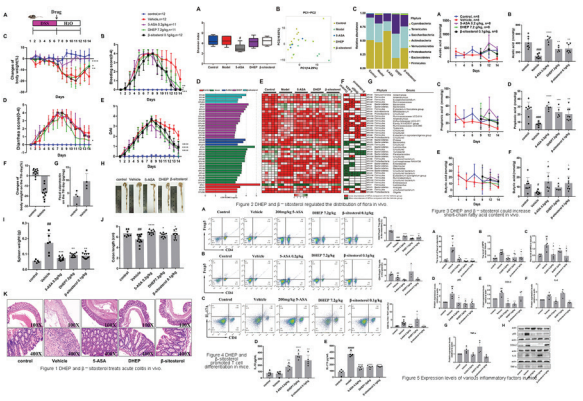
K. Ding, Z. Fan, J. Zhang, Y. Zhang, J. Ma, P. Chen, Y. Liu, H. Xin
Nanjing, China

Purpose/Background: There is a clinical need for new, more effective treatments for ulcerative colitis. In this study, we compared the efficacy of Ding's ulcer enema and its main component β-sitosterol in the treatment of ulcerative colitis, and initially explored its mechanism. The content of β-sitosterol in Ding's ulcer enema was determined by HPLC, and the therapeutic effect was evaluated by DSS-induced mouse UC model.

Methods/Interventions: Adult female C57BL/6 mice, weighing 20–24 g, were obtained from Yangzhou University Comparative Medical Center. Mice were treated with 3.5%(w/v) DSS in drinking water for 7 days, followed by switching to regular drinking water 7 days. Test compounds were administered by enema 7 days following the DSS containing water. To investigate the effect of DHEP, all mice were randomly divided into 5 groups: control (Sterile water, the /vehicle), model (Sterile water), DHEP (7.2g/kg), 5-ASA (0.2g/kg), and β-sitosterol (0.1 g/kg). Clinical signs, body weight, colon length, Evaluation of disease activity index (DAI) and histological changes were recorded. Alterations of intestinal microflora were analyzed by 16sRNA high-throughput sequencing and GC-MS, The contentof the fecal calprotein, IL-10 and IL-17A was performed using corresponding ELISA kit, expressions of NF-κB, COX-2, IL-6 and TNF-α were detected by Western blotting.

Results/Outcome(s): The experimental results showed that the content of β-sitosterol in Ding's ulcer enema was XXXX; Ding's ulcer enema and β-sitosterol could significantly alleviate the symptoms of UC, significantly reduce IL-6, COX-2, TNF-α, NF -κB expression of inflammatory factors. Further mechanistic studies have shown that Ding's ulcer enema could increase the abundance of Proteus in the intestinal tract of UC mice, while β-sitosterol significantly increased the abundance of Paeniclostridium and Akkermansia; both groups could improve UC mice. The short-chain fatty acid content in the colon remodeled the balance of Treg/Th17 cells in UC mice to achieve a therapeutic effect. This study preliminarily proved that β-sitosterol plays an important role in the treatment of UC as the main component of Ding's ulcer enema.

Conclusions/Discussion: β-sitosterol is expected to play a good therapeutic effect as a substitute for Ding's ulcer enema.



LYMPH NODE STROMAL DERIVED EXTRACELLULAR MIRNA AND COLORECTAL CANCER TUMORIGENESIS.

P1217

L. McKean[1], S. Baker[1], A. Klinger[1], G. Maresh[1], X. Zhang[1], C. Solomon Gallo[2], L. Li[1], D. Margolin[1]
[1]*New Orleans, LA;* [2]*Brisbane, QLD, Australia*

Purpose/Background: MicroRNAs (miRNAs) are short non-coding RNAs that are implicated in post-transcriptional regulation of gene expression by affecting stability and translation of miRNAs. The lymph node stromal cell (LNSC) microenvironment may enhance tumorigenesis through extracellular vesicle (EV) mediated

communication via miRNAs. Abnormal expression of miRNAs in human cancers is associated with enhanced tumorigenesis and metastatic potential.

Methods/Interventions: Total miRNA sequencing was performed on tonsil-derived stromal cells, mesenteric LNSCs and their EVs and 5 well-studied CRC cell lines using Next Generation Sequencing. MicroRNAs overexpressed in LNSCs and their EVs compared to CRC cells were further analyzed using in silico computer prediction models (DIANA-miRPath v2.0). MicroRNAs with higher expression in LNSC EVs than CRC cells were explored in known cancer specific pathways in the Kyoto Encyclopedia of Genes and Genomes (KEGG) database and were selectively chosen for tumor cell migration/proliferation assays. In vivo studies with patient derived orthotopic xenograft (PDOX) mouse model have been done with intrarectal injections of CRC cells, LNSCs as well as microRNA into the murine rectal submucosa. Tumor growth and metastasis is then analyzed using weekly bioluminescent imaging.

Results/Outcome(s): *In vitro* testing using migration and proliferations assays were performed on the SW620 and HT-29 CRC cell lines transfected with different miRNA mimics and compared to regular and transfection reagent controls. Cells treated with the mimics of miR-155 showed increased cellular proliferation and migration ($p< 0.0001$). Cells treated with miR-199-3p, 143-3p, 214-3p showed increased cellular proliferation compared to the controls ($p<0.02$, $p< 0.02$, $p<0.01$, respectively). SW620 cells treated with combination of miRNA 143-3p and 199-3p showed increased cellular proliferation compared to controls and to each miRNA individually ($p<0.002$). Preliminary *in vivo* experiments using a PDOX mouse model showed promising tumorigenesis with miR-155 mimic transfected tumor cells compared with control groups. We are currently treating SW620 cells with miRNA inhibitor transfection for inhibitory effects on tumor progression.

Conclusions/Discussion: We have previously shown that LNSCs and the associated EVs appear to contribute to enhance CRC tumorigenesis, possibly through miRNA carried in EV cargos. Our studies suggest that transfection of different miRNAs enhances CRC progression and combination of some miRNAs might have a synergistic effect in CRC progression. These miRNAs could potentially have a role as future targeted therapeutic strategies for human CRC.

ANALYSIS OF THE CANCER GENOME ATLAS COLON CANCER (TCGA – COAD) COHORT SHOWS UP-REGULATION OF COMP CORRELATES WITH DISEASE STAGE AND MOLECULAR SUBTYPE AND IS ASSOCIATED WITH POOR OUTCOMES.

P1218

V. Nfonsam, R. Runyan, L. Nfonsam, R. Pandey
Tucson, AZ

Purpose/Background: Colon cancer (CC) is the third most commonly diagnosed cancer and the second leading cause of cancer related deaths in the United States. Alterations and differential expressions of certain genes including Cartilage Oligomeric Matrix Protein (COMP) have been implicated in colon cancer carcinogenesis. Colon cancer has also been shown to exist in several subtypes. The aim of this study is to establish the role of COMP in CC disease stage and sub types and also on disease outcomes.

Methods/Interventions: We analyzed a larger population of CC samples from TCGA dataset for expression profile of COMP gene. RNA-Seq data for 480 CC tumor samples and 41 normal samples were analyzed. The raw counts data was normalized using variance stabilizing transformations (VST) method. Tumor samples were stratified by patient's stage (I to IV) and colon molecular subtypes (CMS1 to CMS4. A t-test was performed to assess the significance of difference in expression between the groups. We also performed an unbiased survival analysis using the TCGA-COAD cohort using the UCSC Xena Cancer Browser.

Results/Outcome(s): COMP is expressed at a significantly higher level in tumor samples compared to normal and the elevation of expression occurs as early as stage I (Fig. 1). There is also a statistically significant increase in expression in stage IV compared to Stage I disease. Stratifying the tumor populations by colon molecular subtypes (Fig. 2) we see several fold increase in CMS4, a type enriched in mesenchymal markers, stromal invasion, and angiogenesis, as compared to other subtypes. The level of expression was found to be relatively low in CMS3 (metabolic subtype) compared to other subtypes but has still significantly higher COMP expression than in normal tissues. Overall all colon tumor subtypes show a higher expression of COMP gene compared to normal tissue. The overall survival analysis revealed that patients with CC expressing the highest levels of COMP present with poorer survival outcomes.

Conclusions/Discussion: Higher expression of COMP is seen in CC compared to normal tissue and correlates with stage of disease and tumor subtype. Elevated expression of COMP also correlates with poorer survival. COMP has a potential as a biomarker for CC.

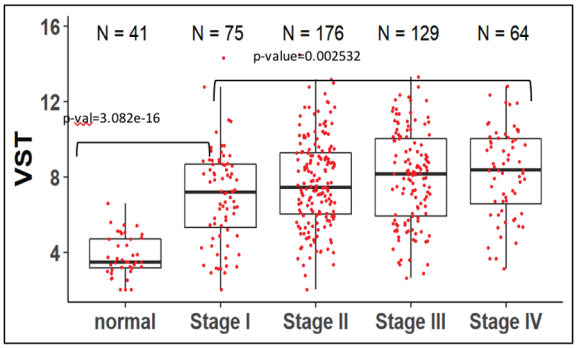


Figure 1

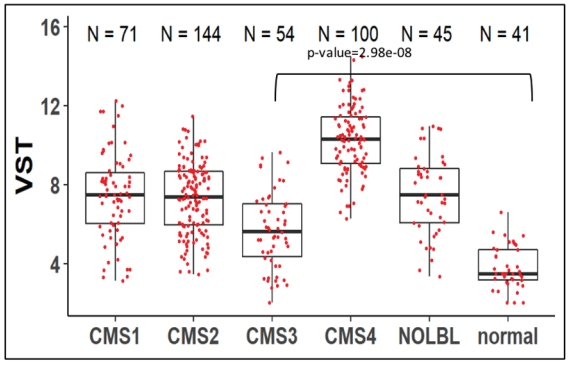


Figure 2

SIDE-TO-SIDE ANASTOMOSIS CAUSES INTESTINAL STASIS AT ANASTOMOTIC SITE AND ADJACENT DISTAL COLON BY IMPAIRED COLONIC MOTILITY.

P1219

T. Kono[1], M. Shimada[2], K. Kubota[3], A. Fichera[4]
[1]Sapporo, Japan; [2]Tokushima, Japan; [3]Ibaraki, Japan; [4]Dallas, TX

Purpose/Background: Side-to-side stapled ileocolonic anastomosis is one of the most utilized anastomotic techniques in colorectal surgery. However, side-to-side anastomoses are anti- peristaltic and they have the long-term risk of an enlarged blind loop, although the underlying cause is debated. We hypothesized that decreased intestinal motility at the anastomotic site compared to other anastomotic techniques (i.e., end-to-end anastomosis) results in stasis of the intestinal content. This study aimed to compare intestinal motility between different types of enterotomy and suture of the intestinal wall.

Methods/Interventions: Isolated rat proximal colon segments were placed in Krebs solution. For surgical treatment, short transverse enterotomy of 0.5 cm or longitudinal enterotomy of 1.0 cm was made on the isolated colon segments. Transverse (TS), longitudinal (LS), or Heineke-Mikulicz (HM) configuration suture was applied for single-layer closure. The specimens were divided into 4 groups; non-surgical treatment (NT), TS, LS, and HM groups. To estimate intestinal motility and transit, the prokinetic agent hydroxy-α-sanshool (Am J Physiol Gastrointest Liver Physiol. 308: G579, 2015) was added to the serous membrane side. Intestinal motility was evaluated based on changes in intraluminal pressure and a spatiotemporal map made from a video image of the segment. To evaluate intestinal transit, we measured the transit time of plastic beads from the proximal to the distal end of the colonic segment.

Results/Outcome(s): A slight decrease in colonic diameter was observed around the suture site in the LS group compared to the NT group, although there was no change in the TS and HM groups. Propulsive contractions, which are rhythmical wringing out motions, were induced in all the groups. However, the LS group showed decreased contractility at the suture site and at its distal end. The peak amplitude and the area under the curve of the intraluminal pressure at the distal end of the sutured region were elevated, accompanying contractions of the proximal colon, which were attenuated in the LS group compared with the other surgical treatment groups. Intestinal transit time was the longest in the LS group among the surgically treated groups (NT: 20.0±1.5 min; LS: 47.3±3.7 min).

Conclusions/Discussion: Longitudinal suture following longitudinal enterotomy induced the most severe luminal narrowing compared to the other groups, and it correlated with impaired colonic motor function. These results suggest that in order to prevent intestinal stasis at the anastomotic site, longitudinal enterotomy and suture line in the side to side configuration should be avoided. When a longitudinal enterotomy is needed to construct the anastomosis, HM configuration (i.e., Kono-S anastomosis) that results in a transverse suture line should be utilized to reduce the risk of intestinal stasis.

OUTCOMES FOLLOWING ISCHEMIC COLITIS COMPLICATED BY INFECTION IN PATIENTS WITH A HISTORY OF KIDNEY TRANSPLANTATION.

P1220

S. Hill[1], A. Parsikia[2], N. Barragan[1], D. Samson[2], R. Latifi[2], J. Ortiz[1]
[1]Toledo, OH; [2]Valhalla, NY

Purpose/Background: Patients with a history of kidney transplantation are among a susceptible group that may harbor greater risk of morbidity or mortality in the setting of ischemic colitis and concomitant infection, posing a challenge for clinicians considering surgical intervention. We aim to compare outcomes among patients with and without a history of renal transplant following surgical management of ischemic colitis complicated by infection.

Methods/Interventions: NIS data from 2005 to 2014 were reviewed. ICD9 codes were utilized to identify patients undergoing treatment of ischemic colitis, and ICD9 procedure codes identified those who underwent

abdominal surgery. The dataset was divided into two groups, kidney transplant (KTP) and non-kidney transplant (nKTP), selecting for history of kidney transplantation. Kidney transplant patients were matched with a similar cohort of non-kidney transplant patients based on baseline patient and hospital characteristics, using the nearest neighbor matching method (1:2, caliper 0.2). We additionally evaluated the role of infection as a risk factor, including pneumonia, wound infection, urinary tract infection, post-operative infection, and peripheral vascular infection. The time interval of surgical procedures to the diagnosis was considered as well. We performed Univariate and multivariate analysis to compare outcomes (including mortality, hospital charges, and length of stay) between KTP and nKTP groups. We further examined the data and any difference in outcomes between transplant and nontransplant centers.

Results/Outcome(s): 92,340 patients with ischemic colitis that underwent abdominal surgery during this time period. We identified 206 kidney transplant patients, 10 of whom developed infection. KTP subjects who underwent surgical management of ischemic colitis further complicated by infection experienced significantly greater mortality, cost, and length of stay, as demonstrated by weighted multivariate analysis. The data also demonstrated significantly greater in hospital mortality (odds ratio 6.293 vs 1.508), but shorter length of stay (odds ratio 0.127 vs. 0.154), and lower hospital charges (odds ratio 0.140 vs. 0.200) at transplant centers when outcomes were stratified across transplant versus nontransplant centers.

Conclusions/Discussion: Subjects undergoing surgical treatment for ischemic colitis with a history of KTP experience greater mortality and are predisposed to increased total hospital charge and longer length of stay when their condition is superimposed with infection. Further, KTP subjects undergoing treatment for ischemic colitis at transplant centers demonstrate greater mortality rate but shorter length of stay and lower cost associated with hospitalization than those treated at nontransplant centers.

Table 1: Baseline Characteristics and Outcomes in Kidney Transplant Patients with Ischemic Colitis

Characteristics of Patients and Hospitals	No Kidney TXP (N=92,134)		Kidney TXP (N=206)		Total (N=92,340)		P-value
	n	%	n	%	n	%	
Age>65	59382	64.5%	69	33.50%	59451	64.40%	<0.01
Male	56597	61.4%	95	46.10%	56692	61.40%	<0.01
Race							
Black	7999	10.1%	32	18.2%	8031	10.1%	<0.01
Hispanic	5395	6.8%	20	11.4%	5415	6.8%	0.017
Mortality index category							
<-1	11275	12.2%	4	1.9%	11279	12.2%	<0.01
0-2	11482	12.5%	4	1.9%	11486	12.4%	<0.01
3-10	21548	23.4%	48	23.3%	21596	23.4%	0.977
>10	47829	51.9%	150	72.8%	47979	52.0%	<0.01
Infection	5033	5.5%	10	4.9%	5043	5.5%	0.701
Primary expected payer, Medicare	60891	66.2%	161	78.2%	61052	66.2%	<0.01
Location/teaching status, Urban teaching	44894	48.9%	144	70.2%	45038	48.9%	<0.01
Location, kidney transplant center	20251	22.0%	101	49.0%	20352	22.0%	<0.01

Weighted Outcomes in Patients with Superimposed Infection, Anywhere			
Outcome	OR	95% CI	P-value
In hospital mortality	1.508	1.193 to 1.905	0.001
Total charge	0.154	109,350.587 to 171,712.657	<0.01
Length of stay	0.200	13.585 to 19.152	<0.01

Weighted Outcomes in Patients with Superimposed Infection, Transplant Center			
Outcome	OR	95% CI	P-value
In hospital mortality	6.293	3.109 to 12.739	<0.01
Total charge	0.127	114,718.037 to 280,297.282	<0.01
Length of stay	0.140	9.424 to 20.532	<0.01

Note: OR for total charge and length of stay represents the coefficient of the linear regression
OR, odds ratio
CI, confidence interval

REVISIT TO DENONVILLIERS' FASCIA BASED ON ANATOMICAL STUDY USING MICRO-COMPUTED TOMOGRAPHY AND HISTOLOGY.

P1222

S. Yang, N. Kim, J. Kang
Seoul, Korea (the Republic of)

Purpose/Background: Understanding of the anatomy of Denonvilliers' fascia (DVF) is essential for operating on mid to low rectal cancer patients, especially at the level of the seminal vesicles and prostate in male. Whether the correct surgical plane in the anterior dissection of total mesorectal excision (TME) is anterior or posterior to the DVF remains a debate. This study aimed to investigate the location of the DVF using micro-computed tomography (mCT) with phosphotungstic acid (PTA) preparation for the acquisition of its three-dimensional information non-destructively to observe the relationship between DVF and pelvic autonomic nerve and MRF.

Methods/Interventions: Eight specimens were obtained bilaterally from four fresh human cadavers. All cadavers utilized in this study were legally donated to the Surgical Anatomy Education Centre at Yonsei University College of Medicine. Four specimens were used soft-tissue contrast staining PTA to obtain mCT images, while the other 4 were used for Masson's trichrome staining. The mCT observations with PTA tissue preparation enabled a detailed 3D examination of the relation between DVF and urogenital neurovascular bundle and MRF. The scanned images were reconstructed using NRecon reconstruction software (Bruker).

Results/Outcome(s): Multidirectional sectioned images obtained using mCT showed that DVF consisted of a multilayered structure consisting of condensed median and pan-shaped dispersed lateral portions. Starting from the posterolateral corner of the seminal vesicle and prostate, the complex multi-layer DVF fuses to form a single layer adherent to the medial prostate which forms a distinct plane of separation between the MRF of the distal rectum in coronal and sagittal sections. It continued to the perineum and adverse trapezoid, apron shape with the homogenous monolayer. At the level of the prostate, DVF seems to be easily separated from the mesorectal fascia and went down to the perineal body. In the histologic findings, the Denonviller's fascia (DVF) was typically shown as a distinct fibrous sheet anterior to the rectum consisted of a multilayered structure as a mixture of collagenous, connective and elastic tissue with some smooth muscle fibers that separating the rectum from the seminal vesicles and the prostate. The urogenital neurovascular bundle at the posterolateral corner of the prostate is separated from the mesorectum by a DVF on the Masson's trichrome staining.

Conclusions/Discussion: Based on findings from mCT and Masson's trichrome staining, DVF separates the urogenital neurovascular bundle from the mesorectum. To

preserve all autonomic nerves for urogenital function and for optimal oncologic outcomes, optimal TME for rectal cancer requires dissection posterior to the DVF unless cancer located at the anterior wall of the rectum and obtaining a sufficient margin is not at risk.

CATHEPSIN B SILENCING INDUCES APOPTOSIS BY TARGETING NOTCH PATHWAY IN COLORECTAL CANCER CELLS.

P1223

M. Abdulla[1], K. Al Khayal[1], O. Al Obeed[1], R. Ahmad[1], T. Bin Traiki[1], J. McKerrow[2]
[1]*Riyadh, Saudi Arabia;* [2]*San Diego, CA*

Purpose/Background: Cathepsins are a group of multifunctional cysteine and aspartyl proteases that regulate tumor growth, invasion, migration, metastases and angiogenesis. Cathepsin B (CTSB) primarily functions as an endopeptidase within endolysosomal compartments in normal cells. Activity of CTSB is known to be crucial for tumorigenesis, angiogenesis, invasion and metastases. It has been suggested that CTSB is a promising target for therapy, chemoprevention and molecular detection of neoplasia.

Methods/Interventions: Transient depletion of CTSB was achieved by siRNA transfection in human CRC cell lines. Effect on cell proliferation was measured by real time xCELLigence RTDP. CTSB inhibition, Bcl2 and Notch family protein expression was determined using western blotting. Flow cytometry was employed to measure apoptosis based on AnnexinV/PI co-detection.

Results/Outcome(s): The transfection of CRC cell lines with CTSB siRNA revealed significant inhibition of cell proliferation of human CRC cell lines. CB silencing induced cell apoptosis, inhibited Bcl2, BclxL and cell cycle regulator cyclin D1. In addition, CTSB silencing downregulated Notch1 and its target gene HES1 implying a probable crosstalk between CTSB and Notch pathway. Furthermore, knocking down CTSB enhanced the efficacy of 5-Fluorouracil in human CRC cell lines

Conclusions/Discussion: The present study demonstrated a novel findings that Cathepsin B is associated with notch pathway activation and may represent a promising therapeutic target in CRC.

SURVIVIN EXPRESSION IN COLORECTAL CARCINOMA IN EGYPT AN IMMUNOHISTOCHEMICAL STUDY.

P1224

M. Zoheir
Alexandria, Egypt

Purpose/Background: In Egypt, it is the fifth most common cause of cancer deaths. However the percentage of young-onset colorectal cancer cases in Egyptians is strikingly high with more than one third of cases occurring under age 40 years. Many researches is interested in survivin as a diagnostic marker and potential drug target because of its predominantly cancer-specific expression in adult human organ tissues. it is expressed in fetal organs and in fetal tissues where apoptosis occurs. Survivin was not found in normal adult tissues. During colorectal tumorigenesis, survivin protein expression is significantly and progressively increased during the transition from low dysplasia adenoma to high dysplasia to carcinoma. Aim of this work was to determine the expression of surviving in colorectal carcinoma and to correlate its expression withother established prognostic parameters of colorectal cancer in Egypt

Methods/Interventions: 50 cases of colorectal carcinoma and ten cases of normal colonic tissue (taken from normal colonoscopic specimens)were studied Cases were collected between January 2017 and April 2018 from the Pathology Department, Medical Research Institute, Alexandria University, Egypt. Surviving. Immunohistochemical staining using monoclonal antibodies, the expression was scored according to the percentage of positive cells: 0= 0%, 1= 1-25%, 2= 26-50%, 3=51-75%, 4=76-100%. The staining intensity whichwas rated as follows:0=negative,1=weak,2=mild,3=moderate,4=strong The sum of intensity and the extent scores was used as the final staining score

Results/Outcome(s): The 50 cases of colorectal cancer were divided into 38 malignant ulcers, 9 infiltrating mass and 3 polypoidal. 4 cases mucoid carcinoma and 46 cases adenocarcinoma. (according to their grade into; 7cases well diferentiated, 30y moderately differentiated and 9 poorly differentiated) No survivin positive staining either nuclear or cytoplasmic was detected in the normal colonic tissue Survivin was positive in twenty nine out of thirty eight cases with ulcerating growth pattern and seven out of nine cases with infiltrating growth pattern. Statistical analysis revealed that there was high statistically significant association between the infiltrating tumor growth pattern and survivin expression ($p \leq 0.05$) i.e. Survivin positive cases were higher in infiltrating growth pattern than in ulcerating and polypoidal growth patterns ; out of nine cases having infiltrating growth pattern seven were survivin positive.

Conclusions/Discussion: Survivin is not expressed in normal colonic mucosa but is expressed in paracancerous adenomatous tissue and in colorectal carcinoma, therefore it may be involved in colorectal carcinogenesis Survivin is associated with aggressive phenotype characterized by infiltrative growth pattern, histologic grade, positive lymph nodes metastasis and higher tumour stage it indictes poor prognosis

PLATINUM (PT)-COORDINATION COMPLEX ALTERS REDOX BALANCE AND INDUCES APOPTOSIS IN COLORECTAL CANCER BY TARGETING MAPK PATHWAY.

P1225

K. Al Khayal, R. Ahmad, M. Abdulla, O. Al Obeed
Riyadh, Saudi Arabia

Purpose/Background: Colorectal cancer (CRC) is a heterogeneous tumor having various genetic alterations. The current treatment options had limited impact on disease free survival due to therapeutic resistance. Novel anticancer agents are needed to treat CRC specifically metastatic colorectal cancer. A novel coordination complex of platinum, (salicylaldiminato)Pt(II) complex with dimethylpropylene linkage (PT) exhibited potential anti-cancer activity. In the present study, we explored the molecular mechanism of PT-mediated inhibition of cell proliferation in colorectal cancer cells.

Methods/Interventions: PT-mediated inhibition on tumorigenicity was measured by colony formation assay. Flow cytometry was employed to measure apoptosis/necrosis, reactive oxygen species generation, mitochondrial membrane potential and caspase-3/-7 activation. Total glutathione was determined in PT-treated cells by ELISA. Alteration in Bcl2 family proteins, cyclins expression and activation of PARP and cytochrome c release were measured by western blotting. Western blotting was further used to determine the modulation of MAPK pathway. Transient transfection was used to silence p38 protein in colorectal cancer cell line.

Results/Outcome(s): PT significantly inhibited the colony formation in human colorectal cancer cell lines (HT-29, SW480 and SW620) by inducing apoptosis and necrosis. This platinum complex was shown to significantly increase the reactive oxygen species (ROS) generation, depletion of glutathione and reduced mitochondrial membrane potential in colorectal cancer cells. Exposure to PT resulted in the downregulation of anti-apoptotic proteins (Bcl2, BclxL, XIAP) and alteration in Cyclins expression. Furthermore, PT increased cytochrome c release into cytosol and enhanced PARP cleavage leading to activation of intrinsic apoptotic pathway. Moreover, pre-treatment with ROS scavenger N-acetylcysteine (NAC) attenuated apoptosis suggesting that PT-induced apoptosis was driven by oxidative stress. Additionally, we show that PT-induced apoptosis was mediated by activating p38 MAPK and inhibiting AKT pathways. This was demonstrated by using chemical inhibitor and siRNA against p38 kinase which blocked the cytochrome c release and apoptosis in colorectal cancer cells.

Conclusions/Discussion: Our data demonstrates that the platinum complex (PT) exerts its anti-proliferative effect on CRC by ROS-mediated apoptosis and activating p38 MAPK pathway. Thus, our findings reveal a novel mechanism of action for PT on colorectal cancer cells and may have therapeutic implication.

METASTASIS-ASSOCIATED BIOMARKERS AND PROGNOSTIC MODEL FOR COLON CANCER.

P1226

H. Yang, Z. Wang
Shanghai, China

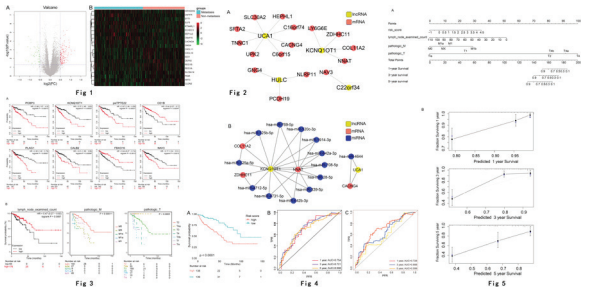
Purpose/Background: The aim of this study was to develop a prognostic model, combining dysregulated genes and clinical parameters related to colon cancer metastasis.

Methods/Interventions: The colon cancer data were downloaded from UCSC Xena database. mRNAs and lncRNAs differentially expressed between a non-metastasis group and metastasis group were screened out. Then a ceRNA network was constructed and a risk score model was created from prognosis-related genes. Finally a prognostic nomogram model was proposed for predicting survival rate and verified on GDC dataset.

Results/Outcome(s): 1. Identification of the mRNAs and lncRNAs involved in colon cancer metastasis According to N stage and M stage data, a total of 186 and five differentially expressed mRNAs and lncRNAs were identified (**Figure 1A**). The top 10 downregulated and upregulated genes are listed in **Figure 1B**. **2. Construction of the ceRNA network** An mRNA–lncRNA coexpression network was built (**Figure 2A**). LncRNAs with high connectivity in this network included *UCA1* and *KCNQ1OT1*. Next a ceRNA network was composed (**Figure 2B**). In the ceRNA network, lncRNA *KCNQ1OT1* was a hub node. **3. Selection of the prognosis-related differentially expressed mRNAs and of clinical parameters** K-M survival analysis was conducted to screen out prognosis-related differentially expressed mRNAs. *PCBP3*, *KCNQ1OT1*, *psiTPTE22*, *PLAG1*, *CALB2*, and *NAV3* in the low-expression group were associated with higher survival probability compared with those in the high-expression group (**Figure 3A**). In contrast, *CD1B* and *FBXO16* manifested the opposite trend (**Figure 3A**). In addition, clinical parameters pathologic M and T turned out to be associated with the prognosis (**Figure 3B**). **4. Construction and validation of an RS model containing the possible prognosis-related differentially**

expressed mRNAs Multivariate Cox proportional hazards regression analysis was performed on the 38 prognosis-related differentially expressed mRNAs to construct an RS model. According to the RS, K-M analysis revealed that the high-risk group tended to have a poorer prognosis than that in the low-risk group (**Figure 4A**). In addition, AUCs of 1,3,5-year survival rates indicated high sensitivity and specificity of this RS model (**Figure 4B**). Finally GDC dataset were used to validate this RS model (**Figure 4C**). **5. Assessment and validation of the prognostic nomogram model containing the prognosis-related clinical parameters** The prognostic nomogram model was constructed from the above RS (**Figure 5A**). Then a combined model was chosen for assessment of the prognostic ability of the nomogram by means of the GDC dataset. As presented in **Figure 5B**, the prognostic nomogram model containing the prognosis-related clinical parameters is reliable.

Conclusions/Discussion: *KCNQ1OT1*, *PCDHA2*, *PLAG1*, *CALB2*, and *CD1B* can serve as biomarkers of colon cancer, and our prognostic nomogram model dealing with metastasis may be employed for the prognosis of colon cancer in clinical practice.



ANALYSIS OF CARTILAGE OLIGOMERIC MATRIX PROTEIN (COMP) SPLICE VARIANTS EXPRESSED IN COLON CANCER.

P1227

N. Omesiete, L. Nfonsam, J. Jandova, A. Cruz, R. Runyan, R. Heimark, T. Doetschman, V. Nfonsam
Tucson, AZ

Purpose/Background: Cartilage Oligomeric Matrix protein (COMP) plays a role in the assembly and stabilization of extracellular matrix and has been implicated in the process of colon cancer (CC) carcinogenesis. Studies have shown, COMP protein is upregulated in younger patients with CC and this upregulation is associated with tumor aggressiveness and earlier recurrence via it's co-expression with EMT genes. COMP protein is known to have four alternate splice variants and our previous mRNA study showed alternate splice variants 1 and 3 to be expressed in the normal colon and CC. The aim of this study was to confirm that the COMP alternate spliced variants are indeed translated into protein

Methods/Interventions: Protein expression analysis using western blot technique was performed on snap frozen tissue (healthy, tumor and matching adjacent) obtained from 6 patients with benign disease, sporadic early and late onset CC. Tissues were lysed and total protein extracted. Total Protein concentration was measured using a bicinchoninic acid (BCA) protein assay. Thirty micrograms of total protein lysate and recombinant human COMP protein (positive control) was separated by Sodium dodecyl sulfate–polyacrylamide gel electrophoresis (SDS-PAGE). Proteins were transferred from gel to a nitrocellulose membrane and Immunodetected using target protein (monoclonal and polyclonal antibody against COMP protein epitopes purchased from R&D system) and a loading control. Bands were visualized with chemiluminescence.

Results/Outcome(s): No expression of COMP protein was observed in the healthy, tumor or matching adjacent colon samples probed with monoclonal COMP antibody suggesting the absence of the epitope in normal colon or colon cancer tissue. When probed with COMP polyclonal antibody double bands were detected in all samples. The observation of these bands confirms our mRNA expression analysis that COMP alternate splice variants are transcribed and translated to functional proteins in normal colon and colon cancer.

Conclusions/Discussion: COMP alternate splice variants are differentially transcribed and expressed in normal colon and colon cancer suggesting a potential role as both diagnostic and therapeutic targets in colon cancer.

TO DIVERT OR NOT DIVERT? AN ACS NSQIP ANALYSIS EVALUATING THE ROLE OF PROXIMAL DIVERSION IN PATIENTS UNDERGOING EMERGENT RESECTION & PRIMARY ANASTOMOSIS FOR PERFORATED DIVERTICULITIS.

P01176

A. Pooni, M. Brar, A. de Buck van Overstraeten, R. Gryfe, H. MacRae, E. Kennedy
Toronto, ON, Canada

Purpose/Background: Recent evidence suggests primary anastomosis may be a safe alternative to Hartmann's procedure in the setting of emergent resection for perforated diverticulitis. However, the role of proximal diversion is not clearly defined, with its use inconsistently applied in the literature. Therefore, the objective of this study was to evaluate the effect of proximal diversion on 30-day surgical outcomes in a cohort of patients undergoing emergent resection and primary anastomosis for perforated diverticulitis.

Methods/Interventions: Eligible cases were identified in the 2013-2018 ACS NSQIP dataset using ICD10 codes 57.20 and 57.21 for perforated diverticulitis. For dataset years prior to ICD10 capture (2013-2015), cases were

identified using the ICD9 code 562.11 for diverticulitis and the corresponding emergent indication "perforation" in the targeted colectomy dataset. Eligible procedures of primary anastomosis with or without proximal diversion were identified using CPT codes 44140,44145, 44146,44204, 44207,44208. Both laparoscopic and open cases were included. Elective cases were excluded. To ensure complete capture of proximal diversion, concurrent procedure codes 44310, 44320,44187,44188 for laparoscopic and open diverting loop stomas were incorporated. Patient and procedure characteristics, and 30-day outcomes were abstracted. Multivariable logistic regression was used to evaluate the effect of proximal diversion on 30-day outcomes adjusting for confounding.

Results/Outcome(s): In total, 1653 cases met inclusion criteria. 1135 (68.7) underwent resection and primary anastomosis. 518 (32.4%) underwent resection, primary anastomosis and proximal diversion. The groups differed significantly with respect to ASA class, pre-operative WBC count, incidence of pre-operative SIRS/sepsis, use of laparoscopy and wound classification. On multivariable logistic regression, primary anastomosis without proximal diversion was associated with a higher odds of mortality *(HR=2.31, 95% CI:1.24-4.31)*, septic shock *(HR=2.71, 95%CI:1.72 – 4.24)* and failure to wean off of ventilator support *(HR=4.6, 95% CI:2.72 – 7.90)*. Conversely, the absence of proximal diversion was associate with decreased odds of readmission *(HR=0.54, 95% CI:0.36 – 0.75)*. No difference in incidence of surgical site infection, prolonged length of stay or reoperation was observed (table 1).

Conclusions/Discussion: In this study, primary anastomosis without diversion was associate with increased odds of post-operative septic shock, failure to wean off ventilator support and mortality. Despite the decreased readmission rate, given the seriousness of these complications, these findings support the use of proximal diversion in the setting of perforated diverticulitis when primary anastomosis is being considered.

30 Day Outcomes *(reference = Anastomosis +Diversion)*	Adjusted Odds Ratio (95% CI)	P-value
Mortality	**2.31 (1.24 - 4.31)**	**<0.001**
Post-Operative Septic Shock	**2.71 (1.72 – 4.24)**	**<0.001**
On Ventilator Greater Than 48h	**4.64 (2.72 – 7.90)**	**<0.001**
Incisional Wound Complications	3.76 (2.332-6.176)	0.62
Organ Space Surgical Site Infection	0.83 (0.59 – 1.17)	0.29
Re-Admission	**0.54 (0.36 – 0.75)**	**<0.001**
Re-Operation	1.06 (0.70 – 1.61)	0.78
Length of Stay > 14d	1.1 (0.81 – 1.50)	0.55

Table 1: Multivariable analysis: Adjusted odds of 30-day outcomes

RISK PREDICTION AND TREATMENT OF HEMORRHAGIC CHRONIC RADIATION ENTERITIS PATIENTS WITH LOWER EXTREMITY DVT AFTER PELVIC MALIGNANCY RADIATION.

P1251

X. Huang, Y. Kuang, Z. Yuan, M. Zhu, Q. Zhong, J. Wang, H. Wang, T. Ma
Guangzhou, China

Purpose/Background: After pelvic malignancy radiation, chronic radiation-induced enteritis (CRE) is an unavoidable and common complication, and it is progressive and difficult to reverse. Lower extremity deep venous thrombosis (LEDVT) is another severe complication, which can cause cardiopulmonary embolism or even death. Moreover, bleeding is one of the most common symptoms of CRE. Once hemorrhagic CRE patients suffer from LEDVT, hemostasis and anticoagulation therapy will be adopted simultaneously, which is a therapeutic paradox. This study aimed to investigate prevalence and associated risk factors for LEDVT in CRE patients after pelvic malignancy radiation, then to explore treatment for hemorrhagic CRE patients with LEDVT.

Methods/Interventions: A total of 608 CRE patients after pelvic malignancy radiation treated in our hospital between November 2011 to October 2018 were retrospectively analyzed. Univariate analysis was conducted to investigate the risk factors for LEDVT in CRE patients. Multivariate analysis and receiver operating characteristic (ROC) curve analysis were performed to identify independent risk factors and determine their clinically valid cut-off points. Further, treatment of hemorrhagic CRE patients with LEDVT was explored.

Results/Outcome(s): Of the 608 CRE patients, there were 94 (15.5%) CRE patients with edema in the lower limbs, 32 (5.3%) patients were diagnosed with LEDVT. Among the CRE patients with LEDVT, 65.6% (21/32) patients were with hematochezia simultaneously, 29 (90.6%) patients were anemic, with 17 (53.1%) patients having moderate anemia and 7 (21.9%) having severe anemia. Multivariate analysis showed recent surgical history (≤6 Month) (OR=4.411, P=0.030), hemoglobin (Hb) (OR=0.964, P=0.038) and D-dimer (OR=1.264, P=0.023) significantly associated with development of LEDVT. ROC curve analysis showed optimal cut-off values of Hb and D-dimer were 82.5 g/L and 1.11 μg/mL, respectively. After colostomy, obvious bleeding remission was found in 84.6% of hemorrhagic CRE patients with LEDVT rapidly. And LEDVT of the patients were obvious improved or disappeared following anticoagulation therapy or with vena cava filter or stent placement.

Conclusions/Discussion: Prevalence of LEDVT was 5.3% in CRE patients. And recent surgical history, Hb and D-dimer were the independent risk factors, which could potentially be diagnostic markers for predicting

the presence of LEDVT in CRE patients. When the Hb is lower than 82.5 g/L in CRE patients, recent surgical history is shorter than six months, or/and the D-dimer is higher than 1.1 μg/mL, it is necessary to note whether there is LEDVT or not. In addition, colostomy treatment might be a good choice for intractable hemorrhagic CRE patients with LEDVT, in whom it was much safer to adopt anticoagulant therapy after colostomy, followed by obvious bleeding remission.

ELECTIVE SURGERY FOR DIVERTICULAR DISEASE IN U.S. VETERANS: A VASQIP STUDY OF NATIONAL TRENDS AND OUTCOMES FROM 2004-2018.

P1228

M. Napolitano[1], J. Randall[2], F. Brody[1], J. Duncan[1]
[1]*Washington, DC;* [2]*Maywood, IL*

Purpose/Background: Indications and techniques for elective surgery to treat diverticular disease have changed with time. In the U.S., recent studies have demonstrated a trend towards minimally invasive surgical approaches with a decrease in postoperative complications. No study has investigated this subject in veterans receiving care within the Veterans Health Administration. This study's objective was to determine and compare the practice patterns in surgical approaches and outcomes with respect to elective surgical management of diverticular disease in U.S. veterans over the past fifteen years using the Veterans Administration Surgical Quality Improvement Project (VASQIP) database.

Methods/Interventions: Patients undergoing elective, non-emergent surgery for diverticular disease were identified by targeted ICD and CPT codes within the VASQIP database between the years 2004 to 2018. Demographics, comorbidities, operative approach (open, laparoscopic, robotic), rates of ostomy creation, and postoperative complications were collected for comparison during the study time period using chi-square tests. The 15-year time period was divided into 3-year increments to assess changes in approaches and outcomes over time.

Results/Outcome(s): A total of 4,719 patients met inclusion criteria for analysis. Rates of open surgery decreased (83.4% to 51.2%, p<0.001) while use of laparoscopy increased from 16.6% to 48.8% (p<0.001) between the beginning and end of the study period. The rates of overall complications decreased significantly during the years reviewed (27.8% to 16.3%, p<0.001), as did infectious complications (24.4% to 11.0%, p<0.001) and wound complications (20.8% to 9.9%, p<0.001). The mean BMI of the cohort, the use of robotic surgery, and the percentage of female patients increased significantly across the sample period. Rates of ostomy creation did not change significantly (18.2% to 20.7%, p=0.296), but hospital length-of-stay decreased from an average of 9.2 to 7.2 days (p<0.001). A total of 68 cases (1.4%) were performed robotically, with no robotic cases performed prior to 2013.

Conclusions/Discussion: The increased utilization of laparoscopy in veterans undergoing elective surgery for diverticular disease coincided with a significant decrease in the rate of overall, infectious, and wound complications as well as a decrease in the average length-of-stay following surgery. These trends mirror those reported nationally in non-veteran patients. The rates of complications and ostomy creation were higher in veterans compared to the civilian population, which may be due to a higher incidence of comorbidities and tobacco use in our veteran cohort. Robotic surgery represents a very small fraction of operations performed in this study. The explanations behind these trends may warrant additional investigation.

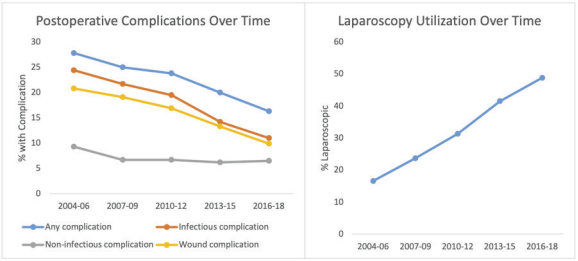


Figure: Complication rate after elective surgery for diverticular disease per year, correlating with an increase in the use of laparoscopy over the study period

COMPLICATIONS OF PROTECTIVE ILEOSTOMY REVERSAL POST LOW ANTERIOR RESECTION: DOES THE TIME HAVE AN IMPACT ON THE OUTCOME?

P1229

F. Sauri[1], A. Sakr[2], M. Alessa[1], E. Zakarneh[1], S. Yang[1], N. Kim[1]
[1]*Seoul, Korea (the Republic of);* [2]*Mansoura, Egypt*

Purpose/Background: A protective ileostomy is a common surgical procedure, the optimal timing for its closure remains controversial, most of the surgeons are closing ileostomy after 2-3 months, Although ileostomy closing considered a simple procedure it can cause significant morbidity, the complications related to ileostomy are two types, complications related to the presence of stoma which increasing by the increase in the duration to its reversal and complications related to its closure. This study aims to evaluate the complications after closure of protective ileostomy in rectal cancer patients and to clarify any relation between its rate and type and the time from the creation to the closure.

Methods/Interventions: Data from January 2010 to December 2017 from severance hospital, Yonsei University South Korea, a total number of 405 patients who had protective ileostomy and ileostomy closure were retrospectively reviewed. Our sample has been enrolled in 2 arms,

the first arm includes whose ileostomies closed at or before three months and the second arm involved whose ileostomies closed after three months from the index surgery, Statistical analysis was performed and compared in both arms

Results/Outcome(s): After the analysis, we found 72% of our patients were males, with a mean age of 60 years, the patients who have higher clinical stage, have low location rectal cancer, who received neoadjuvant chemoradiotherapy, and received adjuvant chemotherapy were higher in number with significant p values in the arm who's ileostomies closed after three months. Univariate analysis revealed that the interval between the ileostomy creation and closure was not a significant risk factor for the whole postoperative complication, The majority of the complications were surgical site infection and ileus, surgical site infection was found to be significantly higher in the group which ileostomies were closed in duration less than or equal three months from the index surgery with ($p= 0.002$), and in the patients whose hospital stay was more than seven days ($p=0.010$), There was no significant association between the interval and the postoperative ileus and adhesions ($p= 0.280$) although both were higher in the group which closed after three months, The hand-sewn anastomosis was a significant risk factor for the whole complications ($p=0.035$) and intestinal obstruction complications (ileus and adhesive obstruction) with ($p= 0.001$), The rate of overall complications post closure in our hospital was 24%.

Conclusions/Discussion: Unlike its effect on the pre-closure complications noted in the literature, the duration between the creation of protective ileostomy and its reversal was not a significant independent predictor of post-closure complications rate in our study but it found to have impaction in the complications types particularly the surgical site infection.

TRANSANAL MINIMALLY INVASIVE SURGERY (TAMIS) IS AN EFFECTIVE APPROACH FOR PATIENTS WITH ANASTOMOTIC FAILURE REQUIRING REDO PROCTECTOMY.

P1232

S. Hill, S. Hahn, D. Meyer, C. Harnsberger, P. Sturrock, J. Davids, K. Alavi, J. Maykel
Worcester, MA

Purpose/Background: Anastomotic leak or stricture are reported in 5-20% of patients after proctectomy and are a cause of significant patient morbidity such that redo pelvic surgery may be required. Transanal minimally invasive surgery (TAMIS) can facilitate direct access to the pelvis with increased visualization and maneuverability for technically difficult redo surgery.

Methods/Interventions: Patient characteristics, initial surgery, interval history, and redo proctectomy data were reviewed retrospectively from consecutive patients who were referred to our medical center for redo proctectomy via TAMIS over an 18-month period.

Results/Outcome(s): Seven patients underwent redo proctectomy with the TAMIS approach. Initial operations were low anterior resection (LAR; n=6) for rectal cancer following neoadjuvant chemoradiation and restorative total proctocolectomy with pouch reconstruction (n=1) for familial adenomatous polyposis. All had primary anastomoses with diverting ileostomy. At the time of anastomotic failure, five patients no longer had their diverting ileostomy while two were still diverted (loop ileostomy from initial surgery and end sigmoid colostomy for chronic pelvic abscess). Anastomotic defect (n=6) or stricture (n=1) were evaluated by history and physical, contrast enema, and endoscopy. Median time from initial operation to redo proctectomy was 27 months (range:13-67). Redo proctectomy with the TAMIS approach included redo-LAR with coloanal anastomosis and diverting loop ileostomy (n=4), completion proctectomy with end colostomy (n=2), and pouch resection with end ileostomy

P1232

Patient and Operative Characteristics	TAMIS patients (n = 7)
Age at TAMIS, years, median (IQR)	45 (38-51)
Gender, male, n (%)	4 (57%)
Body mass index, median (IQR)	24 (21-29)
American Society of Anesthesiologists classification, III or IV	3 (43%)
Prior pelvic radiation (neoadjuvant therapy)	6 (86%)
Time interval from initial surgery to redo proctectomy, months, median (IQR)	27 (15-39)
Cystoscopy, bilateral ureteral stents	7 (100%)
Abdominal approach, open	6 (86%)
Length of surgery, hours, median (IQR)	6.4 (5.6-7.0)
Redo coloanal anastomosis, successful (n=4)	4 (100%)
Post-TAMIS length of stay, median (IQR)	8 (6-9)
Time interval from TAMIS to stoma reversal, months, median (IQR) (n=4)	4 (4-6)

(n=1). The abdominal portion was performed open for 6 patients (86%). All had cystoscopy with bilateral ureteral stent placement. The two patients who underwent completion proctectomy had left gracilis muscle flap closure of the perineal wound. Median operative time was 6.4 hours (IQR 5.6-7.0). Intraoperatively, two sustained carbon dioxide emboli (n=2), which resolved with supportive care and did not require conversion or termination. There were no other intraoperative complications. All four planned redo coloanal anastomoses were successfully created. Hospital length of stay was a median of 8 days (IQR 6-9). There were three readmissions within 30 days (two superficial SSI, one dehydration). No patients had post-operative anastomotic leaks and all four diverted patients were reversed at a median of 4 months (IQR 4-6). All symptoms prompting redo surgery remain resolved at an 18-month median follow-up (range: 8-26).

Conclusions/Discussion: For those with expertise in transanal surgery, TAMIS is a safe and effective option for patients with anastomotic failure requiring redo proctectomy as it provides direct access to and visualization of the pelvis. The ability to transect the rectum under direct vision and preserve the sphincter complex facilitates the opportunity to restore intestinal continuity.

MCKITTRICK-WHEELOCK SYNDROME: A CASE SERIES.

P1233

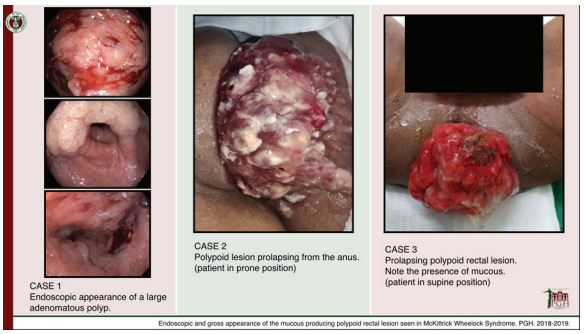
M. Villanueva, M. Tampo, M. Lopez
Manila, Philippines

Purpose/Background: McKittrick-Wheelock syndrome (MKWS) is a rare and life-threatening disease characterized by the triad of 1) chronic mucous diarrhea, 2) renal function impairment with hydroelectrolyte imbalance, and 3) a giant colorectal tumor. Often, the tumor is a rectal adenoma. With the mortality being certain, if left untreated, it is important to raise awareness on the presentation, diagnosis, and management of this disease entity. Here, we report of 3 cases of MKWS.

Methods/Interventions: This is a case series of three patients managed as McKittrick-Wheelock syndrome at the Philippine General Hospital from August 2018 to May 2019.

Results/Outcome(s): Case 1: A 47/F presented with chronic watery diarrhea, prerenal azotemia, and encephalopathy from severe hyponatremia. She had a huge adenomatous polyp at 3cm from anal verge (FAV), with the biopsy showing a tubulovillous adenoma. After rectal resection, reversal of cessation of the diarrhea and reversal of the azotemia were noted. **Case 2:** A 62/F who was having diarrhea for a year, with a history of hospital admissions for recurrent hypokalemia and hyponatremia. On admission the patient was azotemic, requiring hemodialysis. She had a large polypoid lesion that was prolapsing from her anus, the biopsy of which was tubulovillous adenoma. Final histopathology after rectal resection showed a pT2N0 well-differentiated cancer. **Case 3**: A 65/M with a prolapsing rectal mass with copious mucoid discharge. He also had chronic diarrhea. On admission, he was found to be azotemic, with hypokalemia and hypochloremia. Although determined to be a tubuvillous adenoma on initial biopsy, the mass was eventually reported to have carcinoma in situ after being resected.

Conclusions/Discussion: We presented three cases of MKWS that were successfully managed with surgical resection. Resolution of their symptoms, reversal of their renal impairment, and correction of their electrolyte depletion were noted after removal of the tumor with a sphincter-saving operation.



Endoscopic and gross appearance of the mucous producing polypoid rectal lesion seen in McKittrick Wheelock Syndrome. PGH. 2018-2019.

NEGATIVE PRESSURE WOUND THERAPY AFTER OSTOMY CLOSURE.

P1234

B. Kline, E. Olecki, D. Brinton, W. Koltun
Harrisburg, PA

Purpose/Background: After ostomy closure, management of the stoma site wound is widely variable. In this study we evaluated patients who underwent ostomy closure managed with negative pressure wound therapy (NPWT) versus those managed by packing or partial closure to determine whether NPWT was associated with decreased subsequent wound infection complications at the stoma site.

Methods/Interventions: We retrospectively identified 318 patients who had undergone either colostomy or ileostomy closure between July 2015 and June 2019. Chart review was performed to gather characteristics of these patients including sex, age at surgery, disease (IBD, cancer, diverticulitis, or other), and management of the previous stoma site (no NPWT or NPWT). NPWT was placed intraoperatively and discontinued prior to patient discharge from the hospital. The endpoint of this study was wound infection, defined by the need for wound probing

and initiation of antibiotics. Wound infections were further divided into those that occurred before hospital discharge or those found at a follow up appointment within 30 days.

Results/Outcome(s): There were 16 postoperative wound infections out of 318 stoma closures (5%). Six of these were before discharge, while 10 were at follow up appointments. Wound infections were higher in colostomies (7/112 or 6%) compared to ileostomies (9/206 or 4%), although this was not significant (p=0.6). A table comparing the No NPWT group to the NPWT group is attached. There was no significant difference in wound infection rate between NPWT and wound packing. Although not statistically significant, the lowest infection rates were found in the NPWT prior to hospital discharge (2/135 or 1%), with a subsequent increase in infection post discharge once NPWT was discontinued (7/133 or 5%).

Conclusions/Discussion: This study found an overall wound infection rate of 5% in patients with ostomy closure at our institution over the last 4 years. There was a trend toward decreased early infection rates while hospitalized in patients with NPWT in place, with increasing rates after NPWT discontinuation and discharge.

P1234

	No NPWT N=183	NPWT N=135	p-value
Sex			0.04
-Female	70 (38%)	68 (50%)	
-Male	113 (62%)	67 (50%)	
Age at surgery			0.5
-≤55	104 (57%)	65 (48%)	
->55	79 (43%)	70 (52%)	
Disease			<0.001
-Cancer	40 (22%)	42 (31%)	
-Diverticulitis	52 (28%)	57 (42%)	
-IBD	62 (34%)	30 (22%)	
-Other	29 (16%)	6 (5%)	
Stoma type			0.001
-Colostomy	50 (27%)	62 (46%)	
-Ileostomy	133 (73%)	73 (54%)	
Infection			0.3
-No	176 (96%)	126 (93%)	
-Yes	7 (4%)	9 (7%)	
Infection timing			0.3
-Early	4 (57%)	2 (22%)	
-Late	3 (43%)	7 (78%)	

IS THERE ONE SIZE FITS ALL SOLUTION FOR SPECIMEN EXTRACTION FOR MINIMAL INVASIVE SURGERY FOR COLORECTAL CANCER?

P1236

C. Kim
Hwasun, Korea (the Republic of)

Purpose/Background: Periumbilical midline incision is most commonly used in laparoscopic colon cancer surgery, and more frequently used for single incision surgery. However, it is associated with high incidence of IH as high as 40%. We aimed to reduce the incidence of incisional hernia (IH) in specimen extraction site in patients undergoing laparoscopic colon cancer surgery by applying a new muscle splitting transumbilical incision.

Methods/Interventions: All of the patients who underwent elective laparoscopic colectomy due to colon malignancy from June 2015 to May 2017 in the Department of Colon and Rectal Surgery, Chonnam National University Hwasun Hospital, Gwangju, South Korea were selected and their medical records were reviewed. All patients had either vertical (n=429) or newly invented periumbilical transverse incision (n=125).

Results/Outcome(s): During median length of follow-up period of 23.6 (range; 3-41) months, incisional hernia was occurred in 12.1% (67/554) of patients. The median time from index surgery to hernia diagnosis was 4.3 months (range 1-23.3 months). Symptomatic

hernia was 22.3% (15/67) and incisional herniorrhapy was performed in 10.7% (7/67) during the study period. The hernia incidence was significantly lower in transverse group (3 vs 64, 2.4% vs 14.9%, $p<0.001$). On multivariate analysis, BMI ≥ 23 (OR 2.282, 95% CI 1.245-4.182, $P = 0.008$) and postoperative surgical site infection (OR 3.780, 95% CI 1.969-7.254, $P < 0.001$) and vertical incision (OR 7.113, 95% CI 2.173-23.287, $P < 0.001$) were independently related with increased incidence of incisional hernia

Conclusions/Discussion: Transumbilical transverse incision dramatically reduced the rate of incisional hernia in minimally invasive colorectal resection. Also high BMI and SSI are independent risk factors for incisional hernia. We suggest a new method of incision for various laparoscopic surgeries as well as specimen extraction in minimally invasive colorectal resection.

DISSEMINATED HISTOPLASMOSIS REQUIRING OPERATIVE INTERVENTION FOR RECURRENT BOWEL OBSTRUCTIONS; IMPORTANT CONSIDERATIONS FOR SURGICAL DECISION-MAKING.

P1237

K. Peterson, C. Davitt, J. Evans, K. Ludwig
Wauwatosa, WI

Purpose/Background: Histoplasmosis is a rare fungal infection that can disseminate to the gastrointestinal system and cause a diffuse fibrotic process. We describe the case of a patient with disseminated histoplasmosis who presented with multiple readmissions for recurrent bowel obstructions previously managed with medical therapy alone. Surgical consultation was sought due to the impairment on quality of life and the frequency of recurrence.

Methods/Interventions: Progression of the disease is chronicled by colonoscopic, histological, radiographic, and surgical images. A thorough diagnostic investigation identified a focal stricture at the ileocecal valve and after appropriate pre-operative planning, including optimization of nutrition, colonoscopic evaluation, and appropriate antifungal therapy, the patient underwent ileocolic resection with primary ileocolic anastomosis. The patient's post-operative resolution of symptoms and improved quality of life provides insight into clinical management of recurrent bowel obstructions.

Results/Outcome(s): A review of the current literature does not provide clear guidelines of when recurrent partial bowel obstructions should be managed operatively, but instead, the decision is often guided by case-by-case scenarios based on clinical judgment.

Conclusions/Discussion: This case illustrates a number of important surgical decision-making considerations to help guide surgeons should they be presented with an unusual cause of a common clinical scenario – recurrent bowel obstructions.

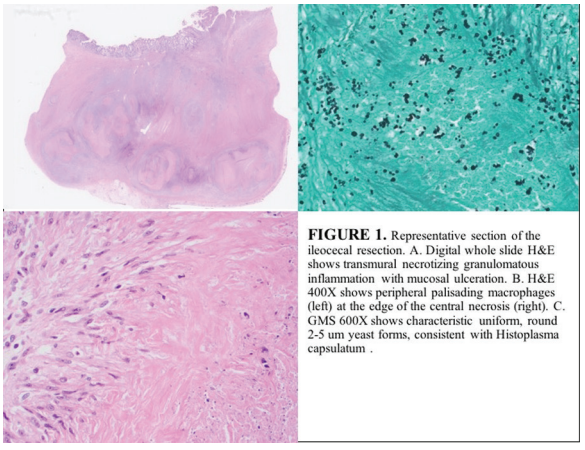


FIGURE 1. Representative section of the ileocecal resection. A. Digital whole slide H&E shows transmural necrotizing granulomatous inflammation with mucosal ulceration. B. H&E 400X shows peripheral palisading macrophages (left) at the edge of the central necrosis (right). C. GMS 600X shows characteristic uniform, round 2-5 um yeast forms, consistent with Histoplasma capsulatum .

THE EFFECT OF AN ILEOSTOMY OUTPUT BASED DISCHARGE PROTOCOL ON READMISSION AND ACUTE KIDNEY INJURY RATES.

P1238

A. Cunningham[1], B. Gontarz[2], U. Siddiqui[2], R. Scott[3], A. Raissis[3], D. Mullins[3], A. Ayers[3], S. Banerjee[3], R. Lewis[3], S. Brown[3]
[1]Farmington, CT; [2]Hartford, CT; [3]Bloomfield, CT

Purpose/Background: Readmission rates after ileostomy creation are reported to be between 12 - 35% in the current literature. The association between high ileostomy output and readmission within 30 days of discharge as well as acute kidney injury has been described. Previous studies have addressed whether implementing enhanced recovery protocols have affected the readmission rate. In those instances, a multidisciplinary approach was implemented and the combined effect analyzed. The purpose of our study was to evaluate whether an ileostomy output based discharge protocol alone decreased 30 day readmission rates and acute kidney injury on readmission at our institution.

Methods/Interventions: A single center retrospective review was performed on patients who received an ileostomy between April 2014 and December 2018. One element of our protocol for patients with an ileostomy includes maintaining ostomy output between 500 - 1200cc for two consecutive days prior to discharge. The compliant group (CG) was defined as those with ostomy outputs >500cc and <1200cc in the two days prior to discharge,

excluding the day of discharge. The non-compliant group (NCG) was defined as those who either had high or low output on either day prior to discharge.

Results/Outcome(s): A total of 169 patients underwent ileostomy creation during our study period. Approximately 50% of our patients were ≥ 65 years of age. Ileostomy output compliance rate was 43.78% (n=74) for both days prior to discharge. Both compliant and non-compliant groups were comparable in terms of age, gender, BMI and comorbidities. The compliant group had a higher proportion of patients who underwent elective operation (CG 67.6% vs NCG 38.7%, p-value 0.001). There was no difference in the surgical approach or type of ileostomy in the two groups. There was no observed difference in the length of stay (CG 10.97±9.49 days vs NCG 11.06 ± 7.02 days, p-value 0.943), readmission rate (CG 17 (23.0%) vs NCG 9 (9.5%), p-value 0.851) and rate of acute kidney injury on readmission (CG 8 (10.8%) vs NCG 9 (9.5%), p-value 0.774) in our cohort. The difference in the aforementioned parameters was still insignificant when separating patients according to low, high or low and high ostomy outputs.

Conclusions/Discussion: Although the existing literature identifies high ileostomy output as a predictor of readmission after ileostomy creation, our retrospective study does not suggest that implementing a discharge protocol based on ileostomy output alone affects readmission rates or acute kidney injury on readmission. In both of our groups, readmission and acute kidney injury rates were comparable. Further investigation should be performed to evaluate if other strategies to decrease readmission rates after new ileostomy creation are more successful.

A COMBINED VASCULAR AND COLORECTAL SURGERY APPROACH TOWARDS MANAGEMENT OF AN INFECTED AORTO-COLONIC FISTULA.

P1239

S. Rangarajan[1], N. Mantilla[2]
[1]*Colton, CA;* [2]*Chicago, IL*

Purpose/Background: Patient is an 81 year old female with a history of a symptomatic 8 cm Abdominal Aortic Aneurysm status-post Endovascular Repair in February 2017, complicated by development of a type II endoleak. She remained asymptomatic until August 2019 when she presented with hematochezia and abdominal pain. CT Angiography demonstrated an increase in aortic aneurysm size with gas in the aortic sac and inflammation in the adjacent sigmoid colon, consistent with an aorto-colonic fistula. Vascular and Colorectal surgery teams worked in conjunction to approach this challenging case.

Methods/Interventions: Vascular team began and noted that the sigmoid was densely adherent to the aneurysm sac. Proximal control as obtained. However, the large aneurysmal mass with adherent colon obstructed the left common iliac artery. At this point, Colorectal proceeded. Colon distal to the aneurysm was freed and the bowel was transected distally with a stapler. The same was done proximal to the aneurysm. The adherent freed colon was then carefully dissected off of the aneurysm sac. Vascular then completed the aortic reconstruction. Colorectal noted that the proximal rectosigmoid stump was ischemic and resected this with a stapler. Splenic flexure was then mobilized to perform a colorectal anastomosis and divert proximally. However, the descending colon was ischemic and 15 cm of colon were resected, resulting in a completion left hemicolectomy. The middle colic vessels and marginal artery were evaluated with Doppler and did not have good signals. Mesentery of the proximal end of colon did have strong Doppler signals. End colostomy was brought out of left lower quadrant and matured after closure of the abdomen.

Results/Outcome(s): Patient recovered well post-operatively. She was extubated on post-operative day 3 and was started on a liquid diet. Stoma function improved. Patient did develop a DVT that was treated with systemic anticoagulation. Patient was subsequently discharged to a rehab facility. She presented again to the hospital less than two weeks later with hematemesis and via stoma. EGD confirmed an ulcer with a bleeding vessel that was treated endoscopically. She was subsequently discharged to a rehab facility and recovered well. Patient was seen in clinic recently and noted to have a well-functioning stoma. Her oral intake and nutritional status are both poor and she is improving this with g-tube and protein shake supplementation.

Conclusions/Discussion: A combined approach between vascular and colorectal surgery to stabilize an infected aorto-colonic fistula concerning for impending rupture is described here. A transabdominal approach was utilized, with vascular exposure proceeding first followed by resection of the involved colon to facilitate further exposure, finishing with aortic reconstruction and ostomy maturation. This proved to be an efficient and effective means of managing this complex and rare disease process.

Sigmoid Colon adherent to Aortic Aneurysm Sac

IDENTIFICATION OF RISK FACTORS FOR ANASTOMOTIC LEAK IN PATIENTS WITH ACUTE COMPLICATED DIVERTICULITIS UNDERGOING PRIMARY ANASTOMOSIS.

P1240

H. Consuegra, C. Buzas, K. Long, R. Hoffman
Danville, PA

Purpose/Background: Historically, acute complicated diverticulitis has been managed with a Hartmann's procedure. However, recent data has suggested that primary anastomosis (PA), with or without a diverting loop ileostomy (DLI), is a safe option. This study aimed to evaluate risk factors associated with anastomotic leak in patients who underwent a sigmoid colectomy with primary anastomosis for complicated diverticulitis.

Methods/Interventions: All patients who underwent a laparoscopic or open sigmoid colectomy with PA, with or without a DLI, for the treatment of acute complicated diverticulitis were identified in the NSQIP PUF from 2016-2017. Clinical characteristics and 30-day outcomes were compared for patients who experienced a leak versus those that did not. Multivariate logistic regression was utilized to identify factors associated with the development of an anastomotic leak.

Results/Outcome(s): There were 1,989 patients identified with acute complicated diverticulitis; of those, 497 patients were managed with a sigmoid colectomy and PA. Patients were predominately female (279; 56.1%), with a mean age of 61 years. Seventy-nine (15.9%) patients had a DLI, while 418 (84.1%) did not. There were 26 anastomotic leaks identified (5.2%). Of those, 5 (19.2%) had a DLI. There was no significant difference in the rate of leak between those with a DLI (5; 6.3%) and those without (21; 5.3%) (p=0.59). On univariate analysis, there were no significant differences between the clinicodemographic characteristics of patients who experienced or did not experience a leak except for smoking (38.5% vs 18.5%; p=0.02) and chronic steroid use (23.1% vs 9.3%; p=0.04). On multivariate analysis, current smoking (OR 4.02; 95% CI 1.44-11.26) and chronic steroid use (OR 3.84; 95% CI 1.16-12.69) remained the only significant predictors of anastomotic leak. Inpatient mortality (15.4% vs. 4.9%; p=0.05), unplanned reoperation (50.0% vs. 5.3%; p<0.001), unplanned readmission (38.5% vs. 28.2%; p>0.001), ileus (57.7% vs. 29.7%; p=0.003) and prolonged ventilator dependence (30.8% vs. 12.1%; p=0.006) were all significantly worse in those with a leak than without a leak respectively.

Conclusions/Discussion: In patients presenting with acute complicated diverticulitis requiring surgical intervention, there was an increased risk of anastomotic leak noted in current smokers and in patients on chronic steroids, regardless of the presence of a DLI. Knowledge of these specific risk factors may help influence operative decision making and decrease the morbidity and mortality of an anastomotic leak.

CONCOMITANT FISSURE-FISTULA: SPOTTING THE ZEBRAS AMONGST THE HORSES.

P01228

D. Mckeown, K. Wilkins, J. Calata, B. Chinn, S. Alva, J. Notaro
Philadelphia, PA

Purpose/Background: Current literature suggests that the overall incidence of an anal fissure in the general population is 11%, with the majority of these occurring in the posterior midline. What has not been studied, however, is the presence of a concomitant fistula, which is identified either in the office or at the time of definitive surgery for the fissure. Examination in the office is usually difficult due to the pain associated with the fissure. There is a lack of data with respect to concomitant fissure fistulas in the Colorectal surgery literature.

Methods/Interventions: IRB approval was obtained by Hackensack-Meridian Health. We conducted a retrospective review of all adult patients (>18 years of age) treated for anal fissure between July 1st, 2015 and December 31st, 2018. Patients were identified using ICD-10 codes. Patients who were identified as having a fistulotomy at the time of surgery were identified using CPT codes. These

patients were analyzed separately, looking at patient demographics, operative details, and whether the fistula was identified preoperatively.

Results/Outcome(s): A total of 284 patients were identified who presented to our practice for the treatment of an anal fissure. There were 139 males (48.9%), the average age was 45.4 (range 18-91), and the average BMI was 29.1. We identified 37 patients who had a concomitant fissure fistula (7.7%). Of these patients, 59.5% were male (n=22), and the average age was 45.1 (range 22-73). The average length of symptoms before presenting to the office was 32.6 weeks, and all of these patients failed non-operative management with a calcium channel blocker. A hypertrophic papilla was identified in 23 patients (62.2%), and a fistula was identified before an operative procedure in 16 patients (43.2%). 94.6% of the fissure fistulas were identified in the posterior midline, with the remainder in the anterior midline. The fistula was noted to be inter-sphincteric in 23 patients (65.7%). EUA, Botox injection, and fistulotomy was performed the majority of the time 81.1% (n=30), and the majority of the Botox was injected circumferentially (83.8%). The rate of recurrence of the fissure was 21.6% (n=8); 6 of these patients were treated conservatively and improved; 2 were treated with lateral internal sphincterotomy. The average length of follow-up was 78.6 months.

Conclusions/Discussion: Concomitant fissure-fistula is an under-reported phenomenon in the current literature. We report a prevalence of 7.7% in our population. The authors feel that is important to recognize that when a fissure-fistula that involves muscle is treated with fistulotomy acts in a similar way to performing a lateral internal sphincterotomy (LIS). One should aim to identify a fistula prior to sacrificing muscle as a fistulotomy after sphincterotomy may increase the risk of incontinence.

DO FISTULAS HEAL AT DIFFERENT RATES DEPENDING ON LOCATION? A LOOK AT SECOND STAGE FISTULA REPAIR.

P1241

J. Berry
Shreveport, CT

Purpose/Background: Fistula-in-ano remains a challenging disease to treat, especially fistulas that are not amenable to simple fistulotomy. We wanted to take a look at the "second stage fistula repair" procedures of endorectal advancement flap, LIFT procedure, and fistula plug and whether fistula location had any effect on fistula healing rate.

Methods/Interventions: We looked at a 7-year series of 3 surgeons using the CPT codes for endorectal mucosal advancement flap, LIFT procedure, and fistula plug. We included all cases whose operative notes reflected these codes and we excluded any cases with unclear documentation. We wanted to ask if fistula location had any effect on healing rate of the fistula and we looked at other variables as well such as time to recurrence and whether it was a redo or not. End points were clinical evidence of healing or recurrence based on office exam. We ended up with n=50 total cases.

Results/Outcome(s): 42% of fistulas being treated with second stage repair were "anterior" and these had a 19% recurrence rate. 22% of fistulas were "posterior" and these had a 36% recurrence rate. 16% of fistulas were "lateral" and these had a 50% recurrence rate. Flap repair was chosen for anterior fistulas 86% of the time and for posterior fistulas 100% of the time. Lateral fistulas were repaired by LIFT 50% of the time and by flap 38% of the time. In general, use of fistula plug carried the highest recurrence rate, followed by LIFT and advancement flap. Whether the operation was a "redo" or not did not have a significant effect on fistula healing rate. In total, this 3-surgeon group had a recurrence rate for flap, LIFT, or plug repair of 32%.

Conclusions/Discussion: In conclusion, this group of surgeons tended to pick endorectal advancement flap for the vast majority of their second stage fistula repairs and they achieved good results consistent with the existing literature for advancement flap fistula closure. They tended to choose flap closure for anterior and posterior fistulas, while they tended to choose the LIFT procedure for lateral fistulas. Interestingly, the LIFT procedures were most successful in anterior and posterior located fistulas, with 100% of the recurrences for LIFT being in the lateral position. It should be said, however, that the lateral fistula group did have the highest recurrence rate (50%) when compared to the anterior (19%) and the posterior (36%) groups, suggesting a higher recurrence rate in general with lateral fistulas. In this cohort we did not see an increase in recurrence in "redo" second stage fistula repair, which is inconsistent with the current literature.

ENDOSCOPIC TREATMENT AND COLOSTOMY CAN SHORTEN THE CLINICAL COURSE OF HEMORRHAGIC CHRONIC RADIATION PROCTOPATHY.

P1242

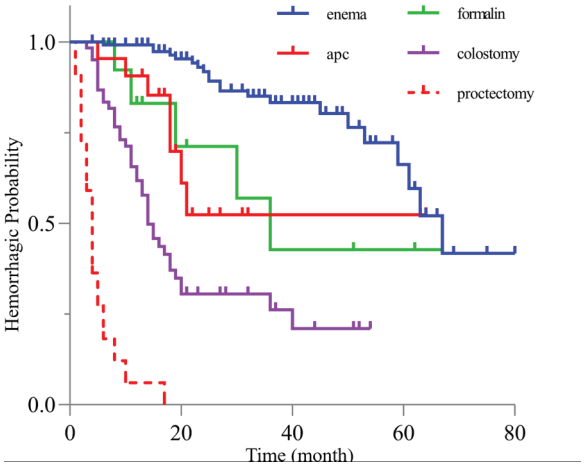
Z. Liu, Z. Yuan, Q. Zhong, T. Ma
Guangzhou, China

Purpose/Background: Despite many treatments were proved useful treatments to hemorrhagic chronic radiation proctopathy, the clinical course of hemorrhagic chronic radiation paoctopathy and efficacy of different treatments on it still unclear.

Methods/Interventions: The clinical course of chronic radiation proctopathy were measured by descriptive statistics. Univariate and multivariate analysis of risk factors for duration of hemorrhage and complications were conducted by logistic regression analysis.

Results/Outcome(s): Results: 309 cases with hemorrhage as the main symptom were screened out from 703 patients with chronic radiation proctopathy. Among them, 293(95%) were females, and 266(86.1%) were cervical cancer. The median latency of hemorrhage was 8 months. The average period of hemorrhage was 24.1(±18.7) months. The duration of hemorrhage was influenced by different treatments, and the order of curative effect is: proctectomy > colostomy > formalin = APC > enema. Increasing Hb levels were observed and tended to be stable in 2 years after radiotherapy. Different treatment (P<0.001) was an independent factor for the duration of hemorrhage. The duration of hemorrhage (P=0.012) was also the independent risk factor for chronic radiation proctopathy complications.

Conclusions/Discussion: Hemorrhagic chronic radiation proctopathy can aggravate gradually within first two years and then tended to heal spontaneously. The clinical course of chronic radiation proctopathy can be shortened by medical intervention, including endoscopic treatments and surgical interventions.



IS MODIFIED-STARR PROCEDURE AN ALTERNATIVE TO DELORME'S OPERATION FOR MILD RECTAL PROLAPSE? TWO-CENTERS RETROSPECTIVE STUDY.

P1243

H. Chen[2], Z. Chen[3], Q. He[1], D. Ren[1], H. Lin[1]
[1]*Guangzhou, China;* [2]*Foshan, China;* [3]*Fuzhou, China*

Purpose/Background: External rectal prolapse might be debilitating conditions with both anatomic and functional sequelae. Our group had first reported the safety and feasibility of a new procedure with modified Stapled TransAnal Rectal Resection (modified-STARR) stapler in patients presenting with cases of mild rectal prolapse(MRP) (the length of prolapse > 5 cm). The present study aims to compare the feasibility and safety of the modified-STARR and Delorme's operation in the treatment of MRP.

Methods/Interventions: Between December 2012 and May 2019, all patients with MRP admitted to the sixth affiliated hospital of Sun Yat-sen University and People's Hospital Affiliated to Fujian University of Traditional Chinese undergoing modified-STARR and Delorme procedures were retrospectively analyzed. A total of 87 patients with MRP was identified, including 65 patients undergoing modified-STARR (Group 1) and 22 patients undergoing Delorme's operation (Group 2). Recurrence was defined as a full-thickness prolapse of the rectal wall. The recurrent rate was estimated by the Kaplan-Meier method, and the differences in recurrence were evaluated with a stratified log-rank test.

Results/Outcome(s): 65 patients (33 female) underwent the modified STARR procedure and 22 (8 female) underwent the Delorme's procedure. The mean age was 56.4±18.9 in group 1 and 48.5±25.0 in group 2 (P=0.274). There was no significant difference between both groups in the duration of symptom (Group 1 vs. Group 2: 8.3±12.6 yrs vs. 7.8±9.4 yrs, P=0.607) and length of prolapse (Group 1 vs. Group 2: 3.4±1.1yrs vs. 3.7±1.3yrs, P=0.272). The group 1 had significantly shorter operation time (37.3±16.6min vs. 73.9±29.9min, P<0.0001), less intraoperative blood loss (14.9±14.6ml vs. 29.3±16.2ml, P<0.0001), and shorter hospitalization time (12.7±5.4d vs. 16.8±4.8d, P=0.002). The constipation score in both groups was improved significantly in postoperative six months(P<0.05). The Wexner incontinence score in both groups was improved in postoperative six months, but this difference in group 2 was not significant. There was no statistically significant difference in the incidence of postoperative complications in both groups (1/58 vs. 2/17, P=0.127). The median duration of follow-up was 19.5 (3–78) months. The recurrent rate was 14.63% in group 1 and 28.6% in group 2 (14.6%(6/41) vs. 28.6%(4/14),P=0.444). Survival curve was drawn by Kaplan-Meier method and statistically analyzed by the log-rank test to find that there was no significant difference between the two groups (P=0.296, Fig.1)

Conclusions/Discussion: Our data suggested that there was no statistically significant difference in the rate of recurrence between both groups. But the modified-STARR had shorter operative time and less intraoperative blood loss. Modified STARR is a potential alternative to Delorme's procedure, although prospective studies need to be conducted.

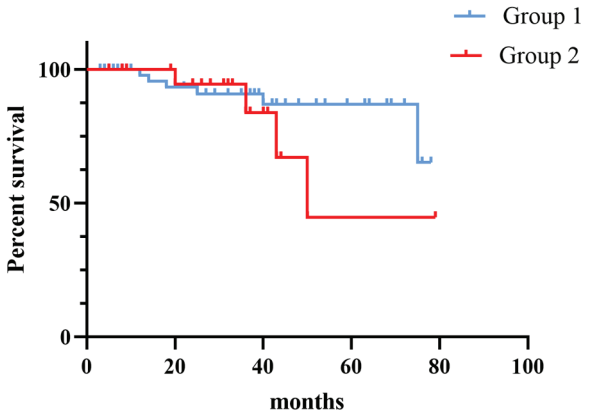


Fig1: Kaplan–Meier curve for recurrence-free survival

OUTCOMES OF SURGICAL MANAGEMENT OF BUSCHKE-LOWENSTEIN TUMOR IN A PHILIPPINE TERTIARY HOSPITAL.

P1244

S. Manlubatan, M. Tampo, M. Lopez
Manila, Philippines

Purpose/Background: The Philippines, at present, has the fastest-growing number of cases of human immunodeficiency virus (HIV) in the world. Consequently, other sexually transmitted infections (STI) are rising in number. Many of these patients are men having sex with men (MSM). Buschke-Lowenstein tumor (BLT), or giant condyloma acuminata, is an STI caused by the human papilloma virus (HPV), and the number of reported cases has increased in recent years. This study investigated the profile, management, and outcomes of patients who underwent surgery for BLT over a five-year period at the Philippine General Hospital (PGH).

Methods/Interventions: This was a descriptive retrospective study that covered the period from January 2015 to December 2019. A review of our electronic database and patient records was conducted. A Data Collection Form was filled out. Frequencies and percentages were reported.

Results/Outcome(s): A total of seven patients underwent surgery for BLT. All were male, with ages ranging from 21 to 41 years (mean 29.9 years). All sought consult for an anal mass (*i.e.* cauliflower-like lesion). Other reported symptoms were: foul-smelling discharge (100%, 7/7), pain (71%, 5/7), bleeding (71%, 5/7), and pruritus (28%, 2/7). Duration from initial discovery of an anal lesion to time of consult ranged from 5 to 48 months (mean 19.5 months). Seventy-one percent of the respondents self-medicated with various topical agents and home remedies (*i.e.* apple cider vinegar) prior to consult with a physician. All the patients were HIV-positive, and were receiving antiretroviral therapy. All were involved in MSM, with multiple partners. One also engaged in heterosexual practice. All patients admitted to having engaged in both insertive and receptive anal intercourse. All underwent excision with healing by secondary intention, with a mean postoperative length of stay of 3 days (range 1 to 11 days). Two had recurrence of perianal warts between 2 to 3 months from time of surgery, and were addressed with cauterization. Three had an anal stricture. Of these, two underwent anal dilatation alone. One had to undergo proximal bowel diversion, with a plan to perform an anoplasty. The patient, however, has since failed to follow-up. One patient was found to have intraepithelial carcinoma without dermal invasion within the BLT on histopathologic analysis.

Conclusions/Discussion: Buschke-Lowenstein tumor is a rare STI characterized by local aggressiveness but with a low malignant potential. Wide excision, either with concomitant grafting or healing by secondary intention, remains to be the mainstay of treatment. Investigating patient profile, management, and outcomes may contribute to mitigating this disease that has seen a rise in incidence in recent years.

Table 1. Patient profile, postoperative length of stay, complications, and histopathologic results of patients with Buschke-Lowenstein tumor from January 2015 to December 2019. PGH.

Patient	Age/Sex	Comorbidities	Onset of symptoms to surgery (months)	Length of post-operative stay (days)	Post-operative complications	Histopathologic results
EH	33/M	None	48	11	Recurrence (2 months), stricture (2 months and 11 months)	Condyloma acuminata
EL	33/M	Idiopathic thrombocytic purpura; smoking	12	2	Stricture (3 months)	Condyloma acuminata
NM	29/M	None	8	1	None	Intraepithelial carcinoma without dermal invasion
GB	23/M	None	8	1	Recurrence (8 months); stricture (2 weeks)	Condyloma acuminata
CS	21/M	None	5	2	None	Condyloma acuminata
DM	29/M	None	8	2	None	Condyloma acuminata
RF	41/M	None	36	2	None	Condyloma acuminata

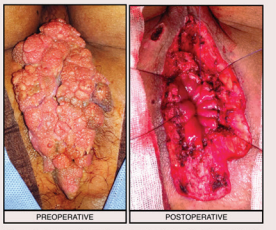


Figure 1. Pre-operative and postoperative photos of a 41-year old male with Buschke-Lowenstein tumor who underwent excision of the mass. PGH, 2019.

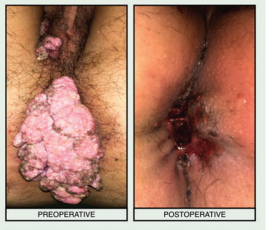


Figure 2. Pre-operative and postoperative photos of a 33-year old male with Buschke-Lowenstein tumor who underwent excision of the mass. PGH, 2017.

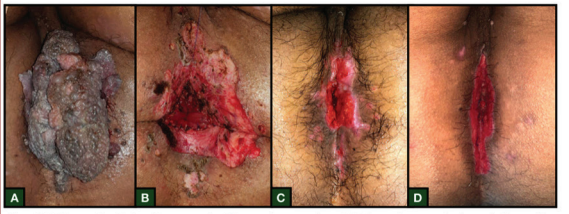


Figure 3. (A) Pre-operative, (B) immediate postoperative, (C) two weeks postoperative and (D) three week postoperative photos of a 29-year old male with Buschke-Lowenstein tumor who underwent excision. PGH, 2019.

PRESENCE OF ASSOCIATED COCCYDYNIA IN ANORECTAL CONDITIONS: MISSED DIAGNOSIS CAN LEAD TO PATIENT DISSATISFACTION AND WRONG TREATMENT.

P1245

P. Garg[1], D. Reddy[2], N. Garg[3]
[1]*Panchkula, India;* [2]*Hyderabad, India;* [3]*Chandigarh, India*

Purpose/Background: Many anorectal conditions like fissure-ano, fistula-in-ano etc are painful as well as refractory. Continuation of pain around perianal region in post-operative period can confuse the surgeon as whether the continuing pain is due to residual pathology/refractory disease or is due to an another cause. Patients suffering from these chronic painful anorectal conditions develop a tendency to sit on one side(wrong posture) to avoid putting pressure on anal region. Due to uneven posture, they become highly prone to develop coccydynia. Incidentally, coccydynia also presents as pain in posterior perianal region. Missing diagnosis of coccydynia in postoperative period can lead to erroneous attribution of symptoms to operated anorectal condition and subsequent error in treatment. Additionally, non-correction of existing coccydynia pain(persistence of symptoms) can lead to patient dissatisfaction and increased frustration after anorectal surgery

Methods/Interventions: The possibility of coccydynia was kept in mind in every patient especially the ones with wrong posture. Unlike pain of anorectal conditions which increased on sitting (pressure increased on anus), the pain of coccydynia increased on standing from the sitting position. In case of doubt, tenderness on coccygeal palpation while doing per rectal examination confirmed the diagnosis. If the coccydynia was found, it was actively treated by following steps- 1) instructing the patient to sit straight, 2) using a U-mattress while sitting and 3) coccyx straightening(manipulation) on per-rectal examination.

Results/Outcome(s): 224 patients were operated for fistula-in-ano over a period of 1 year. The mean age-37.1±11.2, M/F-179/45. 15 patients complained of low back pain or posterior perianal pain twelve weeks after surgery when the perianal/surgical wound had completely healed. Coccydynia was found in 11 of these patients. They were managed as mentioned above and all resolved on conservative management.

Conclusions/Discussion: Patients of painful chronic anorectal conditions (fissure-in-ano, fistula-in-ano) are prone to develop coccydynia due to wrong posture. Coccydynia can be easily diagnosed(clinically) and treated. Failure to diagnose associated coccydynia can only lead to patient dissatisfaction but can also lead to erroneous attribution of symptoms to anorectal pathology. This can lead to wrong diagnosis and treatment.

DIFFERENCE IN PATIENT AND SURGEON PERCEPTION AND PREFERENCE OF SURGICAL PROCEDURE TO TREAT PILONIDAL SINUS DISEASE.

P1246

P. Garg[1], D. Reddy[2], N. Garg[3]
[1]*Panchkula, India;* [2]*Hyderabad, India;* [3]*Chandigarh, India*

Purpose/Background: There are several procedures in vogue for pilonidal sinus disease(PSD) due to which there is no accepted gold-standard. The two main types of surgery advocated are flap (Karyadakis, Boscom, Limberg etc) and non-flap (laying open, wide excision with midline closure, endoscopic etc) procedures. The main advantage of flap procedures is flattening of back contour which circumvents the need to clean the buttock hairs periodically after the surgery. On the other hand, non-flap procedures require regular cleaning of back hairs for few years but their advantage is preservation of back contour. Thus normal anatomy is not distorted. Which of these two factors is given more importance by patients and operating surgeons was assessed in this study.

Methods/Interventions: Patients suffering from PSD and surgeons who operate PSD were interviewed by a questionnaire. They were asked to tell their preference for a procedure which would preserve the buttocks contour but would require regular cleaning of back hairs for several years(at least till the attainment of 30 years age) (non-flap) vs a procedure(flap) which permanently flatten the contour of the upper part of the buttocks but has the advantage of non-requirement of any hair cleaning after surgery. It was assumed that the recurrence rate was similar in both the groups.

Results/Outcome(s): 30 patients of PSD and 26 surgeons were included in the study. The mean age (years) was 24±5.9(patients) and 48.2±8.3(surgeons). M/F-25/5(patients) and 25/1(surgeons). PSD was recurrent in 9/30(30%) patients. 6 surgeons had experience of operating PSD for 0-10 year, 9 had 11-20 years and 11 had 21-40 years. Cases of PSD operated/year:1-5= 5 surgeons, 6-10=9, 11-20=6, 21-40=3, >41=3. 96.7%(29/30) patients preferred non-flap surgery and only 3.33%(1/30) said that he would prefer flap surgery. However, only 65.4%(17/26) surgeons preferred non-flap surgery and 34.6%(9/26) preferred flap surgery (The difference was significant, p=0.0036, Fisher's exact test-two tailed). The reasons given by the patients for preferring non-flap surgery were- loss of buttock's contour(alteration of normal anatomy) would be permanent, poor cosmesis (most patients were in younger age group with mean age of 24 years) and bigger scar. Periodic cleaning of back hairs, though cumbersome, was preferred over these disadvantages of flap surgery.

Conclusions/Discussion: The preference for non-flap surgery(non-alteration of buttocks contour) was

significantly higher by the patients than by the surgeons. This has implications while advocating and deciding surgical procedures to treat pilonidal disease.

FIGURE-1: RESULTS

	Pilonidal Sinus Disease **Patients (n=30)**	**Surgeons** operating Pilonidal Sinus Disease **(n=26)**	Significance (Fisher's Exact Test)
Age in years (Mean)	24±5.9	48.2±8.3	
Sex ratio	M/F-25/5	M/F-25/1	
	Pilonidal status Primary- 21/30 (70%) Recurrent- 9/30 (30%)	**Experience of Surgeon** **Cases of PSD operated/year:** 1-5 cases= 5 surgeons, 6-10 cases=9 surgeons 11-20 cases=6 surgeons 21-40 cases=3 surgeons >41 cases=3 surgeons	
Preference of Surgical Procedure	Non-Flap - 96.7%(29/30) Flap - 3.33%(1/30)	Non-Flap- 65.4%(17/26) Flap - 34.6%(9/26)	**p=0.0036** (Significant)
The reasons given by the patients for preferring non-flap surgery were- loss of buttock's contour(alteration of normal anatomy) would be permanent, poor cosmesis (most patients were in younger age group with mean age of 24 years) and bigger scar. Periodic cleaning of back hairs, though cumbersome, was preferred over these disadvantages of flap surgery.			

ENDOSCOPIC TREATMENT WITH NEGATIVE PRESSURE WOUND THERAPY FOR PILONIDAL SINUS: THE VAC EPSIT.

P1247

E. Schembari, A. Leo, C. Knowles, P. Giordano
London, United Kingdom

Purpose/Background: Endoscopic pilonidal sinus treatment (EPSiT) is a novel minimally invasive option for the treatment of pilonidal disease (PD). The aim of this study was to optimize the postoperative wound management after EPSiT using an ultraportable negative pressure wound therapy (NPWT) device.

Methods/Interventions: All patients with PD treated by EPSIT from November 2017 to October 2019 were managed postoperatively with a commercially available NPTW dressing applied to the wound. All patients were prospectively entered into a dedicated database. Primary outcome measures were healing rate and return to normal activities. Secondary outcomes were postoperative complications, time to heal and patient's satisfaction.

Results/Outcome(s): Thirteen male patients underwent VAC EPSiT (mean age 27.8 years, range 16-52 years). Two patients had previous surgery for PD and they presented with a recurrence. The mean follow-up was 10 months (range 1-24 months). All patients returned to daily activities within one week from the operation. In one patient only a partial healing of the tract was achieved requiring a further EPSiT and NPWT. There were no other complications. The median time to heal was 32 days. Five patients were satisfied and eight were very satisfied with this treatment.

Conclusions/Discussion: NPWT in combination with EPSiT is a simple option that helps postoperative wound management facilitating a quicker recovery and possibly improving overall outcome.

EFFECTIVENESS OF MUCOSA-SPHINCTERAL ADVANCEMENT FLAP OF INTERSPHINCTERIC SPACE (M-SAFIS) FOR TRANSSPHINCTERIC FISTULA:A MODIFIED LIFT PROCDURE EXPERIENCE.

P1248

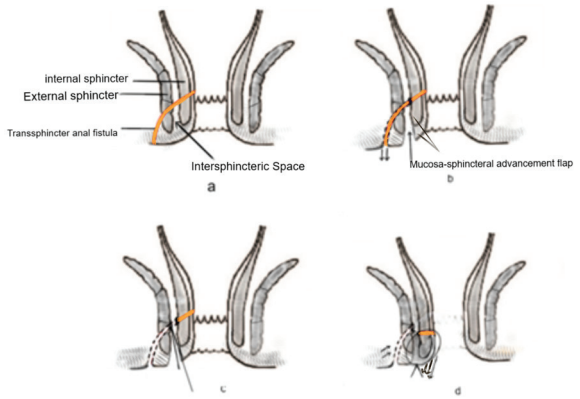
Q. Wang, J. Xu, J. Zhu
Shanghai, China

Purpose/Background: To evaluate the effectiveness of Mucosa-sphincteral advancement flap of intersphincteric space(M-sAFIS)-a new modified procedure of LIFT in the treatment of transsphincteric fistula.

Methods/Interventions: A retrospective study was performed of the patients with transsphincteric fistula treated by M-sAFIS from March 2017 to June 2018 in the Department of Anorectal Diseases,Shanghai Shuguang hospital. Curved incision was made in the anal canal skin. The fistulas between the external opening and the lateral border of the external sphincter were removed in a tunnel-based way. Purse string suture was performed in the defect of external sphincter. The mucosa-sphincteral flap was moved down and fixed by intermittent suture with the external sphincter. Patients and fistula characteristics,healing, recurrence and postoperative complications were reviewed.

Results/Outcome(s): Eighty-eight patients underwent the M-sAFIS with a median follow up of 12 months(range,7-22month). Of the 88 patients, 33 (37.5%) underwent incision and drainage for perianal abscess, 43 were high anal fistula (48.9%) and 75 healed completely and did not require any further surgical treatment. The clinical healing rate was 85.2%. Recurrence occurred in 13 patients,7 of whom did not recover from the wound three months after operation. No postoperative complications such as bleeding and infection occurred in all patients. There was occasional air leakage after further internal sphincterotomy in one patient reported (Wexner anal incontinence score =1).

Conclusions/Discussion: M-sAFIS is a safe and effective sphincter-preserving technique for the management of transsphincteric anal fistula, which is worthy of clinical promotion.



SIGMOID DIVERTICULITIS AND SPLENIC FLEXURE MOBILIZATION: EXPLORING ANASTOMOTIC LEAK RATES AS A MARKER FOR A TENSION FREE ANASTOMOSIS.

P1249

S. Agarwal, E. Kunkel, J. Salem, C. Martin, H. Schoonyoung, J. Marks
Wynnewood, PA

Purpose/Background: Diverticular disease is a highly debated topic in the surgical community. In 2018, the EAES and SAGES consensus conference sought to provide recommendations to guide surgeons in diverticulitis management. One statement recommended the descending colon should be fully mobilized to provide sufficient length for a tension-free anastomosis, there was weak evidence regarding routine splenic flexure mobilization. This study seeks to clarify this recommendation, as it is our hypothesis that splenic flexure mobilization creating a tension free anastomosis between the descending colon and rectum leads to a decrease in anastomotic leaks.

Methods/Interventions: We identified 470 patients from a prospective database who underwent laparoscopic sigmoid resection with splenic flexure mobilization for diverticular disease. Hartmann's procedures were excluded. Perioperative data was collected. Primary endpoints included anastomotic leak and peri-operative morbidity and mortality. All surgeries were performed by a single surgeon at a tertiary referral center.

Results/Outcome(s): Between 1996 and 2019, 470 patients underwent elective laparoscopic surgery with splenic flexure release for diverticulitis. There were 255 females (54.3%) and 215 males (45.7%). The average age was 59 y/o (range 24-84) and the average BMI was 27.9 kg/m^2 (range 15.7-51.6). All patients received a preoperative bowel prep and 84 patients (17.8%) had preoperative ureteral stent placement. All patients underwent anterior resections with primary anastomoses and complete splenic flexure mobilization. The average operative time was 244.6 minutes (range 29-679) and the average EBL was 144.3mL (range 0-1200). All anastomoses were made using an EEA stapler. One procedure (0.2%) was converted to open due to extensive adhesions and 3 cases (0.6%) had intraoperative complications including staple line leak, splenic injury and bowel ischemia. Anastomotic leak occurred in 4 patients (0.8%). Two of these patients were taken back for a Hartmann's procedure and 2 patients were managed with bowel rest and IR drainage. Other immediate post-operative morbidity was reported in 28 cases (5.9%) and delayed morbidity was reported in 16 cases (3.4%). There was one post-operative mortality which occurred on POD3 due to small bowel ischemia.

Conclusions/Discussion: In patients who have undergone elective laparoscopic procedures for sigmoid diverticulitis with routine splenic flexure mobilization, we report a leak rate of 0.8% as compared to reported rates of 2.1-11% in the current literature. Postulating that anastomotic leak rate is a reasonable marker for a tension-free anastomosis, these results support the need for splenic flexure mobilization in order to create an adequate anastomosis. We recommend that splenic flexure mobilization be routinely performed and believe that our low anastomotic leak rate is due in part to colonic mobility.

CLINICAL OBSERVATION OF MODIFIED LIMBERG FLAP AND CLASSIC LIMBERG FLAP IN THE TREATMENT OF PILONIDAL SINUS DISEASE.

P1250

F. Ji
Shanghai, China

Purpose/Background: To compare the clinical therapeutic efficacy of modified limberg flap and classic limberg flap in the treatment of pilonidal sinus disease

Methods/Interventions: The clinical data of 45 patients with sacrococcygeal pilonidal sinus in department of gastrointestinal sugery, Shanghai east hospital affiliated to Tongji university from 2016 June to 2018 Mar, were analyzed retrospectively. Fifteen patients were treated by modified limberg flap excision and 30 patients were treated by classic limberg flap

Results/Outcome(s): No significant difference was detected between two groups in terms of operation time, mean hospital stay and recurrence rate. The modified limberg flap group had less post-operation complication than classic limberg flap group($P<0.05$)

Conclusions/Discussion: Compared with classic Limberg flap group, modified Limberg flap group was better in reducing postoperative complications by reducing the tension of sutured flap.

TRANSRECTAL APPROACH FOR EXCISION OF PERIRECTAL LEIMYOMA.

P1252

A. Castrodad, M. Williams, R. Baucom
Lubbock, TX

Purpose/Background: Perirectal leiomyoma represents a rare entity of tumors related to the rectum. Leimyomas account for 3.8% of benign soft tissue tumors and arise from smooth muscle. Malignant transformation is rare and their pathophysiology is not well-described. This is the case of a 38 year old female, referred by Urology for a perirectal mass after undergoing transvaginal excision of a soft tissue tumor. Initially thought to be a nabothian cyst, she presented with symptoms of dyspareunia and constipation. Intra-operatively, transvaginal ultrasound was performed demonstrating multiple solid masses outside the rectal wall, measuring from 3cm to 7cm. One of the masses was excised transvaginally, and pathology was consistent with leiomyoma. A pelvic MRI was obtained for further characterization. This demonstrated a benign-appearing mass which appeared to originate from the intersphincteric groove. This extended cephalad and involved the muscular layer of the distal rectum.

Methods/Interventions: Digital rectal exam demonstrated a palpable mass in the left lateral position, about 4cm in diameter, firm but not fixed, arising at the level of the sphincter complex. No mucosal irregularity was present, and no lesion was visible on flexible sigmoidoscopy. Given her symptoms of constipation, and the malignant potential of this tumor, she opted for surgical excision. Because the patient wished to avoid proctectomy, and these lesions appeared benign, a trans-rectal approach was planned for resection. At the time of surgery, the lateral rectal wall was incised over the palpable tumor. A few of the superior-most internal sphincter muscle fibers were divided, and the tumor was found to be arising from the intersphincteric plane. The mass was easily dissected free from surrounding tissues, and was removed en-bloc. It measured 5cm by 3cm. The rectal wall was closed in a running fashion, including a modified sphincteroplasty.

Results/Outcome(s): Final pathology was consistent with leiomyoma. In the immediate postoperative period, she experienced some incontinence to flatus and liquid stool. Four weeks later, her incontinence had resolved fully, and the rectal wall was well-healed.

Conclusions/Discussion: Although it was not certain that the patient's constipation and dyspareunia were due to these benign tumors, because of the malignant potential she opted for surgical resection. Surgical excision continues to be the treatment of choice for leiomyoma, with negative margins in order to decrease the risk of recurrence. The perirectal location of this tumor provided an additional challenge to preserve continence while achieving an adequate resection. Perirectal leiomyoma is a rare tumor, and can be challenging to resect given the proximity to the sphincter complex. Removal of these masses should take into consideration the location and the best approach to achieve complete resection and preservation of continence.

CURRENT PRACTICE PATTERNS OF CARE BETWEEN SURGEONS AND NON-SURGEONS FOR BENIGN ANORECTAL CONDITIONS.

P1253

T. Ward, C. Stafford, H. Kunitake, L. Bordeianou, T. Francone, C. Cauley, R. Goldstone, R. Ricciardi
Boston, MA

Purpose/Background: Benign anorectal diseases are common conditions with few data-driven treatment algorithms. We sought to examine outpatient practice patterns for these conditions across the United States.

Methods/Interventions: We abstracted data from the National Ambulatory Medical Care Survey (NAMCS), conducted by the Centers for Disease Control and Prevention and the National Center for Health Statistics. NAMCS provides nationally-representative data on ambulatory medical care services in the United States through a stratified random sample of visits to non-federally employed physicians. Next, we reviewed all patients with benign anorectal conditions, including hemorrhoidal disease, anorectal abscess, anal fissure, and anal fistula, evaluated from 1/2014 through 12/2016. Then, we studied differences in care received by patients treated by surgeons versus non-surgeons.

Results/Outcome(s): From a total of 2,759,240,782 patients, 20,917,052 patients were seen for anorectal conditions. The most common anorectal conditions were symptomatic hemorrhoids, fissures, abscesses, and fistulae. Approximately 29% of patients with anorectal conditions were evaluated by a surgeon rather than a non-surgeon. Surgeons were more likely to perform comprehensive physical exams for anorectal conditions compared to non-surgeons including a rectal exam (59% vs. 21%; $p < 0.0001$) and/or anoscopy exam (6% vs. 0.8%; $p = 0.005$). In the treatment of anal fissure, surgeons and non-surgeons equally prescribed topical nitro or calcium channel blockers for new patients. However, there was great variability in prescription practices for hemorrhoidal disease with topical steroids, laxatives, and topical analgesics prescribed as the top three treatments. Surgeons were less likely to prescribe topical protective agents such as zinc oxide and/or topical starch compounds (1% vs 10%; $p = 0.007$) and 1/8 as likely to prescribe potential irritants like dulcolax suppositories ($p \leq 0.05$) compared to non-surgeons. Interestingly, surgeons were less likely to offer dietary and/or nutrition counseling than non-surgeons during visits (9% vs. 30%; $p = 0.006$).

Conclusions/Discussion: Benign anorectal conditions are commonly seen by surgeons and non-surgeons with significant differences in treatment approach, especially when hemorrhoidal diseases are diagnosed. In particular, non-surgeons commonly prescribe topical barriers and laxative suppositories despite little data to support their use. The low anoscopy and rectal examination rates suggest a troubling practice pattern of potentially inadequate physical examinations which could lead to missed or delayed cancer diagnoses. These outpatient data point to a number of opportunities for further education and standardization in the management of benign anorectal conditions.

IMPACT OF CARE COORDINATION ON CONTENT OF COMMUNICATION BETWEEN SURGEONS AND PATIENTS WITH RECTAL CANCER.

P1254

E. Lawson, J. Sommovilla, A. Buffington, A. Zelenski, G. Schwarze
Madison, WI

Purpose/Background: Diagnosis and treatment decisions for rectal cancer can be complex, balancing functional and oncologic outcomes, integration of multiple information sources, and coordination of physicians from different specialties. Our objective was to characterize the content of communication between surgeons and patients prior to initiation of treatment. Specifically, we aimed to describe how discussion focused on care coordination impacts the content of communication during the remainder of the visit.

Methods/Interventions: We performed secondary analysis of audio recordings collected for a large interventional study that included patients aged ≥60 with at least one comorbidity who were meeting with a surgeon to discuss major surgery at one of five academic medical centers. For this study, we identified patients diagnosed with rectal cancer. Our team of 4 investigators from varying backgrounds coded transcripts individually and met frequently as a group to refine a coding taxonomy using the process of constant comparison, logging progress with NVivo software. We conducted higher level analysis to characterize the content of communication related to types of care coordination, specific details and conditions under which care coordination was conducted, and consequences.

Results/Outcome(s): The cohort included 18 patients with rectal cancer seen by 8 colorectal surgeons across 5 hospitals. Care coordination consumed much of the conversation; on average 23.7% (SD 14.6) of content. During visits, surgeons gathered information regarding cancer staging and worked to organize logistics for further work-up and treatment planning. At times, conversation centered simply on figuring out names of doctors and how they could be contacted. Obtaining imaging results was particularly challenging and surgeons went to great lengths to gather this information. To mitigate information gaps, surgeons asked patients about critical details including specific location of the tumor or extent of invasion. Patients expressed remorse when they could not provide needed information or had missing reports. Surgeons directed frustration at the system regarding the need to gather clinical details from multiple sources and coordinate logistics for neoadjuvant treatment. Surgeons attempted to inform patients about their disease and discuss important lifestyle and cancer-related tradeoffs, such as need for an ostomy or consequences of a low anastomosis. However, the ability to solicit patient input and engage in shared decision making was often limited by incomplete clinical data or conditioned on approval by a multidisciplinary tumor board.

Conclusions/Discussion: Much of the conversation between colorectal surgeons and patients is consumed by care coordination. Care coordination could be improved by investments that rely less on the surgeon and the patient, which in turn would focus the clinic visit on addressing patient needs and shared decision making.

TO IMPROVE IS TO CHANGE: IMPACT OF FRAILTY ASSESSMENT ON FAILURE TO RESCUE FOLLOWING AN ANASTOMOTIC LEAK.

P1255

J. Dressler, N. Shah, S. Lueckel, W. Cioffi
Providence, RI

Purpose/Background: Colorectal surgery in older patients is increasingly common. While poorer postoperative outcomes are more common in the elderly, age is only partially responsible. Recently, frailty, a multisystem syndrome linked to important health outcomes, has been associated with increased postoperative complications, such as anastomotic leak (AL). This study aimed to determine whether patient frailty is a risk factor for worse morbidity and mortality, a failure to rescue, in the setting of AL.

Methods/Interventions: Using ACS-NSQIP data, elective colectomies for colorectal neoplasia from 2015-2017 who had an AL were identified. Frailty was defined using the 5-factor modified frailty index (mFI-5). This measured frailty tool has been shown to have a strong predictive ability for mortality and postoperative complications. Patients with a score greater than 0 were considered frail, with higher mFI-5 scores indicating a greater degree of frailty. Patients were considered to have one of the four

outcomes, mortality, septic shock, myocardial infarction, or pneumonia if it occurred within 30 days of surgery and was noted in the database. Univariable logistic regression models were used to assess the relationships between frailty and each outcome.

Results/Outcome(s): Of 30,180 elective colectomies with primary anastomosis performed for neoplasia, we identified 880 patients who experienced an AL, 525 (60%) of whom were frail. Compared to non-frail patients, a greater proportion of frail patients experienced mortality (3.4% vs. 5.9%), septic shock (16.1% vs. 21.0%), myocardial infarction (1.1% vs. 2.9%), and pneumonia (6.8% vs 11.8%). Furthermore, those with higher frailty scores had higher odds of morbidity and mortality (Table).

Conclusions/Discussion: Our findings indicate that in the setting of AL, the odds of failure to rescue increase with greater patient frailty. As the number of frailest patients (mFI-5 of 3) was small, more studies should explore this association with greater sample size. Though frailty is an evolving area of research, these findings suggest that a validated, rapidly administered measure of frailty, such as the mFI-5 score, could play an important role in determining whether frail patients may benefit from alternative surgical management strategies, be it in preoperative counseling and screening, intraoperative decision-making, or postoperative level of care.

THE ABDOMINAL AORTIC CALCIFICATION ON PREOPERATIVE CT SCANS IS A RISK FACTOR ASSOCIATED WITH ANASTOMOTIC LEAKAGE IN LAPAROSCOPIC SURGERY FOR COLORECTAL CANCER.

P1256

S. Morita, M. Tsuruta, R. Seishima, K. Shigeta, K. Okabayashi, Y. Kitagawa
Shinjuku-ku, Japan

Purpose/Background: ***Background*** In laparoscopic surgery (LS) for colorectal cancer (CRC), anastomotic leakage (AL) is one of the most severe and critical complications. However, a definitive preoperative predictor of anastomotic leakage remains elusive despite of several previous attempts to identify. On the other hand, CRC patients with arteriosclerotic disease have been increasing as a result of the aging society and westernized diets in Japan. The aim of this study was to evaluate the correlation of preoperative arteriosclerosis on AL.

Methods/Interventions: ***Methods*** The subjects comprised 126 CRC patients who underwent LS for CRC with double-stapling technique (DST) reconstruction at Keio University School of Medicine between January 2014 and December 2016. Twenty-eight patients were excluded due to insufficient data or having undergone multiples surgeries, and thus 98 patients were enrolled in this study. The preoperative assessment of arteriosclerotic disease was performed by preoperative abdominal CT. Concretely, the calcification volume% (CV%) of aortic calcification between the level of the root of a celiac artery and aortic bifurcation was calculated by using ZIOstation2. Patients' clinicopathological characteristics and surgical outcomes were taken from their medical records, and statistical analysis was performed to assess the correlation between CV% and AL.

Results/Outcome(s): ***Results*** Among 98 cases, AL was observed in 16 cases (16.3%). The median of CV% (± range) was 2.35 (0-40.3) %, and it was significantly correlated with AL ($p < 0.01$). Otherwise, age, male, hypertension, and taking anticoagulant drugs demonstrated a significant correlation with AL by univariate analysis. Multivariate analysis adjusted with the cofounding factors mentioned above even demonstrated that CV% was an independent risk factor for AL (OR: 1.12, 95% confidence interval [CI]: 1.01-1.24, $p = 0.03$).

Conclusions/Discussion: ***Discussion*** Although there are several risk factors for AL, blood supply to the anastomosis is one of the most important. While CV% quantifies the grade of arteriosclerosis, it could also feasibly be used to evaluate the degree of arteriosclerotic change even in marginal arteries surrounding the anastomosis, and consequently, it could potentially predict the risk of AL in LS for CRC. ***Conclusion*** The calcification of abdominal aorta may be a promising predictor for AL in LS for CRC with DST reconstruction.

P1255 Table 1 – Morbidity and Mortality by Frailty

	mFI-5 Score			
	0 (n=355)	1 (n=342)	2 (n=161)	3 (n=22)
	Ref.	OR (95% CI)	OR (95% CI)	OR (95% CI)
Mortality	-	1.3 (0.6-2.8)	2.3 (1.0-5.2)*	6.4 (1.9-21.7)*
Septic shock	-	1.4 (0.01-2.1)	2.4 (1.5-3.8)*	3.7 (1.5-9.4)*
Myocardial infarction	-	1.3 (0.4-4.9)	4.6 (1.4-25.5)*	8.8 (1.5-50.8)*
Pneumonia	-	1.6 (0.9-2.7)	2.4 (1.3-4.4)*	2.2 (0.6-7.9)

*significant at the α=0.05 level

TaTME FOR SEVERE IATROGENIC RECTAL ANASTOMOTIC STENOSIS AND RECTOVAGINAL FISTULA AFTER RECTAL CANCER RESECTION: SERIAL REPORT OF 3 CASES.

P1257

P. Wang, W. Tong, Q. Wang, L. Zhang, L. He, M. Li
Changchun, China

Purpose/Background: The iatrogenic rectal anastomotic stenosis and the rectovaginal fistula are severe complications of rectal cancer resection. Because of the characteristics of the deep structure of the abdominal cavity and pelvis, it's hard to find a suitable method to solve the fibrotic scar stenosis or fistula. Transanal total mesorectal excision(taTME) is a procedure which may have a better vision of hard-to-access anatomical areas in the deep cavity than traditional procedures. In this study, we performed TaTME in a series of cases with rectal anastomotic stenosis and rectovaginal fistula after rectal cancer resection.

Methods/Interventions: 3 cases were admitted to the First Hospital of Jilin University from September 2018 to November 2019. The first patient, 69 years old, male, who underwent the laparoscopic rectal cancer resection in the local hospital, admitted to our hospital because of anastomotic stenosis, the patient occurred anastomotic leak 3 months after the rectal cancer resection and underwent colostomy. In order to solve the problem of anastomotic stenosis, we performed TaTME and colostomy closure to resect the stenosis and reconstruct the anastomosis; The other two patients who were 54 and 58 years old females, were both diagnosed with rectovaginal fistula and anastomotic stenosis after the rectal cancer resection in the local hospital, and also underwent a second operation of ileostomy or colostomy. We performed TaTME to resect the anastomotic stenosis and repaired the rectovaginal fistula.

Results/Outcome(s): The 3 patients recovered well after the TaTME procedure and the defecation function was good after the ileostomy or colostomy closure.

Conclusions/Discussion: TaTME can be used as a good procedure for severe iatrogenic rectal anastomotic stenosis and the rectovaginal fistula after the rectal resection. And it may has distinct advantages over traditional techniques.

LYNCH-LIKE SYNDROME MAY BE MORE COMMON IN CHINESE MMRD COLORECTAL CANCER PATIENTS - A COHORT STUDY IN A CHINESE TERTIARY-REFERRAL CENTER.

P1258

H. Xu, P. Zhu, Y. Zheng, X. Zhang, Y. Chen, L. Qiao, Y. Zhang, F. Jiang, Y. Li, H. Chen, Y. Chen, Y. Gu, B. Yang
Nanjing, China

Purpose/Background: Lynch syndrome (LS) is the most common colorectal cancer (CRC) with microsatellite instability (MSI) detected by DNA mismatch repair (MMR) gene mutations. Some MSI-CRC patients carry no germline mutations in any of the MMR gene, which are termed as Lynch like Syndrome (LLS). Management of these patients with LLS is complicated because of incomprehensive mechanism and unconfirmed suspicions of hereditary cancers. In this study, we analyzed a large and well-annotated cohort of CRC patients to assess the proportion of LLS through the universal molecular strategies, and related clinicopathologic characteristics.

Methods/Interventions: Patients with colorectal cancer who underwent surgical resection from 2014 to 2018 in our institution were included. Immunohistochemical (IHC) for MMR proteins expression, microsatellite instability (MSI) status and somatic $BRAF^{V600E}$ mutation were evaluated. Tumors with dMMR and/or MSI were sent for germline mutation test and MLH1 methylation analysis. Patients with loss of MMR proteins or MSI-H were defined as MMR-deficiency (MMRd). Those patients without MLH1 promoter methylation and germline mutation were diagnosed with Lynch-like Syndrome (LLS). Clinicopathologic and molecular features of LLS were collected. Fisher exact test, Chi-Square test and Kruskal-Wallis test are used to analyze the comparison between different groups for quantitative variables.

Results/Outcome(s): A total of 404 patients were included. Loss of expression of MMR proteins was identified in 35 patients (8.7%). MSI-H, MSS were observed in 28 (6.9%) and 376 (93.1%) patients respectively. $BRAF^{V600E}$ mutation was detected in 13 patients (3.2%). Among the 42 patients with MMRd, 7 patients (7/42,16.7%) were confirmed with MMR germline mutations and 7 patients (7/42,16.7%) with MLH1 methylation. While 28 patients (28/42,66.7%) had no pathogenic mutations in MMR genes, EPCAM, BRAF or MLH1 methylation, which were considered to be LLS. Patients with loss of MMR proteins but MSS were LLS (13/14, 92.9%). Compared with LS and SCRCs tumors, LLS colorectal carcinomas diagnosed at mean age of 60.7 (SD 11.6) years, had the following characteristics: more common with left-side tumors [64.3%, 18/28, especially rectal tumors (39.3%, 11/28)], and significantly higher rates of lymph node metastases (50%, 14/28 N2).

Conclusions/Discussion: In this study, 66.7% of patients with MMRd tumor were classified as LLS, significantly higher than reports of western countries. Tumors with LLS were more likely to locate in left-side colon, especially rectum, and lymph node metastases. Most of patients who lost MMR proteins with MSS were LLS.

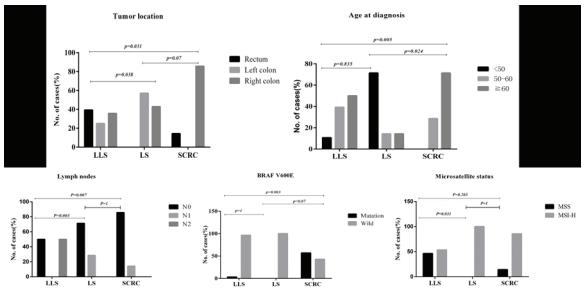


Figure 2. Comparison among Lynch-like syndrome (LLS), Lynch syndrome (LS) and sporadic Colorectal Cancer (SCRC) groups about tumor location, age at diagnosis, lymph nodes, BRAF V600E and microsatellite status, according to Fisher's exact test.

FEASIBILITY, SAFETY AND OUTCOME OF TRANSANAL TOTAL MESORECTAL EXCISION USING A LATERAL-FIRST APPROACH.

P1259

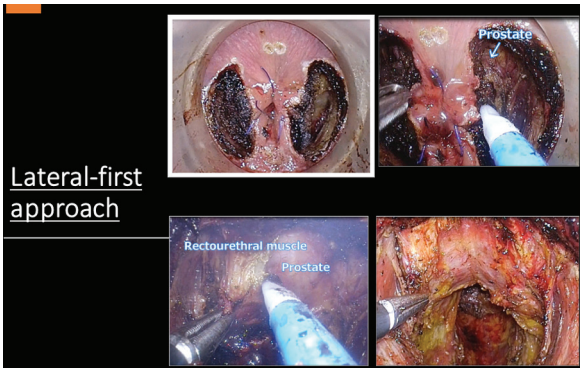
T. Matsuda, K. Yamashita, H. Hasegawa, Y. Kakeji
Kobe, Japan

Purpose/Background: Since transanal total mesorectal excision (taTME) was first introduced for rectal cancer in 2010, it has been employed worldwide by an increasing number of colorectal surgeons. Although it is expected as a promising surgical option for rectal cancer, severe surgical complications such as urethral injury, vaginal perforation, and rectal tube perforation have also been reported. We have developed a lateral-first approach during taTME to overcome such technical difficulties. In the present study, we present the technical tips and short-term outcomes of this technique.

Methods/Interventions: After CO2 insufflation in the rectum, full-thickness dissection of the rectal wall is started at 3-5 o'clock. Once the striated muscle of the puborectal or levator ani muscle is identified, full-thickness rectal dissection is extended up to 1 o'clock. Then, lateral dissection along the surgical plane at 1-5 o'clock (the left side of the patient) is performed following the TME concept in a down-to-up manner. At this step, great care needs to be taken not to injure the neurovascular bundle. Next, rectal wall dissection at 7-11 o'clock is performed likewise (the right side of the patient). After dissection of the rectoprostatic or rectovaginal fascia laterally on the inside of the neurovascular bundle, the posterior wall of the prostate or vagina is identified. Then, the rectourethral muscle or rectovaginal septum is dissected by using the prostate or vagina as a landmark. The dissection of the posterior ligament is also performed simultaneously by using the bilateral levator ani muscle as a landmark.

Results/Outcome(s): Since April 2018, a total of 33 patients with low rectal cancer underwent taTME by using a lateral-first approach. 13 of 33 patients (39.4 %) received neoadjuvant chemoradiotherapy, and 17 patients (51.5 %) received lateral pelvic lymph node dissection. The median operative time and intraoperative blood loss were 354 min and 30 g, respectively. Postoperative complications ≥ Clavien-Dindo classification grade II developed in 13 of 33 patients (39.4 %). The urinary dysfunction developed in 2 patients (6.1 %). Although 1 patient had vaginal injury, there was no case with urethral injury or rectal perforation. Although the distal resection margin was larger than 10 mm in all cases, the radial margin involvement was observed in 2 of 33 patients (6.1 %).

Conclusions/Discussion: TaTME using a lateral-first approach seems feasible and safe. However, further studies are needed to evaluate long-term oncological outcomes.



Operative view during taTME by using a lateral-first approach. After lateral dissection, the dorsal surface of the prostate is recognized. Then, the rectourethral muscle cane be dissected safely.

CLINICAL IMPACT OF NEOADJUVANT TRIPLET CHEMOTHERAPY WITHOUT RADIATION IN PATIENTS WITH LOCALLY ADVANCED RECTAL CANCER.

P1260

F. Teraishi
Okayama, Japan

Purpose/Background: Although neoadjuvant chemoradiotherapy has been demonstrated to reduce local recurrence rates in the patients with locally advanced rectal cancer (LARC), its beneficial effects on overall survival remain unclear. In this study, we evaluated the feasibility and efficacy of neoadjuvant infusional 5-fluorouracil/folinic acid, oxaliplatin, and irinotecan (FOLFOXIRI) therapy without radiotherapy for LARC patients.

Methods/Interventions: A retrospective review was conducted on the patients with low LARC (cStage II and III, except for cT4b tumor) who received neoadjuvant FOLFOXIRI therapy without radiotherapy in our institution. All information was carefully reviewed and collected, including patient demographics, profile of adverse event,

and surgical outcome. The primary endpoint was overall survival. The secondary endpoints were adverse effect, R0 resection rate, postoperative complications, and relapse-free survival.

Results/Outcome(s): Between May 2015 and May 2017, 17 patients with low LARC (T3/4 and/or N+) were received neoadjuvant FOLFOXIRI therapy and were analyzed for safety and efficacy. Mean ages were 62 years old, and 11 patients in male. The most common adverse events of grade3 or more were neutropenia (22.2%) and diarrhea (11.1%). All patients underwent rectal surgery after a median of four cycles of neoadjuvant chemotherapy. Of these, 13 (76.5%) had sphincter saving surgery and R0 resection rates were 88.2%. The severe postoperative complication rate (Clavien-Dindo grade 3 or more) was 11.8%. At a median follow-up of 31 months, the overall survival and relapse-free survival at 3 years were 79.6% and 75.5%, respectively.

Conclusions/Discussion: Our results show that neoadjuvant FOLFOXIRI regimen is a feasible and effective treatment option for selected patients with LARC. Further prospective controlled studies will address the question of whether it can be used as a valuable alternative to chemoradiotherapy in LARC.

THE RELATIONSHIP BETWEEN RAC-1 AND GELSOLIN WITH METASTASIS IN COLON CANCER.

P1261

C. Çelik, S. Er, S. Özden, T. Ünal, Ö. Bozdoğan, B. Yüksel
Ankara, Turkey

Purpose/Background: Colon cancer is a common cause of cancer-related mortality. Gelsolin and Rac-1, which are cell skeleton protein, have been found to be effective on the motility, plasticity, invasion, apoptosis and intracellular signaling of the cell. Some studies in the literature indicate that gelsolin is a suppressor protein for metastasis and some studies show that Rac1-dependent cell signaling is important for malignant transformation. In this study, we aimed to evaluate the relation of Gelsoline and Rac-1 proteins with the distant organ and lymph node metastases in colon cancer.

Methods/Interventions: 40 patients who were included in this study; have been selected with randomization from 263 patients' preparations. 2 groups have been constituted that 20 patients have distant organ metastasis (M1) and 20 patients not (M0). M0 group has been composed of 10 patients with lymph node metastasis (N+) and 10 patients not(N0). All patients underwent surgery for colon cancer between 2010-2017 at the Surgery Department of University of Health Sciences, Ankara Numune Training Hospital. Clinical, radiological, pathological and surgical reports of 40 patients were retrospectively reviewed. Preparations were stained immunohistochemically using the tissue microarray technique.

Results/Outcome(s): There were 30(75%) men and 10(25%) women. The mean age of patients was 62.25±13,29 years. The patients' mean positive lymph node count and mean total excised lymph node count were 1.93±2.68 and 19.07±13.34 respectively. The mean Rac-1 immunoreactivity score(IRS) was 4.60±2.22 and the gelsolin IRS was 4.23±3.05. When comparing the Rac-1 IRS of patients who have distant organ metastasis and not; Rac-1 IRS is high in the M1 group with statistically significance(p=0.020). In the M1 group gelsolin IRS was low but not statistically significant(p=0.478) (Table 1). In the M0 group; when comparing Gelsolin IRS of patients who have lymph node metastasis and not; Gelsolin IRS was low in the N+ patients with statistically significance(p=0.029). Also, the Rac-1 IRS was low in the N+ group but not statistically significant(p=0.165) (Table 1).

Conclusions/Discussion: There are very few studies on this subject in the literature. These proteins have been studied in different types of cancer and may have different behaviors. In this study, which included patients with colon cancer, Gelsolin protein IRS was high in the group of patients who have not had lymph node metastasis. This may show Gelsolin protein may suppressor for lymph node metastasis in colon cancer. As to Rac-1 protein IRS was found high in distant organ metastasis group. This finding may depend on higher expression of Rac-1 in tumor cells which were inclined to metastasis. These findings may indicate that Rac-1 and Gelsolin proteins may be helpful in determining the prognosis of colon cancer after surgery. Further extended and prospective studies are needed on this topic.

P1261 Table 1: Comparison of Rac-1 and Gelsolin Immun-reactivity score between groups.

	Distant organ metastasis			Lymph node metastasis		
	Positive Mean IRS (SD)	Negative Mean IRS (SD)	p-value	Positive Mean IRS (SD)	Negative Mean IRS (SD)	p-value
Rac-1	5.40 (±2.28)	3.80 (±1.88)	0.020	3,30 (±1.83)	4.30 (±1.89)	0.165
Gelsolin	3,90 (±2,97)	4.55 (±3.17)	0.478	3,00 (±2.58)	6.10 (±3.03)	0.029

IRS: Immun-reactivity score, SD: Standart Deviation

TRANSVAGINAL LAPAROSCOPIC RIGHT COLECTOMY FOR COLON NEOPLASIA.

P1262

Y. Xiao, J. Lu, L. Xu
Beijing, China

Purpose/Background: The laparoscopic technique has been used for colorectal surgery for decades. The natural-orifice transluminal endoscopic surgery (NOTES) approach has been used in operations on the colon and rectum to minimize abdominal trauma, as for example in transanal total mesorectal excision (taTME), laparoscopic colectomies with transanal or transvaginal specimen extraction. Up to now, transabdominal assistant with laparoscopic technique is critical for colorectal NOTES operations, so it is called hybrid NOTES technique. Pure NOTES has not been reported for colonic resection. Recently, we tried to perform laparoscopic right colectomy via the transvaginal approach.

Methods/Interventions: Under general anesthesia, the patients were placed in the lithotomy position. The anterior vaginal fornix was opened and a single-port laparoscopic device was placed (Figure 1). Long laparoscopic instruments, with a length of 43 cm, were introduced. All patients underwent laparoscopic right colectomy approach via the transvaginal approach. A side-to-side overlap ileocolic anastomosis was made using an articulating endoscopic linear cutter. The specimen was extracted through the vagina. If the operation is difficult, we would switch to traditional laparoscopy or open surgery.

Results/Outcome(s): Totally nine female patients with colon neoplasia were enrolled in Peking Union Midical College Hospital from Jaunary 2019 to November 2019. The mean age was 73±10 years old. Seven patients underwent pure transvaginal laparoscopic surgery, and two patients were converted to troditional laparoscopic surgery. Reasons for conversion to laparoscopic surgery include ileal vascular injury and difficulty in anastomosis. The mean operation time was 219±37 minutes. Total blood loss was 329±654 mL. Postoperative complications occurred in 3 patients including postoperative abdominal hemorrhage, vaginal bleeding and pelvic infection. No perioperative death occurred. The average postoperative hospital stay was 6.2±1.3 days. The postoperative pathology reported five cases of five cases of colon adenocarcinomas, two cases of adenomas, and two cases of high-grade intraepithelial neoplasias.

Conclusions/Discussion: This is the first report of series of right colectomy performed using transvaginal NOTES without transabdominal assistance. We hope that the transvaginal approach might be a feasible alternative to transabdominal laparoscopic colectomy.

The transvaginal single-port device

THE PROGNOSTIC IMPACT OF PRIMARY TUMOR SITE AND KRAS MUTATION AFTER CURATIVE INTENT SURGERY FOR COLORECTAL CANCER WITH LIVER METASTASES.

P1263

H. Kim, S. Yang, Y. Han, M. Cho, H. Hur, B. Min, K. Lee, N. Kim
Seoul, Korea (the Republic of)

Purpose/Background: Tumor location and KRAS mutational status have emerged as a new predictive and prognostic factor of colorectal cancer, particularly in patients with unresectable metastatic colorectal cancer. While primary tumor location and KRAS mutational status are major sources of biologic heterogeneity, the effect of these factors on prognosis after surgery for Colorectal liver metastases (CRLM) have not been well studied. The aim of the study was to define the prognostic impact of primary tumor site and KRAS mutational status among patients who underwent curative intent surgery for CRLM.

Methods/Interventions: A total of 227 patients who underwent a curative intent surgery for synchronous CRLM between January 2006 and December 2015 at Severance Hospital with available KRAS mutational status were identified. Clinicopathologic characteristics and long-term outcomes were compared according to the tumor location and KRAS mutational status. We also cross-classified tumor location and KRAS mutation in 4 categories and compared survival outcomes.

Results/Outcome(s): 41 patients had a Right-sided (RS) (18.1%) and 186 (81.9%) had a Left-Sided (LS) tumor. Approximately one-third of tumors (34.4%) harbored KRAS mutations. Both primary tumor extent and liver metastases characteristics was not different according to tumor location and KRAS mutation status. KRAS mutant

type was more observed RS tumor (n=21; 51.2 % vs. n=57; 30.6 %, P=0.012). Median, 1-, 3-, and 5-year overall survival (OS) were 43.4 months, 93.3, 76.9, and 59.9%, respectively. Kaplan-Meier analysis revealed worse 3-year disease free survival (DFS) and 3-OS in RS tumor than in LS tumor (DFS : 12.6% vs. 21.3%, P=0.003 and OS : 46.2% vs. 79.4%, P = 0.039). KRAS mutational status did not impact on DFS and OS. RS tumor was found significantly in multivariable analysis for DFS and OS (HR 1.88, 95% CI 1.29-2.73, P = 0.001 and HR 1.66, 95% CI 0.98-2.81, P = 0.060, respectively). In contrast, KRAS mutational status was not found to be risk factors for DFS and OS. RS tumor with mutant-KRAS had the worst oncological outcomes and LS with wild-KRAS showed the best overall survival outcome in Kaplan-Meier analysis after categorizing 4 categories with tumor location and KRAS status. RS tumor with mutant-KRAS showed statistically significant higher hazard ratio compared with LS tumor with wild-KRAS (HR 2.73, 95% CI 1.66-4.50, P < 0.001 and HR 2.52, 95% CI 1.19-5.36, P = 0.016, respectively).

Conclusions/Discussion: Tumor location has a prognostic impact in patients who underwent curative intent surgery for CRLM. In contrast KRAS was not identified as prognostic factor. However, we clearly identified the worst oncological outcome in RS tumor with mutant-KRAS. Based on more details of tumor genetic information, we can predict prognosis of colorectal cancer with liver metastasis with high accuracy and can step forward to develop new treatment strategy.

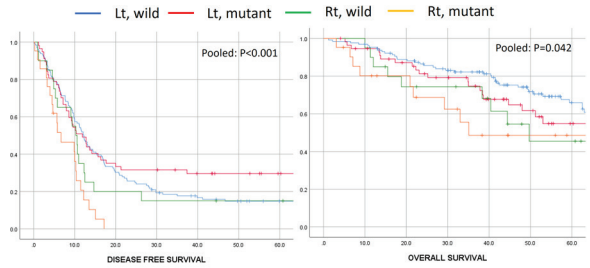


Figure 1. Survival outcomes according to tumor location and KRAS status

LAPAROSCOPIC LOW ANTERIOR RESECTION FOR RECTAL CANCER WITH TRANSANAL SPECIMEN EXTRACTION AND LEFT COLONIC ARTERY PRESERVATION.

P1264

L. Zheng, X. Wang
Beijing, China

Purpose/Background: Low anterior resections are increasingly performed laparoscopically for rectal cancer. Natural orifice specimen extraction surgery (NOSES) has been reported as an alternative approach without additional incisions or extensions. In this video, we aimed to demonstrate the safety and feasibility of laparoscopic low anterior resection for rectal cancer with transanal specimen extraction and left colonic artery preservation.

Methods/Interventions: The patient was 65 years old, body mass index (BMI) was 25.3. The tumor (cT2N0M0) with a distance of 8cm from the anal verge. He was placed in the lithotomy-Trendelenburg position and tilted to the right. The medial-to-lateral dissection and Low tie of the inferior mesenteric artery was performed. After mobilization of the rectum and left colon, the rectum was transected below the tumor with a linear stapler. The specimen was extracted either through the rectal stump. For transanal extraction an incision was made below the staple line of the rectal stump and a sterile plastic sleeve was introduced through the port. Next, a grasper was brought through the anus, and the specimen was pulled outside through the plastic sleeve. The anvil of a circular stapler was placed at the end of the proximal colon. The rectum stump was re-stapled with a linear stapling device. After washout of the rectal stump intracorporeal end-to-end colorectal anastomosis was performed with the use of a circular stapling device. The 12-mm port was used as a drain site without protective intestinal stoma.

Results/Outcome(s): Operative time was 260mins, blood loss was 15mL, exhaust time was 32 hours, length of hospital stay was 6days. The TNM stage was pT2N0M0.

Conclusions/Discussion: This procedure is a well-established strategy and may be considered as an alternative procedure to conventional laparoscopic resection for rectal cancer. However, the long-term benefits of this approach require further evaluation.

IMPACT OF EGFR AMPLIFICATION AND KRAS/NRAS MUTATION ACCORDING TO STAGE IN NORTHEAST ASIAN COLORECTAL CANCER PATIENTS.

P1265

W. Kang, S. Park, B. Kye, H. Kim
Seoul, Korea (the Republic of)

Purpose/Background: Molecular biomarkers play very important role in the diagnosis and treatment of colorectal cancer. The epidermal growth factor receptor (EGFR) is closely related to tumorigenesis and tumor progression of colorectal cancer (CRC). KRAS serves as a mediator between extracellular ligand binding and intracellular transduction of signals from the EGFR to the nucleus. The aim of this study was to determine the relationship with EGFR, KRAS and NRAS status according to stage.

Methods/Interventions: We retrospectively analyzed the clinicopathologic features, and the status of EGFR amplification, KRAS mutation, NRAS mutation in 249 colorectal cancer patients who received colorectal resection between 2015 and 2018 in Yeouido St. Mary's Hospital, South Korea.

Results/Outcome(s): EGFR status showed significant association with stage, (p=0.015) but no association with other factors including age, sex, KRAS and NRAS status.

EGFR negative status tend to be more in stage 3 compared to other stags. KRAS, NRAS status did not showed any significant association.

Conclusions/Discussion: The patients with stage 3 CRC have high probability of EGFR negative status in Northeast Asia. Further research for the altering mechanism of EGFR amplification according to stage is needed.

PRESERVING LEFT COLIC ARTERY IN ANTERIOR RESECTION REDUCES THE INCIDENCE OF ANASTOMOTIC LEAKAGE IN RECTAL CANCER PATIENTS.

P1266

H. Zheng, V. Tong
Chongqing, China

Purpose/Background: The preservation of left colonic artery(LCA) in anterior resection of rectal cancer raised consistent controversies. In this study, we tried to investigate whether the preservation of LCA would influence the incidence of anastomotic leakage in rectal cancer patients. We further explored the branching types of the inferior mesenteric artery(IMA).

Methods/Interventions: 160 patients underwent laparoscopic or robot-assisted anterior resection for rectal cancer were recruited, among which 56 patients were performed with LCA preserved while the other 104 patients performed with LCA non-preserved. The intraoperative conditions and postoperative complications were carefully evaluated and throughly collected. Furthermore, abdominal enhanced computer tomography(CT) scan and three-dimensional CT angiography(3D-CTA) were performed to assess IMA types and to evaluate positions relationship of LCA, sigmoid artery(SA) and superior rectal artery (SRA) in 108 rectal cancer patients.

Results/Outcome(s): The incidence of anastomotic leakage(AL), reoperation rate and postoperative hospital stay was found significantly decreased in the preservation group comparing to the non-preservation group. The blood loss and intraoperative complication were not increased in the preservation group. Furthermore, no significant difference was observed in the total number of harvested lymph nodes(LNs) and the number of positive LNs in the two groups. The IMA were divided into 4 types that 53(49.1%) were type I, 24(22.2%)were type II,18(16.7%)were type III,and 13(12%)were type IV.

Conclusions/Discussion: According to our results, the preservation of LCA in anterior rectal resection could help reducing the anastomotic leakage, postoperative hospital stay, and reoperation rate and without increasing other known risks. Accordingly, this operation method should be recommended for the rectal cancer patients. Furthermore, our founding on the IMA types would provide guide on the operation procedure of anterior rectal resection with LCA preserved in rectal cancer patients.

UTILITY OF SUBCUTANEOUS DRAINS IN LOWERING SSSI RATES FOLLOWING ILEOSTOMY AND COLOSTOMY CLOSURE.

P1267

A. Shah[1], N. Mitra[1], G. Bellini[2], X. Yan[1], E. Pettke[3], V. Cekic[1], H. Shantha Kumara[1], R. Whelan[1]
[1]*New York, NY;* [2]*Milwaukee, WI;* [3]*Seattle, WA*

Purpose/Background: Unfortunately, superficial surgical site infections (sSSI's) are not uncommon after colostomy closure (CC) and ileostomy closure (IC) operations. The sSSI rates range from 1.5% to 20% in the literature. Because of high sSSI rates some surgeons do not close the skin after stomal closure. In theory, a subcutaneous drain placed between the closed fascia and the skin should allow skin closure while preventing formation of hematomas or subcutaneous fluid collections; thus, drains may lower the sSSI rate. This retrospective study's purpose was to assess the impact of subcutaneous drains on sSSI rates after IC and CC.

P1266 Short-term outcomes

	LCA preservation(n=56)	LCA non-preservation(n=104)	P value
Overall early complication [n (%)]	5 (8.9)	28 (26.9)	0.007
Anastomotic leakage[n (%)]	2 (3.6)	14 (13.5)	0.047
Ileus [n (%)]	1 (1.8)	4 (3.8)	0.812
Surgical site infection [n (%)]	0 (0)	1 (1)	1.000
Anastomotic bleeding [n (%)]	0 (0)	2 (1.9)	0.765
Urinary tract infection [n (%)]	1 (1.8)	1 (1)	1.000
Urinary dysfunction [n (%)]	0 (0)	3 (2.9)	0.502
Postoperative diarrhea [n (%)]	2 (3.6)	6 (5.8)	0.820
Reoperation [n (%)]	1 (1.8)	11 (10.6)	0.044
Postoperative hospital stay: days (min–max)	8 (5-28)	8 (4-56)	0.018
Indwelling catheter dwell time: days (min–max)	5 (2-9)	6 (2-30)	0.059
Peritoneal drainage tube dwell time: days (min–max)	6 (4-21)	7 (2-25)	0.113

Methods/Interventions: Patients (pts) undergoing stomal closure between 2009-2019 enrolled in an IRB approved prospective data base were eligible for entry. As of 2014 either a small penrose drain (separate lengths of drain aligned vertically in wound from fascia to beyond the skin level anchored with skin suture) or Jackson Pratt (JP) drain were placed in the stomal wounds that were staple closed (with penrose drains between staples). The database plus the operative, hospital, and office charts were utilized; in particular, the short term outcome and rate of sSSI's were noted

Results/Outcome(s): A total of 108 pts met study criteria. Skin wounds were staple closed in all cases. No drain was used in 61 pts (54%) whereas a drain(s) was placed in 47 pts (46%). The drains were removed between 5-14 days after surgery. The breakdown between IC and CC was similar between the 2 groups; IC's accounted for 82% of drain negative (DN) and 80.9% of drain positive (DP) patients whereas the remainder underwent CC. All pts got preoperative IV antibiotics, and colostomy closure pts got mechanical and PO antibiotic bowel preps. Of note, a colon bundle was in use for 8 out of 9 DP CC patients who had Hartmann pouch reversal operations. No "bundle" was applied for any IC or DN CC patient. No differences were noted in the age, sex, BMI or indications for stoma formation. There were 9 sSSI's noted in the DN group (9/61, 14.8%) while no wound infections were noted in the DP group (0/52, 0%; p= 0.005).

Conclusions/Discussion: In this preliminary study of 108 pts, drainage of the subcutaneous wounds of stomal closure patients was associated with 0 sSSI's, whereas in patients without drains, the sSSI rate was 14.8%. The fact that a colon bundle used for 17% of the DP group may have contributed to the lower sSSI rate in that subgroup. Because of the small size of this study it is not possible to draw firm conclusions, however, this outcome suggests the routine use of subcutaneous drains for IC and CC may lower sSSI rates. Based on these results, a larger randomized study is warranted.

NODAL STATUS IN RIGHT COLECTOMY WITH COMPLETE MESOCOLIC EXCISION (CME) FOR RIGHT COLON CANCER: AN ANALYSIS OF PATHOLOGY REPORTS.

P1268

M. Maspero, A. Giani, M. Origi, J. Crippa, C. Bertoglio, P. Carnevali, M. Mazzola, C. Magistro, G. Ferrari
Meda, Italy

Purpose/Background: The extent of dissection required to perform a proper oncological resection for right colon cancer is still under debate, although evidence suggests that complete mesocolic excision (CME) with central vascular ligation (CVL) reduces local recurrence rates and improves disease free survival. In this study, we present an analysis of CME pathology reports.

Methods/Interventions: We retrospectively analysed data from all consecutive patients operated for right colon adenocarcinoma at our centre between 2016 and 2018. All patients received CME. We analysed the number of harvested lymph nodes and their anatomical location, and assessed the behaviour of the disease according to tumour location.

Results/Outcome(s): 170 patients received right colectomy for colon cancer, with a mean age of 73 years (SD 11). 150 (88%) procedures were laparoscopic - 5 (3%) of which had to be converted-, 20 (12%) were open. 24 (14%) patients received extended right hemicolectomy. All resections were R0. Stage was I in 48 (28%) cases, II in 56 (33%), III in 53 (31%) and IV in 11 (6%). 9 patients were M+. Lymph nodes (LNs) were positive in 63 (37%) patients: 37 (22%) N1 and 26 (15%) N2. The mean number of harvested LNs was 24 (SD 12). Pericolic and intermediate LNs were harvested in 170 (100%) patients, LNs near the vascular origins in 99 (58%). LNs near the vascular origins were positive in 10 (6%) cases. LNs near the origin of ileocecal vessels (ICV) were described in 70 (41%) reports: the mean n. of LNs was 4 (range 1 - 14). LNs were positive in 6 (9%) cases. LNs near the origin of right colic vessels (RCV) were

P1268

	Cecum (n = 66)	Ascending (n = 62)	Hepatic flexure (n = 21)	Transverse (n = 21)
N+	27 (41%)	22 (35%)	7 (33%)	7 (33%)
N+ near the origin of vessels	4 (15%)	6 (27%)	2 (9%)	1 (5%)
LNs found near ICV	24 (36%), N+ 3 (12%)	32 (52%), N+ 2 (6%)	7 (33%), N+ 0	7 (33%), N+ 1 (14%)
LNs found near RCV	11 (17%), N+ 0	19 (31%), N+ 2 (10%)	7 (33%), N+ 2 (29%)	6 (29%), N+ 0
LNs found near right branch of MCV	11 (17%), N+ 0	11 (18%), N+ 1 (9%)	4 (19%), N+ 0	3 (14%), N+ 0
LNs found near main MCV	4 (6%), N+ 1 (25%)	6 (10%), N+ 1 (17%)	4 (19%), N+ 0	7 (33%), N+ 0
Overall survival	64 (97%)	55 (89%)	21 (100%)	21 (100%)
Local relapse	1 (1%)	0	0	1 (5%)
Distant relapse	5 (8%)	0	1 (5%)	2 (9%)

Values are n. of cases (%)

described in 43 (25%) reports : mean n. 3 (range 1 - 17). LNs were positive in 4 (9)%) cases. LNs near the origin of the right branch of the middle colic vessels (MCV) were described in 29 (17%) reports: mean n. 3 (range 1 - 9). LNs were positive in 1 (3%) case. LNs near the origin of the main branch of the MCV were described in 21 (11%) cases: mean n. 3 (range 1 - 6). LNs were positive in 2 (9%) cases. Nodal behaviour according to tumour location is described in Table 1. The mean follow up was 15 months (SD 9). 51 (30%) patients received adjuvant therapy. Overall survival was 161 (95%). There were 2 (1%) local recurrences and 8 (5%) distant relapses.

Conclusions/Discussion: Our preliminary results show good oncological outcomes with CME. We describe the number and location of LNs harvested near the origin of vessels, which may otherwise not be excised. Our study highlights the importance of standardised pathology reports and of a good collaboration between the surgical team and the pathologists.

INITIAL EXPERIENCE OF SINGLE PORT ROBOTIC LEFT COLECTOMY AND LOW ANTERIOR RESECTION (SPRLAR).

P1269

S. Agarwal, E. Kunkel, J. Salem, C. Martin, H. Schoonyoung, J. Marks
Wynnewood, PA

Purpose/Background: The Single Port (SP) daVinci robot is a novel robotic platform, combining the benefits of SILS and robotic surgery into an advanced operative platform, employing a fully articulated 3D camera and three arms via a 2.5cm trocar. This abstract reports the first clinical experience of single-incision left colectomies and low anterior resections using the SP robot.

Methods/Interventions: Under IRB approval we enrolled 10 patients for SP Left Colectomy/LAR by a single surgeon at a tertiary referral center. All patients who were candidates for colectomy/LAR were considered for inclusion in this study. Peri-operative data was collected in a prospective fashion.

Results/Outcome(s): Between 10/2018 and 11/2019, 10 patients underwent SP left colectomy (n=5) and SP rLAR (n=5). Indications were diverticulitis (n=6), sigmoid adenocarcinoma (n=3), and obstructive defecation with sigmoid omega loop (n=1). Nine patients were women and 1 was a man; the average BMI was 24.5 kg/m^2 (19.7 – 30.9). In all cases the SP robot and a 12mm assistant port was placed through a gel port path. The robot was docked an average of 1.9 times (1-4) with a median docking time of 7.0 minutes (2.0-20). In all 10 cases, the splenic flexure was released, and a colorectal anastomosis was created using an EEA 28 stapler. Mean time on the console was 164.3 minutes (range 90-241); 180 minutes for the first 5 cases (138-241) versus 144 minutes (90-185) for the second 5 cases (p-value 0.13). The mean EBL was 95.5mL (20 – 300mL). One case had two additional 1.5mm ports placed following splenic flexure release and IMA transection due to fistulous adhesions. The procedure was completed through a single incision in the other 9 cases, averaging 4.4 cm (3.5 – 6) in size. There was no immediate or delayed postoperative morbidity or mortality with an average follow-up period of 3.4 months. Clinical course was as follows: Clears tolerated- POD 0.3 (0-1); LR Diet- POD 1.9 (1-3); Flatus- POD 2.1 (1-4); BM POD 2.0 (1-4). Average length of stay was 3.2 days (range 2-8).

Conclusions/Discussion: This initial clinical experience with SPrLAR demonstrates the feasibility and safety of this technique. The set-up time for the robot is small and re-docking to move the table is not problematic. There was a 40 minute decrease in console time in the second half of this experience, though not statistically significant. Clinical outcomes were excellent. As experience grows and further instrumentation becomes available in the form of staplers, energy sealers and suction, the applications will expand and warrant additional careful studies, but these first results are exciting.

PREOPERATIVE NEOADJUVANT CHEMOTHERAPY TO PREVENT DISTANT RECURRENCE IN STAGE I-III COLON CANCER PATIENTS AFTER CURATIVE RESECTION: WHO MIGHT HAVE BENEFIT?

P1270

P. Chandrachamnong, W. Riansuwan
Bangkok, Thailand

Purpose/Background: Although the outcomes of colon cancer treatment have been improved particularly in local control, approximately one-third of the patients still have

P1270 Univariate analysis for significant risk factors of distant recurrence in stage I-III colon cancer patients

	All (n=321)	Distant Recurrence (n=64)	No Recurrence (n=257)	OR (95% CI)	P-value
N1b stage	53 (16.5%)	13 (20.3%)	40 (15.6%)	2.33 (1.07-5.07)	0.032
N2a stage	30 (9.3%)	15 (23.4%)	15 (5.8%)	7.19 (3.07-16.80)	<0.001
N2b stage	19 (5.9%)	8 (12.5%)	11 (4.3%)	5.22 (1.88-14.48)	0.001
Perineural invasion	55 (17.1%)	18 (28.1%)	37 (14.4%)	2.32 (1.21-4.44)	0.010

a distant recurrence. We, therefore, conduct this study to determine the risk factors of distant recurrence in stage I-III colon cancer patients after curative resection who might have benefit from preoperative neoadjuvant chemotherapy.

Methods/Interventions: A retrospective chart review was performed in patients who have diagnosed with stage I-III adenocarcinoma of the colon and underwent curative resection in our institute between 2007 and 2011. Significant clinical and pathological risk factors were identified by univariate and multivariate analysis.

Results/Outcome(s): 321 patients were retrieved with 64 (19.9%) distant recurrence. Univariate analysis identified perineural invasion, N1b stage, N2a stage, and N2b stage as significant factors for distant recurrence **(Table)**. After multivariate analysis, the prognostic factors for distant recurrence were only N2a stage [adjusted OR (95%CI): 5.9 (2.2-16.0); $p < 0.001$] and N2b stage [adjusted OR (95%CI): 4.4 (1.3-14.8); $p = 0.016$].

Conclusions/Discussion: To reduce distant recurrence and increase survival, preoperative neoadjuvant chemotherapy should be considered as an upfront treatment in colon cancer patients with positive more than three lymph nodes (N2a and N2b stage).

PREOPERATIVE SUBCLASSIFICATION OF T3 RECTAL CANCERS BY DEPTH OF MESORECTAL INVASION (MED) USING A 5 MM CUT-OFF WITH ENDORECTAL ULTRASOUND (ERUS) AND MAGNETIC RESONANCE IMAGING (MRI).

P1271

C. Cózar Lozano, S. Garcia-Botello, R. Martí Fernández, M. Bauzá Collado, D. Moro Valdezate, J. Martí-Arévalo, V. Pla Martí, A. Espí Macías
Valencia, Spain

Purpose/Background: Validated rectal cancer staging groups T3 tumors in a single stage and MED subclassification is not standard practice. A 5 mm MED cut-off has been suggested as predictive for local recurrence and overall survival and accuracy of MRI for this measurement has been proven. Studies have shown high accuracy rates of ERUS in staging of rectal tumors, but T3 subclassification by ERUS has been scarcely reported. Our aim is to report concordance between MRI and ERUS for preoperative staging of T3 rectal tumors using the 5mm cut-off point.

Methods/Interventions: Patients > 18 years were consecutively and prospectively included from 2008 and 2018 prior local institutional review board approval and informed consent. Patients staged as cT3 by ERUS or MRI were included. ERUS was performed with a 6-16 MHz 360 transducer (B & K Medical Systems Pro Focus 2202® scanner and B-K 2050 probe, Herlev, Denmark). Real-time dynamic interpretation of 2 and 3D images was performed by experienced surgeons and MRI evaluation by a rectal MRI radiologist with a 1.5-t, magnetic resonance whole-body imager (signa Echo-Speed Plus with EXCITE; GE Medical Systems, Milwaukee, Wi) with a pelvic phased array coil. Maximum depth of penetration beyond the outer longitudinal muscle layer was measured on the workstation using electronic calipers and divided into: MED ≤5mm (Group 1) and MED >5mm (Group 2). Patients classified as T1/T2 by either technique were included in Group 1 and those as T4 in Group 2. Statistical analyses were performed using SPSS (Version 26 for Mac). Concordance rate and Kappa coefficient were calculated. The Kappa coefficient varies between -1 and 1, considering: k=-1, random match; k<0.2, poor match; k=0.2-0.4, low match; k=0.4-0.6, moderate match; k=0.6-0.8, good match; k=0.8-1, very good match.

Results/Outcome(s): 159 patients staged as cT3 by either ERUS or MRI were initially included. 54 patients were excluded: incomplete ERUS due to tumor stenosis (35), MRI contraindications (12) and pathological T3 subdivision not assessed by MRI (7). The final study group included 105 patients, median age 70 years (43-90, 68 (65%) male). Median distance of the tumor from the anal verge was 7 cm (2-14cm). On ERUS assessment 6 (5.7%) patients were T2, 97 (92%) T3 and 2 (1.9%) T4 whilst on MRI 2 patients (1.9%) were T1, 9 (8.6%) T2, 92 (87.6%) T3 and 2 (1.9%) T4. There was good concordance (Kappa (K)= 0.753) between techniques when the 5mm cut-off point was used (Table 1). Concordance was greater for the mid (K = 0,874) than low (K= 0,643) or superior (K=0,588) rectum.

Conclusions/Discussion: T3 subclassification above and below 5mm is feasible by ERUS, shows good concordance with validated MRI measurements and can easily be incorporated into the diagnostic workup and reporting for these patients.

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MED	MRI<5mm	MRI>5mm	Total
EUS <5mm	81 (77.14%)	5 (4.76%)	86 (81.90%)
EUS <5mm	3 (2.86%)	16 (15.24%)	19 (18.1%)
Total	84 (80%)	21 (20%)	105 (100%)

Table 1. Concordance rates for MED measurements taken by MRI and ERUS.

RISK FACTORS OF DISTANT RECURRENCE IN STAGE I-III RECTAL CANCER PATIENTS AFTER CURATIVE TREATMENT.

P1272

A. Mongkhonsupphawan, W. Riansuwan
Bangkok, Thailand

Purpose/Background: Local recurrence in rectal cancer surgery has been decreased due to the advent of total mesorectal excision and perioperative neoadjuvant chemo-radiation. However, distant recurrence still is an unsolved problem in these patients. We, therefore, conducted this study to identify the prognostic factors of distant recurrence in rectal cancer patients who underwent curative surgery.

Methods/Interventions: A retrospective chart review of rectal cancer patients who underwent curative surgery at our institute between 2007 and 2011 was performed. Univariate and multivariate analysis were used to determine the significant factors of distant recurrence.

Results/Outcome(s): 299 rectal adenocarcinoma patients who underwent curative surgery were identified with 86 (28.8%) distant recurrence. With univariate analysis, age, preoperative CEA, tumor deposit, lympho-vascular invasion, perineural invasion, circumferential resection margin, T3 to T4a stage, and N1b to N2b stage were significant factors of distant recurrence **(Table)**. However, only preoperative CEA [adjusted OR (95% CI): 1.0 (1.00-1.01); P = 0.05], N2a stage [adjusted OR (95% CI): 5.5 (2.17-14.28; P < 0.001], and N2b [adjusted OR (95% CI): 3.8 (1.5-9.5); P = 0.004] were independent predictors of distant recurrence by multivariate analysis.

Conclusions/Discussion: To decrease distant recurrence, preoperative upfront induction chemotherapy should be considered in rectal cancer patients with high preoperative CEA or suspected positive more than three lymph nodes (N2a and N2b stage).

TRANSANAL TOTAL MESORECTAL EXCISION ACHIEVES EQUIVALENT ONCOLOGIC RESECTION COMPARED TO LAPAROSCOPIC APPROACH, BUT WITH FUNCTIONAL CONSEQUENCES.

P1273

G. Ong, B. Tsai, O. Johansen, F. Lane, R. Melbert, T. Reidy, D. Maun
Indianapolis, IN

Purpose/Background: Management of distal rectal cancers balances optimal oncologic resection with reestablishing intestinal continuity while maintaining acceptable bowel function. Total mesorectal excision (TME) has become the gold standard in rectal cancer surgery and a laparoscopic approach is common in experienced centers. Transanal total mesorectal excision has been gaining popularity due to potential benefits over laparoscopic total mesorectal excision. The objective of this study was to compare transanal with laparoscopic TME for distal rectal cancer by a single surgeon at our institution. Primary outcome measures included adequacy of oncologic resection. Perioperative measures and postoperative complications were secondarily examined.

Methods/Interventions: A retrospective review of all proctectomy for distal rectal cancer (<6 cm from anal verge) by a single surgeon was performed between January 2014 and September 2019. Patients were grouped by transanal total mesorectal excision (taTME) versus laparoscopic total mesorectal excision (laTME). Demographic, operative, and postoperative data were analyzed and compared using student's t-test or Fisher's exact test.

Results/Outcome(s): There were 20 taTME and 30 laTME patients (Table). The abdominal portion of both taTME and laTME procedures was performed robotically. There was one conversion to open procedure in each group. All patients had protective loop ileostomy at the

P1272 Univariate analysis for significant risk factors of distant recurrence in stage I-III rectal cancer patients

	All (n=299)	Distant Recurrence (n=86)	No Recurrence (n=213)	OR (95% CI)	P-value
Age (year)*	62 ± 13	60 ± 12	63 ± 13	0.98 (0.96-0.99)	0.035
Preoperative CEA (ng/mL)**	4.4 (2.5,12.8)	7.9 (3.3,22.6)	3.8 (2.4,8.3)	1.00 (1.00-1.01)	0.013
T3 stage	186 (62.2%)	61 (70.9%)	125 (58.7%)	8.29 (1.07-63.79)	0.042
T4a stage	14 (4.7%)	8 (9.3%)	6 (2.8%)	22.66 (2.32-221.09)	0.007
N1b stage	36 (12.2%)	11 (12.9%)	25 (12.0%)	2.68 (1.13-6.34)	0.024
N1c stage	6 (2.0%)	4 (4.7%)	2 (1.0%)	12.21 (2.09-71.35)	0.005
N2a stage	37 (12.6%)	19 (22.4%)	18 (8.6%)	6.44 (2.87-14.44)	<0.001
N2b stage	48 (16.3%)	23 (27.1%)	25 (12.0%)	5.61 (2.66-11.83)	<0.001
Tumor deposit	12 (4.1%)	7 (8.2%)	5 (2.4%)	3.66 (1.12-11.87)	0.031
Lympho-vascular invasion	93 (31.2%)	36 (41.9%)	57 (26.9%)	1.95 (1.15-3.31)	0.012
Perineural invasion	74 (24.8%)	36 (41.9%)	38 (17.9%)	3.29 (1.89-5.73)	<0.001
Circumferential resection margin	32 (10.7%)	18 (20.9%)	14 (6.6%)	3.79 (1.79-8.05)	0.001

* Mean ± SD; ** Median (IQR)

time of proctectomy. Compared to laTME, taTME patients had more distal tumors although there was no difference in pathologic distal resection margin or frequency of positive distal margin. Operative times were longer for taTME, but there was no difference in length of stay, lymph node harvest, or frequency of pelvic abscess or anastomotic leak. There was a higher rate of postoperative fecal incontinence in taTME patients.

Conclusions/Discussion: Transanal TME provides equivalent oncologic resection compared to laTME with similar anastomotic healing and complication rates. Transanal approach may allow successful resection of more distal tumors with the consequence of higher incidence of postoperative fecal incontinence. We conclude that taTME should be reserved for the most distal tumors, when achieving a negative distal resection margin may be compromised by the laTME approach.

FRAILTY ATTENUATES THE MORTALITY EFFECT OF PREOPERATIVE BLOOD TRANSFUSION FOR ELECTIVE COLECTOMIES.

P1274

A. Morris, B. Tracy, R. Gelbard, J. Sciarretta, V. Shaffer
Duluth, GA

Purpose/Background: Frailty and perioperative blood transfusions have both been associated with worse outcomes following colorectal surgery. However, the interaction of these two variables is not described. We sought to explore the relationship between frailty and blood transfusions in elective colorectal surgery.

Methods/Interventions: We performed a retrospective review of colectomies performed for malignancy captured by the 2016 NSQIP database. We excluded outpatients, non-elective operations, patients with bleeding disorders, and those lacking preoperative hematocrit levels or discharge dispositions. Demographics, preoperative laboratory values, modified frailty index (mFI), and operative approaches were collected. Patients were grouped by whether they received preoperative blood transfusion (pre-BT) within 72 hours of surgery. Outcomes assessed were complications, discharge dispositions (inpatient facility, rehab, home), and 30-day mortality.

Results/Outcome(s): There were 12,518 patients in the cohort; 0.8% (n=102) received pre-BT and 99.2% (n=12,416) did not. Of the cohort, 42.3% (n=5,296) were not frail, 38.5% (n=4,817) had mild frailty [mFI 0.2], 17.7% (2,216) had moderate frailty [mFI 0.4], and 1.5% (n=189) had severe frailty [mFI ≥0.6]. Patients receiving pre-BT were older (75 years vs 66 years, p<.0001), more often female (60.8% vs 48.9%, p=0.02), and had a lower mean preoperative hematocrit (28.3% vs 37.9%, p<.0001). Hospital length of stay was significantly longer in the pre-BT group (7 days vs 4 days, p<.0001) and rates of pneumonia (4.9% vs 1.4%, p=0.004) and >48 hours mechanical ventilation (2.9% vs 0.8%, p=0.01) were higher in the pre-BT group. More patients receiving pre-BT expired (3.9% vs 0.6%, p<.0001) or were discharged to an inpatient facility (12.8% vs 4.6%, p=0.0001). On multivariable logistic regression predicting 30-d mortality, after adjusting for age, any complication, sex, and laparoscopic versus open approach, the odds of mortality for pre-BT decreased as mFI increased (mFI≥0.2: OR 5.12, 95% CI 1.65-15.86, p=0.005), (mFI≥0.4: OR 4.79, 95% CI 1.55-14.80, p=0.007), (mFI≥0.6: 3.83, 95% CI 1.19-12.27, p=0.02) (Figure 1). However, the odds of mortality for intra/postoperative transfusions remained stable with increasing frailty indices.

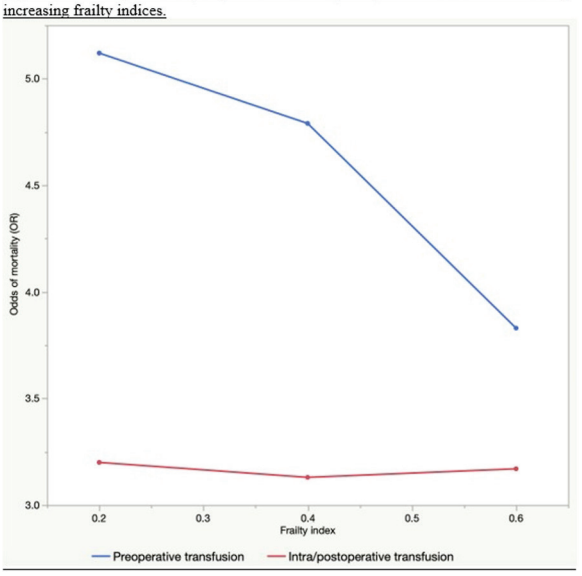
Conclusions/Discussion: Preoperative blood transfusion within 72 hours of oncologic colon resection is associated with a higher incidence of adverse outcomes. Although pre-BT and postoperative transfusions increase the odds of death, increasing frailty only attenuates the mortality effect of pre-BT. Further studies are needed to better understand the impact of frailty on this patient population.

P1273

	taTME	laTME	p value
n	20	30	
Body mass index	28.35 ± 1.18	28.59 ± 1.03	0.882
Distal tumor distance from anal verge (cm)	3.09 ± 0.47	4.66 ± 0.24	0.0029
Operative time (min)	285.8 ± 11.8	256.6 ± 8.7	0.048
Conversion to open	1 (5%)	1 (3.3%)	0.9999
Length of stay (days)	4.2 ± 0.6	4.7 ± 0.5	0.492
Pathologic distal margin (cm)	1.16 ± 0.16	1.40 ± 0.21	0.4162
Positive distal margin	1 (5%)	2 (6.6%)	0.9999
Positive circumferential margin	0 (0%)	2 (6.6%)	0.5102
Lymph node harvest	17.5 ± 1.6	18.1 ± 1.2	0.7723
Postop fecal incontinence	6 (30%)	2 (6.6%)	0.0427
Pelvic abscess or leak	1 (5%)	4 (13.3%)	0.6359

taTME, transanal total mesorectal excision; laTME, laparoscopic total mesorectal excision

Figure 1. Mortality odds for preoperative and intra/postoperative blood transfusions by increasing frailty indices.



PREOPERATIVE & POSTOPERATIVE NARCOTIC USE IN COLORECTAL SURGERY - IS THERE CORRELATION WITH COMPLICATIONS?

P1275

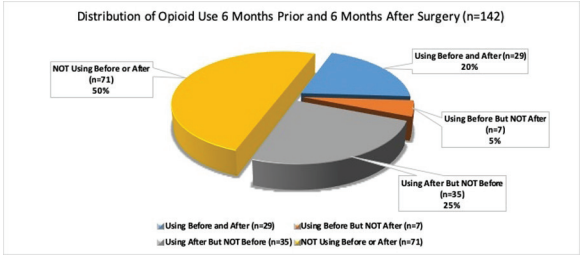
J. Abdelsayed, M. Chandra, J. Downs
Dallas, TX

Purpose/Background: Pain control following colorectal surgery can be difficult to achieve and despite multimodal pain therapy, opioids are still used in a majority of patients. However, opioid dependence and abuse is a growing national concern. The objective of this study is to examine patients who underwent elective colorectal surgery at a community hospital in 2018 and evaluate their preoperative and postoperative narcotic use and its relation to postoperative complications.

Methods/Interventions: We retrospectively reviewed patients who underwent elective colorectal surgery at a single community hospital in 2018 and measured their narcotic use in morphine milligram equivalents (MME) postoperatively. These patients were then cross-referenced in a state pharmaceutical database to obtain their preoperative and postoperative acute narcotic use. Differences in perioperative complications, MME, length of stay (LOS), as well as long term narcotic use 6 months postoperatively were then analyzed using multivariable logistic regression.

Results/Outcome(s): 142 patients underwent elective colorectal operations and were part of the hospital's Enhanced Recovery After Surgery (ERAS) pathway. Sixty-Nine were male (49%), and 100 (70%) were over the age of 55 years old. Minimally invasive surgical (MIS) approaches were undertaken in a majority of patients- 58% robotic, 33% laparoscopic, and 9% open. Mean MME at 24hrs for men and women was 14.7 & 13.7, respectively. Narcotic use for younger patients was significantly higher at 24hrs (26 v. 9), 72hrs (163. 61), 0-3 months (333 v. 151) and 4-6 months (265 v. 131) postoperatively for patients <55yo vs >55yo. Average narcotic use at 24 & 72 hrs was lower for MIS vs open while long term use at 4-6 months revealed similar long term use (12% v. 8%). An intra-corporeal anastomosis was performed in 20% of patients with decreased MME at 24 hrs (7.3 v. 15.8) & 72 hrs (60 v. 100), 0-3 months (113 v. 226) and 4-6 months (21 v 200) postoperatively. Eighteen percent of the cohort were taking opioids >3 months preoperatively while only 12% of patients were still using opioids >3 months postoperatively. Of the patients on long term narcotics 4-6 months postoperatively, MME use was higher in the immediate postoperative period (18.7 v. 13.6), had higher MME per LOS (569 v. 168) but were not more likely to experience complications (174 v. 131) or use narcotics preoperatively (5% v. 25%).

Conclusions/Discussion: In elective colorectal surgery patients, immediate postoperative narcotic use was decreased in patients with a minimally invasive approach, increased age, and intra-corporeal anastomosis creation. Patients who used narcotics long term after surgery had higher immediate postoperative narcotic use but were not more likely to experience postoperative complications or use narcotics preoperatively. This study suggests that perioperative narcotic use does not predict long term narcotic use.



Distribution of Opioid Use 6 Months Prior and 6 Months After Surgery

SURGICAL MANAGEMENT OF RECURRENT RECTAL CANCER INVOLVING THE LATERAL PELVIS.

P1276

S. Ivey, T. Newhook, G. Chang, J. Skibber, B. Bednarski
Houston, TX

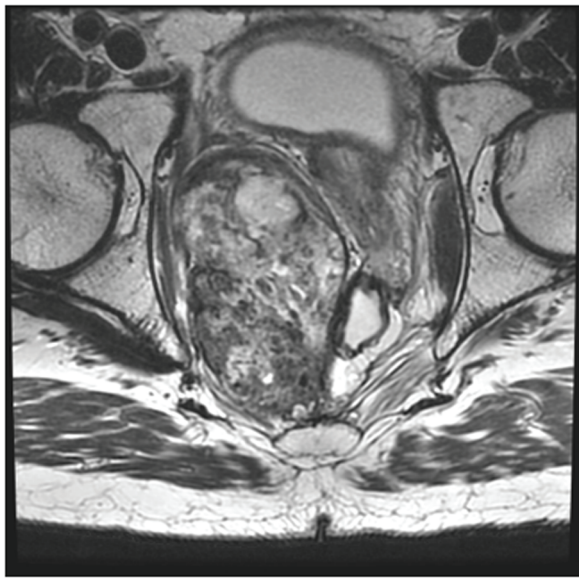
Purpose/Background: Recurrent rectal cancer involving the lateral pelvis poses unique challenges for surgical resection. This case details multidisciplinary management including the technical approach to complete soft tissue resection of the lateral pelvis. The patient is a 66 year old male who had surgery for a pT2N0 rectal cancer in 2008. In 2016, he developed pain with sitting. Colonoscopy was negative. Computed tomography (CT) scan showed a right pelvic mass and no metastatic disease. Biopsy confirmed

a poorly differentiated adenocarcinoma. He underwent chemoradiation and surgical exploration, but was deemed unresectable due to pelvic sidewall involvement. He received 6 months of chemotherapy and presented for a second opinion on resectability in 2018. Pelvic magnetic resonance imaging (MRI) showed the mass displacing the rectum, bladder and prostate, and abutting the right obturator internus muscle and distal sacrum (Figure) and CEA=27.1. Multidisciplinary tumor board consensus was to proceed with pelvic exenteration with complete resection of the right lateral pelvic sidewall, distal sacrectomy and intraoperative radiation therapy (IORT).

Methods/Interventions: In December 2018, he underwent total pelvic exenteration with en bloc resection of the obturator nerve/vessels, left internal iliac artery/vein, obturator internus muscle and S5 sacrectomy with urology, plastic surgery and radiation oncology. The right lateral pelvis was approached with ligation of the internal iliac artery and vein below the superior gluteal branches exposing the sacral nerve roots. The obturator nerve, artery and vein were divided proximally and distally. The obturator internus muscle was resected off the medial wall of the acetabulum. The terminal branches of the internal iliac vessels were ligated exposing the sciatic notch. The perineal dissection joined the right pelvic dissection at the ischial spine. The distal sacrum was amputated. Surgical margins were grossly negative. IORT was delivered with 12.5Gy. The perineum was reconstructed with a gracilis myocutaneous flap and bioprosthetic mesh. Procedure length was 14.5 hours. Estimated blood loss was 4 liters.

Results/Outcome(s): The patient's initial hospital course was uncomplicated. He worked with physical and occupational therapy. He was discharged on POD 12 ambulating independently. He developed a pelvic abscess requiring readmission, intravenous antibiotics and percutaneous drainage. Pathology revealed moderately differentiated adenocarcinoma. All margins were negative with a close 1mm radial margin anteriorly. Surveillance CT in September 2019 showed no evidence of recurrent disease and CEA=1.5.

Conclusions/Discussion: This case demonstrates the benefit of a systematic operative approach to the lateral pelvis driven by the anatomy visualized on pelvic MRI. Furthermore, it highlights the role of multidisciplinary care both in and out of the operating room for patients with locally advanced or recurrent rectal cancer.



IS TaTME AN ONCOLOGIC SAFE SURGICAL APPROACH FOR TREATMENT OF ADVANCE RECTAL NEOPLASM?

P1277

P. Collera, L. Sanchon, C. Gomez, M. Labro, C. Soto, A. Osorio, C. Guariglia, M. Bardaji
El Prat de Llobregat, Spain

Purpose/Background: Gold Standard for rectal cancer treatment is total mesorectal excision (TME) and it can be perform by open, laparoscopic or transanal approach. Some studies, such as COLOR II, had reported that the laparoscopic approach is not inferior to the open TME, however laparoscopic approach may present technical limitations in male obese patients with narrow pelvis, also in those with low rectal tumours. The use of the transanal approach for TME (taTME) would allow a minimally invasive surgery, with a better approach in these patients with surgical results comparable to open or laparoscopy approach. However, there is controversy with the use of taTME due to the lack of medium and long-term oncological and functional outcomes. We present our oncologic results of rectal cancer patients treated by taTME, with at least 3 years follow-up.

Methods/Interventions: In our centre, 79 patients of the 199 cases of rectal cancer treated by taTME approach had an oncologic follow-up of minimum 3 years. 53 men and 26 women, aged between 29 and 91 years old (mean of 65.92). Surgeries were performed from August 2013 to November 2016. We analysed the data of mortality, recurrence and disease-free survival.

Results/Outcome(s): In our centre, 79 patients of the 199 cases of rectal cancer treated by taTME approach had an oncologic follow-up of minimum 3 years. 53 men and 26 women, aged between 29 and 91 years old (mean of 65.92).

Surgeries were performed from August 2013 to November 2016. We analysed the data of mortality, recurrence and disease-free survival.

Conclusions/Discussion: We consider that taTME surgical approach for treatment of rectal cancer is safe and feaseable, with med-term oncological results comparable to the laparoscopic and open approach. Larger series with longer follow-up are necessary to validate taTME for surgical rectal cancer treatment.

INTEREST AND PREFERENCE IN ONLINE PEER SUPPORT FOR PATIENTS WITH LOW ANTERIOR RESECTION SYNDROME.

P1278

J. Moon, K. Zhao, R. Garfinkle, O. Monton, N. Morin, C. Vasilevsky, P. Zelkowitz, M. Boutros
Montreal, QC, Canada

Purpose/Background: Current management for Low Anterior Resection Syndrome (LARS) is both symptom-based and empirical. Patients often experience anxiety and isolation due to their symptoms. Online peer support may help patients manage and validate their experience due to the unique advantages of anonymity and 24-hour availability. Online peer support has been associated with positive health outcomes in other populations; however its use in patients with LARS has not been studied. The goal of this study was to examine how sociodemographic, psychological, and bowel function characteristics impact interest and preference for online LARS peer support.

Methods/Interventions: After Institutional Review Board approval, we conducted a single institution cross-sectional study of rectal cancer survivors using an online/telephone survey. The survey consisted of questions on sociodemographic factors, the Perceived Stress Scale (PSS), the LARS score, and 2 questions assessing interest in participating in a LARS online peer support platform as a member and/or mentor. Participants were also asked to rate their preference for 12 online peer support features that comprise four themes: platform format (4), communication (4), individual support (3), and monitoring (1). Multiple logistic regression was performed to identify predictors of interest in online peer support.

Results/Outcome(s): Of 101 rectal cancer survivors contacted, 69 completed the survey (68.3% response rate). In total, 35/69 (51%) participants reported interest in online peer support for LARS. Age <65 years (69% vs 31%; $p<0.01$) and LARS (minor or major) vs. no LARS (80% vs 20%; $p<0.01$) were associated with interest in online peer support. The most common explanation for disinterest was lack of online access (83%). On multiple logistic regression, adjusting for sex, ethnicity, income, and education, age <65 years (OR 9.1; 95% CI 2.3-50.0) and LARS (OR 20.0; 95% CI 4.2-100.0) were significant predictors of interest in LARS online peer support. In addition, 34 patients (40%) expressed interest in being a peer mentor. Of the five most highly endorsed features (monitoring by health professional, 82%; Q&A with peers, 79%; listserv, 79%; message board by topic, 79%; mobile accessibility, 76%), three were regarding the platform format. Features for individual support, though less preferred, ranged from 36% (connecting to meet offline) to 61% (private messaging). Interest in "anonymous posting" was significantly associated with male sex (48% vs 33%; $p=0.03$), whereas interest in "space to share own story" was inversely associated with severe stress on the PSS (33% vs 47%; $p=0.02$).

Conclusions/Discussion: There is significant interest in the use of online peer support for LARS among younger patients and those with bowel dysfunction. Development of an online peer support app tailored to meet the interest and preference of this population may contribute to improved patient-centered care.

COLORECTAL CANCER SCREENING IN THE ELDERLY: IS AGE JUST A NUMBER?

P1279

W. Alswealmeen, L. Sadri, K. Bakhshi, J. Heliman, M. Zebley, S. Kim, S. Fassler
Abington, PA

Purpose/Background: Colorectal cancer screening has improved mortality and outcomes for patients diagnosed with colon cancer between the age of 50-75. In recent years, the general population has been living well beyond this age limit and also has greater functional capacity. As such, we are encountering more patients beyond the recommended age limit of 75 years who require endoscopy and intervention for symptomatic colon cancer. Currently, there are no standardized national guidelines for screening and surgery in this age group. The aim of our study was to identify benchmark indices and outcomes for screening patients above seventy-five years of age.

Methods/Interventions: We retrospectively queried the electronic medical records at our single-institution center between the years of 2011-2019. We identified patients above the age of 75 who were diagnosed both with colorectal cancer and also had undergone subsequent surgery. We analyzed patient demographics, perioperative mortality, age at last colonoscopy as well as their frailty score. Frailty was assessed using the Modified Frailty Index based on the modifications to the Canadian Study of Health and Aging Frailty Index. A score of 1 to 11 was calculated based on the patient's history of 1) diabetes mellitus, 2) chronic obstructive pulmonary disease and or pneumonia, 3) congestive heart failure, 4) myocardial infarction, 5) hypertension requiring medication, 6) previous percutaneous coronary intervention, cardiac surgery, or angina, 7) peripheral vascular disease, 8) impaired sensorium, 9) transient ischemic attack or stroke,

10) stroke with neurological deficit, and 11) dependent functional status. The MFI was assigned from 0 to 11, where 0 signified the absence of frailty and 11 indicated maximum frailty.

Results/Outcome(s): 180 patients were identified. 53.5% were females (n=114) and 46.5% males (n=99). 171 patients had elective surgery (95%) including surgery at the time of diagnostic admission compared to 8 emergent cases (5%). The average age for last colonoscopy was 81.8 years. Almost all patients had colonoscopy due to symptoms. The 11-point modified frailty index was retrospectively calculated. 75% of patients had scores between 0 and 2, n=135. 1% of patients had scores >6, n=2. There were 4 perioperative mortalities within 30 days of surgery, 2%.

Conclusions/Discussion: Older patients who underwent both colonoscopy and surgery for symptomatic colon cancer did so with low mortality, 2%. Furthermore, the average age of our group was 6.8 years older than the recommended age cutoff. The majority of these patients scored between 0-2 on the modified frailty index. This suggests that not only are older patients more fit than previously thought, but they are also able to tolerate colorectal interventions more liberally as well. Utilizing frailty indices to identify who should continue screening beyond 75 years of age might prove beneficial for this patient population. Further studies are recommended to support this.

DOES THE USE OF MESH DECREASE THE RECURRENCE AFTER RECTAL PROLAPSE REPAIR?

P1111

R. Rowen[1], A. Crume[1], J. Clark[1], P. Bossart[1], V. Muralidharan[2], O. Dziadkowiec[2], M. Murday[1]
[1]Salt Lake City, UT; [2]Idaho Falls, ID

Purpose/Background: Rectal prolapse is the full thickness extrusion of the circular folds of the rectum beyond the anal verge. In our practice, it remains a commonly encountered problem and a prior retrospective study showed that the recurrence rate after repair was significantly higher than reported in the literature and favored the use of mesh. Selection bias due to the recent adoption of mesh use and lack of time for follow-up was thought to be the cause of this finding. Several factors have been classically associated with rectal prolapse including elderly age, female sex and multiparous status. These are not causative factors as it can also be seen in young, nulliparous women and men. A prior study within our practice showed the possibility of a near linear relationship between increasing recurrences of rectal prolapse with increasing BMI. Using the database created from these prior studies and expanding it to include additional surgeries, I investigated whether the use of mesh is associated with a decreased risk of recurrence when used during an initial repair and if obesity (BMI>30) contributes to a high recurrence rate. The purpose of this study is to determine whether the use of mesh during the initial surgical repair decreases the odds of rectal prolapse recurrence.

Methods/Interventions: This is a retrospective chart review of patient's who underwent surgery for rectal prolapse, performed by the staff at St. Mark's Colon and Rectal Fellowship from August 2012 to October 2019. The electronic charts were reviewed with ICD-9 (569.1) or ICD 10 (K62.3) codes for rectal prolapse. The data collected included details from the operations (description of operation, use of mesh, recurrence) and BMI. With an alpha value of 0.01 and a sample size of 226, the power to detect a prolapse recurrence with or without the use of mesh was calculated to be 92%. Logistic regression was used to determine the relationship between the use of mesh (Yes/No) and the recurrence of rectal prolapse. We also assessed whether BMI (>30 vs <30) confounds the relationship between the use of mesh and the odds of rectal prolapse recurrence by including it as an interaction term in our model.

Results/Outcome(s): The use of mesh was found to significantly decrease the rate of rectal prolapse recurrence OR = 0.14 (95% CI 0.18-0.42). We did not find enough evidence that the relationship between mesh and rectal prolapse reoccurrence changes when we account for BMI (OR 3.88, 95% CI 0.4-37.3). Though in general there is a non-significant trend of having a BMI >30 and more prolapse reoccurrences.

Conclusions/Discussion: There was a significant decrease in the rate of recurrence when mesh was used in the initial surgical repair of rectal prolapse. We did not find enough evidence to show that obesity (BMI >30) is significantly related to recurrence or that it confounds the relationship between the use of mesh or prolapse re-occurrence.

COST-EFFECTIVENESS OF NON-ANTIBIOTIC THERAPY FOR ACUTE UNCOMPLICATED DIVERTICULITIS.

P1112

S. Lachance, R. Garfinkle, N. Morin, G. Ghitulescu, J. Faria, C. Vasilevsky, M. Boutros
Montreal, QC, Canada

Purpose/Background: Uncomplicated sigmoid diverticulitis is common in Western countries, and is associated with significant socioeconomic burden. Traditional management relies on inpatient administration of either oral or intravenous antibiotics with resumption of oral intake as symptoms improve. However, recent literature has questioned the benefit of antibiotics in the treatment

of left-sided diverticulitis. Thus, the aim of the present study was to assess which treatment option (antibiotic vs. non-antibiotic) was more cost-effective in the treatment of left-sided uncomplicated diverticulitis.

Methods/Interventions: A systematic review of the literature (1946-2018) for prospective comparative studies assessing outcomes of antibiotic vs. non-antibiotic management in the management of uncomplicated diverticulitis was conducted. Using a decision tree analysis, the costs and effectiveness of treating left-sided uncomplicated diverticulitis with or without antibiotics were assessed. The primary outcome of the model was prevention of any negative diverticulitis outcome within the first 6 months following treatment of the index episode, including: recurrent uncomplicated diverticulitis, chronic/ongoing diverticulitis, intra-abdominal abscess, fistula, free perforation, and obstruction. A third-party payer perspective was adopted. Costs were obtained from the Canadian Institute for Health Information and Quebec's Physician Fee Schedule, and were expressed in 2018 Canadian dollars (CAD). Effectiveness was measured in quality-adjusted life years. One-way and two-way sensitivity analyses were performed.

Results/Outcome(s): For patients with uncomplicated left-sided diverticulitis, the use of antibiotics was associated with higher cost (additional $265.79 CAD) with minimally increased effectiveness (0.05 additional quality-adjusted life years), resulting in an incremental cost-effectiveness ratio of $5315.80 CAD per quality-adjusted life year. On sensitivity analyses, the decision was sensitive to the probability that antibiotics would be successful in the treatment of diverticulitis without any complications incurred. Non-antibiotic treatment became dominant (less costly and more effective) only when the probability of complications with antibiotic therapy was below 0.737.

Conclusions/Discussion: At the current reported level of efficacy, the use of antibiotics is a cost-effective strategy in patients with left-sided uncomplicated diverticulitis, assuming a willingness to pay of $50,000 CAD per quality-adjusted life year.

CLINICAL, ULTRASONOGRAPHIC AND MANOMETRIC CHARACTERIZATION OF FECAL INCONTINENCE PATIENTS WITH ANAL SPHINCTER INJURY.

P1113

M. Recalde Rivera, J. de León Rendón, A. Garza Cantú, C. Mazariegos Barneond, J. Olvera Delgado, B. Jiménez Bobadilla, S. Vidal Girón, J. Villanueva
Mexico, Mexico

Purpose/Background: Fecal incontinence (FI) is defined as the recurrent and involuntary loss of fecal material or flatus after acquiring the capacity for continence. The structural lesions of the anal sphincter complex have been recognized for many years as a prominent etiology of this disease, either by the presence of obstetric lesions in women or by the history of anal surgery in both genders. The aim of the present study was to describe the demographic, clinical, ultrasonographic and manometric characteristics of patients with FI and anal sphincter injury treated at the Anorectal Physiology Unit in a third level hospital in our country.

Methods/Interventions: A retrospective study was conducted and 37 patients with diagnosis of FI and history of anal sphincter injury were included. The demographic, clinical, ultrasonographic and manometric characteristics were collected from clinical records. Cleveland Clinic Florida Fecal Incontinence Score (CCFFIS) and Starck Ultrasonographic Severity Index (SUSI) were used to evaluate the severity of fecal incontinence and anal sphincter injury, respectively.

Results/Outcome(s): Of patients included 83.8% were women. The average age was 48.64±13 years old. 27% had a history of proctologic surgery. Women had a mean of 3.55±1.82 pregnancies, 2.62±1.67 of vaginal deliveries, and of these patients; 37.9% had an episiotomy, 20.7% used forceps and 51.72% had a history of obstetric tear. The mean of CCFFIS was 13.06±5.0 points and the mean of SUSI was 10.51±3.39 points. In manometric evaluation, the mean of resting pressure (RP) was 32.44±19.2 mmHg and the contraction pressure (CP) was 59.75±30.69 mmHg. When we evaluated rectal sensitivity with rectal compliance tests, the mean of the first rectal sensation (FRS), first defecation desire (FDD) and intense defecatory desire (IDD) were 41.52±22.33 cc, 70.06±22.67 cc and 125.38±38.32 cc, respectively. We did not find correlation between the total scores of CCFFIS and SUSI ($r=0.31$; $p=0.06$). CCFFIS has no correlation between RP ($r=-0.17$; $p=0.32$), CP ($r=-0.30$; $p=0.09$), FRS ($r=0.02$; $p=0.90$), FDD ($r=-0.05$; $p=0.78$) and IDD ($r=-0.35$; $p=0.05$); while SUSI correlated with RP ($r=-0.52$; $p=0.001$) and CP ($r=-0.65$; $p=<0.001$) but not with FRS ($r=0.14$; $p=0.42$), FDD ($r=0.10$; $p=0.59$) and IDD ($r=-0.23$; $p=0.29$). A cut off of 8 points in SUSI allows to discriminate between a resting pressure less or greater than 40 mmHg with a sensitivity of 90% and specificity of 60% (AUC: 0.83; $p=0.004$) and represents a greater risk to have a resting pressure less than 40 mmHg (OR 8.4 [IC95% 1.18 – 59.49] $p=0.03$).

Conclusions/Discussion: FI with anal sphincter injury is a frequent condition in female gender. Its diagnosis and treatment are very complex and requires an integral evaluation considering clinical, imaging and functional aspects in order to assess the severity of FI and homogenize its diagnosis criteria and treatment.

PUDENDAL NERVE CRYOABLATION FOR CHRONIC PELVIC PAIN.

P1114

S. Fox[1], K. Griffen[2], G. Blestel[2], J. Hinshelwood[3], Y. Yurko[2]
[1]*Wilmington, NC;* [2]*Greenville, SC;* [3]*Wilmington, SC*

Purpose/Background: Pudendal neuralgia accounts for 4% of those with chronic pelvic pain. It is the most common cause of chronic perineal pain, and a significant cause of impaired quality of life. Early treatment is associated with a better prognosis, and should be stepwise beginning with behavior modification, pelvic physical therapy to down-train overactive pelvic floor muscles, and pharmacologic agents. Image-guided pudendal nerve blocks are effective but not durable. Patients who gain temporary relief from nerve blocks may have a durable response to CT guided cryoablation. This study evaluates the efficacy of pudendal cryoablation for refractory neuralgia. Primary outcomes were reduced pain scores and improved pain-related quality of life scores. Results will be used to develop a protocol to treat refractory pudendal neuralgia at Prisma Health.

Methods/Interventions: This prospective cohort study included all patients presenting with refractory pelvic pain to Colon and Rectal Surgery at Prisma Health from August 2018 to July 2020. A diagnosis of true pudendal neuralgia was made based on theNantes criteria; all 5 inclusion criteria must be met: 1) Pain is in the area innervated by the pudendal nerve extending from the anus to clitoris; 2) Pain is more severe when sitting; 3) Pain does not awaken patients from sleep; 4) Pain is relieved by diagnostic pudendal block; and 5) The patient has no objective sensory impairment. Exclusion criteria are: 1) Pain is located exclusively in the coccygeal, gluteal, pubic, or hypogastric area (without pain in the area of distribution of pudendal nerve); 2) Pruritus; 3) Exclusively paroxysmal pain; or 4) Abnormalities on any imaging test that might explain the pain. Demographics, risk factors, and pain history are performed. All patients with a diagnosis of refractory pudendal neuralgia were referred to interventional radiology for pudendal nerve block and cryoablation. The Brief Pain Inventory (BPI) was used to calculate pain score pre-ablation and post-ablation at 24 hours, 45 days, and 6 months.

Results/Outcome(s): Preliminarily, six patients have met inclusion criteria. One did not respond improve after the pudendal nerve block, and therefore was excluded. Two required repeat cryoablation due to recurrent symptoms. All had improved pain and quality of life scores.

Conclusions/Discussion: Data collection is ongoing. Pudendal cryoablation may offer durable reduced pain and improved quality of life for refractory pudendal neuralgia, however patient selection is critical.

UTILITY OF PERISTEEN IN CLINICAL PRACTICE: A LOOK BACK.

P1115

D. Assiss[2], K. Braid[2], C. Shephard[2], V. Owen[2], S. Gearhart[1], E. Stein[2]
[1]*Towson, MD;* [2]*Baltimore, MD*

Purpose/Background: Background: Not being able to control when bowels release stool, or the inability to produce a bowel movement, can be very challenging and uncomfortable. Options for management include medical therapy, rehabilitation and surgery, and results from these

P1115 Baseline characteristics of patients trained on Peristeen

Characteristic	Patients trained on Peristeen, n = 34
age, mean +/- SD	47.8 +/- 16.8
gender, female	31 (88.6%)
BMI, mean +/- SD	26.5 +/- 8.2
Symptoms	
constipation	23 (67.6%)
fecal incontinence	6 (17.6%)
constipation and fecal incontinence	2 (5.9%)
Indications for Peristeen	
anatomic (imperforant anus)	4 (11.8%)
spinal cord dysfunction	6 (17.6%)
refractory to medical management	3 (8.8%)
severe outlet obstruction	7 (20.6%)
refractory to medication and severe outlet obstruction	14 (41.2%)
NBD score 0 - 6 (very minor)	2 (5.9%)
NBD score 7 - 9, Minor	5 (14.7%)
NBD score 10 - 13, Moderate	7 (20.6%)
NBD score 14 +	20 (58.8%)

interventions are often suboptimal. Peristeen is a transanal irrigation system that empties the lower bowel, and its' benefits have been demonstrated in patients with neurogenic bowel dysfunction. **Aim:** To explore the value of Peristeen in real life treatment of debilitating defecatory symptoms and to determine if it is an alternative to surgery in this patient population.

Methods/Interventions: Method: Data was collected on patients from Johns Hopkins Hospital and Johns Hopkins Bayview Medical Center evaluated for constipation, obstructed defecation, and fecal incontinence, who had failed optimal medical management and were referred for Peristeen enema training. All patients underwent assessment using the Neurogenic Bowel Dysfunction (NBD) score and a score ≥ to 7 indicates that the bowel management routine is affecting the patients' quality of life. Patients were categorized by symptoms, and underwent a formal training session. Follow-up was obtained by chart review for evidence of Peristeen use and for surgical interventions required due to failure of improvement with Peristeen.

Results/Outcome(s): Results: 34 patients were included (47.8±16.8 years old, mean body mass index [BMI] 26.5±8.2, 31 [88.6%] female, see table). Symptoms were variable and included: constipation (67.6%), fecal incontinence (17.6%), both constipation and fecal incontinence (6%) and other symptoms (8.8%). The median NBD score was 16, and 31 (91.1%) patients had an NBD score over 7 on initial clinic visit. Follow-up occurred over 1 to 12 months. Over 60% of patients were still on Peristeen and no patient was referred to surgery for failed use of the transanal irrigation system.

Conclusions/Discussion: Conclusion: Peristeen is used and found to reduce symptoms, and in our practice, was able to defer surgical intervention in patients with debilitating chronic constipation/mixed fecal incontinence for up to 1 year.

SACRAL NERVE STIMULATION (SNS) IS AN EFFECTIVE TOOL FOR TREATMENT OF LOW ANTERIOR RESECTION SYNDROME (LARS).

P1116

K. Go, T. Cataldo
Boston, MA

Purpose/Background: Low anterior resection syndrome (LARS) may affect up to 70% of patients following rectal resection and negatively impacts quality of life. It is significantly more likely in patients having undergone chemoradiation in association with rectal cancer treatment. Sacral nerve stimulation (SNS) may benefit patients whose LARS is unresponsive to other treatments, however, data on its efficacy are limited.

Methods/Interventions: Patients diagnosed with LARS refractory to medical therapy that underwent permanent SNS implantation after a successful 2 week trial were identified. Data on bowel dysfunction, oncological history, and surgical history were obtained from patient records and phone survey.

Results/Outcome(s): Ten patients with LARS underwent two-staged implantation of the SNS device. Seven patients received neoadjuvant chemoradiation for treatment of rectal cancer; one patient received radiation after resection. Most common symptoms were increased frequency of stools, fecal incontinence, and clustering of bowel movements. All patients proceeded with stage 2 of SNS implantation. 80% of patients reported improvement in symptoms. Of the two patients who did not experience improvement, one patient proceeded with SNS removal and colostomy, and the other patient underwent SNS removal. The SNS device was removed in one patient due to wound infection. Prior to explanation, this patient reported improvement in symptoms and worsening of symptoms following device removal. This patient is awaiting reimplatation.

Conclusions/Discussion: Our study demonstrates that SNS is a safe and useful tool to treat LARS symptoms.

LAPAROSCOPIC VENTRAL MESH RECTOPEXY IN STRUCTURAL DISORDERS OF THE POSTERIOR PELVIC COMPONENT: EARLY SURGICAL AND FUNCTIONAL OUTCOMES.

P1117

S. Leventoglu, A. Yildiz, A. Yildiz, B. Mentes, Y. Oner
Ankara, Turkey

Purpose/Background: Laparoscopic ventral mesh rectopexy (LVMR) is used in rectal prolapse, as well as in the repair of structural disorders in the posterior pelvic component associated with functional disorders (rectocele, intussusception, distal mucosal rectal prolapse, sigmoidocele, enterocele, etc.). The aim of this study was to evaluate the early surgical and functional results in LVMR patients, using validated indexes.

Methods/Interventions: Thirty tree patients (29 females) who underwent LVMR between November 2016 and November 2018 were prospectively evaluated, using pre-prepared standard forms. Demographic characteristics, Cleveland Incontinence Scoring System (CCIS), Cleveland Constipation Scoring System (CCSS), Obstructive Defecation Syndrome Scoring System (ODS), Birmingham Bowel and Urinary Symptoms Questionnaire (BBUSQ), PAC-QoL (The Patient Assessment of Constipation Quality of Life) and FI-QoL (Fecal Incontinence and Quality of Life Assessment) scores were evaluated preoperatively and postoperatively. Preoperative MRI defecography was applied to all patients and graded according to

the Oxford classification. All patients underwent LVMR using the Vypro II® composite mesh according to the original D'Hoore technique. Clavien - Dindo scoring system (CD) was used for postoperative complications.

Results/Outcome(s): The mean follow-up CCSS, ODS and BBUSs decreased significantly in the follow-up period of 10 (range, 3-26) months while PAC-QOL / FI-QOL scores were observed to increase significantly, when compared to the preoperative period (0.0003, $p = 0.0036$, $p = 0.0069$, and $p = 0.0032$, respectively). In two patients, CD class 1 complication (ecchymosis on trocar location) developed. Conversion to open surgery / intraoperative complications and postoperative mesh complications were not observed. No late period complications, such as retrograde ejaculation, impotence, or urinary retention developed.

Conclusions/Discussion: According to our early results, evaluated in many aspects, LVMR is a safe and effective option for the treatment of the structural disorders of the posterior pelvic component, improving the quality of life associated with constipation.

THE NOVEL USE OF A FAT GRAFTING TECHNIQUE TO TREAT FECAL INCONTINENCE.

P1118

C. Keung, M. Salerno, L. Roth
Providence, RI

Purpose/Background: Fecal Incontinence (FI) is a diagnosis that carries significant morbidity, this is compounded due to embarrassment and stigma. It is estimated that FI affects up to 20% of the population. The effects of FI affect all aspects of life. Options for FI are limited in its efficacy, long term success, and patient's perception of implanted devices. FI is due to many causes but one etiology is damaged perianal tissue and compromised sphincter function from vaginal deliveries. Artificial bulking agents have been used but approved agents are limited. Current agents only bulk the damaged tissue. Mesenchymal Stem Cells (MSCs) is a potential bulking agent with regenerative properties. Adipose tissue is a reservoir of MSCs, and its use would be a novel treatment approach for FI. Autologous adipose tissue is harvested by lipo-aspiration, then processed by fragmentation. The fragmentation is specific as it maintains an intact stromal vascular environment but provide enough disruption of the MSCs to initiate the cascade for angiogenesis, neuronal sprouting, and fibroblast production. In the setting of FI, reimplantation of fragmented adipose tissue may be a new treatment modality. The purpose of this study is to demonstrate that FI can effectively be treated by this fat grafting technique.

Methods/Interventions: Currently 2 subjects have been enrolled with the diagnosis of FI. Pre-treatment documentation of their incontinence symptoms were quantified using Wexner Incontinence Score (WIS), Fecal Incontinence Symptom Diary (FISD), and Fecal Incontinence Quality of Life Score (FIQLS). Patients then underwent autologous fragmented fat grafting in the operating room. This involved adipose tissue harvesting, fragmentation, and targeted injections to the muscle defects in the inter-sphincteric space and around portions of the external anal sphincter. Follow-up to monitor efficacy was performed at 1, 3 and 6 months; with long term follow-up planned.

Results/Outcome(s): Both patients demonstrated improvements in their FI symptoms on follow-up at 6 months after fat grafting. The patients' improvement is quantified comparing the WIS, FISD, and FIQLS. The WIS improved from 14 at screening to 10 at 6 months post treatment for the first patient, and from 14 to 11 for the second patient. The FIQLS improved from 2.10 at screening to 3.03 at 6 months post treatment for the first patient, and from 1.9 to 2.77 for the second patient. Evaluating the incidence of incontinence from the diary, the first patient's incontinence improved from 21% of all stooling events, to 12%. The second patient's incontinence improved from 29% to 18%. There were no adverse events that occurred.

Conclusions/Discussion: The use of fat grafting by autologous micro-fragmented tissue is a novel modality to treat fecal incontinence with preliminary success. The plan is to increase study size and monitor success up to 24 months.

FUNCTIONAL OUTCOMES AND QUALITY OF LIFE IN PATIENTS WITH SLOW-TRANSIT CONSTIPATION AFTER COLECTOMY.

P1119

Y. Tian, V. Tong
Chongqing, China

Purpose/Background: Although total or subtotal colectomy is a proven treatment for slow-transit constipation (STC), the associated functional outcomes and quality of life are rarely studied. This study aims to evaluate the effectiveness of surgery for STC regarding functional outcomes and quality of life.

Methods/Interventions: The cohort included 30 patients who underwent surgery for STC in our department from March 2013 to September 2018. Preoperative, intra-operative, and postoperative 3-month, 6-month, 1-year, 2-year follow-up details were recorded. Functional outcomes for all patients were assessed by bowel movements, abdominal pain, bloating, straining, laxative, enema use, diarrhea, and the Wexner constipation and incontinence (WC and WI) scales. Quality of life was evaluated using the Gastrointestinal Quality of Life Index (GIQLI) and the short-form (SF)-36 survey.

Results/Outcome(s): At the 2-year follow-up, a large number of patients (93.1%, 27/29) stated that surgery was beneficial to their health. At each time point following

surgery, the frequency of bowel movements per week increased significantly compared with the preoperative findings ($P<0.05$). Compared with the preoperative values, the occurrence of bloating, straining, and laxative and enema use decreased significantly at each time point follow-up ($P<0.05$). The occurrence of abdominal pain and diarrhea was lower at 2-year than at 3 months follow-up ($P<0.05$). The WI scores at 6-months, 1year, and 2 years were significantly lower than those at 3months follow-up ($P<0.05$). At each time point following surgery, the WC and the GIQLI scores were greater than the preoperative scores ($P<0.05$). At each follow-up time point, the SF-36 score was higher in six spheres (role physical, role emotional, physical pain, vitality, mental health, and general health) as compared to preoperative scores($P<0.05$). Social function improved over preoperative values at 6 months, 1 year, and 2 years follow-up ($P<0.05$).

Conclusions/Discussion: Total or subtotal colectomy for STC not only alleviated constipation symptoms dramatically but also resulted insignificant improvements in the patients' quality of life.

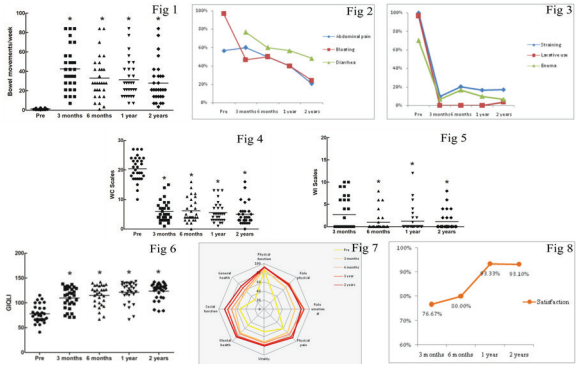


Fig.1. Bowel movements of STC patients

Fig.2. Abdominal pain, Bloating and Diarrhea of STC patients

Fig.3. Straining, laxative and enema use of STC patients

Fig.4. WC scales of STC patients

Fig.5. WI scales of STC patients

Fig.6. GIQLI scales of STC patients

Fig.7. SF-36 test results of STC patients

Fig.8. Satisfaction of STC patients

TRANSPERINEAL RESECTION OF AN INCARCERATED, STRANGULATED J POUCH.

P1120

S. Rakestraw, R. Kucejko, R. Moore, B. Phillips, S. Goldstein, G. Isenberg, C. Costanzo
Philadelphia, PA

Purpose/Background: Prophylactic total proctocolectomy with ileal pouch-anal anastomosis is recommended in patients with familial adenomatous polyposis (FAP) to reduce their risk of colon cancer. In rare instances, the ileal pouch can prolapse out of the anus. Even less frequently, this prolapsed pouch can become strangulated and incarcerated. We present an incidence of an incarcerated, strangulated, prolapsed J-pouch that was resected and reconstructed transperineally.

Methods/Interventions: A 31-year-old female with FAP complicated by colorectal cancer status post chemotherapy and total proctocolectomy; hepatoblastoma status post liver resection, abdominal radiation, and chemotherapy; and duodenal carcinoma status post pancreaticoduodenectomy with jejunostomy and chemotherapy; now on bevacizumab, presented to an outside hospital with bright red blood per rectum and was found to have a prolapsed J pouch. Following unsuccessful attempts at manual reduction, she was transferred to our emergency room with a strangulated, incarcerated J pouch. She was taken emergently to the operating room for a J pouch resection with ileal pull through. A transperineal approach was taken due to her complex abdominal anatomy, history of abdominal radiation, and recent bevacizumab infusion.

Results/Outcome(s): She recovered well and was discharged home on post-operative day 9. She returned to clinic six weeks post-operatively and continued to recover well with no evident wound dehiscence.

Conclusions/Discussion: Ileal pouch prolapse is a rare complication that must be considered as a source of abdominal pain and rectal bleeding in patients with a pouch. In patients with a hostile abdomen, a transperineal approach should be considered in J pouch resections and reconstruction.

GRADE 3 MALE ENTEROCELE: A CASE REPORT.

P1121

E. Wood, C. Reickert, M. Asai
Detroit, MI

Purpose/Background: An enterocele occurs when the small intestine herniates in the pouch of Douglas. This is most commonly seen in eldery, multiparous females after hysterectomy where the small bowel herniates into the vagina. Enteroceles are associated with other pelvic floor disorders including rectal prolapse, rectocele, and cervicocystoptosis. The vast majority of previously reported case series are predominantly female. Enteroceles in men are exceedingly rare and treatment in this patient population is not well established.

Methods/Interventions: We present a case of a male patient with a large enterocele requiring manual reduction. He ultimately underwent rectopexy with perineoplasty.

Results/Outcome(s): A 47 year old, previously healthy African American male presented to the hospital with chronic constipation and rectal prolapse. His past surgical history was significant for bilateral inguinal hernia repair, and he had no history of trauma or surgery to his pelvic floor. The patient had a three-year history of constipation with intermittent mucous drainage and hematochezia.

When he first became symptomatic, he underwent a colonoscopy which revealed diverticulosis and internal hemorrhoids. His drainage and bleeding were initially attributed to his hemorrhoids. He was treated medically with stool softeners however his symptoms continued to worsen. He then developed rectal prolapse and perianal pain. On physical examination, he was noted to have a golf ball sized rectal prolapse on straining. Defecography revealed a large enterocele prolapsing through the anterior rectal wall (Image 1). The patient underwent an open rectopexy with perineoplasty. His symptoms completely resolved after surgery and repeat defecography three months after the procedure showed no sign of enterocele (Image 2).

Conclusions/Discussion: Enterocele is herniation of small bowel in the pelvic cul de sac. This has been attributed to stretching and laxity of the pelvic floor muscles secondary to a multitude of factors including chronic constipation or alteration in the pelvic anatomy after hysterectomy. Male enterocele is a rare disease. Treatment is usually tailored to symptoms. For our patient, rectopexy and perineoplasty not only resulted in improvement on imaging but also resulted in symptomatic relief.

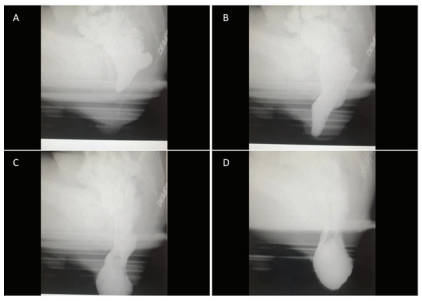


Image 1A-D. Pre-operative defecography demonstrating large enterocele

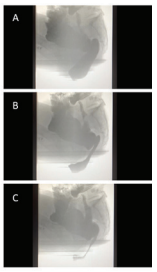


Image 2A-C. Post-operative defecography with resolution of enterocele and successful evacuation

FUNCTIONAL OUTCOMES FOLLOWING VENTRAL RECTOPEXY IN PATIENTS WITH RECTAL PROLAPSE.

P1122

C. Ratto, M. Goglia, F. Litta, V. De Simone, P. Campennì, R. Orefice, A. Marra, A. Parello
Rome, Italy

Purpose/Background: Ventral rectopexy (VR) is a tailored surgical approach to patients with rectal prolapse (RP) of various degree. The results of this approach should be registered not only on defecatory symptoms, but also on urinary and sexual function. The purpose of this study is to verify, through validated scores, how VR modifies functional outcomes of the pelvic floor.

Methods/Interventions: A total number of 67 female patients have undergone VR between January 2013 and May 2018. Indications for VR were an internal RP in 42 patients (62.7%) and an external RP in 25 patients (37.3%), according to Oxford Classification. At the preoperative assessment 29 patients (43,3%) had a past medical history including hysterectomy whereas 38 patients (50.7%) shown an enterocele at the defecography. Before VR (T0), and 12 months after surgery (T1), several questionnaires were administered to all the patients in order to assess functional outcomes of VR: Altomare score, Longo score and Cleveland Clinic Constipation Score (CCCS) for obstructed defecation and constipation, ICIQ-SF score for urinary incontinence, and PISQ-12 for sexual activity. Twenty-nine out of 67 patients reached a long term follow up, FU (57.1±24.5 months, T2). T0, T1 e T2 data were compared in terms of mean values (± standard deviations).

Results/Outcome(s): 1 patient (1.4%) reported sub-occlusive episodes, 3 patients (4.3%) had minor complications. Comparing preoperative to 12-month FU, most of the patients presented a significant reduction of Altomare score (18.4±5.4 vs. 11.5±6.1, $p<0.05$), Longo score (24.2±14.6 vs. 7.7±8.4, $p<0.05$), and CCCS (19±4.5 vs. 12±6.1; $p<0.05$). Fourty-four (65.7%) patients out of 67 referred preoperative concomitant ODS and FI symptoms. At 1-year FU, these 44 patients showed statistically significant improvements in all the scores related to ODS and chronic constipation, as well as in the CCIS (7.2±4.9 vs. 3.5±4.4). Among the 45 patients who referred urinary incontinence symptoms, the ICIQ-SF registered a statistically significant decrease (10.6±5 vs. 6.2±6.8). Regarding sexual activity, no differences were registered through the PISQ-12 score. Improvements in the scores registered at 12 months were maintained at long term FU (T1 vs. T2 $p>0.05$ in Altomare score, Longo score, CCCS, CCIS).

Conclusions/Discussion: These data have demonstrated that VR is a safe surgical technique which is associated with a significant improvement of constipation, obstructed defecation and fecal incontinence scores at 12-month FU visits. Moreover, positive results are maintained at long term FU. Urinary continence improved after the surgical operation, whereas no differences were registered regarding sexual functionality.

LAPAROSCOPIC VENTRAL RECTOPEXY IS SAFE WHATEVER THE AGE.

P1123

M. Monsinjon, v. de Parades, J. Loriau
Paris, France

Purpose/Background: Rectal prolapse (RP) is responsible of fecal incontinence or rectal emptying disorder. Perineal approach was considered to be an option for high risk post-operative patient because of the possibility to do it under regional anesthesia. But perineal approaches are known for their high recurrence rates from 9 to 23% for a first procedure and until 50% in a second procedure. Laparoscopic ventral rectopexy is known to have a lower prolapse recurrent rate. Surgeons are still reluctant to propose laparoscopic rectopexy to elderly patients especially because definition of elderly women is changing

today. The aim of this study is to comparate the post-operative morbidity in patients aged 80 and older with younger undergoing laparoscopic rectopexy for rectocele or rectal prolapse.

Methods/Interventions: We conducted a retrospective study including all patients undergoing laparoscopic rectopexy between the first of January 2012 and the first of November 2017. Procedures were only laparoscopic and robotic. For all patients' clinical data, surgical procedure and post-operative morbidities were abstracted from the informatic file. A post-operative morbidity is defined by any complication occurring in the first post-operative 30 days. We called all patients in 2018 to evaluate the recurrence rate at long term. We compared young patient (YP) with an aged inferior to 80 years old and old patient (OP) aged over 80 years old.

Results/Outcome(s): 218 patients were included: 75 OP and 143 YP. In YP group, mean age was 59 years old for a mean age in OP group at 86 years old .79% of YP were ASA 1-2 whereas 90.6% of OP was ASA 3-4. There was no difference about personal history of anterior rectopexy (11.9% in YP versus 8% in OP, p=0.375) .87% of YP had a radiologic exam versus 36% of OP (p<0.001). We did operate the OP for POP whereas YP was operated for both POP and internal rectal prolapse (p<0.001). Post-operative morbidity was 12.4% and there were no differences in any post-operative complications between two group, 16% of global complications in OP group and 9.8% in YP group (p=0.237). There was no difference in complications' severity (ASA classification). There were only two reoperations for bowel obstruction in the OP group but with no significative difference (p=0.117). There was one death in OP after a strangled inguinal hernia at 24 post-operative days. Duration of hospital stay was significantly longer in OP (5.8 days versus 4.3 days, p<0.001). Mean follow-up was 1.8 years in OP group and 0.9 years in YP group. Prolapse recurrence occurs in 13.3% of OP versus 6.3% of YP (p=0.08) and the only risk factors in logistic regression that we found was history of rectopexy for POP (OR= 3.59, CI [1.06-10.66]).

Conclusions/Discussion: Our Study demonstrates that it is safe to perform laparoscopic ventral rectopexy in patients even older than 80. There is no more reasons to avoid laparoscopic approach to treat rectal prolapse in elderly.

ASSOCIATION OF MALNUTRITION WITH POST-OPERATIVE OUTCOMES AFTER ILEAL POUCH-ANAL ANASTOMOSIS.

P1124

J. Ray, E. Esen, S. McIntyre, M. Mataga, A. Matarasso, H. Kirat, M. Grieco, F. Remzi
New York, NY

Purpose/Background: Ileal pouch-anal anastomosis (IPAA) is a procedure offered to patients with Ulcerative Colitis (UC) who require total proctocolectomy but opt for restoration of bowel continuity. Due to various risk factors, these patients are prone to malnutrition. It has been well established that malnutrition is associated with adverse postoperative outcomes after major abdominal surgery. The aim of this study was to determine if various measures of preoperative nutritional status are associated with post-operative complications after IPAA.

Methods/Interventions: We included UC patients who underwent IPAA in the American College of Surgeons' National Surgical Quality Improvement Program [ACS-NSQIP] from 2005-2017 who had the preoperative variables of BMI, weight loss, and albumin recorded. We defined malnutrition as either BMI <18.5, weight loss <10% in the 6 months prior to surgery, or albumin <3.5g/dl. Univariate and multivariate analyses comparing malnutrition variables and outcomes of postoperative morbidity, reoperation, and length of stay (LOS) were performed. Multivariate analysis was used to identify independent predictors of the significant outcomes.

Results/Outcome(s): We identified 5112 patients who underwent IPAA. After excluding those with missing malnutrition parameters, we included 3150 patients in our sample: mean BMI 26.0±5.3, preoperative weight loss >10% in 5.9% and preoperative hypoalbuminemia in 20.4%. Univariate analysis indicated that hypoalbuminemia was significantly associated with postoperative morbidity (34.1% vs 26.8%, p value <0.001, reoperation (9.9% vs 5.7% p<0.001), and LOS (7 [5-12] vs 6 [4-8], p <0.001) and weight loss was significantly associated with postoperative morbidity (39.1% vs 27.6%, p = 0.001). Multivariate analysis controlling for co-morbidities showed hypoalbuminemia (OR 1.26 [95% CI 1.04-1.53]) and weight loss (OR 1.50 [95% CI 1.09-2.07]) were independent predictors of postoperative morbidity. Hypoalbuminemia (OR 1.66 [95% CI 1.21-2.27]) was also an independent predictor of need for reoperation and LOS above the median (OR 1.56 [95% CI 1.30-1.88])

Conclusions/Discussion: This study supports the hypothesis that preoperative malnutrition contributes to negative postoperative outcomes after IPAA and that nutritional optimization should be a focus of surgical preparation.

EXPOSURE TO TOFACITINIBE NOT RELATED TO RECURRENCE OF ANAL PRE-MALIGNANT LESION: A CASE REPORT.

P1125

C. Bortolzzo Graciolli Facanali, N. Sousa Freitas Queiroz, C. Sobrado, M. Rodrigues Borba, E. Vieira da Silva Filho, A. Scanavini Neto, S. Nahas, I. Cecconello
Santos, Brazil

Purpose/Background: Ulcerative colitis (UC) is a chronic inflammatory bowel disease with increased incidence worldwide. Evolving treatment goals for UC patients have changed from induction and maintenance of clinical remission to endoscopic and histologic healing aiming change in the natural history of the disease (1). The identification of different inflammatory pathways led to the development of new UC therapies as tofacitinib, a small molecule directed at inhibiting the Janus kinase inflammatory pathway. There are increasing concerns about the safety and side effects of new drugs and the risk of malignancies with tofacitinib is unknown.

Methods/Interventions: The objective of this report is to describe the outcomes of a patient with an anal pre-malignant lesion treated with tofacitinib.

Results/Outcome(s): Case description: A 60-year-old female patient with severe UC referred for follow-up at a tertiary referral center under oral and topical 5- asa and azathioprine. The patient presented an anal HPV lesion which was resected and relapsed after 3 months. Viral serologies were negative. The pathology on relapse showed a premalignant anal lesion compatible with AIN I, which motivated the discontinuation of azathioprine. Thus, the patient had worsening of bleeding and abdominal pain, high C-reactive protein value 45 mg/dL, colonoscopy with left sided colitis (Mayo 3). Thus, Tofacitinib 10 mg / day was initiated for 2 months and after the induction period, maintenance was performed at a dose of 5 mg every 12 hours. Patient presented clinical response and remission, with complete improvement in abdominal pain and bleeding, CRP normalization (0,7mg/dL). After a three month follow-up patient continued assimptomatic, with no recurrence of anal lesion.

Conclusions/Discussion: Tofacitinib is an oral non-biological small molecule januskinase inhibitor approved in several countries for the treatment of UC with proven efficacy compared to placebo with a good safety profile (2,3). Data assessing the risk of malignancies with tofacitinib is lacking. Most studies on the topic are restricted to the evaluation of clinical trial participants or open extension of preselected trials with heterogeneous and short-term clinical outcomes. In this case, the authors decided for the treatment with tofacitinib due to its short half-life, alowing rapid resolution of its immunosuppressive effect following discontinuation if the patient returns with the premalignant lesion.

ANTEGRADE REFEEDING IN AN A PATIENT WITH CROHN'S DISEASE USING A PROXIMAL JEJUNOSTOMY AND MUCUS FISTULA.

P1126

M. Barlek
Pittsburgh, PA

Purpose/Background: Proximal ostomies create a dilema for providing adequate nutrition and maintaining hydration. There are few articles on how best to manage these patients. Here we present a malnourished Crohn's patient who required a small bowel resection for stenosis causing a bowel obstruction. This was complicated by an anastamotic dehsicence requiring creation of a proximal jejunostomy and a mucus fistula. The patient was not a candidate for TPN creating a complex dilemma for providing nutrition. The patient had a proximal jejunostomy with a high output stoma that resulted in very little nutrient absorption. Nutrition was given by feeding his mucus fistula with tube feeds and refeeding his mucus fistula with the output of his proximal jejunostomy to aid in nutrient reabsorption to attmept to maintain a euvolemic state.

Methods/Interventions: The patient was started on TPN as an inpatient, but due to ongoing active drug abuse, he could not leave the hospital with an IV for TPN. Post-operatively, the patient was started on TPN. A jejunostomy tube was placed in to the patient's mucus fistula and tube feeds were started and were avanced to a goal rate. When the patient was tolerating his tube feeds, his mucus fistula was refed. This was done by draining the output from his proximal jejunostomy and straining this output with gauze into a cup. This output was then given as bolus flushes with his tube feeds. The patient was able to be weaned off his TPN and take oral food for comfort. The patient was able to be discharged to a skilled nursing facility on this regimen. The patient required adjustments to his bolus refeeding regimen and PO intake to maintain an adequate hydration status.

Results/Outcome(s): The patient was able to maintain adequate nutritional parameters and was able to have his stomas reversed. He was then able to resume a regular diet without requiring any further nutritional support.

Conclusions/Discussion: Proximal ostomies create a dilema in regards to stoma care, nutritional status, hydration and maintinaing an electrolyte balance. Using the output of the jejunostomy, in addition to enteral nutrition via the mucus fistula, is a viable option to maintain adequate nutrition without the pitfails of using TPN.

PERIOPERATIVE WOUND COMPLICATIONS IN PROCTOCOLECTOMY PERFORMED FOR CROHN'S DISEASE: A RETROSPECTIVE STUDY FROM A SINGLE INSTITUTION.

P1127

N. Smith, R. Hollis, I. Sapci, B. Click, M. Regueiro, A. Lightner
Cleveland, OH

Purpose/Background: Patients with Crohn's disease (CD) who undergo total proctocolectomy with end-ileostomy (TPC+EI) are at high risk for developing post-operative wound complications, especially perineal wound morbidity. In many cases, this can be attributed to the presence of complex perianal fistulizing disease. The risk of post-operative wound complications is further compounded by preoperative exposure to immunosuppressive agents for disease control. The primary aim of this study was to investigate the rate of post-operative wound complications following TPC+EI for colonic/perianal CD and secondarily determine risk factors for postoperative morbidity.

Methods/Interventions: A retrospective review of all adult patients with colonic/perianal CD who underwent TPC+EI from 3 hospitals within our institution's health network from 2009-2015 was performed. Patients with a preoperative diagnosis of ulcerative colitis or indeterminant colitis were excluded. Data collected included smoking history, the presence of perianal fistulizing disease, exposure to corticosteroids, immunomodulators, and/or biologics within 12 weeks prior to surgery, inter- vs. extra-sphincteric dissection, method of perineal wound closure, 30-day perineal wound breakdown, perineal superficial surgical site infection (SSI), and long term chronic sinus tracts.

Results/Outcome(s): 93 patients met inclusion criteria. Median age was 42 years (range 29-54) and 54% were female. A total of 29 patients (26%) received either corticosteroids, immunomodulators, or biologic therapy within 12 weeks of TPC+EI. Intersphinteric dissection was seen in 75 patients (81.5%). 25 patients (26.9%) experienced a perineal wound complication. Of these 25 patients, 8 (32%) were exposed to corticosteroids preoperatively, 4 (16.1%) were exposed to preoperative immunomodulator therapy, and 11 (44%) were exposed to biologic therapy preoperatively; 18 (72%) had perianal fistulizing disease at the time of TPC+EI and 5 (20%) had active tobacco use. Overall rates of perineal wound complications did not differ by presence of perianal fistulising disease (29.5% vs 21.9%, p=0.43) or by Tobacco use (27.8% vs 26.7; p=0.92). Preoperative exposure to biologics was associated with an increased rate of perineal wound breakdown (25.8% vs 9.7%; p=0.04), but not SSI or chronic perineal sinus, whereas preoperative corticosteroid exposure was associated with higher SSI rates (18.2% vs. 4.2%; p=0.03) but not perineal wound dehiscence or chronic sinuses. Primary wound closure was associated with lower risk of chronic sinus formation (6.1% vs 29.6%; p<0.01).

Conclusions/Discussion: Nearly one third of CD patients undergoing TPC+EI experience a perineal wound breakdown. Preoperative management of biologic and steroids medications as well as wound closure technique, may be important targets to improve future outcomes.

IS BMI ASSOCIATED WITH REPEAT ILEOCOLECTOMY IN CROHN'S DISEASE?

P1128

P. Maerz, E. Olecki, C. Nembhard, T. Weaver, W. Koltun
Hershey, PA

Purpose/Background: Crohn's Disease (CD) is characterized by recrudescence despite aggressive medical and surgical management. Recent studies have suggested that obesity may play a role in increased or worsened disease activity. No study has shown that obesity impacts rate of reoperation in CD. We sought to determine if body mass index (BMI), as a marker of obesity, impacted the need for repeat ileocolectomy(IC).

Methods/Interventions: After IRB approval, a retrospective review was conducted to identify patients who underwent IC for CD by a single surgeon at a tertiary care center from 1993-2018. Pre-operative, intra-operative and post-operative data was collected on239 patients undergoing ileocolectomy. Data was then analyzed using univariate analysis and multivariate logistic regression.

Results/Outcome(s): Of the 239 patients reviewed, 46(15%) required repeat IC, with a mean follow up of 6.3 years and a average age of patients 40.9(±15) years. Comparing those who required repeat IC and those who did not, there was no statistical difference in gender, comorbidities (endocrine, pulmonary, or cardiac), smoking status, or overall BMI. There were also no differences in post-operative complications (superficial surgical site infection, deep surgical site infection, urinary tract infection, return to OR, deep vein thrombosis, death). Those that required repeat operation were noted to more likely have pre-operative steroid use (80.4% v 60%, p = 0.009), have been on biologic therapy (69% v 47%, p = 0.024) and have a history of anal disease (34.8% v 20%, p = 0.035) on univariate analysis. Patients were then segregated by BMI into underweight (<18), normal (18-25), overweight (25-30) and obese(>30) categories. These groups then underwent logistic regression analysis controlling for biologic and steroid use. No statistical difference was seen amongst these groups despite controlling for confounding factors.

Conclusions/Discussion: Though BMI has previously been associated with Crohn's disease recrudescence, we found that BMI was not associated with surgical recurrence. This suggests that if adipose tissue plays a role in

Crohn's Disease recurrence, it is more complex than can be explained by simple BMI. This study is limited by nature of being a single operator retrospective review. Further work is needed to better characterize the effect of excess body fat and surgical recurrence in CD.

UNUSUAL THROMBOEMBOLIC EVENTS AS HARBINGERS OF INFLAMMATORY BOWEL DISEASE.

P1129

J. Miller-Ocuin, G. Waters, J. Ashburn
Winston-Salem, NC

Purpose/Background: Inflammatory bowel disease (IBD) patients are at increased risk for venous thromboembolism (VTE) typically presenting as deep venous thrombosis (DVT) and/or pulmonary embolism (PE). Thromboembolism at other venous sites or in the arterial system are rare. Here we describe 4 patients with unusual presentations of thromboembolism in the setting of inflammatory bowel disease.

Methods/Interventions: Patients diagnosed with IBD, either ulcerative colitis (UC) or Crohn's disease (CD), presenting with unusual thromboembolic events were included. Patient demographics and clinical course variables were obtained.

Results/Outcome(s): Here we report four patients with IBD-associated thromboses. Our first patient is a 41-year-old female who presented with acute distal aortic, left iliac, and bilateral lower extremity thrombi. She was unable to tolerate anticoagulation due to hematochezia for which she underwent colonoscopy with diagnosis of severe active areas of colitis ultimately requiring total colectomy. The second patient is a 61-year-old female with left ventricular thrombus discovered incidentally on CT scan of the abdomen and pelvis during a CD flare. Due to inability to tolerate therapeutic anticoagulation, total colectomy was performed. Thirdly, we report a 31-year-old female with colitis and rectovaginal fistula treated with Humira. She had a cerebrovascular accident thought to be secondary to Humira which was later found to have resulted from a cavernous sinus thrombosis. She ultimately required total colectomy. Our last patient is a 51-year-old female with CD who was noncompliant with Remicade and presented with CVA due to both superior sagittal sinus and right transverse sinus thrombosis; she underwent venous thrombectomy by Neurosurgery and is currently tolerating therapeutic anticoagulation with medical management of her colitis.

Conclusions/Discussion: Thromboembolism is a rare extraintestinal manifestation of IBD that results in significant comorbidities. IBD should be considered as an etiology of unusual thromboembolic events to maximize therapeutic intervention for both colitis and embolic disease.

SURGICAL OUTCOMES OF ACUTE MESENTERIC ISCHEMIA IN THE PAST DECADE.

P1130

H. Lim, K. Park, S. Jeong, S. Ryoo, Y. Kwon, J. Park, M. Kim
Seoul, Korea (the Republic of)

Purpose/Background: Acute mesenteric ischemia results from various causes of hypoperfusion and hypooxygenic damage to intestine and has wide range of clinical presentations. Despite recent advances in critical care of surgical patients, the morbidity and mortality remains high after surgical intervention.

Methods/Interventions: We have prospectively registered 47 consecutive patients (mean age, 71.7 yrs, M:F, 28:19) who underwent surgery for acute mesenteric ischemia between January 2009 and September 2019 in a tertiary referral hospital and retrospectively analyzed the overall outcome.

Results/Outcome(s): The ischemic region was small bowel in 28(59.6%), right colon in 16(34.0%), left colon in 9(19.1%), and total colon in 7(14.9%). Emergent operations were performed 40(85.1%) patients, and elective operations in 7(14.9%). The causes of disease were vascular occlusion in 32(68.1%) and nonocclusive cause in 15(31.9%). Medical co-morbidities were present in 36 patients (76.6%). Resection with stoma formation was performed in 20(42.6%) and primary anastomosis in 27(57.4%). Postoperative morbidities occurred in 21 patients (44.7%) and mortality in 10(21.3%). Comparison with our previous report 10 years ago, there was a tendency towards less morbidity (85.7% vs 44.7%) and mortality (44.9% vs 21/3%).

Conclusions/Discussion: Even in the advances of critical care and imaging modalities, postoperative morbidities and mortality remained high. Intensive preoperative care to prevent shock and immediate proper operation before deterioration of the patient's condition is mandatory.

REPEAT VS. INITIAL ILEO-COLECTOMY FOR CROHN'S DISEASE: A COMPARATIVE REVIEW.

P1131

C. Nembhard, E. Olecki, P. Maerz, S. Patel, W. Koltun
Hershey, PA

Purpose/Background: Crohn's disease is known to primarily affect the terminal ileum and is often treated with ileo-colectomy. However, this is not curative and repeat ileo-colectomy may be required in up to 75% of patients. Factors affecting the need for repeat ileo-colectomy and its peri-operative outcomes are not clearly defined. The objective of this study is to identify the differences and possible risk factors between patients who undergo first time vs. repeat ileo-colectomy

Methods/Interventions: This is an Institutional Review Board approved retrospective evaluation of patients with Crohn's disease who underwent an ileo-colectomy performed by a single surgeon at a single tertiary center between 1992 – 2019. The patients were divided into two groups: those who had previous ileo-colectomy (P-IC) and those having their first ileo-colectomy (F-IC). Patients were compared using univariate analysis.

Results/Outcome(s): We analyzed 227 patients, 54.6% were male. See Table 1. There were no statistically significant differences in co-morbidities, pre-operative immunosuppression, type of anastomosis, post-operative complications (surgical site infection, urinary tract infection, thrombo-embolic complications, myocardial infarction, Clostridium Difficile infection, post-operative hemorrhage, fascial dehiscence) or death. Patients undergoing repeat ileo-colectomy more often had anal disease, required open procedures associated with a higher estimated blood loss, transfusion rate and return to the operating room. Despite this, complications, length of stay and 30 day re-admission rates were similar.

Conclusions/Discussion: Repeat ileo-colectomy is a more morbid procedure than initial ileo-colectomy and is more often associated with anal disease and a stricturing phenotype.

P1131 Table 1. Showing Comparison of Variables between P-IC and F-IC

Variable	P-IC (n=75)	F-IC (n=152)	p-value
Age, years	43 +/- 1.5	38 +/- 1.1	0.003
Mean duration of disease, years	18.7 +/- 1.4	10.1 +/- 0.8	<0.001
History of Anal Disease	33.8%	18.8%	0.001
Indication for intervention:Stricture	73.3%	53.3%	0.05
Failure medical management	5.3%	14%	
Fistula	8%	8.7%	
Abscess	9.3%	17.3%	
Perforation	4%	6.7%	
Pre-operative Biologic / Steroid Use	67.6%	60.5%	0.30
Laparoscopic Procedures	8%	41.2%	<0.001
Elective Procedures	86.7%	79.5%	0.20
Mean Length of Resection, cm	22.5 +/- 1.4	26.8 +/- 0.9	0.01
Stoma creation	14.9%	20.5%	0.36
Estimated blood loss (EBL) > 300 mL	22.3%	11.1%	0.03
Blood Transfusion	10.8%	2.7%	0.012
Return to the Operating Room (OR)	8.1%	1.3%	0.01
Biologic use post-operatively	59.2%	47.9%	0.15
Length of Stay, days	6 +/- 0.5	6.5 +/- 0.5	0.45
30 day Readmission	17.6%	10.9%	0.20

EXTENDED VERSUS LIMITED MESENTERIC EXCISION FOR OPERATIVE CROHN'S DISEASE: 30-DAY OUTCOMES FROM THE ACS-NSQIP DATABASE.

P1132

M. Abdulkarim, E. Salama, A. Pang, C. Vasilevsky, G. Ghitulescu, J. Faria, N. Morin, M. Boutros
Montreal, QC, Canada

Purpose/Background: It has been suggested that extended mesenteric excision (ME) in Crohn's disease (CD) may reduce endoscopic and surgical recurrences when compared to limited resection. However, it is unclear if this procedure increases perioperative morbidity. The aim of this study was to compare perioperative morbidity between limited and extended ME in segmental colectomies for CD.

Methods/Interventions: After institutional review board approval, a retrospective study was performed using the American College of Surgeons National Surgical Quality Improvement Program Colectomy-Specific database 2014-2018. CD patients who underwent partial colectomies (ileocolic and partial colon resections) were included and those with concurrent cancer were excluded. Lymph node (LN) yield was used as a surrogate for the extent of ME. To validate the LN cut-off, a 10-year retrospective review was performed at our institution where limited ME is standard practice. The primary outcome was 30-day NSQIP major morbidity, defined as a composite of incisional, intraabdominal, cardiac, thromboembolic, renal, and pulmonary complications. Secondary outcomes

were abdominal and bleeding complications. Predictors of postoperative morbidity were assessed by multiple logistic regression. A power calculation demonstrated an ability to detect a 5% absolute risk increase in our primary outcome with a power of 0.90 and significance of 0.05.

Results/Outcome(s): To determine the LN cut-off, 125 CD patients who underwent surgery at our institution were reviewed. Of these, 41 met inclusion criteria. The median LN yield for limited MEs was 6 (IQR 3-6), with 12 representing the 90th percentile. A cut-off of 12 LN was thus selected to differentiate between the 2 types of MEs. To assess the impact of ME on morbidity, a cohort of 2,839 CD patients was created using the NSIQP database: 2361 underwent limited ME and 478 underwent extended ME. On univariate analysis, those with limited ME were more likely to be smokers (23.6% vs 19.0%, p=0.035), anemic (55.4% vs. 47.6%, p=0.004) and have undergone open surgery (45.8% vs 33.7%, p=0.001), but there was no significant difference in NSQIP major morbidity (14.82% vs 14.64%, p=0.976). On multiple logistic regression, controlling for age, sex, BMI, smoking, preoperative sepsis, preoperative anemia, surgical approach, emergency surgery, stoma, bowel preparation, and immunosuppression, the extent of ME was not an independent predictor of NSQIP major morbidity (OR 1.07, 95% CI 0.78-1.44). Likewise, the extent of ME was not associated with an increase in abdominal complications (OR 0.98, 95% CI 0.75-1.27) or post-operative bleeding (OR 0.98, 95% CI 0.63-1.49).

Conclusions/Discussion: Extended ME for ileocolic and partial colon resections for CD is safe and was not associated with an increase in perioperative NSQIP major morbidity.

Table 1. Multiple Logistic Regression for NSQIP Major Morbidity

Factors	OR	CI (2.5%)	CI (97.5%)	P-value
Extended Mesenteric Excision	1.071	0.787	1.442	0.656
Age	0.999	0.991	1.006	0.719
Sex (Male)	0.799	0.631	1.010	0.061
BMI	1.007	0.989	1.025	0.460
Pre-op Sepsis	4.070	2.893	5.715	<0.001
Approach: MIS	0.429	0.336	0.547	<0.001
Emergency	1.330	0.855	2.039	0.198
Mechanical Bowel Prep Alone	1.043	0.584	1.288	0.514
Oral Bowel Prep Alone	0.867	0.584	1.288	0.839
Both Mechanical and Oral Prep	0.874	0.659	1.137	0.305
Immunosuppressed	1.167	0.919	1.488	0.210
Smoker	1.422	1.103	1.825	0.006
Stoma	1.119	0.752	1.636	0.571
Anemia	1.596	1.251	2.041	<0.001

PREOPERATIVE TREATMENT MAY NOT AFFECT ON OPERATION FOR ULCERATIVE COLITIS WITH MEDICAL INTRACTABILITY.

P1133

K. Koganei, K. Tatsumi, R. Futatsuki, H. Kuroki, H. Kimura, A. Sugita
Yokohama, Japan

Purpose/Background: In the biologic and imunosuppressive era, surgery for ulcerative colitis (UC) still has important roll. The purpose of this study is to clarify the effect of preoperative treatment on the operation for the UC patients with medical intractablity.

Methods/Interventions: Two hundred and thirty-four cases under 70 years old with surgery for their medical intractable UC were included. Medical records were reviewed and clinical data was collected. Average age at onset of UC was 33 years old and average age at first operation was 40 years. Two hundreds and thirteen cases were planned to perform one stage restorative proctocolectomy with stapled ileal pouch anastomosis. Four out of 213 cases created temporal ileostomy for incomplete anastomosis. Eighteen patents underwent planned staged IPAA (17 stapled IPAA). One case has been refusing to close her ileostomy. Tree cases had total proctocolectomy as their weakened sphincter function. Average duration of follow-up after operation was 34 months. In ninety-eight of all cases, steroid was used. Other preoperative treatment that were employed for induction of remission were as follows; infliximab (57%), tacrolimus (47%), adalimumab (18%), cyclosporin (6%). Patients were divided into two groups, one was 126 cases whose preoperative treatments were within the second line therapy (Group A) and the others was 108 cases treated more than the third line therapy (Group B). Clinical data were compared between two groups.

Results/Outcome(s): Two hundred and thirty-four cases under 70 years old with surgery for their medical intractable UC were included. Medical records were reviewed and clinical data was collected. Average age at onset of UC was 33 years old and average age at first operation was 40 years. Two hundreds and thirteen cases were planned to perform one stage restorative proctocolectomy with stapled ileal pouch anastomosis. Four out of 213 cases created temporal ileostomy for incomplete anastomosis. Eighteen patents underwent planned staged IPAA (17 stapled IPAA). One case has been refusing to close her ileostomy. Tree cases had total proctocolectomy as their weakened sphincter function. Average duration of follow-up after operation was 34 months. In ninety-eight of all cases, steroid was used. Other preoperative treatment that were employed for induction of remission were as follows; infliximab (57%), tacrolimus (47%), adalimumab (18%), cyclosporin (6%). Patients were divided into two groups, one was 126 cases whose preoperative treatments

were within the sencond line therapy (Group A) and the others was 108 cases treated more than the third line therapy (Group B). Clinical data were compared between two groups.

Conclusions/Discussion: Preoperative medical treatments seems not to give negative impact on operative treatment for UC patients with medical intractable, even though more than three agents were employed.

THE RISK OF POSTOPERATIVE VENOUS THROMBOEMBOLISM IN THE ERA OF BIOLOGICS FOR INFLAMMATORY BOWEL DISEASE.

P1134

E. Yeap, T. Suhardja, H. Chouhan, T. Nguyen, W. Teoh
Dandenong, VIC, Australia

Purpose/Background: There is contradictory evidence for whether biologic agents have an increased risk of venous thromboembolism (VTE). This has mostly been studied in rheumatoid arthritis patients and in patients with inflammatory bowel disease (IBD) who are being medically managed. However, there is little evidence on the risk of VTE and biologics in the perioperative setting. The primary outcome of our study is to review the incidence of deep venous thrombosis (DVT) and pulmonary embolism (PE) in patients with inflammatory bowel disease who were receiving biologic agents prior to surgery and those who were not.

Methods/Interventions: A retrospective chart review was performed at a single colorectal unit from 1 July 2010 to 30 June 2019 of all patients who underwent bowel resection for IBD. Medical notes were reviewed for preoperative medication and if biologic agents were used. Diagnostic imaging reports and progress notes were reviewed for diagnosed DVT and PE post-operatively.

Results/Outcome(s): A total of 132 patients underwent bowel resection for IBD over this period. 23 of these patients received biologics preoperatively (17.4%) and 109 did not (82.6%). Of the 23 patients who received a biologic agent, 8.7% had a VTE complication. By comparison, only 4.6% (5/109) of patients who did not receive a biologic agent had a VTE complication. Within the biologic group, one patient had a DVT (received adalimumab) and one patient had a PE event and a DVT (received vedolizumab). Amongst the patients who were not receiving biologics prior to surgery, 2/109 (1.8%) had a DVT and 3 had a PE (2.8%). Subgroup analysis demonstrated that patients who received biologics did not have a more complex course post-operatively otherwise. Of the 23 patients in the biologic group, 14 had recorded first administration dates for biologics. The average duration of biologics preoperatively for patients who did not have a VTE was 600 days compared to 1073 days for those who did have VTE.

Conclusions/Discussion: Systemic inflammation can trigger the coagulation cascade and VTE risk has been observed to be higher during a flare of IBD. However, there has been conflicting evidence about the VTE risk of biologic agents. There has been little research into their effect in the perioperative period when a prolonged hospital stay often with a significant period with decreased mobility, vessel trauma, relatively long operative time and intraoperative positioning may increase the risk. In this retrospective review, we have found that a higher percentage of patients in the biologic group experienced a VTE complication. In the perioperative period, patients with inflammatory bowel disease have a relatively high risk of VTE. The VTE risk of biologics requires assessment on a larger scale. VTE prevention should be considered such as prophylactic anticoagulation and early mobilisation.

VENOUS THROMBOEMBOLISM RISK IN PATIENTS WITH INFLAMMATORY BOWEL DISEASE IS SIMILAR TO CANCER PATIENTS POST-RESECTION.

P1135

E. Yeap, T. Suhardja, H. Chouhan, T. Nguyen, W. Teoh
Dandenong, VIC, Australia

Purpose/Background: Venous thromboembolism (VTE) events have been reported in up to 9% of colorectal surgery patients. Current guidelines recommend extended prophylaxis in cancer post-major colorectal resection. Inflammation triggers the coagulation cascade; however, the risk of postoperative VTE in patients with benign disease such as inflammatory bowel disease (ulcerative colitis and Crohn's disease) is less well-studied.

Methods/Interventions: A retrospective chart review of 1044 patients undergoing colorectal resection for cancer or inflammatory bowel disease (IBD) was conducted from July 2010 to June 2015 in a single colorectal unit. Medical notes and diagnostic imaging reports were reviewed for a diagnosis of deep vein thrombosis (DVT) or pulmonary embolism (PE). The primary outcome was to assess the rates of VTE in patients who were diagnosed with IBD and colorectal cancer patients. Further subgroup analysis was performed to examine the role of other contributing factors.

Results/Outcome(s): 944/1044 patients (90.4%) underwent resection for cancer and 9.6% (100 patients) for IBD. The rate of VTE in cancer patients was 2.2% (21/944) which was similar to the rate in inflammatory bowel disease (2% or 2/100 patients). In the group with malignancy, 12 patients had a DVT (1.3%) and 9 had a PE (0.9%). All the patients in the IBD group who had a VTE had a DVT (2/2). Further subgroup analysis was performed. In both groups, those patients who went on to have a VTE complication experienced a prolonged length of stay compared to those who did not. In the IBD patients who did not have

a DVT or PE, the average length of stay was 16.9 days compared to 25.5 days in the group who did have a VTE complication. In the cancer group, patients who went on to have a VTE complication were significantly more likely to have a length of stay greater than 14 days (57.1% vs 19.8%, p<0.05).

Conclusions/Discussion: A similar rate of VTE was found in both groups of patients. There is a lack of evidence in the literature regarding specific risks of VTE in the perioperative period for patients with inflammatory bowel disease. We propose that patients who have major resection for IBD be considered to have a relatively high risk of VTE, particularly patients with a prolonged length of stay. The role of appropriate prophylactic measures should be evaluated for this patient group.

THE RISK OF INFECTION AND RELATED FACTORS IN PATIENTS WITH CROHN'S DISEASE TREATED WITH INFLIXIMAB.

P1136

L. Luo, H. Xu, P. Zhu, B. Yang
Nanjing, China

Purpose/Background: To explore the types, characteristics and related risk factors of infection after infliximab treatment in patients with CD.

Methods/Interventions: The patients with CD underwent the IFX from July 2010 to April 2019 were collected from the clinical medical HIS database of affiliated hospital of nanjing university of traditional Chinese medicine. The types and characteristics of infection were counted and risk factors related to infection were analyzed.

Results/Outcome(s): A total of 207 patients with CD were included in this study. 36% of the patients developed infection after IFX application, 15% were opportunistic infection, 21% were adverse infection events, and no serious infection occurred. Univariate analysis showed that gender, the time from the onset of initial symptoms to the diagnosis of CD, and the level of RBC, HB, albumin and CRP were all correlated with infection after IFX treatment in CD patients(all P<0.05). Multivariate logistic regression analysis showed that male [OR = 0.357, 95%CI (0.187, 0.682), P = 0.002] was a protective factor for infection. Higher CRP levels [OR = 1.02, 95%CI (1.006, 1.034), P = 0.004] are risk factors for infection.

Conclusions/Discussion: Patients with CD had a higher risk of infection after IFX application. Men are protective factors for infection, while longer delays in diagnosis, poorer nutrition and the worse severity of the inflammation are risk factors for infection. Therefore, in clinical practice, infection screening around the use of IFX should be strengthened in patients with CD.

AN UNUSUAL CASE OF SQUAMOUS CELL CARCINOMA ARISING FROM CHRONIC PILONIDAL DISEASE.

P1137

M. Lin, B. Butler
Buffalo, NY

Purpose/Background: Malignant transformation of pilonidal disease leading to squamous cell carcinoma (SCC) is a rare complication of a well-recognized entity. To our knowledge, approximately 60 cases have been reported in the literature. We present a 64-year-old male with pilonidal disease for 45 years. He underwent 2 prior surgeries at ages 17 and 19, but decided not to pursue any additional treatments. However, due to pain and persistent foul-smelling drainage with intermittent bleeding, the patient presented to colorectal clinic for evaluation. On examination, there was extensive involvement of 11 cm.

Methods/Interventions: The patient underwent excision with primary closure. On pathology, malignancy was considered, but the consensus was benign chronic inflammation with pseudoepitheliomatous hyperplasia. The patient recurred and underwent a second excision with rhomboid rotational flap closure, from which he healed completely.

Results/Outcome(s): Gross pathology from the second operation revealed a 7 x 5 x 1.5 cm portion of skin with subcutaneous tissue. After careful evaluation of the specimen by several pathologists, it was thought that there was an invasive well-differentiated keratinizing SCC extending from the surface epithelium to within 0.2 mm of the deep margin. Given that we had excised tissue to the level of the sacrum, obtaining deeper margins would imply radical surgery with partial removal of the sacrum. After extensive discussion, the patient chose not to pursue adjuvant radiation and opted for close observation with high-resolution ultrasound at 3-month intervals. The patient continues to be disease-free at one year.

Conclusions/Discussion: Pilonidal disease is a common disorder characterized by recurrent formation of abscesses or draining sinuses over the sacrococcygeal area. The development of SCC secondary to chronic inflammation and recurrent disease is a rare but serious complication. Pathological evaluation in the presence of chronic inflammation can be difficult. The pathogenesis of malignant transformation in chronic pilonidal disease is thought to be similar to that of other longstanding non-healing wounds, such as Marjolin's ulcer. Patients with SCC from chronic pilonidal disease are best treated with wide local excision to include the presacral fascia and a wide margin of skin and subcutaneous tissue. However, complete excision may not always be feasible if the tumor extends down to the sacrum. As such, local recurrence is common after excision. In these cases, adjuvant radiotherapy can decrease local recurrence rates. The role of adjuvant chemotherapy

is not well-defined. Given the low incidence of SCC arising from chronic pilonidal disease, there are no large randomized controlled trials to rely upon when making treatment decisions. Further prospective trials are needed to better evaluate the role of chemotherapy and radiotherapy in conjunction with surgery to treat SCC from chronic pilonidal disease.

SYNCHRONOUS OCCURRENCE OF ANAL MELANOMA WITH PAPILLARY THYROID CARCINOMA IN A 72 YEAR-OLD FEMALE IN THE PHILIPPINES: A CASE REPORT.

P1138

S. Santos, S. Salvoro, M. Hernal, O. Basilio
Davao City, Philippines

Purpose/Background: Anal melanoma is a rare disease with an extremely poor prognosis of less than 10% 5-year survival (Malaguarnera, 2018), it accounts for only 1 % of all melanomas and all anorectal carcinoma (Kothonidis et al., 2017). On the other hand, papillary thyroid cancer is the most common type of thyroid cancer accounting for 80% of all thyroid cancers and has an excellent prognosis (Abdullah et al.,2019). The incidence of anal melanoma as a second primary malignancy in patients with papillary thyroid cancer is rare and is underreported in literature. We aim to review the pathophysiology, prognosis and treatment options of both anal melanoma and papillary thyroid carcinoma.

Methods/Interventions: we present a case of a synchronous anal melanoma and a papillary thyroid carcinoma in a 72-year-old female who underwent wide excision of anal melanoma with right inguinal lymphadenectomy and on immunohistochemistry showed to have a melanosome assay positive for HMB-45.

Results/Outcome(s): The patient undergone wide excision of the anal melanoma with a palliative intent and was discharged with an uremarkable post operative course. On follow-up after 30 days, the patient had no evident local recurrence of the disease.

Conclusions/Discussion: Multiple primary malignancies are increasing in incidenence. However, literature on anal melanoma is scarce, and even scarcer when presenting synchronously with a papillary thyroid carcinoma. Due to its rarity, there are no concensus yet for its surgical and medical management. However, treatment should aim to the least morbid approach possible to maintain functionality and quality of life.

Intraoperative positioning to expose Anal melanoma

COLORECTAL SARCOMATOID CARCINOMA: A RARE CONDITION WITH POOR OUTCOMES.

P1139

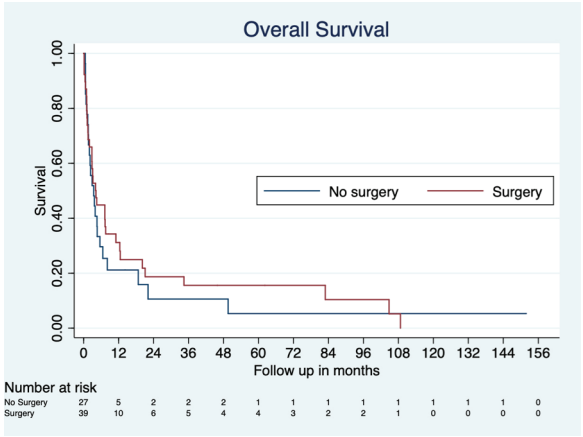
P. Lu, A. Fields, V. Welten, J. Yoo, J. Irani, J. Goldberg, R. Bleday, N. Melnitchouk
Boston, MA

Purpose/Background: Sarcomatoid carcinomas are a rare type of tumor, demonstrating a mixture of properties from both epithelioid and mesenchymal tumors. While such tumors can arise from a variety of primary sites including the lung, bladder, ovary, head and neck, breast, and skin, they are rarely found in the gastrointestinal tract. There have been few prior cases of primary colorectal sarcomatoid carcinomas reported in the literature, and given its rarity, little is known about this aggressive disease. We aim to use a large national database to evaluate the characteristics and survival of patients with colorectal sarcomatoid carcinoma.

Methods/Interventions: The National Cancer Database (NCDB) 2004-2016 was queried to identify patients with colorectal sarcomatoid carcinoma. Patient characteristics, clinical details, and treatment modalities were collected, and descriptive statistics were performed. Survival was calculated with the Kaplan Meier method, and log rank tests were used to compare survival of patients who underwent surgery and those who did not.

Results/Outcome(s): A total of 75 patients were identified with colorectal sarcomatoid carcinoma. The majority of patients were male (61%), aged greater than 70 (52%), white (87%), and had a Charlson comorbidity index score of zero (73%). 59 (79%) patients had primary disease in the colon, and 14 (19%) had primary disease in the rectum. Many patients had unknown disease stage at presentation (43%), and 25 (33%) patients had stage IV disease at diagnosis. With respect to treatment, 44 (59%) patients underwent surgery, of whom 10 (23%) patients had positive margins. 66 (27%) patients underwent chemotherapy, and 9 (12%) underwent radiation. One-year overall survival was 22% (95%CI 13%-33%). There was no difference in unadjusted survival of patients who underwent surgery compared to patients who did not undergo surgery, p=0.55. (Figure).

Conclusions/Discussion: Colorectal sarcomatoid carcinomas are a rare disease with a poor prognosis. Patients undergo a range of treatments including surgery, chemotherapy, and radiation. Further studies are needed to delineate the optimal treatment strategies for this disease.



ADENOCARCINOMA OF THE ANAL CANAL: AN AGGRESSIVE TUMOR REQUIRING EARLY AGGRESSIVE SURGICAL INTERVENTION.

P1140

J. Karas[1], M. Gachbayov[2], A. Kajmolli[2], X. Dong[2], R. Bergamaschi[2]
[1]Orlando, FL; [2]Valhalla, NY

Purpose/Background: Anal canal adenocarcinoma (AA) is an uncommon tumor of the gastrointestinal tract. We seek to provide a detailed description of the demographics, behavior, and outcome of this rare tumor in the United States.

Methods/Interventions: The data on anal adenocarcinoma from SEER Program, between 1973-2015, was extracted. We estimated the incidence rates by demographics and tumor characteristics, followed by analysis of its impact on survival.

Results/Outcome(s): The incidence of AA increased initially by 4.03% yearly from 1973 to 1985, but had a modest decline of 0.32% annually thereafter. The mean age for diagnosis of AA is 68.12 ± 14.02 years. Males outnumbered females by 54.8 to 45.2%. Tumors were mostly localized on presentation (44.4%) and moderately differentiated (41.1%). Both younger and older patients (age<40 years and >80 years, respectively) had poor cancer specific survival rates. Patients with localized disease and well differentiated tumors showed better chances of survival. Surgical intervention improved survival significantly as compared to patients who did not (116.7 months vs 42.7 months, p<0.01).

Conclusions/Discussion: Anal canal adenocarcinoma demonstrated a poor bimodal cancer-free survival in both younger and older patient groups. Surgery significantly improves odds of survival and should be offered to patients amenable to intervention.

ASSOCIATION OF KI-67 INDEX WITH RECTAL NEUROENDOCRINE TUMOR RECURRENCE IN YOUNGER PATIENTS.

P1141

P. Zhou, M. Skalitzky, P. Goffredo, S. Sherman, I. Gribovskaja-Rupp, M. Kapadia, J. Hrabe
Iowa City, IA

Purpose/Background: Rectal neuroendocrine tumors (rNETs) are rare with average age at presentation of 56 years. Given their low incidence, limited data exist on rNETs in patients ≤50 years. The aim of this study was to evaluate presenting symptoms, tumor characteristics, and recurrence in patients ≤50 years with rNETs at a Neuroendocrine Tumor Center of Excellence.

Methods/Interventions: A retrospective chart review identified patients ≤50 years with rNETs presenting to a tertiary care institution between 2010 and 2017. Demographics and symptomatology, tumor characteristics, and outcomes were analyzed.

Results/Outcome(s): Fifteen rNET patients met inclusion criteria; median age was 45 (29-50); 53% were male. All NETs were found on endoscopy, which was performed for symptoms in 10 patients; for routine screening in 3 patients (age 50); for family history of Lynch syndrome in 1; and for inflammatory bowel disease surveillance in 1. The most common symptoms at diagnosis included abdominal pain (60%) and stool changes (53%), with only 20% having rectal bleeding. Rectal NETs usually presented with favorable biology. Ki-67 was <2% in 73%, and 80% were well-differentiated. Median primary tumor size was 7 mm with only four lesions ≥10mm. Twelve patients had stage I tumors at initial presentation treated with polypectomy or endoscopic mucosal resection. Of the remainder, 2 patients had stage III and 1 stage IV disease at presentation. Among stage III rNETs, one was detected

on screening colonoscopy and the other by colonoscopy performed for rectal bleeding, pain and stool changes. Both tumors were 4.5 cm with Ki-67 of 4% and 46%, respectively. The widely-metastatic stage IV tumor was 1.3cm with Ki-67 of >95%. All advanced stage tumors were >1 cm and received further pelvic imaging demonstrating involved lymph nodes. At median follow-up of 4.2 years, 3 patients progressed and 2 died. The only progression among stage I patients was at 2.8 years with local recurrence and liver metastasis from a 10mm primary tumor with Ki-67 of 20%, with death occurring at 11.6 years. The stage III patient with Ki-67 of 46% developed liver metastases within 1 year of diagnosis and was alive at 3.7 years. The stage IV patient died within 1 year. Higher Ki-67 was significantly associated with progression by Cox model (HR 1.05, 95% CI 1.004-1.09, p=0.03).

Conclusions/Discussion: In this series of rNETs in younger patients, those with low-risk features (well-differentiated, low Ki-67 index, size <1 cm) were adequately treated by endoscopic resection with no recurrences. Larger tumors were associated with nodal metastases, and all recurrences were from tumors with elevated Ki-67. Although the low number of events precluded more detailed statistical analysis, even in this small sample, higher Ki-67 significantly correlated with recurrence. These findings suggest that rNETs of larger size or higher Ki-67 at diagnosis may benefit from additional staging and surveillance imaging.

ANAL HPV AND SURVEILLANCE: TIME TO ESTABLISH UNIFORM GUIDELINES.

P1142

Y. Assaf, S. Shenoy, M. Nittala, A. Cheng
Kansas City, MO

Purpose/Background: Human papilloma virus (HPV) infection of the anus is highly prevalent in the US veteran population. High grade anal intraepithelial neoplasia (AIN-3, HSIL, carcinoma in situ)) is a precursor for anal squamous cell carcinoma and has been associated with high risk HPV subtypes 16,18,31. Surveillance protocol is not well defined for anal HPV diseases and treatment of HSIL remains unclear as the disease course is not well established. The goal of our study is to examine the disease course of HPV related anal disease with the aim to establish a protocol on frequency of surveillance and to identify factors that define high risk patients.

Methods/Interventions: This is a retrospective study of patients treated with HPV anal diseases in the period between 2006-2018. After IRB approval, database was searched from pathology archives, surgery and oncology. Terms used to identify patients were HPV, anorectal, perianal and anal carcinoma. All anal lesions were biopsied and gross disease was excised or fulgurated. Patients who presented or progressed to squamous cell cancer underwent treatment with standard Nigro protocol. Patients with AIN (low or high-grade dysplasia) were monitored with continued surveillance and periodic exams, biopsies. A statistical analysis of disease activity was conducted primarily looking at mean time of progression or regression of HSIL lesions. Risk factors for progression to HSIL and SCC were analyzed such as P16 positivity, gender, ethnicity, smoking, diabetes, alcohol abuse, history of immunosuppression, and history of previous cancers.

Results/Outcome(s): There were 56 patients included in the study. 29 patients were diagnosed with HSIL. Of these patients, 11 patients exhibited regression of the HSIL lesion to Low grade (LSIL) lesion. The mean time to regression was 334 days [range 35 -2071 days]. Two patients with HSIL progressed to squamous cell cancer with a mean time of progression of 58 days. Using Chi square analysis, Caucasian patients were more at-risk disease progression compared to other ethnicities. [CHI=8.2939, p value=.0158). Similarly, patients with a history of diabetes were more prone to progression of disease. [CHI=11.1042, p value = .0039]. Remaining risk factors were not statistically significant for disease progression.

Conclusions/Discussion: Patients with HSIL who regressed to LSIL, did so in about 1 year after therapy. Patients that progressed to SCC, did so rapidly. We recommend patients who are diagnosed with HSIL, undergo a surveillance EUA at frequent intervals. However, the study fails to identify specific risk factors or establish any predictability in the disease course associated with anal HPV disease. Further prospective research is needed to include high risk HPV serotyping, p16 immuno-histochemistry and E6/E7 RNA profiling on all samples to elucidate and establish surveillance guidelines.

UNUSUAL COLON TUMORS OF SCHWANNIAN ORIGIN: CASE REPORTS AND REVIEW OF LITERATURE.

P1143

A. Rather, A. Fisher
Dover, DE

Purpose/Background: Schwannomas of gastrointestinal tract (GI) are rare mesenchymal tumors derived from the Schwann cells that form the neural sheath. In the GI tract these occur most frequently in the stomach. Isolated colorectal schwannomas are extremely rare and are usually discovered incidentally as a submucosal mass on routine colonoscopy. Granular cell tumor of the GI tract is another extremely rare neoplasm with much speculation and controversy regarding its histogenesis. Recent studies suggest a Schwann cell origin based on immunohistochemistry (IHC) and ultrastructure. Given the rare presentation of these two pathologies in the colon, literature was reviewed for the clinicopathological and IHC details and two cases are described.

Methods/Interventions: Literature was reviewed and demographics, comorbidities, method of diagnosis, pathological features, clinical course and management of two cases presented.

Results/Outcome(s): Two cases of incidental rare colon pathologies are described. The first patient underwent colon resection and pathology revealed a mass within the muscular wall of the colon with spindled cells arranged in Verocay bodies with somewhat well circumscribed borders, but no obvious encapsulation. There was focal cytologic atypia and rare mitotic figures. IHC testing revealed spindled cells positive for S-100 and negative for CD117, DOG1, actin and desmin. Final pathologic diagnosis was schwannoma of the colon. The second patient had a colonoscopy with snare polypectomy and pathology revealed neural proliferation most consistent with granular cell tumor. Ki-67 showed a mitotic rate of approximately 45%. Immunostains were strongly positive for S-100 and negative for SMA and CD117.

Conclusions/Discussion: Mesenchymal tumors of GI tract are mainly comprised of a spectrum of spindle cell tumors which include GIST, leiomyoma, leiomyosarcoma and schwannoma. Gastrointestinal schwannomas are spindle cell neoplasms that rarely occur in the colon or rectum with only about 70 cases reported in the literature. Granular cell tumors are also rare GI tumors that are defined as mesenchymal tumors of Schwann cell origin. IHC of both tumors remains the most important diagnostic method and supports a common origin. These tumors stain diffusely positive for S-100. While both these tumors are generally benign and characterized by slow growth, malignant degeneration is certainly a possibility if not completely removed. Surgical management of these tumors is somewhat controversial in the literature. However, consensus seems to be that surgical excision is the standard of care with colon resection the optimal treatment for larger tumors and advanced endoscopic techniques for resection of smaller tumors. Tumors of Schawannian origin in the colon and rectum, although rare, should be considered in the differential diagnosis of submucosal lesions and complete excision is assoicated with very good prognosis and low recurrence rates.

INTRAMUCOSAL ADENOCARCINOMA OF THE LARGE BOWEL: THE CLINICAL CONTEXT AND MANAGEMENT OF AN "ALMOST CANCER".

P1144

C. Choi, T. Plesec, J. Church
Cleveland, OH

Purpose/Background: Intramucosal carcinoma (IMC) of the colon and rectum describes an epithelial lesion where dysplastic cells invade through the basement membrane of the epithelium into the lamina propria. IMC lies between high grade dysplasia (HGD) where dysplastic cells do not pass the basement membrane of the epithelium, and invasive carcinoma (IC) where dysplastic cells invade through the muscularis mucosae into the submucosa. These lesions represent a continuum of invasion and are considered high risk to progress towards cancer. While HGD and IC are distinctly recognizable, IMC is often misunderstood and even controversial. The clinical context and oncogenic implications of IMC in the colon and rectum in the current literature is sparse. In this study the aim is to describe the clinical and oncogenic aspects of these high risk lesions.

Methods/Interventions: IRB approved colonoscopy and polyp databases were used to access lesions containing IMC. Patients with hereditary colorectal cancer syndromes, or without follow-up colonoscopies were excluded. Data included age at lesion excision, gender, personal and family history of colorectal neoplasia. Primary end points included size, location, and method of removal, and local recurrence/persistence of the index lesion. Follow up data included findings and number of surveillance colonoscopies. Endoscopic removal of an index adenoma containing IMC was always followed by a repeat endoscopy at 3 months. Surgery was indicated for persistent or recurrent polyp that could not be completely be removed at second endoscopy.

Results/Outcome(s): Twenty-seven patients (14 women, 13 men) had 28 lesions. Ages ranged from 49 to 92, (mean 73). Overall 15 (52%) lesions were right sided, and 13 (48%) were left-sided. 5/28 polyps were an underlying tubular adenoma, 18 were tubulovillous adenoma and 5 were villous adenomas. Lesion size ranged from 3 to 70 mm, with the mean size of tubular adenomas 18.4 mm, tubulovillous adenoma 39.7 mm and villous adenoma 41.7 mm. Three index polyps were flat, 5 were pedunculated and 19 were sessile. Sixteen out of 19 lesions were effectively removed by snare excision, 2 by hot biopsy and 5 by transanal excision. Colectomy was performed for polyps that could not be snared endoscopically (n=2), or for recurrent polyp after a first attempt at snare (n=3). No patient developed cancer at the polypectomy site and there were no perforations during polypectomy. Twenty six patients had endoscopic follow-up, with an average of 2.7 scopes over a median of 3 years (2 months to 16 years). Metachronous lesions were found in all patients and include 66% tubulovillous adenomas and 89% tubular adenomas.

Conclusions/Discussion: Adenomas containing IMC are a diverse group of lesions occurring in relatively high-risk colons. Any effective endoscopic technique for their removal is acceptable but in this series 18% of patients needed bowel resection to ensure clearance of the index lesion.

MALIGNANT PERIVASCULAR ENDOTHELIAL CELL TUMOR (PECOMA) OF THE RECTUM: A CASE REPORT.

P1145

A. Okonkwo, T. Byrd, G. Oprea, C. Clark, J. Turner, A. Chase
Atlanta, GA

Purpose/Background: Perivascular endothelial cell tumors (PEComas) are rare mesenchymal tumors with poorly established treatment protocols. This report describes a very rare case of a PEComa involving the rectum.

Methods/Interventions: A 73-year old female was referred to colorectal surgery after inconclusive workup of a rectal mass at an outside hospital. Flexible sigmoidoscopy showed no intraluminal rectal mass. MRI revealed an exophytic mass likely arising from the posterolateral wall of the mid rectum adjacent to fibroid uterus and a complex left adnexal mass. Combined surgery with colorectal surgery and gynecology was recommended. Intraoperative biopsies of mass was consistent with uterine fibroids and only BSO was performed. Weeks later, final pathology revealed highly atypical cells suspicious for sarcoma. LAR with hysterectomy was recommended but patient refused. She returned six months later with hematochezia and agreed to surgery.

Results/Outcome(s): LAR with hysterectomy was performed with an uncomplicated postoperative course. Final pathology reported a 5.5 cm spindle and epithelial cell neoplasm, most consistent with a PEComa.

Conclusions/Discussion: PEComas were first reported in 1963. Over 80 cases have been reported in the literature making these mesenchymal tumors extremely rare[1-3]. Most cases are seen in young adults (29.9-38.9 years old) and women (63-64%) [2-3]. The gynecologic tract is the most common site, followed by the GI tract [2] where the most involved location is the rectum [2,3]. Lin and colleagues report 4 cases with metastases, with the liver being the most common site (n=2), followed by peritoneum and pancreas [3]. The term perivascular epithelial cell (PEC) was first coined in 1992 by Bonetti et al and is used to describe epithelial cells that typically coexpress melanocytic (HMB-45; melan-A) and smooth muscle markers (actin; desmin) [2-3, 6]. Tumor size > 5cm, infiltrative growth pattern, high nuclear grade, necrosis, and mitotic activity > 1/50 hpf are associated with subsequent aggressive clinical behavior thus differentiating malignant from benign subtypes [7]. Although surgical resection is not well supported by the literature, it is the favored treatment modality [3,5]. The role of chemoradiation in the treatment in these tumors is ill-defined [3]. PEComas of the rectum are extremely rare mesenchymal tumors. The role of surgical resection as well as chemotherapy and radiotherapy needs further investigation given the paucity of data on these neoplasms.

WITH A HIGH RATE OF INCIDENTAL POLYPS IN OPERATIVE SPECIMEN, IT IS IMPERATIVE FOR A GOOD PREOPERATIVE COLONOSCOPY AND REPEAT SCOPE IN ONE YEAR.

P1146

B. Houlihan, T. Holleran, S. Berkey, M. Bayasi, J. Fitzgerald, T. Stahl, J. Ayscue, B. Bello
Washington, DC

Purpose/Background: With clear standards for colonoscopic screening, patients are frequently getting colectomies for endoscopically unresectable or malignant lesions. Throughout the last year, in our institutions, there have been many incidentally found polyps in the pathologic specimen retrieved from resections, which were not always identified on preoperative colonoscopies. Therefore, we sought to determine the incidence of unexpected polyps and to determine the reasons, while analyzing the quality of our preoperative colonoscopies.

Methods/Interventions: A retrospective review was performed for the past 12 months on all patients that underwent a formal colonic resection (i.e. for an unresectable polyp, cancer, or diverticulitis) at both Medstar Washington Hospital Center and Georgetown University Hospital. For each patient, their chart was analyzed for their demographics, surgery, colonoscopy history, details of their preoperative colonoscopy (i.e. prep, findings, pathology and withdrawal time), and pathology of operative specimen including any incidentally discovered polyps. The incidentally discovered polyps were divided into expected and incidental based on if the lesions were identified in the preoperative colonoscopy.

Results/Outcome(s): In one year, 243 colonic resections were performed at the two hospitals. The overall percentage of polyps found in the pathologic specimen was 29% (n=71). Of those, six were expected lesions with the colonoscopic report detailing purposefully left polyps and several were due to inability to traverse the lesion. The percent of patients with unexpected polyps on completed scopes was 24.7% (n=60). When broken down by potential reasons for missed lesions, most colonoscopic reports did not provide a clear reason for having missed the surgical pathology (n=31, 51.7%). The most commonly identifiable reason was poor preparation of the colon cited in 18% of the missed lesions (n=11). Other reasons included inability due to multitude of polyps which couldn't be counted (n=4, 6.7%), colonoscopy over 1 year prior to surgery (n=2, 3.3%), and background of inflammatory bowel disease confounding the image (n=2, 3.3%). The incidentally found polyps ranged from 0.1 cm to 4.2 cm and between 1 and 17 were found in a single specimen.

Conclusions/Discussion: Our results show a surprisingly high incidence of unexpected polypoid lesions being found in colectomy specimens at 24.7%. While some are quite small, other incidentally discovered lesions are large, and in most there were multiple incidental lesions. This is

highly concerning for the possible development of interval pathologic lesions prior to the patient's next scheduled surveillance colonoscopy. This thus gives more weight to the argument that patients need to be scoped by 1 year post operatively, and that we need to continue to strive for good quality preoperative colonoscopies to assess the entire colon.

SALVAGE SURGICAL TREATMENT IN PATIENTS WITH PERSISTENT OR RECURRENT ANAL SQUAMOUS CELL CARCINOMA AFTER CHEMOTHERAPY AND RADIOTHERAPY TREATMENT.

P1147

A. Paiva, C. Nahas, C. Kimura, U. Ribeiro, S. Nahas, I. Cecconelo, C. Marques
São Paulo, Brazil

Purpose/Background: Combined chemoradiotherapy is the first-line treatment for anal squamous cell carcinoma (SCC), with failure rates below 20%. Salvage abdominoperineal resection (sAPR) is the treatment of choice for patients who failed, although it still presents a challenge with high rates of local recurrence. The aim of this study was to evaluate the risk factors for local recurrence after sAPR in our center.

Methods/Interventions: Retrospective data was collected from medical records of patients who underwent sAPR with curative intent, after recurrence or failure of chemoradiotherapy treatment for anal squamous cell carcinoma in one single cancer Center, between May 2012 and May 2015. We analyzed whether complication rates, recurrence and survival rates were influenced by: gender, age, HIV infection, type of surgery and perineal reconstruction, multivisceral resection, presence of perineural and angiolymphatic invasion, number of compromised lymph nodes and margin status.

Results/Outcome(s): Twenty-two patients were identified, of whom 22.7% were HIV positive of the patients studied, 38.1% were men, with a mean age of 60.6 years. Postoperative complications were observed in 45.4% of the cases and were higher among HIV positive patients (80%) compared to 35.3% in HIV negative patients, but the difference was not statistically relevant (p= 0.135). There was no difference statistically significant in the complication rates of patients requiring flap perineal reconstruction and primary closure (p=0.69). Lymphovascular invasion and positive radial margin (p = 0.003) were the only factors associated with increased risk of recurrence (p=0.013 and 0.003, respectively). Radial margin was compromised in 45.5% of the cases and was the only factor associated with increased overall mortality (p=0.002), in agreement with rates reported by the literature (9-55%). The mean follow-up was 17.8 months and the overall recurrence rate was 45.5%.

Conclusions/Discussion: Abdominoperineal resection remains the only potentially curative option for anal SCC after chemoradiotherapy failure, but with high recurrence rates. In our experience, lymphovascular invasion was associated with increased risk of recurrence and compromised resection margin was the most important factor negatively affecting survival, reinforcing the importance of R0 resection, as well as early diagnosis of recurrence and timely intervention.

PERIANAL BASAL CELL CARCINOMA – 40 YEARS EXPERIENCE.

P1148

S. Liu, K. Mathis, S. Kelley
Rochester, MN

Purpose/Background: Basal cell carcinoma of the perianal region is a very rare presentation of an otherwise common dermatologic condition. There is a paucity in literature describing the natural progression and treatment success of this condition with long follow-up. Also, due to the rarity of presentation, it is often lumped with other genital basal cell carcinoma in literature. We present here the 40 years experience update on the management of only perianal basal cell carcinoma at our colon and rectal surgery practice at a tertiary referral hospital.

Methods/Interventions: Retrospective chart review was approved by the local IRB. All pathology reports, operative notes, and clinic notes were reviewed. Patients were excluded if they did not have a clinical follow-up with a perianal physical exam.

Results/Outcome(s): A total of 30 patients were identified of which 28 (17% female, avg age 70) had follow up data (avg 5.6 years). Twenty-six patients (92%) were treated with local excision and 3 patients (10%) required multiple excision due to positive margins. The average lesion size of the lesion was 2.6cm^2 (average longest dimension of 1.8cm). The average final surgical margins obtained was 1.1cm. Eight patients (28.6%) had multiple basal cell lesions in other anatomic regions. The surgical wound had opened up at the first follow-up visit in 67% of patients and only one patient (3.6%) required skin grafting. There were no recurrences after a pathologic negative margin was obtained. There was no mortality related to basal cell carcinoma.

Conclusions/Discussion: Perianal location is a very rare presentation of basal cell carcinoma. Ultimately this condition can be successfully treated with local excision with an average of 1cm surgical margin with nearly zero recurrences. Despite the difficulty in primary closure in these wounds, very rarely does this have to escalate beyond conservative management. However, the discovery of perianal basal cell cancer should prompt a complete dermatologic exam due to high rates of concurrent disease in other locations.

TRANSANAL MINIMALLY INVASIVE SURGERY (TAMIS) FOR RECTAL CARCINOIDS.

P1149

V. Rodriguez-Rapale, D. Bolton, J. Monson, B. Orkin
Orlando, FL

Purpose/Background: Rectal carcinoids are typically small, low grade neuroendocrine neoplasms and comprise only 1-2% of all rectal tumors. Standard treatment is local excision with clear margins. Transanal minimally invasive surgery (TAMIS) has become our treatment of choice because of superior visualization and access to the upper rectum; however, there is little in the literature on this. We reviewed our experience to assess perioperative and oncologic outcomes.

Methods/Interventions: Our prospective TAMIS database queried for surgically treated rectal carcinoids was retrospectively reviewed for clinical data, preoperative and operative details, and outcomes.

Results/Outcome(s): Between July 2011 and October 2018, 15 patients underwent full-thickness excision with TAMIS for rectal carcinoid; 9 (60%) were primary surgical excisions, and 6 (40%) were excisions after attempted endoscopic resection. Tumors were located between 5-12 cm (mean 7 cm) from the anal verge. Tumors were less than 2 cm in all cases. The mean OR time was 49 min. Post-intervention complications were very low with only 1 patient presenting with abdominal pain and proctitis (6.6%). Intact specimens with negative margins were obtained in all cases. No evidence of disease or recurrence were observed.

Conclusions/Discussion: TAMIS is a safe and useful alternative for the treatment of rectal carcinoids less than 2 cm in diameter for both primary excision and for positive or unknown margins after endoscopic resection. In this setting, complication rates are very low and pathologic and oncologic outcome are excellent.

ENDOSCOPIC POLYP CONTROL OVER THE LONG TERM IS POSSIBLE IN OLIGOPOLYPOSIS SYNDROMES.

P01150

M. Abbass, J. Church, D. Liska, M. O'Malley, L. Laguardia, S. Milicia, V. Vilchez, C. Burke, G. Mankaney, M. Kalady
Cleveland, OH

Purpose/Background: Oligoplyposis syndromes feature patients with <100 polyps in the colon and the rectum. *MUTYH*-Associated Polyposis (MAP) and Serrated Polyposis Syndrome (SPS) are examples. Treatment of the colorectal polyposis aims to prevent cancer and there is a choice between colectomy and colonoscopic polypectomy. The relative roles of endoscopy and surgery have not been well-described. We hypothesized that aggressive control of polyps at initial and subsequent colonoscopies can effectively control cancer risk without requiring colectomy

Methods/Interventions: A single institution hereditary colorectal cancer syndrome registry was queried for patients with MAP or SPS (WHO Type 1) who had had at least 5 years of endoscopic follow-up. WHO Type 1 SPS is defined as 5 or more serrated polyos proximal to the sigmoid colon, 2 of which are >10mm in size. Yearly colonoscopy is routine for these patients and polyps greater than 5mm are removed, The total number of polyps was counted. Indications for surgery include high grade dysplasia, and polyp number and/or size that make endoscopic control impossible.

Results/Outcome(s): 7 patients with MAP and 19 patients with SPS were included. Average age in the MAP group was 62 (50-74) years old. The average number of colonoscopies was 11 (6-16) over an average time of 9 years (range 5 to 15); the average number of cumulative polyps was 148 (8-333) per patient. The average age in the SPS group was 70 (56-84) years. The average number of colonoscopies was 8 (5-11) over and average follow-up of 11 years (range 5 to 18); the cumulative polyp number was 41 (10-147) polyps per patient. There were no colorectal cancers in MAP population during surveillance. There were two colon cancers in the SPS group during surveillance. Both patients underwent curative resection (both stage I cancers) and have no recurrence after 5 years. The table shows the number of polyps removed at each colonoscopy. Numbers in red represent the exam at which a cancer was found. The total number of polyps removed is also given. The data show that patients with high initial polyp counts stabilize over time with yearly exams showing the rate of polyp development. Other patients always have low polyp numbers.

Conclusions/Discussion: In patients with MAP or SPS, the largest polyp burden usually exists on initial colonoscopy. Aggressive polypectomy and subsequent surveillance allows adequate neoplastic control and should be considered instead of immediate colectomy in patients without an absolute indication for colectomy.

Syndrome	Patient Number	Age	Gender	Exam	Surgery	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
SPS	1	68	M	11	No	11	3	13	3	1	3	0	4	4	5	0					
SPS	2	62	M	6	No	2	2	2	3	1	1										
SPS	3	70	M	6	No	4	0	23	12	26	4										
SPS	4	84	M	9	No	4	3	1	0	2	4	4	8	2							
SPS	5	76	M	5	No	2	13	1	8	5											
SPS	6	60	M	5	No	32	22	3	2	6											
SPS	7	80	F	8	No	1	1	0	2	7	3	5	10								
SPS	8	76	M	10	No	3	1	17	6	25	26	35	12	7	15						
SPS	**9**	**80**	**M**	**9**	**yes**	3	0	2	4	7	0	1	1	1							
SPS	10	58	M	10	No	2	5	4	8	11	3	5	8	2	11						
SPS	11	70	M	8	No	6	5	2	4	2	1	2	3								
SPS	12	69	F	5	No	4	3	2	1	1											
SPS	**13**	**77**	**M**	**8**	**yes**	20	9	36	13	12	13	4	3								
SPS	14	66	F	7	No	2	1	3	1	0	3	0									
SPS	15	83	M	11	yes	0	2	4	6	2	2	2	3	2	6	3					
SPS	16	63	F	7	No	3	3	4	2	4	0	3									
SPS	17	80	F	5	No	4	5	0	0	2											
SPS	18	56	F	5	No	2	0	4	3	2											
SPS	19	59	F	6	No	13	2	11	2	6	6										
MAP	20	68	F	14	No	50	50	45	25	34	14	15	20	7	10	19	10	10	24		
MAP	21	63	F	12	No	6	8	14	3	15	18	14	8	13	18	18	17				
MAP	22	50	F	7	Yes	9	0	2	0	0	1	5									
MAP	23	74	F	14	No	12	13	8	4	4	9	10	10	7	9	3	49	20	6		
MAP	24	57	M	16	No	2	15	2	29	3	3	10	4	12	7	7	13	10	15	6	22
MAP	25	65	F	7	No	2	5	6	2	4	4	5									
MAP	26	59	F	6	No	100	21	60	3	3	5										

UTILIZATION OF A PATIENT COACH PROGRAM WITH A NEW SMART STOMA BAG SYSTEM.

P1150

I. Sapci, S. Steele, T. Hull, S. Holubar, D. Liska, M. Valente, S. Hinckley, E. Gorgun
Cleveland, OH

Purpose/Background: Patients who are undergoing ostomy creation for the first time face many challenges including physical, social and psychological. Peer support can potentially help patients with new ostomies and assist them with the socio-emotional aspects of their journey. Aim of our study is to describe the patient experience with a peer support program (Patient Coach Program) that was initiated as part of a clinical trial with a new stoma appliance.

Methods/Interventions: This is an ongoing Institutional Review Board approved prospective trial, designed to observe the clinical effects of a new stoma appliance and remote care program. Study began enrollment in July 2019. Patient Coach Program is a peer-to-peer educational support and communication program that aims to improve self-management and assists patients with social aspects of having a new ostomy. Patient coaches are trained to provide educational, socio-emotional, and technical support including providing supplies to patients starting in the pre-operative stage, continuing postoperatively and beyond discharge until day 90 after surgery. All patient coaches previously/currently have a stoma. Interactions with patient coaches are made via phone calls and recorded in a secure portal. The meta-data of these interactions was reviewed and the free-text documentation coded according to the categories of the City of Hope Quality of Life Questionnaire for patients with ostomy.

Results/Outcome(s): A total of 18 patients had interactions with the patient coaches between July 2019-November 2019. Mean number of interactions per patient was 9 (Range: 3-26). Peer support coaching was found to be acceptable based on free-text reviews and durable to new ileostomy patients and 164 coaching interactions were recorded. Coaching contact predominantly began in the perioperative week (81 interactions, 38%) The mean (SD) duration of phone calls was 81 (182) minutes. Mean duration of coaching follow-up was 39 days (4-101). Of 51 coaching interactions in which meaningful quality of life support was provided 37 (73%) related to physical aspects of their condition. 8 (51%) related to psychological aspects and 2 (4%) related to social aspects.

Conclusions/Discussion: When paired with an app and appliance-based remote monitoring program, peer-to-peer support is acceptable to patients with ostomies and helpful to provide meaningful quality of life support which in turn can be expected to improve outcomes in this complex patient group. Ongoing results from the trial will further evaluate the benefit of the coaching program.

THE IMPACT OF AN ERAS PROGRAM IMPLEMENTATION ON COLORECTAL SURGERY RESULTS.

P1151

R. Rocha, C. Carneiro, A. Soares, R. Camarneiro, P. Azevedo, V. Nunes
Cascais, Portugal

Purpose/Background: Enhaced recovery after surgery (ERAS) is a multimodal approach centered on a multidisciplinary team working in collaboration before, during and after surgery, in order to enhance patient experience and at the same time to improve surgical outcomes. Our hospital started this program in 2018, and we pretend to compare our results in colorectal surgery before and after the program implementation.

Methods/Interventions: We have analyzed 198 patients submitted to colo-rectal surgery between 2017 and 2018, of which 50 patients were ramdomly chosen before ERAS implementation, and 148 were patients consecutively submitted to colorectal sugery at our institution. This is a prospectively collected data study with an historical control sample. We analysed sociodemographic parameters, as well as type of surgery (laparoscopic vs open), type of resection, readmission rate, reoperations rate and serious complications rate. Our primary endpoints were lenght of stay and anastomotic leak rate. Patients submitted to urgent/emergent surgery we excluded.

Results/Outcome(s): Comparing the two groups before and after ERAS implementation, the groups were comparable in terms of age (mean 67 years) and gender (56% men before and 66% after ERAS). Laparoscopic surgery represented 40% of the procedures before ERAS and 53% after implementatios. Colon and rectal surgery remained in the same proportions in the two periods (colon 68; rectal 32%). Regarding the endpoints, the length of stay was 12,2 days before and 7,1 days after ERAS ($p<0,05$); anastomotic leak rate decreased from 12,5 to 6,5; reoperation rate decreased from 16% to 12% ($p<0,05$); serious complications decreased from 18% to 8,8% ($p<0,05$); 30 day readmission rate decreased from 10% to 6%.

Conclusions/Discussion: The two groups were comparable in terms of gender, age, surgical approach and colo vs rectal surgery, reflecting a stable surgical practice in our group in the two years which highligths the marked improvments in our series with ERAS implementation. Regarding our endpoints, our results improved around 50%, dropping our length of stay from 12,2 to 7,1 and our leak rate from 12,5 to 6,5. Our study confirms the benefits of an ERAS program in terms of hard endopints such as length of stay and surgical complications. Patient satisfaction evaluation before, during and after surgery needs further evaluation.

INTRACORPOREAL VERSUS EXTRACORPOREAL ANASTOMOSIS FOR ROBOTIC LEFT COLECTOMIES: SHORT-TERM CLINICAL OUTCOMES.

P1152

E. Cha, J. Gallagher, M. Soliman
Orlando, FL

Purpose/Background: Intracorporeal anastomosis in minimally invasive right colectomies has shown some advantages compared to the extracorporeal anastomosis in a recent multicenter trial. Applying similar theory, the purpose of this study was to compare the short-term clinical outcomes of intracorporeal (IC) and extracorporeal (EC) anastomosis for robotic left-sided colectomies - low anterior resection (LAR), descending colectomy and sigmoidectomy for both benign and malignant disease.

Methods/Interventions: This study was a retrospective, single surgeon study with data variables collected and maintained without identifiable patient information. From January, 1st, 2017 through August 31st, 2019, patients who were undergoing robotic laparoscopically-assisted LAR (CPT 44207) and descending colectomy/sigmoidectomy (CPT 44204) were included. Patients who had hand-sewn anastomosis were excluded. The baseline variables collected were: age, BMI (body mass index), ASA (American Society of Anesthesiologists) class, gender, and preoperative diagnosis. The outcome variables retrieved for comparisons were: intra-operative outcomes (estimated blood loss and operative time), and recovery outcomes (length of stay, anastomotic complications, and readmission rates).

Results/Outcome(s): A total of 132 robotic left-sided colectomy patients were evaluated for two techniques of anastomosis. Out of these patients, 70 patients underwent EC anastomosis while 59 underwent IC anastomosis. Three patients who had hand-sewn colonanal anastomosis were excluded. Overall, the intracorporeal anastomosis patient group had longer intraoperative time while less estimated blood loss. Both groups had similar length of stay, leak rates and readmission rates. Subcategorical analysis of LAR compared to descending colectomy/sigmoidectomy groups did not show any statistically significant difference.

Conclusions/Discussion: This comparison of two anastomotic techniques for robotic left-sided colectomies - LAR, descending and sigmoidectomy - based on a single, expert robotic surgeon shows promising clinical outcomes for intracorporeal technique that is safe and replicable. A larger multicenter study can further elucidate clinical outcomes of these two techniques.

Table 1. Intraoperative and postoperative outcomes

Variables	IC (n = 59)	EC (n = 70)	p value
LOS (Days)	3.3	3.7	NS
Leak (n)(%)	1 (1.7%)	0	NS
Readmission (n)(%)	5 (8.5%)	6 (8.3%)	NS
EBL (mL)	20.5	22.9	NS
Op Time (hrs)	3.2	2.9	P = 0.0429
DLI	14	10	NS

IC = Intracorporeal anastomosis, EC = Extracorporeal anastomosis, LOS = length of stay in days, EBL = estimated blood loss in mL, Op Time = intra-operative time from wheel-in to wheel-out in hours

COLORECTAL SURGERY RESIDENCY: OPERATIVE EXPERIENCE AND PRACTICE INFLUENCE.

P1153

S. Qureshy, H. Liang, D. Maron, G. Dasilva, S. Wexner, E. Weiss
Weston, FL

Purpose/Background: Colorectal surgery residency emphasizes training in multiple surgical modalities. There is limited literature on how residency influences trainees' adoption of certain techniques.

Methods/Interventions: An anonymous web-based survey was sent to residents (n=55) trained at our institution between 2006 and 2017 regarding what % of 6 common colorectal surgical procedures (right hemicolectomy, sigmoidectomy for cancer or diverticulitis, low and upper rectal cancer resection, J pouch) were done laparoscopically, hand-assisted, open or robotic during residency and in current practice.

Results/Outcome(s): Of 33 (60% respondents, 8 (24%) completing two years of residency, 9 (28%) are in private practice, 13 (39%) are hospital employed, and 11 (33%) are university employed. Average resident age was 33.2 ±2.3 years during training. 21 (63%) performed right hemicolectomy laparoscopically 76-100% of the time during residency. In practice, 20 (60.1%) performed it laparoscopy >75% and 4 (12%) performed it robotically >75%. For sigmoidectomy of cancer during residency, 17 (51.5%) responders did laparoscopic surgery 51-75% of the time and 15 (45%) did hand assisted 26-50%. In practice, 17 (51.5%) did laparoscopic >75%, and 5 (15%) did robotic >75%. For sigmoidectomy for diverticulitis, 25 (75.8%) did >50% of cases laparoscopically. In practice, 20 (60.6%) did laparoscopically >50%, and 10 (30.3%) used robotics >50%. For upper rectal cancer, 16 (48.4%) used laparoscopy for 51-75% of cases and 10 (30.3%) used hand-assisted 25-50%. In practice, 15 (45.5%) use laparoscopy for 76-100% and 12 (36.4%) use robotics for >50%. For lower rectal cancer, 15 (45.5%) used laparoscopy 51-75%, and 12 (36.4%) did hand assisted for 26-50%. In practice, 9 (27.3%) used laparoscopy and similarly robotics for 76-100%. For J pouch creation, 11 (33.3%) used laparoscopy >75% and 10 (30.3%) used hand-assisted for 26-50%. In practice, 13 (39.4%) use laparoscopy for >75% and 9 (27.3%) use robotics for >50%. There was no significant difference between laparoscopic and open approach

usage during and after residency. Hand-assisted was done more during training than in practice for all surgeries (right hemicolectomy ($p=0.0156$), sigmoidectomy for cancer and diverticulitis ($p<0.0001$ and $p=0.0002$), upper and lower rectal cancers ($p=0.0018$ and $p=0.0010$), and J pouch ($p=0.0063$). Robotics were used more after residency for all surgeries (right hemicolectomy ($p=0.0156$), sigmoidectomy for cancer and diverticulitis ($p=0.0020$) and ($p=0.0010$), upper and lower rectal cancer ($p=0.0001$ and $p<0.0001$), and J pouch ($p=0.0005$).

Conclusions/Discussion: This survey showed that during residency, laparoscopic surgery continued into the resident's current practice. Despite doing less robotic cases during residency, most use robotic surgery in common colorectal cases, displaying an overall trend in increased robotics and decreased hand assisted surgery usage.

"WE FIX"–A SOCIAL-ECOLOGICAL FRAMEWORK OF SURGEON IDENTITY.

P1154

S. Rivard, C. Vitous, A. De Roo, M. Byrnes, P. Suwanabol
Ann Arbor, MI

Purpose/Background: Surgeons frequently make decisions that carry high risk of postoperative morbidity and mortality. Many surgeons receive no formal training in the complicated decision-making process and develop their own approach through a combination of training, experience, and personal beliefs. As such, we designed qualitative interviews to better understand this process.

Methods/Interventions: We interviewed 46 Michigan surgeons (35 perform high-risk colorectal surgery) regarding approaches to decision making for high-risk patients. Surgeons participated in semi-structured in-depth 30-60 minute interviews that included specific probes and questions regarding the decision making process, role of cognitive and functional outcomes, barriers and facilitators to palliative care, and personal responses to postoperative complications. Interviews were coded first for broad content domains and then on the emergent theme of "surgeon identity" to understand the role of personal and professional identity in high-risk decisions. We applied interpretive analysis in iterative theme identification. Transcribed interviews were coded in MaxQDA qualitative data analysis software.

Results/Outcome(s): Most surgeons referenced the impact of surgeon identity on high-risk decision making in ways that closely aligned with the domains of the social-ecological model: individual, interpersonal, environment, community, policy (Figure 1). *Individual* factors encompassed personality traits (e.g. risk-aversion), life experiences (e.g. loss of a loved one), and beliefs about the role of a surgeon. *Interpersonal* factors were focused on surgical training (e.g. surgical education and resident to attending transition) and professional norms (e.g. differences between subspecialties and between surgery and medicine). *Environmental* elements included practice setting and the field's shifting culture. *Community* influences included professional norms, such as surgeon mentality and stereotypes, as well as American culture. *Policy* factors were centered around medicolegal concerns. We found that the professional experience intersected across all domains, influencing interactions at every level.

Conclusions/Discussion: High risk decisions are unavoidable in surgery. While each surgeon has developed an individual approach, the majority of surgeons recognized the importance of their professional surgeon identity. As this identity is a critical component of decision making, it should be actively shaped and not passively acquired. The social-ecological model serves as a framework to understand the complexities of surgeon identity and its malleability by external factors and professional experience. Through this framework, we can focus on modifiable aspects of surgeon identity. Environmental factors can be changed by cultivating collaborative, supportive practices. Interpersonal factors can be influenced by focused education in decision making as well as formalized mentorship during the resident to attending transition.

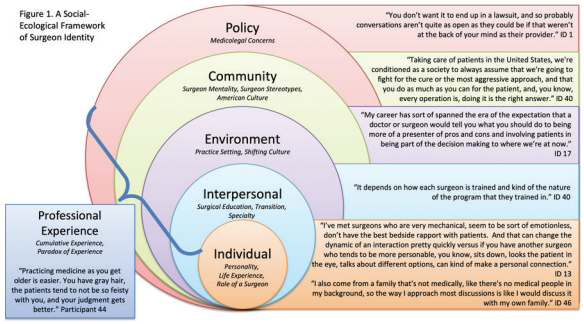


Figure 1. A Social-Ecological Framework of Surgeon Identity

WHAT CHANGED IN ROBOTIC COLORECTAL SURGERY WITH DA VINCI XI ROBOTIC SURGICAL SYSTEM AS COMPARED TO DA VINCI SI? A META-ANALYSIS.

P1155

A. Rojas, A. Kajmolli, M. Gachabayov, L. Quinter, G. Angelos, R. Bergamaschi
Valhalla, NY

Purpose/Background: Robotic procedures allow surgeons to overcome the kinematic restrictions of its laparoscopic counterpart. Nonetheless, da Vinci Si has its own well recoginized limitations including complex docking mechanics, inability to access multiquadrant procedures such as splenic flexure mobilization and bulky external arms. Da Vinci Xi robotic surgical system (RSS) was developed to solve the aforementioned limitations. The aim of this meta analysis was to evaluate whether

adoption of the da Vinci Xi RSS has improved outcomes of robotic colorectal surgery.

Methods/Interventions: Pubmed and MEDLINE (via Ovid) databases were systematically searched. Postoperative complication rate was the primary endpoint. Docking time, total operation time, and conversion rates were secondary endpoints. Mantel-Haenszel method with odds ratio, 95% confidence interval [OR (95%CI)], inverse variance method with standardized mean difference, 95% confidence interval [SMD (95%CI)] were used for the meta-analysis

Results/Outcome(s): Four studies totaling 383 patients (229 Si and 154 Xi) were included. No statistically significant difference in postoperative complication rates between Si and Xi was found [OR(95%)= 1.16(0.67,1.99); p=0.78] with low among-study heterogeneity (I^2=0%) (Figure 1). Docking time was significantly shorter in Xi [SMD(95%CI) = 4.18 (2.12, 6.23); p=0.04] with high heterogeneity (I^2=76.4%). The overall operating time did not differ [SMD (95%CI) = 23.4 (10.9, 35.8); p=0.39] with low heterogeneity (I^2=1%). Conversion rates were similar [OR (95%CI) = 1.17 (0.31, 4.44); p=0.69 with low heterogeneity (I^2=0%).

Conclusions/Discussion: This meta-analysis foud that the use of da Vinci Xi RSS is associated with significantly decreased docking time with no significant impact on postoperative complication, overall operative time and conversion rates.

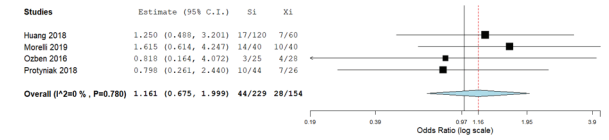


Figure 1. A forest plot of the meta-analysis of postoperative complication rates.

ADAPTATION OF INTRACORPOREAL ANASTOMOSIS FOR ROBOTIC RIGHT COLECTOMY IN EXPERT HANDS.

P1156

A. Machado-Hopkins, E. Cha, J. Gallagher, M. Matos, M. Soliman
Orlando, FL

Purpose/Background: Recent multicenter trial for minimally invasive (both robotic and laparoscopic) right colectomies has shown advantages of intracorporeal anastomosis over traditional extracorporeal anastomosis technique. Ergonomics of robotic surgery has facilitated such adoption of a new technique possible. The purpose of this study was to review a single expert surgeon's experience in initial adaptation.

Methods/Interventions: This study was a retrospective, single surgeon study with data variables collected and maintained without identifiable patient information. From August 2014 through October 2016, patients who had underwent robotic right colectomies were included in this study. Patient who underwent additional combined procedures were excluded. The baseline variables collected were: age, gender, BMI (body mass index), ASA (American Society of Anesthesiologists) class, and preoperative diagnosis. The outcome variables included: intra-operative outcomes (estimated blood loss, and operative time), and short term clinical outcomes (length of stay, anastomotic complications, and readmission rates).

Results/Outcome(s): A total of 40 patients were included in this review. First twenty patients were included once the surgeon introduced a completely robotic intracorporeal technique. The second group of patients were selected when the surgeon was performing an intracorporeal anastomosis routinely with all robotic right colectomies. Two patient groups had similar characteristics. There was a statistically significant reduction in intra-operative time (wheel in/wheel out) and less estimated blood loss despite having a trainee with each case. Short term clinical outcomes were similar for both groups.

Conclusions/Discussion: Intracorporeal anastomosis for robotic right colectomy is a safe, replicable technique. On a larger multicenter trial, it has shown to have advantages compared to traditional extracorporeal anastomosis.

Table 1. First 20 vsersus Expert 20 - Intraoperative/Postoperative Outcomes

Variables	First 20	Expert 20	p-value
Intraop Time (Hr)	4.52	2.38	**P < 0.05**
EBL (mL)	59.75	24.47	**P < 0.05**
LOS (Days)	3.3	3.2	NS
Readmission (n)	2	2	NS
Leak (n)	0	0	NS

LOS = length of stay, EBL = estimated blood loss, NS = non-significance

CLOPIDOGREL AND PHARMACOGENETICS: RETHINKING PERIOPERATIVE ANTIPLATELET MANAGEMENT.

P1157

S. Dantu, J. Albright
Syracuse, NY

Purpose/Background: Clopidogrel is a prodrug. Without activation by hepatic cytochrome P450 2C19 (CYP2C19), it cannot exert its antiplatelet effects at the platelet P2Y12 receptor. CYP2C19 polymorphisms are common, causing increased or decreased enzyme activity. The Clinical Pharmacogenetics Implementation Consortium, at the direction of the NIH, has developed guidelines regarding clopidogrel prescribing based on genotype. Below we describe a major bleeding complication following ligation of intersphincteric fistula tract (LIFT) due to CYP2C19 gain of function (GoF) variant causing enhanced platelet inhibition.

Methods/Interventions: L.C. was a 54-year-old male on clopidogrel for his cardiac stents who presented with

a 4-month history of purulent drainage from a high transsphincteric anal fistula. He underwent LIFT and restarted aspirin and clopidogrel as directed on POD#2. He returned on POD#4 with surgical site bleeding that resolved with manual pressure. The clopidogrel was held. He returned again POD#6 with persistent bleeding and orthostasis. We estimated 3-4 units of blood loss, all from the 2.5 cm incision skin edge. Bleeding stopped with suturing.

Results/Outcome(s): VerifyNow P2Y12 point-of-care platelet function assay showed persistent platelet inhibition despite holding clopidogrel for 3 days. CYP2C19 genotyping revealed a *17 allele, consistent with the ultrarapid metabolism known to be associated with increased bleeding risk on clopidogrel.

Conclusions/Discussion: Discussion: We observed a patient experiencing significant postoperative bleeding from a minor surgery due to enhanced platelet inhibition from CYP2C19*17 GoF allele. This is important for surgeons because estimates suggest up to 28% of patients have this GoF allele, placing them at increased risk for bleeding. No surgical guidelines exist to guide perioperative clopidogrel management based on platelet activation studies or genotype information. Such information may help to optimize timing of surgery based on individual factors. As individual genetic data become more widely available (e.g. 23andMe), surgeons may want to incorporate this information into their clinical decision making. Conclusion: It is feasible to rapidly test platelet inhibition in surgical patients using the point of care VerifyNow assay. Such testing has the potential to guide genotyping, and ultimately surgical management of patients on clopidogrel.

DESIGN OF A PHASE III, DOUBLE-BLIND, RANDOMIZED TRIAL TO EVALUATE THE SAFETY AND EFFICACY OF ALLOGENEIC STEM CELLS (DARVADSTROCEL) FOR THE TREATMENT OF COMPLEX PERIANAL FISTULA(S) IN PATIENTS WITH CROHN'S DISEASE (ADMIRE-CD II TRIAL).

P1158

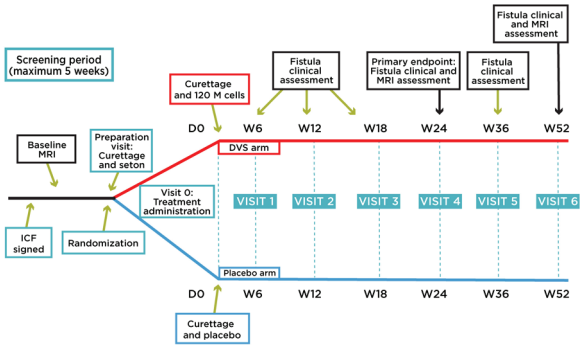
S. Wexner[5], W. Sandborn[1], J. Panés[2], I. Gilaberte[3], P. Gulati[4], B. Zhang[4], J. Pfeifer[4], D. Garcia-Olmo[3]
[1]*La Jola, CA;* [2]*Barcelona, Spain;* [3]*Madrid, Spain;* [4]*Cambridge, MA;* [5]*Weston, FL*

Purpose/Background: Darvadstrocel (DVS) is an expanded, allogeneic, adipose-derived, mesenchymal stem cell (eASC) therapy that has been approved in the EU, Switzerland and Israel for treating complex perianal fistulas (CPAF) in patients with Crohn's disease (CD), when those fistulas have shown an inadequate response to at least one conventional or biologic therapy.[1] The pivotal efficacy and safety data supporting this approval were provided by the Phase III ADMIRE-CD I trial (NCT01541579).[2,3] The trial demonstrated that DVS treatment was safe and effectively induced fistula closure, maintained for up to 52 weeks.[2,3] A second trial, ADMIRE-CD II (NCT03279081), has been designed and is currently ongoing in 10 countries, including the US. The aim of this trial is to provide data that will support the Biologics License Application submission to the US Food and Drug Administration (FDA).

Methods/Interventions: ADMIRE-CD II is a double-blind, 1:1 randomized, placebo-controlled, global clinical trial that evaluates the safety and efficacy of DVS in a sample of 554 patients with CD and CPAF. Patients undergo a preparation procedure under anesthesiato include curettage and seton placement, and are randomized to receive local injection of DVS or placebo 2 weeks later, after a second curettage, seton removal, and closure of the internal opening(s) (Fig. 1). The study follows an add-on design; patients in both arms continued any ongoing treatment with immunosuppressants and/or biologics.

Results/Outcome(s): The design and main endpoints are the same for ADMIRE-CD II as they were in ADMIRE-CD I, a 52 week study with a primary endpoint of combined remission at week 24; however, the inclusion/exclusion criteria have been adjusted: endoscopic confirmation of mild or inactive luminal CD is required and, unlike ADMIRE-CD I, patients who are only refractory to antibiotics are excluded. Additional exploratory endpoints of potential biomarkers and patient-reported outcomes (including health resources utilization) have been added.

Conclusions/Discussion: To our knowledge, this is the largest trial conducted for the treatment of CPAF in CD and with eASC therapy. Allogeneic stem cells could potentially offer a simple, minimally invasive outpatient alternative that, based on the available preclinical and clinical data, might potentially offer a valuable alternative to the current clinical management options for patients with CD and with CPAF with inadequate response to standard medical treatment. **References:** 1. Alofisel®. Summary of product characteristics, 2018. Available at: www.ema.europa.eu. Accessed November 2018. 2. Panés J, et al. Lancet 2016;388:1281–90. 3. Panés J, et al. Gastroenterology 2018;154:1334–42. **Funding:**This study is sponsored by Takeda Pharmaceuticals.



RISKS FACTORS AND OUTCOMES ASSOCIATED WITH FAILURE OF CONSERVATIVE TREATMENT IN ACUTE DIVERTICULITIS.

P1159

S. Ilana, G. Dasilva, S. Wexner
Weston, FL

Purpose/Background: The majority of patients with Hinchey I diverticulitis can be safely conservatively managed. However, some patients may require surgery, which is usually undertaken6-8 weeks after the episode. This study aimed to evaluate possible risks factors for and outcomes following surgery for failure of conservative management during the index hospital admission.

Methods/Interventions: Medical records of all patients who underwent sigmoidectomy for diverticulitis from January 2008 to November 2018 were reviewed. Patients with CT scan confirmed findings of inflammation, microperforation or pericolonic abscess (Hinchey I) were included in the study. Risks factors and outcomes of patients who were admitted for Hinchey I diverticulitis who failed conservative management requiring surgery during the same admission were compared to patients who subsequently underwent elective sigmoidectomy. Univariate analysis was used to evaluate risk factors for immediate surgery. Chi-square test or Fisher's exact test was used, when appropriate, for categorical variables, while Wilcoxon's rank-sum test was applied for continuous variables. Multivariate logistic regression model was performed to determine the most important risk factors associated with same admission surgery, in which the model included the significant factors identified by univariate analysis as covariates.

Results/Outcome(s): 191 patients were reviewed, including 137 patients with phlegmon, microperforation, or pericolonic abscess; 13 (9.9%) of patients had surgery during the index admission and 124 (90.5%) had subsequent surgery. The indications for index admission surgery were worsening of clinical presentation (n=10), immunosuppression (n=1), uncertain diagnoses (n=1) and number of recurrent attacks (n=1);23.1% of these patients had peritonitis at the time of surgery. There were no differences in age, gender, BMI, co-morbidities, previous number of attacks or the 30-day complication rate between the groups. Univariate analysis demonstrated that an open approach (61.5% vs 8.9%, p<0.0001), stoma rates (76.9%vs 5.7%, p<0.0001) and LOS (median 12.0 vs 4.0 days <0.0001) were higher in the index admission surgery group. Multivariate analysis demonstrated that patients undergoing same admission surgery had significantly more open surgery and stoma construction (OR=5.9, 95%CI=(1.17-29.85), p<0.0318).

Conclusions/Discussion: The majority of patients with Hinchey I diverticulitis required surgery during the same admission due to worsening of clinical status without an identifiable risk factor. These patients had significantly more open surgery and stoma construction, and longer LOS compared to those who were able to wait for elective resection.

LONG TERM OUTCOMES OF SPORADIC COLON CANCER VERSUS ULCERATIVE COLITIS-ASSOCIATED COLON CANCER: A CASE MATCHED STUDY.

P1160

C. Tatar, A. Lightner, D. Liska, M. Kalady, S. Steele, E. Gorgun
Cleveland, OH

Purpose/Background: Ulcerative colitis (UC) significantly increases the risk for colon cancer (CC). While multiple studies have described the epidemiological factors, and pathogenesis of CC specific to UC, it remains controversial how the prognosis of UC in CC compares to sporadic CC. We aimed to compare the overall survival (OS) and disease free survival (DFS) of stage-matched sporadic CC patients and UC-CC patients.

Methods/Interventions: A retrospective case-control study of all adult patients who underwent a colon cancer resection between 2005 and 2015 at an IBD referral center was performed. The study group was comprised of patients with a clinical/endoscopic diagnosis of UC for at least six months; the control cohort was comprised of sporadic CC patients. Propensity-score matching was done to match UC-CC patients to sporadic-CC in a 1:2 fashion by age (+/- 5 years), sex, body mass index (BMI), American Society of Anesthesiology (ASA) score, and colon cancer stage. Data collected included patients demographics (Age, gender, BMI, ASA), cancer location, intraoperative variables (surgical approach, estimated blood loss, operation time), and postoperative outcomes (30-day postoperative complications, overall mortality, median time to mortality, and 3 and 5 year OS and DFS as estimated by Kaplan Meier curves).

Results/Outcome(s): A total of 135 CC patients were included: 90 sporadic CC matched with 45 UC-CC patients. Sporadic CC and UC-CC groups were comparable in terms of patient demographics, oncologic characteristics and operative factors except for surgical approach (laparoscopic surgery: 34.4% in sporadic vs 13.3% in UC; p=0.023) and mean examined lymph nodes (32.5 [range, 0.00; 170] in sporadic versus 52.0 [range, 0.00; 193] in UC, p=0.008). At a median follow up time of 3.5 years (range, 0.7-14.1 years), overall mortality was 40% (n=36) in sporadic CC patients and 31.1% (n=14) in UC-CC patients with a median OS of 8.9 and 10.8 years, respectively. The KM estimated 3- and 5-year OS rates in sporadic CC patients were 73.5 and 62.4% respectively and those in UC-CC patients were 78.8 and 69.4%, respectively. (Figure 1a) In sporadic CC patients 4(4.44%) had distant recurrence and 4(4.44%) had local recurrence while 1 (2.2%) UC-CC patient had distant recurrence.

All recurrence occurred within 3 years. The KM estimated 3- and 5- year DFS rates were 88.8% in sporadic CC patients, and they were 96.9% in UC-CC patients (Figure 1b).

Conclusions/Discussion: Stage matched UC-CC patients have similar oncologic outcomes with sporadic CC patients; overall survival, disease free survival, and local recurrence rates do not differ between the two groups.

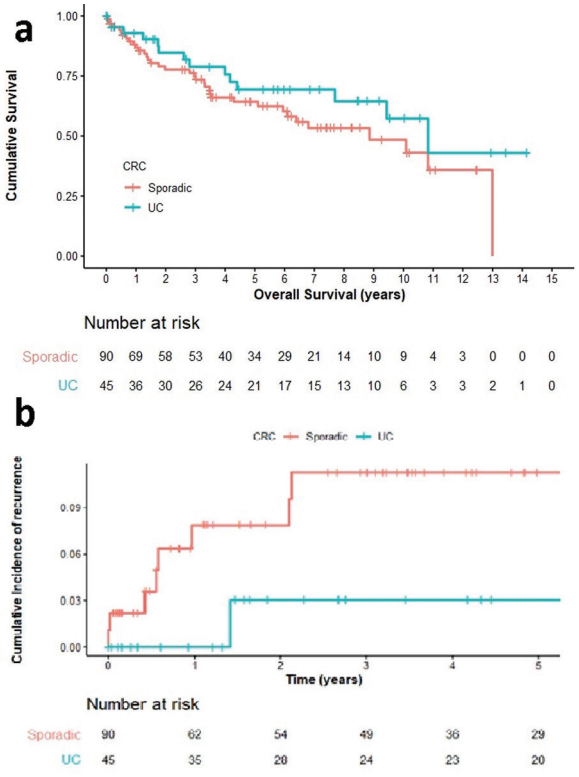


Figure 1a KM curve of OS among colon cancer patients1b KM curve of time to recurrence among colon cancer patients

THE WIDE RANGING SPECTRUM OF NUTRITIONAL STATUS IN PATIENTS WITH CROHN'S DISEASE AND ITS IMPACT ON POSTOPERATIVE OUTCOMES.

P1162

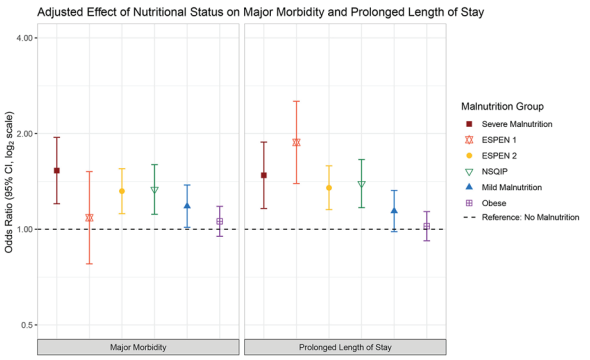
N. McKenna, K. Bews, K. Mathis, R. Cima, E. Habermann
Rochester, MN

Purpose/Background: Malnutrition is an established negative prognostic indicator for surgical outcomes in patients with medically refractory Crohn's disease (CD). However, multiple definitions of malnutrition exist, and it is unknown which is best for understanding patient risk. Further, while obesity increases perioperative morbidity in the general population, its effect in CD is less understood. Therefore, we sought to determine how to best consider malnutrition in CD and what role, if any, obesity plays in postoperative morbidity and hospital resource utilization.

Methods/Interventions: The ACS NSQIP database was queried for patients with Crohn's disease undergoing elective colorectal resection from 2005-2017. Nutritional status was evaluated using the European Society for Parenteral and Enteral Nutrition (ESPEN) definitions, NSQIP's variable for >10% weight loss over the prior 6 months, and the World Health Organization body mass index (BMI) classification system. Patients were then categorized into seven hierarchical nutrition categories: 1) "severe malnutrition" (BMI <18.5 kg/m^2 + weight loss), 2) "ESPEN 1" (BMI 18.5 to 20 (if age <70) or 22 (age ≥70) + weight loss), 3) "ESPEN 2" (BMI < 18.5), 4) "NSQIP" (BMI > 20 (if age <70) or 22 (age ≥70) + weight loss), 5) "mild malnutrition" (BMI 18.5 to 20 (age < 70) or 22 (age ≥70)), 6) "obese" (BMI ≥30), and 7) "no malnutrition." Multivariable logistic regression was performed to evaluate the adjusted effect of nutritional status on 30-day major morbidity and prolonged length of stay (PLOS), which was defined as a LOS >75th percentile for a specific operation.

Results/Outcome(s): A total of 16,984 operations for CD were identified. Slightly more patients met criteria for malnutrition (22% overall; 2% severe malnutrition, 1% ESPEN 1, 6% ESPEN 2, 5% NSQIP, 8% mild malnutrition) than for obesity (19%). Major morbidity (30% severe malnutrition, 25% ESPEN 1, 22% ESPEN 2, 26% NSQIP, 20% mild malnutrition, 19% obese, 17% no malnutrition) and PLOS (28% severe malnutrition, 33% ESPEN 1, 22% ESPEN 2, 27% NSQIP, 20% mild malnutrition, 20% obese, 18% no malnutrition) varied significantly amongst the groups, but both outcomes were more common in malnourished patients (both p<0.0001). After adjusting for patient comorbidities, multiple definitions of malnutrition were independently associated with major morbidity and PLOS, while obesity had no higher risk than normal nutritional status (FIGURE).

Conclusions/Discussion: Multiple definitions of malnutrition are associated with increased risk of major morbidity and hospital resource utilization in CD without clear superiority of one. Conversely, patients with obesity have no increased risk. Therefore, before surgery for CD the focus should be on enhancing the nutritional status of malnourished patients as opposed to weight loss in patients with obesity.



Adjusted Effect of Nutritional Status on Major Morbidity and Prolonged Length of Stay

THE EFFECT OF PERFORATIONS AND TISSUE REINFORCEMENT PLANE IN A LARGE ANIMAL MODEL OF HERNIA REPAIR WITH NEONATAL BOVINE DERMAL MATRIX.

P1163

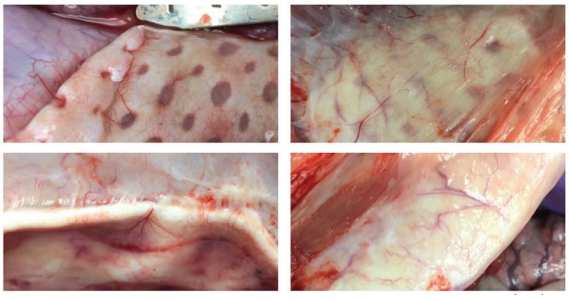
D. Rivadeneira[2], K. Cornwell[1]
[1]*Boston, MA;* [2]*Huntington, NY*

Purpose/Background: Recent clinical data have suggested an interplay between technique, reinforcing material type, and location of reinforcement in complex abdominal wall reconstruction. The goal of this study was to elucidate the effect of two clinically available configurations of a bioprosthetic mesh (perforated vs. non-perforated) in three common locations for hernia reinforcement (onlay, underlay, or retromuscular) in a porcine large animal model evaluating the short-term (30 day) outcomes including complications, mechanical strength, attachment strength to adjacent tissue, and revascularization/cell repopulation.

Methods/Interventions: The porcine hernia repair model involved two 10cm incisions made right and left of midline, lateral to the rectus muscle reinforced with either perforated (2&3mm) or non-perforated material in the onlay, retromuscular, or intraperitoneal tissue plane and secured with interrupted 2-0 suture. At one month, the repairs were imaged, mechanically tested, t-peel tested, and fixed for histology (H&E and Trichrome). Slides were captured with whole slide imaging with resulting digital images analyzed and counted for cell nuclei by automated image processing (9 regions, >81 images per condition, normalized to cells/mm^2).

Results/Outcome(s): Nine pigs were repaired with 18 implants. No hernias or clinical signs of seroma, hematoma, or infection were observed, but upon explantation, a resolving fluid collection was found in a solid onlay condition. Adhesions were observed in 3 locations limited to intraperitoneal underlay repair (2 with perforations, 1 non-perforated). While revascularized in all techniques, with perforations, blood vessels were observed penetrating through the holes (Figure 1). Increased quantities of cells were counted in perforated (3,608 cell/mm^2) compared to non-perforated configurations (2,138 cells/mm^2). The strength of the perforated was found to be lower in the intraperitoneal placement (15.7N) than in the other tissue planes (46.6N and 43.8N). The strength of non-perforated trended higher in the underlay but was not statistically different. Attachment strength was strongest in the onlay condition and was greater under retromuscular perforated conditions (15.7N) than non-perforated (10.7N).

Conclusions/Discussion: All configurations were successful in reinforcing hernias, but technical differences exist between repair techniques and materials configurations. Perforated configurations had increased cell repopulation and revascularization, with no resolving fluid accumulation, appearing best-suited for the onlay or retromuscular repair. Non-perforated configurations may be preferred for intra-abdominally underlay repairs due to increased retained strength. Overall, the interplay between physical characteristics of the reinforcement material and the technique may play a dynamic role in outcomes of hernia repair warranting continued investigation.



Gross imaging of revascularization in the retromuscular underlay (left) and intraperitoneal underlay (right) planes at 30 days in perforated (top) and non-perforated (bottom) conditions.

SURGICAL RECTUS SHEATH BLOCK WITH ROPIVACAINE REDUCES POSTOPERATIVE PAIN AND ANALGESIC REQUIREMENT AFTER SINGLE INCISION LAPAROSCOPIC APPENDECTOMY.

P1164

C. Lee, Y. Lee, I. Lee
Seoul, Korea (the Republic of)

Purpose/Background: Multimodal pain management for enhanced recovery after surgery (ERAS) pathway had been proven beneficial for patients and should now be considered as a standard of care in colorectal surgery. ERAS pathway typically use a multimodal analgesic regimen with nonopioid agents to decrease opioid-related adverse effects. Few data are available on surgical rectus sheath blocks in laparoscopic colorectal surgery and ERAS pathway. This study aimed to compare the perioperative outcomes between single incision laparoscopic appendectomy (SILA) with enhanced recovery after surgery (ERAS) including new surgical RS block and conventional SILA for simple and complicated appendicitis.

Methods/Interventions: Of the 522 consecutive laparoscopic appendectomy cases for acute appendicitis from January 2015 to October 2019, 84 consecutive patients undergoing single incision laparoscopic appendectomy(SILA) at Seoul St. Mary's Hospital. All patients were managed with standardized management. 31 patients received multimodal pain management that included surgical RS block intraoperatively (Figure 1), and 53 patients received conventional pain management with intravenous opioids.

Results/Outcome(s): Significant differences were observed between multimodal pain management group (E Group) and conventional pain management group (C group) in some aspects: the median visual analogue score (VAS) for post-operative 24 hour-pain (E:1.58 ±1.20 vs. C: 3.52±1.41, p < 0.001), the max VAS for post-operative 24 hour-pain (E:2.34±1.91 vs. C: 4.15±1.92, p < 0.001), time to resume liquid diet(hour) (E:1.1±0.28 vs. C: 16.3±8.40, p <0.001) and postoperative hospital stay(hour) (E:16.5±10.0 vs. C: 44.7±27.9, p < 0.001). There were no significant differences between groups about operative rime, complications.

Conclusions/Discussion: Surgical RS block combined with an opioid-sparing analgesia in the setting of the SILA and ERAS program is a safe and feasible method that may provide less postoperative pain and the shortening length of hospitalization.

Figure 1. The surgical rectus sheath block. The needle is placed under semi-blind within the rectus sheath space, which is located between the rectus abdominis muscle and the posterior layer of its sheath. After aspirating to exclude vascular injury, 10ml 0.75% Ropivacaine is infiltrated slowly. The rectus sheath space expands with little resistance as the local anaesthetic is introduced. The procedure is then repeated on the contralateral side of the abdomen.

ANASTOMOTIC LEAK SEVERITY IN PATIENTS UNDERGOING DIVERTING LOOP ILEOSTOMY AND PRIMARY ANASTOMOSIS FOR ACUTE COMPLICATED DIVERTICULITIS: IS IT PROTECTIVE?

P1165

H. Consuegra, R. Hoffman, K. Long, C. Buzas
Danville, PA

Purpose/Background: The standard of care, until recently, for acute complicated diverticulitis has been a Hartmann's procedure. There has been an increasing trend toward performing a primary anastomosis, with or without a diverting loop ileostomy (DLI). This study aimed to determine whether a diverting loop ileostomy following primary anastomosis for the treatment of acute complicated diverticulitis was protective against clinically significant anastomotic leak.

Methods/Interventions: Patients who experienced an anastomotic leak following either a laparoscopic or open sigmoid colectomy with primary anastomosis (PA), with or without a DLI, for the treatment of acute complicated diverticulitis, were identified in the NSQIP PUF from 2016-2017. Anastomotic leak was defined by NSQIP as either requiring no intervention, treated with an interventional means, or requiring a re-operation. Clinical characteristics and the management of leaks were compared for patients who did and did not have a DLI.

Results/Outcome(s): There were 497 patients identified with acute complicated diverticulitis who underwent sigmoid colectomy with PA, with or without a DLI; of those, 26 patients (5.2%) experienced a leak. Of those, 5 (19.2%) had a DLI while 21 (80.8%) did not. Patients were predominantly female (17; 65.4%), above the age of 60 years (15; 57.7%), and had an ASA Class >3 (19; 73.1%). Of the 5 patients who had a DLI, none required re-operation (0%) and 4 (80.0%) were treated by interventional means. Of the 21 without a DLI, 14 (66.7%) required a re-operation; 2 (9.5%) were managed with an intervention. No intervention was necessary for one patient (20.0%) in the DLI group and 4 patients (19.1%) without a DLI. Patients who had a DLI were significantly less likely to experience an anastomotic leak requiring re-operation (p<0.01).

Conclusions/Discussion: Anastomotic leak following primary anastomosis for acute complicated diverticulitis is uncommon. In those patients who do experience a leak, the presence of a diverting loop ileostomy is associated with a significantly decreased need for re-operation. The findings of this study validate the intended function of a DLI.

OUTCOMES OF LAPAROSCOPIC APPENDECTOMY IN ELDERLY PATIENTS.

P1166

K. Alyatama, T. Alsaeed, A. Alkandari, M. Alhunaidi, F. Alhammadi, N. Almutairi, S. Al Ben Ali, J. Alabbad
Kuwait, Kuwait

Purpose/Background: Acute appendicitis is a common surgical emergency. Elderly patients with appendicitis typically present later than young patients and the diagnosis is often obscure. There is higher risk of perforation noted in the elderly as well. Laparoscopic appendectomy improves outcomes with regards to less pain, faster recovery and fewer complications. There exist some concerns regarding cardiopulmonary complications from pneumoperitoneum in elderly patients. The aim of this study was to compare the outcomes of laparoscopic appendectomy in elderly patients versus open surgery.

Methods/Interventions: We retrospectively reviewed the medical records of elderly patients (age > 60 years) who were diagnosed with acute appendicitis from January 2000 to October 2019. The data collected were from 6 general hospitals in Kuwait. The diagnosis of acute appendicitis was made by physical examination, laboratory data, and abdominal computed tomography. The patients were grouped according the operative approach, laparoscopic or open. The surgical approach was decided by the attending surgeon. The analyzed variables were demographics including Charlson comorbidity index, clinical presentation, histopathology findings, length of hospital stay duration, 30-day complications and mortality.

Results/Outcome(s): A total of 111 patients were preoperatively diagnosed with acute appendicitis and were included for the analysis. There were 68 patients underwent laparoscopic appendectomy and 43 patients underwent open appendectomy. There were 9 cases of Lap converted to open. Table 1 summarized the patients' characteristics and clinical outcomes. There were no mortalities in both groups. Five patients were found to have incidental cancer on pathological examination with 1 mucinous cystadenoma in the open group and 1 mucinous cystadenocarcinoma, 1 adenocarcinoma and 2 neuroendocrine tumors in the laparoscopic group.

Conclusions/Discussion: Laparoscopic appendectomy in the elderly patients with comorbid conditions reduced length of hospital stay without increase in overall complications.

P1166 Table 1

	Laparoscopic N=68	Open N=43	p-value
Mean Age in years (SD)	67.3 (6.6)	68.2 (6.7)	0.372
Sex			
Male	34 (50.0%)	29 (67.4%)	0.080
Female	34 (50.0%)	14 (32.6%)	
Charlson comorbidity index			
0	36 (52.9%)	15 (34.9%)	0.152
1	13 (19.1%)	14 (32.6%)	
2	1 (1.5%)	1 (2.3%)	
≥3	18 (26.5%)	13 (30.2%)	
Mean Symptoms duration (SD)	2.3 (1.5) days	2.2 (1.3) days	0.934
Diffuse peritonitis	1 (1.5%)	3 (7.0%)	0.297
30-day complication	16 (23.5%)	10 (23.3%)	1.00
Median LOS in days (IQR)	4 (2.3-6)	6 (3-12)	0.004

ROUTINE LOWER ENDOSCOPY AND ISCHEMIC COLITIS AFTER ENDOVASCULAR REPAIR OF RUPTURED ABDOMINAL AORTIC ANEURYSM.

P1167

S. Slipak, A. Webber, A. Ata, J. Canete, D. Chismark, B. Valerian, E. Lee
Albany, NY

Purpose/Background: Ischemic colitis is a well-documented complication of abdominal aortic aneurysm surgery. Although the overall incidence has been decreasing in the endovascular aneurysm repair (EVAR) era, it remains higher among patients who suffered a ruptured aneurysm. Lower endoscopy (flexible sigmoidoscopy and colonoscopy) has been used to establish the diagnosis and guide management. Our institution is unique in the high-volume nature of vascular surgery and our implementation of routine lower endoscopy after ruptured abdominal aortic aneurysm repair, placing us in the unique position to provide an update on the incidence of colonic ischemia after ruptured aneurysm repair and the outcomes of these challenging patients.

Methods/Interventions: This is a retrospective; single institution review of individuals undergoing ruptured abdominal aortic aneurysm repair between 2008-2019. Clinico-pathologic variables were analyzed to determine the incidence of colonic ischemia and determine 30-day mortality.

Results/Outcome(s): One hundred ninety-seven patients were included in this study. One hundred twenty-nine patients underwent endovascular repair of a ruptured aortic aneurysm. Of these patients, eighty-two (63.57%) underwent endoscopic evaluation following endovascular repair. The mean age of the endovascular group was 73 and did not differ between the

group of patients who underwent endoscopic evaluation following endovascular repair. When comparing these two groups there was no significant difference in comorbidities including diabetes, hypertension, coronary artery disease, smoking, history of smoking, COPD, cholesterol, or renal disease. When comparing 30-day mortality between these groups, there was a significant decrease when the patient underwent endoscopic evaluation (4.88% vs 19.15%, p:0.010). The incidence of colonic ischemia in the group of patients evaluated endoscopically following aneurysm repair was 20.73% and ranged from mild to severe. Of the patients with colonic ischemia present only 3 went on to require surgery.

Conclusions/Discussion: Post-operative endoscopic evaluation of colonic ischemia is helpful in guiding management following endovascular repair of ruptured abdominal aortic aneurysms and is associated with a decreased 30-day mortality. The routine use of endoscopy to evaluate colonic ischemia following endovascular AAA repair should be given strong consideration.

Table 1. Endovascular Demographics

	No Scope (47)	Scope (82)	P value
Diabetes			0.235
No	43 (91.49)	69 (84.15)	
Yes	4 (8.51)	13 (15.85)	
HTN			0.724
No	18 (38.30)	34 (41.46)	
Yes	29 (61.70)	48 (58.54)	
CAD			0.507
No	30 (63.83)	57 (69.51)	
Yes	17 (36.17)	25 (30.49)	
Smoker			0.608
No	39 (82.98)	65 (79.27)	
Yes	8 (17.02)	17 (20.73)	
COPD			0.097
No	43 (91.49)	66 (80.49)	
Yes	4 (8.51)	16 (19.51)	
HLD			0.820
No	33 (70.21)	56 (68.29)	
Yes	14 (29.79)	26 (31.71)	
Renal			0.479
No	44 (93.62)	79 (96.34)	
Yes	3 (6.38)	3 (3.66)	
30 Day Mortality			**0.010**
No	38 (80.85)	78 (95.12)	
Yes	9 (19.15)	4 (4.88)	

Comparison of demographics and mortality rates between the group of patients who underwent post-operative endoscopic evaluation and those who didn't following endovascular AAA repair.

INCISIONAL HERNIAS ARE HIGHER IN MIDLINE INCISIONS COMPARED TO NON-MIDLINE INCISIONS: A SINGLE INSTITUTION REVIEW.

P1168

C. Farzaneh, W. Duong, K. Detweiler, M. Jafari, A. Pigazzi, S. Mills, J. Carmichael, M. Stamos, M. Brady
Orange, CA

Purpose/Background: Despite the introduction of minimally invasive surgery, incisional hernias remain a frequent complication after colectomies. Recent studies have described persistently high incisional hernia rates after minimally invasive right colectomies. Prior studies have discussed that moving the extraction incision off midline can help mitigate these risks. Intracorporeal anastomosis allows for the use of any extraction site. The objective of this study is to determine the rate of incisional hernias of different extraction sites for laparoscopic right colectomy/ileocolectomy at a single institution.

Methods/Interventions: Patients undergoing either a right colectomy or an ileocolectomy between July 2013 and July 2019 at a single academic institution were retrospectively identified. Demographics, operative approaches, extraction sites, and clinical outcomes of these patients were analyzed. The primary outcome was incisional hernias diagnosed by either physical examination or on review of computed tomography imaging in the postoperative period.

Results/Outcome(s): We identified a total of 225 patients undergoing minimally invasive right colectomy or ileocolectomy. Of these, 220 (97.8%) were laparoscopic and 5 (2.2%) were robotic. The majority of procedures were performed for either cancer resection (74.2%) or inflammatory bowel disease (23.6%). Specimens were extracted through the midline (24.4%), Pfannenstiel (64.0%), and off-midline incisions (11.6%). Patient demographics were similar among all groups. 77 extracorporeal anastomoses were performed; of these, 50.6% utilized a midline incision. 148 intracorporeal anastomoses were created; midline incisions were made in only 10.8% of these cases. The overall incisional hernia rate for the entire cohort was 1.33%. Patients with midline extractions had a higher rate of incisional hernias (5.45%) compared to those with Pfannenstiel (0%) or off-midline extractions (0%) ($p < 0.05$).

Conclusions/Discussion: Incisional hernias are significantly decreased when choosing an Pfannenstiel or off-midline incision for specimen extraction. Laparoscopic colectomy with intracorporeal anastomosis is a technique which allows for choice of any extraction site and can help minimize risk of postoperative incisional hernia. Consideration should be given to preferentially using Pfannenstiel or off-midline incisions for specimen extraction.

OPEN VS. MINIMALLY INVASIVE APPROACH FOR EMERGENT COLECTOMY IN PERFORATED DIVERTICULITIS.

P1169

C. Esparza Monzavi[2], S. Naffouje[1], G. Gantt[2], V. Chaudhry[2], J. Nordenstam[2], A. Mellgren[2]
[1]*Tampa, FL;* [2]*Chicago, IL*

Purpose/Background: Minimally invasive surgery (MIS) is associated with postoperative advantages in the elective setting. Traditionally, perforated diverticulitis has been managed with open approach, with a Hartmann's procedure (HP) or a colectomy with primary anastomosis (PA). We aimed to compare the postoperative outcomes of open vs. MIS approaches in the management of perforated diverticulitis.

Methods/Interventions: The NSQIP colectomy database from 2012-2017 was used. Patients with perforated diverticulitis who underwent emergent surgery were selected. Procedures were divided into HP and PA. After patient selection, a propensity score was calculated for the odds of undergoing open vs. MIS colectomies using a multivariable logistic regression model of the patients' perioperative and demographic characteristics: age, sex, race, body mass index (BMI), ASA class, comorbidities, laboratory results, smoking status, steroid use, and preoperative transfusion. Open vs. MIS groups were propensity-score matched 3:1 in the HP group and 1:1 in the PA group. MIS patients with conversion to open colectomy were classified based on the intention-to-treat.

Results/Outcome(s): Of 130,616 patients, 7,105 met inclusion criteria (4,486 HP and 2,619 PA). 1,989 open HP cases were matched to 663 MIS HP cases. 40.9% of MIS HP cases were converted to open. The MIS group underwent longer operations ($p<0.01$) and had lower rates of respiratory failure ($p=0.02$). There were no differences in overall complications, mortality, length of stay (LOS), or home discharge between the MIS and open groups. In the PA cohort, 1,027 cases were matched 1:1. 18.5% of MIS PA cases were converted to open. MIS approach was associated with longer operative times, but yielded a reduction in wound dehiscence ($p=0.02$), sepsis ($p=0.04$), bleeding ($p=0.04$), overall complications ($p<0.01$), LOS ($p<0.01$), and higher rates of home discharge ($p<0.01$). No difference was detected in anastomotic leak, mortality, reoperation, or readmission rates between the MIS and open groups.

Conclusions/Discussion: The known advantages of MIS, shorter LOS and decreased 30-day morbidity, are preserved when primary anastomosis is performed for perforated diverticulitis in the emergent setting. Emergent open and MIS HP for perforated diverticulitis have comparable outcomes, in part due to a 40% conversion rate. It is reasonable to consider an MIS approach for PA or HP in selected patients with perforated diverticulitis.

INTRAOPERATIVE URETERAL INJURY WITH PROPHYLACTIC STENT PLACEMENT IN COLORECTAL SURGERY.

P1170

S. Qureshy, P. Kolarsick, H. Liang, J. Nogueras, G. Dasilva, S. Wexner, E. Weiss
Weston, FL

Purpose/Background: Prophylactic placement of ureteral stent is recommended in complex colorectal surgical procedures but has not been proven to decrease ureteral injuries. Perioperative risk factors related to ureteral injury are well known. Despite stent placement, ureteral injury can occur.

Methods/Interventions: A retrospective case-control review of patients at our institution between January 2005 and January 2019 who underwentprophylactic ureteral stent placement prior to elective colorectal surgery. Patients with intraoperative ureteral injuries with and without stents were compared using a 1:4 ratio. The two groups were compared based on their perioperative characteristics that were obtained from the patient's medical records and evaluated by univariate and multivariate analyses.

Results/Outcome(s): A total of 2584 patients had prophylactic ureteral stent placed before elective colorectal surgery during this time period. Ureteral injuries were noted in 21 (0.8%) despite stent placement and compared to a non-injured control group (n=84). Seventeen (81%) injuries were identified intraoperatively. Univariate analyses showed that male gender ($p=0.0012$), smoking ($p=0.0017$), prior surgery ($p=0.0210$), prior colon surgery ($p=0.0191$), prior rectal surgery ($p<0.0001$), surgery length ($p=0.0020$), and estimated blood loss (EBL) ($p=0.0056$) were significantly associated with ureteral injury. Multivariate logistic regression model revealed that males (OR=6.0, $p=0.0109$), prior rectal surgery (OR=15.1, $p<0.0001$), and EBL =>150 ml (OR=5.1, $p=0.0451$) were the most important risk factors for injury. There was no significant difference in postoperative complications.

Conclusions/Discussion: Ureteral injuries occur despite prophylactic stent placement. However intraoperative identification occurs in 81% of patients. Increased risk of ureteral injury occurs in male patients, patients with prior rectal(pelvic) surgery and increased blood loss.

TO REVERSE OR NOT TO REVERSE A HARTMANN'S - PATIENTS' PERSPECTIVE.

P1171

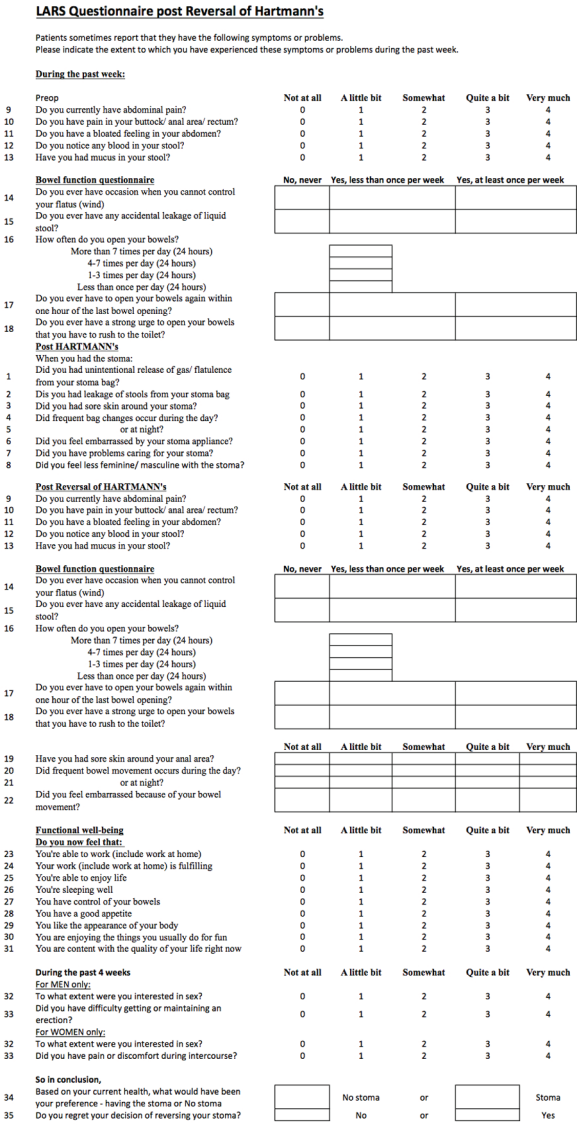
T. Suhardja, X. Chong, E. Yeap, W. Teoh, T. Nguyen, H. Chouhan
Dandenong, VIC, Australia

Purpose/Background: Hartmann's procedure is not an uncommon surgical procedure usually utilised in an emergency colonic obstruction or perforation, where either the risk of performing a primary anastomosis is high or the aim of performing an abbreviated operation in order to allow stabilisation of patient's haemodynamics. Less than half of these patients ever received restoration of their bowel continuity after a Hartmann's. Some early data also showed that reversal of Hartmann's itself is not without its risk and complications.

Methods/Interventions: We looked into patients who underwent a Hartmann's procedure, and how has the stoma and the procedure impacted on their life by asking them to complete a quality of life questionnaire. We then used the same patients as their own control and asked them to complete another quality of life questionnaire, after they have undertaken a restoration of continuity procedure. We provided them with our modified quality of life questionnaire, combined with the Emmertsen and Laurberg Bowel function questionnaire and Low Anterior Resection Syndrome score, in order to assess their subjective outcome after both Hartmann's and Reversal of Hartmann's. The results were then tabulated. See attached picture for a copy of our Monash Colorectal Surgery Quality of Life Questionnaire 35 (Monash CRS QLQ-35).

Results/Outcome(s): After the Hartmann's procedure, more than half of patients initially felt embarrassed with having a stoma (52%). 80% of patients did not have any problem having the stoma, especially after adequate education by stoma nurses, they were quite happy to care for the stoma themselves. After reversal of Hartmann's procedure, 80% have an initial problem with controlling their flatus, but the majority (82%) did not have any leakage or seepage of faeculent fluid. 73% suffer from frequency going to the toilet, mostly 1 to 3 times per day, with more increased bowel frequency occurring during the day than at night. About 16% of patients have urgency and incomplete emptying. In terms of their functional well being, most patients described somewhat being satisfied with going back to work, their sleep, and the appearance of their body. Although we found, about 30% of male patients suffered a little bit of difficulting maintaining an erection. Female patients suffered minimal sexual dysfunction post reversal. 2% of patients regretted ever having the stoma reversed, because of their poor bowel function.

Conclusions/Discussion: Historically, a majority of patients after Hartmann's procedure, never eventually have it reversed. Our study showed that the majority of patients after reversal of Hartmann's have some significant impact on their bowel function. Although this did not necessarily translate to a poorer quality of life.



LARS Questionnaire post Reversal of Hartmann's

Patients sometimes report that they have the following symptoms or problems.
Please indicate the extent to which you have experienced these symptoms or problems during the past week.

During the past week:

	Preop	Not at all	A little bit	Somewhat	Quite a bit	Very much
9	Do you currently have abdominal pain?	0	1	2	3	4
10	Do you have pain in your buttock/ anal area/ rectum?	0	1	2	3	4
11	Do you have a bloated feeling in your abdomen?	0	1	2	3	4
12	Do you notice any blood in your stool?	0	1	2	3	4
13	Have you had mucus in your stool?	0	1	2	3	4

	Bowel function questionnaire	**No, never**	**Yes, less than once per week**	**Yes, at least once per week**
14	Do you ever have occasion when you cannot control your flatus (wind)			
15	Do you ever have any accidental leakage of liquid stool?			
16	How often do you open your bowels?			
	More than 7 times per day (24 hours)			
	4-7 times per day (24 hours)			
	1-3 times per day (24 hours)			
	Less than once per day (24 hours)			
17	Do you ever have to open your bowels again within one hour of the last bowel opening?			
18	Do you ever have a strong urge to open your bowels that you have to rush to the toilet?			

	Post HARTMANN's When you had the stoma:					
1	Did you had unintentional release of gas/ flatulence from your stoma bag?	0	1	2	3	4
2	Do you had leakage of stools from your stoma bag	0	1	2	3	4
3	Did you had sore skin around your stoma?	0	1	2	3	4
4	Did frequent bag changes occur during the day?	0	1	2	3	4
5	or at night?	0	1	2	3	4
6	Did you feel embarrassed by your stoma appliance?	0	1	2	3	4
7	Did you have problems caring for your stoma?	0	1	2	3	4
8	Did you feel less feminine/ masculine with the stoma?	0	1	2	3	4

	Post Reversal of HARTMANN's	**Not at all**	**A little bit**	**Somewhat**	**Quite a bit**	**Very much**
9	Do you currently have abdominal pain?	0	1	2	3	4
10	Do you have pain in your buttock/ anal area/ rectum?	0	1	2	3	4
11	Do you have a bloated feeling in your abdomen?	0	1	2	3	4
12	Do you notice any blood in your stool?	0	1	2	3	4
13	Have you had mucus in your stool?	0	1	2	3	4

	Bowel function questionnaire	**No, never**	**Yes, less than once per week**	**Yes, at least once per week**
14	Do you ever have occasion when you cannot control your flatus (wind)			
15	Do you ever have any accidental leakage of liquid stool?			
16	How often do you open your bowels?			
	More than 7 times per day (24 hours)			
	4-7 times per day (24 hours)			
	1-3 times per day (24 hours)			
	Less than once per day (24 hours)			
17	Do you ever have to open your bowels again within one hour of the last bowel opening?			
18	Do you ever have a strong urge to open your bowels that you have to rush to the toilet?			

		Not at all	**A little bit**	**Somewhat**	**Quite a bit**	**Very much**
19	Have you had sore skin around your anal area?					
20	Did frequent bowel movement occurs during the day?					
21	or at night?					
22	Did you feel embarrassed because of your bowel movement?					

	Functional well-being **Do you now feel that:**	**Not at all**	**A little bit**	**Somewhat**	**Quite a bit**	**Very much**
23	You're able to work (include work at home)	0	1	2	3	4
24	Your work (include work at home) is fulfilling	0	1	2	3	4
25	You're able to enjoy life	0	1	2	3	4
26	You're sleeping well	0	1	2	3	4
27	You have control of your bowels	0	1	2	3	4
28	You have a good appetite	0	1	2	3	4
29	You like the appearance of your body	0	1	2	3	4
30	You are enjoying the things you usually do for fun	0	1	2	3	4
31	You are content with the quality of your life right now	0	1	2	3	4

	During the past 4 weeks	**Not at all**	**A little bit**	**Somewhat**	**Quite a bit**	**Very much**
	For MEN only:					
32	To what extent were you interested in sex?	0	1	2	3	4
33	Did you have difficulty getting or maintaining an erection?	0	1	2	3	4
	For WOMEN only:					
32	To what extent were you interested in sex?	0	1	2	3	4
33	Did you have pain or discomfort during intercourse?	0	1	2	3	4

	So in conclusion,					
34	Based on your current health, what would have been your preference - having the stoma or No stoma		No stoma	or		Stoma
35	Do you regret your decision of reversing your stoma?		No	or		Yes

Modified Colorectal Surgery Quality of Life Questionnaire

CT COLONOGRAPHY: BENEFITS WHEN WELL INDICATED.

P1172

L. Oliveira, H. Guenka, I. Gottlieb
Rio de Janeiro, Brazil

Purpose/Background: The aim of our study was to demonstrate the benefits of CT colonography in patients with incomplete colonoscopy.

Methods/Interventions: All patients that underwent CT colonography in our Institution due to incomplete colonoscopy entered our study. Inclusion criteria was therefore patients that underwent incomplete colonoscopy with adequate bowel preparation. Exclusion criteria was patients that were referred initially for CT colonography. Parameters evaluated were demographics, causes for incomplete colonoscopy, imaging findings and surgical decision based on the findings.

Results/Outcome(s): From September 2017 to September 2019 8 patients that underwent incomplete colonoscopy due to a variety of reasons entered our study. All patients were female with a mean age of 67 (46-82) years old. The indications for colonoscopy was positive fecal occult blood test, altered bowel habits and rectal bleeding. All patients underwent oral bowel preparation with sodium picossulfate. Reasons for incomplete colonoscopy were: redundant sigmoid in one patient, angulated splenic and hepatic angle in 4 patients, sigmoid stenosis in one patient and severe diverticular disease in 2 patients. CT colonography confirmed pronounced stenosis of the sigmoid, obstructed diverticular disease in 2 patients and redundant colon with angulated splenic and hepatic flexure in the others. All patients were imediately sent to CT colonography and perfuration or bowel obstruction due to cancer was excluded in all cases. All patients were discharged after CT colonography and elective bowel resection was indicated for 3 patients, 2 with severe sigmoid diverticular disease and one due to sigmoid stenosis.

Conclusions/Discussion: CT colonography is a new imaging modality that can be complementary to colonoscopy, specially when the patiet is already prepared. The advantages of having this exam in a general hospital is to rule out obstructive cancer or benign stenosis when colonoscopy is incomplete. The new tridimensional images allows a spacial reconstruction of the colon that can help the colorectal surgeon to make better surgical decisions.

MANAGEMENT OF THE HIGH OUTPUT ILEOSTOMY: A SYSTEMATIC REVIEW.

P1173

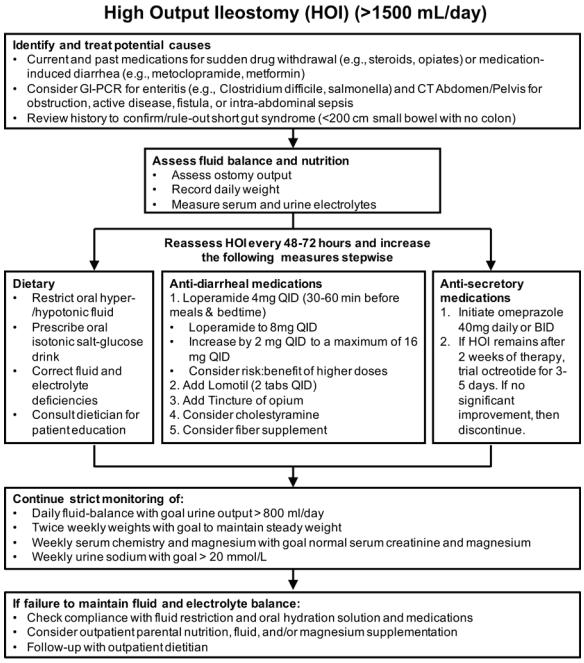
C. Harbaugh, M. Rice, S. Regenbogen, S. Hendren
Ann Arbor, MI

Purpose/Background: Excessive fluid loss from a high output ileostomy (HOI) can lead to dehydration and acute kidney injury, which are the leading causes of readmission after ileostomy creation. While this is an important clinical problem, there is limited evidence to guide the treatment of HOI. The objective of this study was to systematically review the current literature on HOI, to create evidence-based guidance for management of HOI.

Methods/Interventions: PubMed and Cochrane Review Library were searched using keyword and MeSH search terms (February 20, 2019). The study inclusion criteria were relevance to (1) incidence, (2) complications, (3) initial evaluation/differential diagnosis, (4) dietary management, and (5) drug therapy. Titles and abstracts were screened, full-text articles were obtained, and the study type, cohort, and main findings were extracted from each manuscript.

Results/Outcome(s): Ninety-two articles met eligibility criteria. HOI was reported in 16-35% of patients after ileostomy creation. The most common complications of HOI were dehydration and acute kidney injury, with risk of progression to chronic kidney disease. Initial evaluation of the patient with HOI should seek to (1) identify etiology and (2) assess baseline fluid, electrolyte, and nutritional status. Potentially reversible causes included partial obstruction, intra-abdominal infection, active small bowel inflammation, medication withdrawal, and medications with pro-kinetic side effects. Recommended dietary interventions included restriction of hypotonic fluids and consumption of an oral sodium-glucose hydration solution. Pharmacologic therapies included anti-motility medications (loperamide, high-dose loperamide, atropine-diphenoxylate, tincture of opium) and anti-secretory medications (proton pump inhibitors, octreotide). A flow chart to guide management of HOI was created based on the evidence (Figure).

Conclusions/Discussion: Interventions for HOI include dietary modification, oral rehydration solutions, and pharmacologic antimotility, and antisecretory agents. This review is limited by the lack of randomized controlled or high-quality data and the variation in definition of outcomes. Comparative effectiveness analyses are needed for pharmacologic and dietary therapies given their potential side effects and impact on quality of life.



NOVEL ENDOSCOPIC MANAGEMENT OF COLOVESICULAR AND COLOVAGINAL FISTULAE WITH OVER-THE-SCOPE CLIPS.

P1174

C. DeLong, J. Scow, D. Morrell, J. Knoedler, V. Alli, E. Pauli
Harrisburg, PA

Purpose/Background: Conventional surgical management of colovesicular and colovaginal fistulae can be morbid. Many patients have contraindications to operative fistula takedown. Endoscopic management represents a novel, non-invasive alternative that has the potential to definitively treat this condition. This case series evaluates our experience with the management of colovesicular and colovaginal fistulae with endoscopic over-the-scope clip (OTSC) application.

Methods/Interventions: A retrospective medical record review of all patients who underwent attempted endoscopic OTSC management of colovesicular and colovaginal fistulae between 2013 and 2019 was performed. All endoscopic interventions were performed by one of two board-certified surgeons with training in advanced surgical endoscopy. When necessary, cystoscopic wire access of the fistula was performed by a minimally invasive urologist. Preoperative risk factors, operative details, and postoperative outcomes were collected and analyzed.

Results/Outcome(s): Nine patients (56% male, mean age 74.5 ± 8 years, mean ASA score 2.8 ± 0.7) were identified. Fistula types were: colovesical (5), rectovesical (2), colovaginal (1), and rectovaginal (1). The fistula cause was diverticular disease in 7 (78%) cases and surgical complication of pelvic surgery in 2 (22%). Contraindications to conventional surgical management included severe medical comorbidities (56%), surgical complexity (22%), and patient age/preference (22%). The mean defect age was 161 ± 102 days, the mean defect diameter was 4.74 mm (range 2-10), and the mean fistula length was 1.5 cm (range 0.2-2.5). Three (33%) patients had proximal fecal diversion at the time of endoscopic therapy. In 8 (89%) of cases, fistula identification and cannulation was performed through the nonenteric lumen of the fistula (bladder/vagina) given difficulty identifying the enteric side of the fistula in patients with diverticular disease. Initial management with OTSC was technically successful in 7 (78%) patients; OTSCs were not placed in two patients due to distal strictures complicating clip placement (100%) and inability to pass a wire through the fistula (50%). Of the seven patients who underwent OTSC placement, long-term success (mean follow-up 209 ± 222 days) was achieved after initial intervention in 4 (57%) patients. One patient underwent serial OTSC procedures and achieved long-term success after four interventions; two patients have not undergone repeat procedure after initial failure.

Conclusions/Discussion: Endoscopic management of colovesicular and colovaginal fistulae with OTSC offers a promising therapeutic option for patients with contraindications to conventional surgical management. Immediate technical success and long-term success rates are similar to other GI tract applications of OTSCs. Further study will be required to understand factors associated with success and failure of the technique.

COLECTOMY FOR CMV COLITIS: INITIALLY NON-RESTORATIVE BUT USUALLY RECONNECTED.

P1175

B. Hebert, N. McKenna, K. Mathis
Rochester, MN

Purpose/Background: Cytomegalovirus (CMV) colitis is a rare infectious disease that typically only manifests itself in patients who are immunosuppressed. Though typically treated medically, on rare occasions it can require a segmental or subtotal colectomy for refractory disease. Limited data exist on the outcomes of patients who require surgery for CMV colitis.

Methods/Interventions: A retrospective chart review was performed of all patients who underwent colectomy for CMV colitis diagnosed either pre-operatively or on permanent pathology post-operatively at a tertiary care institution between January 1, 2001 and December 31, 2017. Data was collected on patients characteristics, with a focus on immunosuppression regimens, operation performed, 30-day postoperative outcomes, and whether patients eventually had restoration of intestinal continuity.

Results/Outcome(s): A total of 22 patients were identified who met inclusion criteria. The majority of the patients were male (n=13; 59%) with a mean age of 45 years (SD+/-21). The majority of the patients had CMV colitis in the setting of known inflammatory bowel disease (n=16 with ulcerative colitis, n=1 with Crohn's disease). Four of the patients with CMV colitis in the setting of chronic ulcerative colitis also had superimposed Clostridium difficile colitis. All patients except one were immunosuppressed as a result of either medical management of inflammatory bowel disease, medications for a history of solid organ transplant, or chemotherapy for primarily hematologic malignancies. Thirteen of the 22 patients underwent medical treatment of CMV prior to colectomy. The remaining nine patients were found to have CMV colitis on pathology after surgery. Operations performed included subtotal colectomy with end ileostomy (n=15), Hartmann's procedure (n=6), and right hemicolectomy with primary anastomosis (n=1). The average length of stay prior to surgical intervention was six days (range, 1-24) with the average post-operative stay being thirteen days (range, 2-40). Eight patients experienced 30-day morbidity including anastomotic leak (n=1), mucus fistula dehiscence (n=1), and death (n=1). The one death was a result of poor quality of life prior to surgery and decision was made for withdrawl of care. Sixteen of the 22 patients werre able to undergo reestablishment of intestinal continuity at a median of six months after the operation.

Conclusions/Discussion: Colectomy for CMV colitis is primarily non-restorative initially, but patients have a high likelihood of future re-establishment of intestinal continuity. Patients should be cunseled on this and surgeons should continue to prefer non-restorative operations in the setting of an acute inflammatory process.

VISCERAL FAT IS MORE ACCURATE THAN BODY MASS INDEX ON EVALUATION OF THE POSSIBILITY PERFORMING NOSES FOR RECTAL CANCER.

P1177

T. Du, Z. Zhou, F. Ji, B. Huang, C. Fu
Shanghai, China

Purpose/Background: Body mass index (BMI) is widely used to reflect the degree of obesity, and it is also one of the main indexes to predict the feasibility of Natural Orifice Specimen Extraction Surgery (NOSES) for rectal cancer. The aim is to study whether visceral fat can be used as a more sensitive index to predict the feasibility of NOSES than BMI.

Methods/Interventions: The clinical data of 101 rectal cancer patients who were regarded as suitable for NOSES and operated in affiliated Shanghai east hospital of Tongji university from 2018 March to 2019 March were retrospectively analyzed, including 74 cases of NOSES (NOSES group) and 27 cases of small incision laparoscopic anterior resection (small incision group). The visceral fat area (VFA) of abdominal CT images was measured by Image J software, and the differences of VFA, BMI, body surface area (BSA), tumor maximum diameter, abdominal wall fat thickness, anterior posterior diameter of pelvis, left and right diameter of pelvis between the two groups were compared. The diagnostic effect of VFA in predicting the feasibility of NOSES was analyzed by ROC curve.

Results/Outcome(s): There was no difference in BMI, BSA, tumor maximum diameter, abdominal fat thickness, anterior and posterior diameter of pelvis, left and right diameter of pelvis between the two groups ($P > 0.05$). The area of VFA in the noses group was smaller than that in the small incision group (84.9 ± 42.6 vs. 113.4 ± 51.5, $P < 0.01$), and the ratio of VFA / BSA in the noses group was smaller than that in the small incision group ($50.3 + 24.0$ vs. $64.5 + 26.8$, $P < 0.01$). The AUC under ROC curve predicted by VFA is 0.78.

Conclusions/Discussion: Compared with BMI, visceral fat area can be used as a more accurate index to predict the feasibility of noses.

RNF43 P.R117FS MUTATION IN COLORECTAL CARCINOMA AND ITS CLINICOPATHOLOGICAL CO-RELATION.

P1178

A. Kumar, A. Sharma, N. Rastogi
Lucknow, India

Purpose/Background: Ring finger protein 43 (*RNF43*), a part of Wnt signaling pathway, has been recently discovered for its involvement in Colorectal cancer (CRC). It's over expression in colon cancer and tumor growth, was first identified using cDNA microarray profiling. Role of *RNF43* based immune therapies has also been studied in many cancers as its clinical potential. However, the precise role of RNF43 mutations in cancer cells remains to be clarified. The present study has been carried out with objective to find out the mutation of *RNF43 p.R117fs* in CRC in North Indian patients. **Material and Methods:** This is prospective study on 100 cases hsitologically proven CRC. DNA was extracted from tumour tissue of CRC patients having >85% of tumour cells. Sanger sequencing was performed to find out the presence of *RNF3 p.R117fs* mutation. The data was recorded as wild, heterozygous and variant. Results were co-related with clinical information of the patient. Statistical analysis was performed on SPSS20.0.

Methods/Interventions: This is prospective study on 100 cases of hsitologically proven CRC. DNA was extracted from tumour tissue of CRC patients having >85% of tumour cells. Sanger sequencing was performed to find out the presence of *RNF3 p.R117fs* mutation.

The data was recorded as wild, heterozygous and variant. Results were co-related with clinical information of the patient. Statistical analysis was performed on SPSS20.0.

Results/Outcome(s): There were 72 (72%) males and 28 (28%) females with age range from 15-81yrs (Median age 50 year). The site of tumour location data was available for 95 patients. The patients with tumour located in colon were 59% whereas 36% of patients have rectal carcinoma. 8 patients were excluded from the final analysis because of quality check failure. The frequency of *RNF3 p.R117fs* mutation was as wild, heterozygous and variant in 88 (95.6%), 2 (2.1%) and 2 (2.1%) of CRC patients respectively. There was no significant co-relation found between the studied mutation with the clinicopathological parameter.

Conclusions/Discussion: In conclusion, this study confirms the presence of *RNF3 p.R117fs* mutation in north Indian CRC patients. However the correlation of *RNF3 p.R117fs* mutation with Clinicopathological parameter was unclear. A larger study with more number of patients is further suggested to validate our findings.

RECTAL CANCER TUMOR HEIGHT MEASUREMENT: CONCORDANCE BETWEEN CLINICAL EXAM AND MRI.

P1179

S. Navarro[1], S. Chen[3], L. Farkas[2]
[1]*Sacramento, CA;* [2]*Dallas, TX;* [3]*Davis, CA*

Purpose/Background: Rectal cancer is categorized into low, middle, and high categories based on tumor height measurements determined clinically and by MRI. Tumor height guides the initial treatment and determines eligibility for clinical trials.

Methods/Interventions: DESIGN: This was an IRB approved retrospective analysis of MRI and clinical measurements of tumor height, reviewed with gender and age. SETTING: This study was conducted at a single tertiary university center which is accredited by the Commission on Cancer for National Accreditation Program for Rectal Cancer (NAPRC). PATIENTS: 95 patients who were seen by a member of the NAPRC team between 2016-2019 and who had an MRI and clinical evaluation were included. MAIN OUTCOME MEASUREMENTS: The absolute mean difference of the measurement of tumor height between the MRI and clinical exam was calculated. A secondary outcome was to assess whether position within the rectum (high, middle, or low), age, or gender would impact the difference. We further went on to evaluate how the two measurements would change eligibility for four prominent rectal cancer trials. LIMITATIONS: This was conducted at a single center with retrospective methodology.

Results/Outcome(s): Tumor height measurement by MRI and clinical exam have overall good correlation with R=0.88 and p<0.001. The overall mean difference of measurement of tumor height between the two modalities was 1.59 cm. There was a significant association of tumor height and the absolute difference in measurements, with higher tumors having larger absolute difference between clinical and MRI measurements (p=0.04). On multivariate analysis, age and gender were not significantly associated with the absolute difference between measurements. The discordance in measurements lead to a change in eligibility for clinical trials for 31% of our patients. Clinical trial eligibility was not significantly associated with tumor height category, gender, or patient age.

Conclusions/Discussion: The difference in measurement of tumor height by MRI or clinical exam was not associated with age and gender, but was significantly associated with tumor height category. Higher tumor categories were significantly associated with a larger absolute difference between modalities. MRI and clinical measurements of tumor height showed a strong correlation. However, nearly a third of our patients had a change in clinical trial eligibility depending on if the clinical or MRI measurement was used. Tumor height is a critical measurement in assessing patient treatment options. Further, given the high percentage of patients with a change in eligibility based on two methods of measurement, we suggest that the clinical trials need to be consistent in how they write their inclusion criteria in order to ensure the proper patients are included.

Table 3: Association between factors and absolute difference between two measurements, using linear regressions

Variable	Univariate analysis			Multivariate analysis		
	Estimate	95% CI	P-value	Estimate	95% CI	P-value
Location categorization			0.006			0.007
Low	0	-		0	-	
Middle	0.20	-0.55, 0.95		0.09	-0.67, 0.84	
High	1.46	0.55, 2.37		1.41	0.49, 2.33	
Sex			0.126			0.089
Male	0	-		0	-	
Female	0.54	-0.16, 1.24		0.58	-0.09, 1.26	
Age (continuous, in year)	-0.02	-0.04, 0.01	0.210	-0.01	-0.03, 0.02	0.499

A RARE CASE OF COLORECTAL CANCER DIAGNOSED IN PREGNANCY.

P1180

A. Arachchi, E. Yeap
Melbourne, VIC, Australia

Purpose/Background: Cancer is the leading medical cause of death in women of reproductive age. Cancer in pregnancy often raises a diagnostic dilemma given the crossover of symptoms which may be deemed a normal part of pregnancy. The incidence of cancer in pregnant women is reported in the literature as 0.07-0.1%. Colorectal cancer is third most common after breast and cervical cancer at an estimated risk of 0.002%.

Methods/Interventions: We report the case of a pregnant woman who was referred to our department from her general practitioner with increased frequency of bowel motions and per rectal (PR) bleeding for six months. A similar episode had occurred during her second pregnancy but was resolved by haemorrhoid banding. An initial flexible sigmoidoscopy concluded the PR bleeding was due to haemorrhoids. However, due to worsening symptoms of tenesmusff and increased frequency of stools, the patient underwent a second flexible sigmoidoscopy at 24 weeks gestation which demonstrated a colorectal malignancy. Staging was performed with MRI. The patient was offered neoadjuvant chemotherapy to extend the gestational period, however the patient opted for delivery prior to treatment.

Results/Outcome(s): Fourteen days after a Caesarean section at 30 weeks of gestation, the patient underwent a laparoscopic low anterior resection. Histology confirmed the diagnosis of adenocarcinoma of the sigmoid colon.

Conclusions/Discussion: The diagnosis of colorectal cancer in pregnancy can be difficult as the presenting complaints may be attributed to pregnancy. Decisions regarding management are typically managed by a multidisciplinary team but patient choice also plays a significant role. Surgical resection may be possible before 20 weeks gestation without compromising the pregnancy if no adjuvant treatment is required. Later in pregnancy, surgery is associated with preterm delivery. However, this must be weighed up against the risk of progression of disease. Patients with colonic cancers are usually able to proceed to vaginal delivery. Caesarean section is recommended in patients with tumours of the anterior rectum which may be compromised during vaginal delivery. Surgical resection should be performed at least two weeks after delivery to allow the uterus to decrease in size. Up to 23% of pregnant patients with colorectal cancer may have ovarian metastases so prophylactic resection needs to be considered. Prognosis is poor, similar to nonpregnant women of the same age group. PR bleeding in pregnancy is often attributed to haemorrhoids. However, other symptoms such as diarrhoea or tenesmus should raise concerns for a different diagnosis. Although this case report represents a rare situation, the incidence of colorectal cancer in pregnancy is likely to increase as women choose to become pregnant later in life.

RECURRENCE-FREE SURVIVAL AND RISK-STRATIFICATION OF PATIENTS WITH COLON OR RECTAL CANCER.

P1181

S. Qaderi[1], B. Galjart[2], K. Verhoef[2], G. Slooter[3], M. Koopman[4], R. Verhoeven[4], H. de Wilt[1], F. van Erning[4]
[1]Nijmegen, Netherlands; [2]Rotterdam, Netherlands; [3]Eindhoven, Netherlands; [4]Utrecht, Netherlands

Purpose/Background: Disease recurrence after treatment of patients with colorectal cancer (CRC) threatens treatment success and patient survival. The aim of this population-based study was to determine the incidence and location of both loco-regional and distant recurrences. Risk factors for developing recurrences were identified.

Methods/Interventions: Patients with primary stage I-III CRC who were diagnosed and registered in the nationwide Netherlands Cancer Registry between 1 January 2015 and 30 June 2015 and who were treated with curative intent were selected and the presence of disease recurrence was retrieved from medical files by specifically trained data managers in 2019. Crude 3-year RFS rates according to patient, tumor and treatment characteristics were calculated using the Kaplan-Meier method. Multivariable Cox regression analyses were used to evaluate the independent impact of the different patient, tumor and treatment characteristics on the risk of recurrence or death.

Results/Outcome(s): A total of 3.763 and 1.748 patients with colon (68%) or rectal (32%) cancer were included with pathological stage I (32%), stage II (30%) or stage III disease (38%). After a median follow-up of 42 months (IQR 21-47 months), a total of 548 (15%) and 363 (21%) recurrences occurred among patients with colon or rectal cancer. Respectively 33, 75 and 91% of the colon cancer recurrences were diagnosed within 1, 2 and 3 years. For the rectal cancer recurrences, these percentages were 33, 71 and 89% respectively. Median time to recurrence was 16 months (IQR 10-24 months) for colon cancer, and 17 months (IQR 10-26 months) for rectal cancer. Local recurrences were found in 3 and 7% of the patients with colon and rectal cancer, respectively. For local and/or regional metastases this was respectively 2 and 5%; for distant metastases 13 and 16%. In patients with colon cancer, liver metastases were most common (55%), while in patients with rectal cancer lung metastases occurred most often (50%). The 3-year crude RFS of patients with stage I-III colon cancer was 95, 82 and 71%, respectively. For patients with rectal cancer this was 91, 78 and 69%. [Figure] In patients with colon cancer, older age, T3-4 tumor size, positive N stage (N1-2) and poor tumor differentiation were associated with increased risk for recurrence. In patients with rectal cancer, T2-4 tumor size, positive N stage and residual tumor were associated with increased risk of recurrence. Receipt of adjuvant chemotherapy was associated with lower risk of recurrence in both colon and rectal cancer.

Conclusions/Discussion: The present study presents recent, accurate nationwide recurrence data of patients with colon or rectal cancer with higher cure rates than previously published in the literature. These data are important for risk-stratifying of patients requiring additional treatment or longer follow-up. Moreover, the data can be used for future trial development and tailored follow-up protocols.

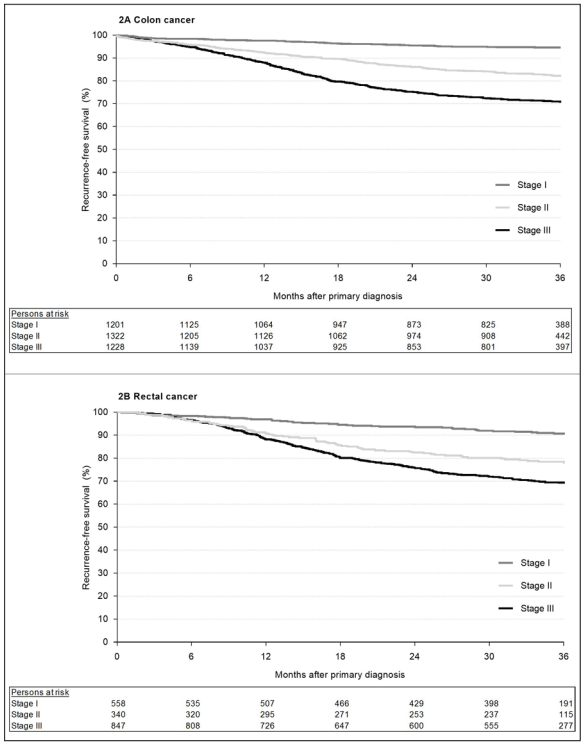


Figure: Three-year recurrence-free survival by primary tumor stage among colon (A) and rectal (B) cancer patients

Log-Rank test A: p<0.0001

Log-Rank test B: p<0.0001

ASSOCIATION BETWEEN PREALBUMIN AND HOSPITALIZATION TIME AFTER NOSES FOR RECTAL CANCER.

P1182

X. Li, C. Fu
Shanghai, China

Purpose/Background: To investigate the association between serum prealbumin levels and hospitalization time after NOSES for rectal cancer.

Methods/Interventions: From January 1, 2016 to June 30, 2017, 73 patients with rectal cancer underwent 3D laparoscopic Natural Orifice Specimen Extraction Surgery (NOSES) were enrolled in this study. Patients were divided into 2 groups according to the level of prealbumin: the low prealbumin group (prealbumin < 220 mg/L), and the normal prealbumin group (prealbumin ≥ 220 mg/L). The difference of the general information and clinicopathological characteristics in patients with different prealbumin levels were analyzed. The Pearson's correlation analysis, Kaplan-Meier survival analysis and Cox proportional risk regression model were adopted to further explore the correlation between prealbumin and hospitalization time after NOSES for rectal cancer.

Results/Outcome(s): There were significant differences in height, weight, erythrocyte, hemoglobin, total protein, albumin, first anal exhaust time after operation, first eating time after operation, hospitalization time after operation and hospitalization expenses between the low prealbumin group and normal prealbumin group ($P < 0.05$). Height, weight, BMI, male, white blood cells, red blood cells, hemoglobin, total protein, albumin, prothrombin time, carbohydrate antigen 19-9, nerve invasion, first anal exhaust time after operation, first eating time after operation, hospitalization time after operation, hospitalization expenses were correlated with prealbumin level ($P < 0.05$). Particularly, the level of prealbumin was negatively correlated with hospitalization time after operation ($r=-0.265$, $P=0.023$). Preoperative low prealbumin was an independent risk factor for delayed discharge after NOSES for rectal cancer (HR=1.861, $P=0.013$).

Conclusions/Discussion: Preoperative low prealbumin is an independent risk factor for delayed discharge after NOSES for rectal cancer. Monitoring preoperative albumin level will help to predict the short-term prognosis of rectal cancer after NOSES.

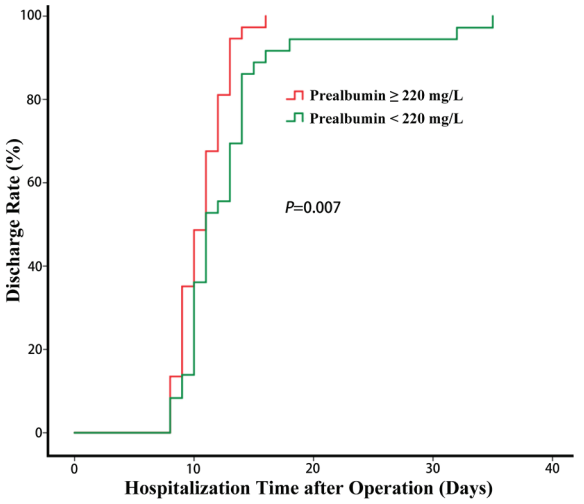


Fig.1 Comparison of hospitalization time after operation in the low (<220 mg/L) and normal(≥220 mg/L) prealbumin groups

A THICK RECTUS ABDOMINIS MUSCLE TRIGGERS OUTLET OBSTRUCTION AND HIGH-OUTPUT STOMA FOLLOWING ILEOSTOMY IN PATIENTS WITH RECTAL CANCER.

P1183

K. Shigeyasu, F. Teraishi, Y. Komatsu, S. Takeda, N. Hata, S. Yano, Y. Kondo, T. Fujiwara
Okayama, Japan

Purpose/Background: Ileostomy creation is an excellent approach to prevent leakage in patients undergoing low anterior resection for the treatment of rectal cancer. However, the two major complications of ileostomy are outlet obstruction and high-output stoma, and these complications remain unavoidable postoperative problems of ileostomy.

Methods/Interventions: The present study aimed to identify the factors associated with outlet obstruction and high-output stoma following ileostomy. Risk factors associated with outlet obstruction and high-output stoma were retrospectively analyzed. This study was conducted at a single expert center. The study included 83 rectal cancer patients who underwent surgery, and of these patients, 34 underwent ileostomy creation. The primary outcome measured was clinicopathological feature related to outlet obstruction and high-output stoma.

Results/Outcome(s): We found that outlet obstruction and high-output stoma were highly related ($p = 0.02$). Additionally, a thick rectus abdominis muscle was the common risk factor of outlet obstruction ($p < 0.0001$) and high-output stoma ($p = 0.02$). The ileostomy model demonstrated that when an ileostomy is created at the thinner lateral side of the R-A muscle, the resistance for intestinal fluid passage will decrease. A limitation of this study is that only retrospective analyses were performed.

Conclusions/Discussion: Our findings suggest that rectus abdominis muscle thickness is a predictive marker of outlet obstruction and high-output stoma and that appropriate ileostomy location according to the rectus abdominis muscle thickness can prevent these complications.

THE IMPACT OF OBESITY ON MARGIN STATUS IN PATIENTS UNDERGOING PROCTECTOMY FOR RECTAL CANCER.

P1184

S. Maroney, D. Koller, M. Abdel-Rasoul, K. Allen, S. Husain
Columbus, OH

Purpose/Background: Obesity is an increasingly common comorbidity in patients undergoing proctectomy for rectal cancer. The technical challenges associated with performing deep pelvic surgeries in obese patients are well documented and obesity is commonly perceived as a risk factor for positive surgical margins. However, it is not known if these technical difficulties truly translate into an inferior oncologic quality of the surgical specimen.

Methods/Interventions: ACS-NSQIP database was reviewed from 2016-2017. Demographic data, tumor location, operative approach, and pathologic and clinical outcomes were included in the investigation. Statistical analyses were performed using Chi-square tests and logistic regression. Odds ratio were estimated and Wald 95% Confidence Intervals were calculated.

Results/Outcome(s): A total of 8289 patients underwent proctectomy during the review period. Operative technique was open in 4171, laparoscopic in 2909 and robotic in 1209 cases. BMI was reported on 8226 patients out of whom 2229 (27%) were obese (BMI ≥30). Mean BMI was 27.1. The distribution of obese patients was similar across open, laparoscopic and robotic approaches (30.8% vs 31.6% vs 31.5%, $p= 0.89$). Positive margin status was noted in 10.33% of patients with BMI <30 and 6.92% of patients with BMI ≥30 ($p=0.0011$). This association was also statistically significant ($p=0.0173$) in multivariable adjusted logistic regression analysis controlling for tumor location in the rectum (upper, middle, lower), T stage, operative approach and gender of the patient. Obese patients (BMI ≥30) had 0.647 (95% CI: 0.495 – 0.844) times lower odds of having a positive margin compared to patients with BMI <30. Multivariate analysis showed that male gender, low tumor location, open surgery, and advanced T-stage were also associated with a higher risk of positive margin.

Conclusions/Discussion: This is the largest study to date comparing the oncologic quality in obese patients undergoing surgical resection for rectal cancer. Despite the operative difficulties encountered during mesorectal excision in obese patients, our data shows that obesity has a favorable effect on surgical margins. These findings are contrary to the common perception and provide a valuable insight, which can be helpful during pre-operative counseling and risk assessment. Furthermore, our data calls for added vigilance during the performance of mesorectal excision on a non-obese patient. We hypothesize that the increased volume of mesorectal adipose tissue in obese patients may render a protective effect against positive margins. Further studies are needed to determine the cause of this association.

DEFUNCTIONING STOMA DURING LAPAROSCOPIC LOW ANTERIOR RECTAL CANCER FOR RECTAL CANCER.

P1185

K. Sakamoto, R. Takahashi, K. Kure, K. Honjo, Y. Okazawa, S. Munakata, M. Kawai, S. Ishiyama, K. Sugimoto, M. Takahashi, Y. Kojima, Y. Tomiki
Tokyo, Japan

Purpose/Background: Laparoscopic low anterior resection (lap-LAR) is a common procedure in patients with rectal cancer. Anastomotic leakage (AL) is one of its postoperative complications and can impair the patient's quality of life. In some patients, we create a defunctioning stoma (DS) to avoid severe peritonitis due to AL. We retrospectively examined postoperative complications in patients who underwent lap-LAR for rectal cancer, including stoma-related complications.

Methods/Interventions: From January 2010 to November 2017, we retrospectively examined [A1] 192 patients who underwent lap-LAR for rectal cancer. We excluded patients with multiple colorectal cancers, those who underwent simultaneous liver resection, and those who were converted to open surgery. Postoperative complications were classified according to the Clavien-Dindo classification (grade 2 or higher). In patients with DS creation, we performed the radiological examination or colonoscopy to confirm the DST anastomosis.

Results/Outcome(s): The median age was 64 years (range; 25–[A1] 86 years). There were 123 males and 69 females. The tumor was located in the upper rectum in 35 patients, middle rectum in 109 patients, and lower rectum in 48 patients. AL was graded in 30 patients (15.6%): Grade A (n=12; 6.3%), Grade B (n=12; 6.3%), and Grade C (n=6; 3.1%). A DS was created in 73 patients (38%). Compared with the non-DS group, there were significant differences in preoperative treatment and tumor location. The DS group showed longer operative time, more blood loss, and a higher rate of simultaneous organ resection. The DS group experienced more postoperative complications than the non-DS group (p=0.067). Small bowel obstruction was higher in the DS group. In the DS group, there were stoma-related complications (n=14; 19.2%), outlet obstruction (n=8), renal dysfunction/electrolyte abnormalities (n=4), peristomal dermatitis (n=1), and stoma prolapse (n=1). In the DS group, stoma closure was performed in 70 patients (95.9%), and the median time to closure was 154 days. The postoperative hospital stay (median) was prolonged in the DS group (DS group: 14 days, non-DS group: 11 days, p <0.001).

Conclusions/Discussion: In the DS group, the stoma was closed in approximately 96% of patients and was not accompanied by severe peritonitis. However, postoperative complications increased slightly due to the stoma-related complications, and the postoperative hospital stays of these patients were significantly prolonged. Cases for DS construction should be carefully selected. It is also important to create an appropriate stoma to decrease the risk of the stoma-related complications.

CLINICOPATHOLOGICAL CHARACTERISTICS IN YOUNG PATIENTS WITH COLORECTAL CANCER.

P1186

T. Yoshida, S. Homma, N. Ichikawa, K. Imaizumi, Y. Miyaoka, H. Matsui, A. Taketomi
Sapporo, Japan

Purpose/Background: Young patients with colorectal cancer often have poor prognosis compared with older patients. We investigated the characteristics of colorectal cancer in young patients.

Methods/Interventions: 693 of patients were enrolled with colorectal cancer who underwent colorectal resection between December 2007 and May 2009: 18 patients under 40 years of age were in group Y (young) and the other 675 patients were in group O (old). We retrospectively examined the clinicopathological characteristics.

Results/Outcome(s): Patient characteristics were nearly similar between groups Y and O except for age: age (33.8 vs. 67.7 years, P<0.0001), sex (men/women 11/7 vs. 388/287, P=0.76), body mass index (23.4 vs. 22.8 kg/m^2, P=0.48), American Society of Anesthesiologists physical status class ≤II/III (17/1 vs. 597/78, P=0.71), and the family history of colorectal cancer (6 vs. 118, P=0.12). Although preoperative clinical stage was similar between the two groups, the tumors were located in the left side colon and rectum in the majority of group Y patients (83%). The ratio of laparoscopic surgery was similar (15 vs. 617, P=0.21) but the operative time was longer in group Y than group O (259.9 vs. 202.8min, P=0.01) and the number of resected lymph nodes was greater in group Y than in group O (34.6 vs. 17.5, P<0.01). The tumor characteristics were similar between the two groups as follows: the tumor size (45.2 vs. 39.9mm, P=0.32), the ratio of poor differentiated adenocarcinoma (12 vs. 547, P=0.16) and the pathological stage (0/I/II/III/IV: 1/6/2/5/4 vs. 41/174/187/168/105, P=0.54). In contrast, the number of metastatic lymph nodes (3.3 vs. 1.4, P=0.01) and the positive ratio of lymph vessel invasion (13 vs. 292, P=0.01) was significantly greater in group Y than group O. Although patients who achieved R0/1 resection were similar (14 vs. 602, P=0.13), the recurrence rate of group Y was higher than that of group O (4 vs. 20, P=0.09) and three-year relapse free survival was 65 and 81% in group Y and O, respectively (P=0.02). However, five-year overall survival rate was almost same between group Y and O (89 vs. 83%, P=0.96).

Conclusions/Discussion: Colorectal cancer in young patients is considered to be highly malignant and has high rate of recurrence. In young patients with colorectal

cancer, however, R0/1 resection with adequate follow-up can provide the similar prognosis compared with older patients.

AN EARLY EXPERIENCE OF ARTISENTIAL®: NEW ARTICULATION LAPAROSCOPIC INSTRUMENTS IN COLORECTAL SURGERY.

P1187

Y. Lee, W. Kang
Seoul, Korea (the Republic of)

Purpose/Background: One of the drawbacks of laparoscopic surgery is just using instruments without articulation. Although several laparoscopic articulation instruments had been introduced but were not effective and practical. Artisential®(LIVSMED) was approved by KFDA and available in real practice from October 2019 in KOREA. This articulation laparoscopic instrument is intuitive and practical. So the author introduces the early experience of colorectal surgery using Artisential® and reported its safety and technical feasibility.

Methods/Interventions: From October 2019 to November 2019, a total of 23 cases of colorectal surgery using Artisential® were performed and perioperative outcomes were reviewed.

Results/Outcome(s): The mean age was 62.5 ± 11.0 years, 9 cases were male and 14 cases were female. The mean BMI was 24 ± 3.26 kg/m2. 1 case was diverticulitis, 1 case was sigmoid volvulus, 13 cases were colon cancer and 8 cases were rectal cancer. 7 cases of right hemicolectomy, 8 cases of anterior resection, 6 cases of low anterior resection, 1 case of intersphincteric resection and 1 case of abdominoperineal resection were performed. Mean operation time was 167.6 ± 67.9 minutes and intraoperative blood loss was 41.1± 45.7 ml. The average hospital stay after surgery was 4.43 ± 3.5 days. There were no intraoperative or postoperative complications.

Conclusions/Discussion: Using Artisential®, a new articulation instrument in laparoscopic colorectal surgery is safe and technically feasible.

COLORECTAL CANCER SURVIVAL RELATED TO AGE OF ONSET: REAL WORLD STUDY BASED ON COLORECTAL CANCER DATABASE DACCCA IN SOUTHWESTERN CHINA.

P1188

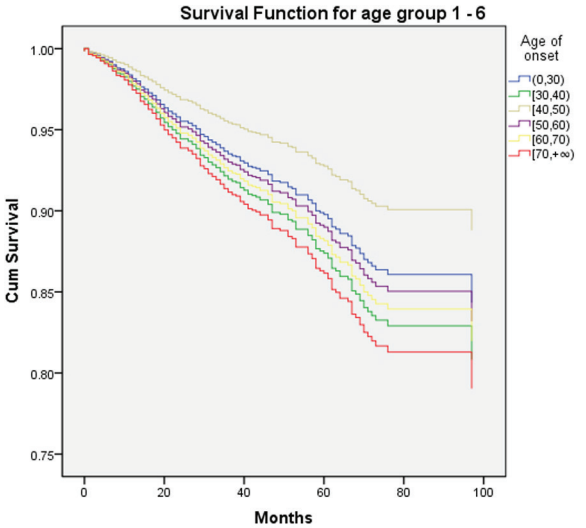
X. He, G. Liu, Y. Liu, X. Wang, L. Li
Chengdu, China

Purpose/Background: In recent years, the incidence of colorectal cancer has become younger. Survival studies have confirmed that patients with early-onset colorectal cancer (<50 years) have a better prognosis than patients with late-onset colorectal cancer. We further grouped the age more detailed and analyze the postoperative prognosis of patients with different ages. We hope to understand the survival and differences of colorectal cancer patients in all ages.

Methods/Interventions: A retrospective extraction of patients from Database of Colorectal Cancer (DACCA) of West China Hospital from January 2009 to January 2019. Screened for patients with first episodes and pathologic diagnosis of colon or rectal cancer. The first group was less than 30 years old, and the last was more than 70 years old, and every 10 years old among 30 and 70 years old went one group. There was a total of 6 groups. We drew the survival curve and compared the different survival time of group by using SPSS 20.0 (IBM, Armonk, USA). COX proportional hazards regression was performed using gender, tumor site, preoperative TNM stage, and BMI as covariates to exclude possible exceptions. Test level $\alpha = 0.05$.

Results/Outcome(s): A total of 4636 patients were divided into this study, 1898 females (40.9%) and 2738 males (59.1%). 385 (8.3%) patients reached the death outcome. The age curve in each group is shown in figure. The overall median survival time was 105.63 months (105.6 ± 0.98). Patients aged 40 to 49 years survived most than other age groups, and patients aged more than 70 years old got the worst survival. Among the covariates, preoperative TNM staging was a risk factor (P <0.001), but gender, tumor site, and BMI did not affect survival (P = 0.192; P = 0.739; P = 0.241).

Conclusions/Discussion: Patients with onset of age between 40 and 49 years have better survival. The reason why patients with different onset of ages have different survival conditions needs to be explored in conjunction with various other covariates. In addition, though the survival of patients at each age of onset is different, it cannot explain that whether it's different in survival status or not. Therefore, the next step is to increase the covariates and explore the differences in more prognostic indicators for each age group.



DOES OBESITY PREDICT ERAS PROTOCOL FAILURE?

P1110

J. Stephens, M. Murday, A. Crume, J. Clark, J. Melvin
Salt Lake city, UT

Purpose/Background: Enhanced recovery after abdominal surgery (ERAS) protocols have been widely adopted in colorectal surgery. ERAS decreases length of hospital stay, opioid use and time to return of bowel function. There have been many studies on ERAS protocols, however there is a paucity of research into the effect of obesity on postoperative recovery of bowel function and ileus while on an ERAS protocol. We have anecdotally observed a higher rate of ileus and longer length of stay in obese patients on the ERAS protocol. This may be related to decreased ability to self-limit their postoperative diet when appropriate. We have undertaken this study to determine if there is a correlation between BMI and postoperative ileus.

Methods/Interventions: A colorectal specific ERAS protocol has been in place in our practice and hospital for the last decade. This has included the use of entereg, the use of Tylenol and gabapentin to help avoid opiate use as well as carbohydrate loading drinks preoperatively. We have also included early ambulation and early enteral feeding as part of our protocol. Previously there has not been a limit on patient oral intake. Patients are counseled to stop intake if feeling nauseated or extremely full. Ileus was defined as any patient who had their diet decreased back to NPO or received an NG tube during the postoperative period before discharge. A retrospective study from August 2017 to November 2019 was performed looking at the rate of ileus and length of stay as related to BMI. We secondarily also looked at confounding factors e.g. diabetes, preoperative opiate use, gastroparesis and IBS as well as type of anastomosis. Only elective colorectal surgeries involving resection and anastomosis were considered.

Results/Outcome(s): With weight dichotomized as BMI <18-29 and ≥ 30 significant results were found. The obesity group had a significant predictive factor for ileus to happen with an odds ratio of 4.8, 95% CI 1.44-18.4. When length of stay was looked at in a similar fashion no significant difference was noted.

Conclusions/Discussion: In conclusion we have found that there is a correlation with higher BMI and resulting ileus. This would suggest obese patients may benefit from a different postoperative diet than our other patients. Further study needs to be done on postoperative intake among patient populations as well as seeing if our data is reproducible at other facilities.

THE IMPACT OF COLON RESECTION SURGICAL APPROACH ON OPIOID PRESCRIBING.

P1189

A. Bastawrous[1], M. Chang[2], K. Brockhaus[3], G. Milky[4], I. Shih[4], Y. Li[4], R. Cleary[3]
[1]Seattle, WA; [2]Ypsilanti, MI; [3]Ann Arbor, MI; [4]Sunnyvale, CA

Purpose/Background: Opioid medications are commonly used to manage acute postoperative pain. However, little is known about the impact of the surgical approach on postoperative opioid use. The aim of this study was to evaluate short- and long-term opioid prescription data after colon resections and compare them by surgical approach.

Methods/Interventions: Using the IBM® MarketScan® Databases from 2013 to 2017, we identified patients ≥ 18 years old continuously enrolled in health insurance who underwent inpatient colon resection (sigmoidectomy, left or right colectomy). Patients were excluded if they were chronic opioid users or had an opioid use disorder, a prolonged length of stay (LOS > 14 days), multiple colon resections, a hospitalization during the follow-up period, or invalid opioid prescription data. Perioperative opioid prescriptions were identified using pharmacy claims data and were defined as any filled prescription from 30 days before admission to 14 days after discharge. Long-term opioid prescriptions were assessed from 90 to 180 days after discharge among patients filling a perioperative prescription. Both perioperative and long-term prescriptions were measured using 1) any opioids, 2) abuse potential opioids (Schedule II or III opioids by Drug Enforcement Administration), and 3) high-dose opioids (≥ 50 Morphine Milligram Equivalents per day). Propensity

P1189 Long-term Opioids Prescriptions (90 to 180 days after discharge) in Propensity Score Matched Cohorts after Colon Resection

	PSM Cohort (n=5521)			PSM Cohort (n=1195)		
	Open	MIS	p-value	Laparoscopic	Robotic	p-value
Any Opioids	1169 (21.2%)	743 (13.5%)	<.0001	153 (12.8%)	131 (11.0%)	0.165
Abuse Potential Opioids	1073 (19.4%)	655 (11.9%)	<.0001	140 (11.7%)	108 (9.0%)	0.032
High-dose Opioids	425 (7.7%)	244 (4.4%)	<.0001	48 (4.0%)	26 (2.2%)	0.011

Variables expressed as n (%). PSM, Propensity score matched; OS, Open surgery; MIS, Minimally invasive surgery; LS, Laparoscopic surgery; RS, Robotic-assisted surgery. Abuse Potential Opioids: Schedule II or III opioids. High-dose Opioids: ≥ 50 average Morphine Milligram Equivalents/day

score matching was used to balance baseline characteristics when comparing opioid prescriptions by surgical approach, minimally invasive (MIS) versus open (OS), and robotic-assisted (RS) versus laparoscopic (LS), respectively. Logistic regression was used to test differences of opioid prescriptions, with p-values < 0.05 considered to be statistically significant.

Results/Outcome(s): Among 5521 matched pairs of MIS versus OS colon resection, MIS significantly decreased long-term prescriptions of any opioids (14 vs 21%), abuse potential opioids (12 vs 19%), and high-dose opioids (4 vs 8%) from 90 to 180 days after discharge (all p-values <0.001). Among 1195 matched pairs of RS versus LS resection, RS significantly decreased long-term prescriptions of abuse potential (9 vs 12%) and high-dose opioids (2 vs 4%) (p-values <0.05), but no significant difference was observed in any opioid use (11 vs 13%). For perioperative opioid prescriptions, MIS had slightly higher prescriptions compared to OS (73 vs 70%, p-value=0.002). Higher perioperative opioid prescriptions were observed among patients with shorter LOS.

Conclusions/Discussion: Minimally invasive colon resection leads to a significant reduction in long-term opioid use when compared to the open approach. Additionally, the robotic-assisted surgical approach reduced the use of abuse potential and high-dose opioids compared to laparoscopic surgery. Further research is recommended to understand the relationship and impact LOS has on opioid prescribing patterns in the perioperative period.

DISPARITIES IN COLORECTAL CANCER CARE: IS ACCESS TO CHEMOTHERAPY THE PROBLEM?

P1190

S. Jochum, L. DeCesare, A. Masood, T. Beck, A. Bhama, H. Govekar, T. Saclarides, D. Hayden
Chicago, IL

Purpose/Background: Recent trends in colorectal cancer (CRC) incidence and mortality show higher rates amongst underserved populations, including African-Americans. Adjuvant chemotherapy (CT) is the standard of care proven to improve survival for stage III colon cancer. The primary aim of this study was to identify any population-based risk factors associated with failure to receive or delay in initiation of CT.

Methods/Interventions: After obtaining IRB approval, a single center retrospective review of adult patients with stage III colon cancer from January 2012-December 2018 was performed. Patients were excluded if they had concurrent operations or if the surgery was emergent. Univariate and multivariate analyses were performed to compare patient-related factors between those who did and did not receive adjuvant CT.

Results/Outcome(s): A total of 120 patients met inclusion criteria. The majority of patients were white (54.5%), 33.9% were black, 4.2% were Asian; the remainder identified themselves as "other" or "prefer not to answer" (7.63%) and most identified themselves as non-Hispanic (85.6%). The mean age was 61.3 (27-89 years). The majority of patients were female (59.3%). 76.3% of the study population received adjuvant CT. The mean age of patients who received CT was significantly lower than those who did not (58.5±15.0 vs. 70.3±14.0, p=0.04). The odds of receiving adjuvant CT decreased significantly by 4.3% with each year of increasing age. Multivariate analysis demonstrated that non-white patients were 1/3 less likely to receive CT than whites (OR 0.33, p=0.043). Patients with public insurance, such as Medicare or Medicaid, were 3.6 times less likely to receive chemotherapy when compared to those with private insurance (OR 0.27, p=0.033). The only risk factor associated with delay in chemotherapy was surgery before 2015 (p=0.031). Recorded reasons for not receiving chemotherapy included patient refusal (n=11, 37.9%), physician recommendation based on patient frailty (n=10, 34.5%), patient self-reported frailty (n=5, 17.2%), lost to follow-up (n=5, 17.2%), and patient concerns regarding side effects (n=4, 13.8%).

Conclusions/Discussion: The majority of our patients received chemotherapy following colectomy for stage III colon cancer. The likelihood of receiving chemotherapy was decreased in patients who were older, non-white, or had public insurance. These disparities may contribute to differences in CRC survival in certain populations. Through more focused efforts to educate and administer chemotherapy to non-white and older patients and to those with less access to healthcare, we may improve equity in colorectal cancer care and survival.

IMPLEMENTATION OF AN ENHANCED RECOVERY PATHWAY IN LAPAROSCOPIC COLON AND RECTAL SURGERY DECREASES OPIOID USAGE: 2-YEAR EXPERIENCE IN A TERTIARY HOSPITAL.

P1191

H. Sanchez Trejo[1], B. Chinn[2], J. Calata[2], J. Lucking[1], F. Altino-Pierre[2], J. Kaplan[2], M. Castillo-Angeles[3], N. Castellano[2]
[1]*Piscataway, NJ;* [2]*Summit, NJ;* [3]*Boston, MA*

Purpose/Background: Enhanced Recovery After Surgery (ERAS) pathways have been advocated to improve clinical outcomes by reducing the length of hospital stay, expediting return to baseline health, reducing the use of narcotics by patients, improving patient satisfaction levels, and reducing costs. We implemented a pilot study in our hospital to determine its impact before adopting it as a policy. Our aim was to measure the effects of an ERAS pathway for laparoscopic colon and rectal surgery on opioid

reduction, length of stay, readmissions, and costs. A multidisciplinary group composed of nurses, anesthesiologists, case managers, social workers, clinical pharmacists, physical therapists, and colon and rectal surgeons were involved in the development and execution of this protocol.

Methods/Interventions: This is a prospective cohort of adult patients who underwent laparoscopic colorectal resections with anastomosis in a referral colorectal center between 2017 and 2019. Prospective data was collected from patients before the multidisciplinary protocol for colon and rectal patients was implemented a year before July 2018. Patients were divided into pre- and post-ERAS groups. Our main outcomes were total morphine milligram equivalents (MME), the length of stay, readmissions and costs, which were compared with the outcomes in patients treated the year before the pathway was implemented. Multivariate linear regression was used to determine the association of ERAS on recovery.

Results/Outcome(s): A total of 128 procedures (63.7%) were in the pre-ERAS group and 73 (36.3%) were in the ERAS group. Among both groups, the mean age was 61.38 (SD 12.65) years and 53.73% were male. Previous opioid exposure (9.38% vs. 2.64%, p=0.07), and conversion rate to open surgery (0% vs. 2.74%, p=0.13) between the pre and post-ERAS groups was not different. In an unadjusted analysis, there was a significant decrease in length of stay with a mean of 3 (IQR 3 - 4) vs 3 (IQR 2 - 4) (p=0.01) in the pre- and post- ERAS respectively and in total MME (50% reduction, p<0.001). After multivariate analysis adjusting for patient characteristics, patients after the implementation of the protocol had a shorter length of stay (Coefficient -0.74, 95% Confidence Interval [CI] -1.46 - -0.03, p=0.04) and lower total MME (Coefficient -39.54, 95% CI -62.71 - -16.37, p=0.001). In addition, our electronic medical record registered a decrease in readmissions from 6.2% to 2.9% following ERAS implementation. Given the complexity of billing, we were unable to gather data of established costs in a reliable and reproducible manner.

Conclusions/Discussion: The implementation of an ERAS pathway in our institution significantly decreased the total amount of opioids used, the length of stay, and readmission rates.

RISK FACTORS ASSOCIATED WITH POOR OUTCOMES ON ENHANCED RECOVERY PROTOCOL FOR COLON AND RECTAL SURGERY.

P1193

G. McGee, P. Pacheco, K. Delfino, N. Engelking, S. Sottile, J. Rakinic
Springfield, IL

Purpose/Background: Enhanced recovery after surgery (ERAS) protocols have become a standard tool in elective colorectal procedures. Many studies confirm an association with decreased complications and length of stay when compared to conventional perioperative management. There is less data on preoperative identification of those patients at risk for less positive outcomes using ERAS management. We retrospectively assessed our prospective ERAS database regarding this question. Our primary outcome was whether patients at higher risk for complications or prolonged LOS can be identified preoperatively; secondary outcomes include identifying whether certain components of ERAS protocol are more important than others for improved outcomes.

Methods/Interventions: Adults (n=203, age 18-92) undergoing elective colorectal resection between Jan 1 2018-Jan 1 2019, including all colon/rectal resections with open or minimally invasive approaches, were entered into the ERAS database. 37 (18%) were excluded because components of the ERAS protocol were not adhered to, leaving 166 for evaluation. The database records comorbidities (CAD, COPD, diabetes mellitus, renal impairment, tobacco use, BMI>30, and immunosuppressive therapy) and complications including surgical site infection (SSI), postoperative infection other than SSI, ileus, Clostridium difficile infection, and anastomotic leak. Treatment with postoperative antibiotics was also recorded as a separate indicator of infectious complications. Comparisons were made with the Chi-Square test for categorical variables and Student's t-test or ANOVA for continuous variables. Correlations were assessed with Spearmans Rho. P-values less than 0.05 were considered statistically significant.

P1191 Descriptive characteristics of the study population

Variable	Pre-ERAS	Post-ERAS	p value
Age (mean)	60.36 (SD 13.43)	63.17 (SD 11.03)	0.13
Sex, n (%)			>0.05
Male	71 (55.46)	36 (49.31)	
Female	57 (44.54)	37 (50.69)	
Previous exposure to opioids (%)	12 (9.38)	2 (2.64)	0.07
Conversion to open (%)	0 (0)	2 (2.74)	0.13
Length of stay (mean)	3 (IQR 3 - 4)	3 (2 - 4)	0.01
Morphine equivalents (mean)	113.2 (SD 117)	52.48 (40)	<0.001

Results/Outcome(s): 114 patients had no complications; 52 (31%) had one or more complications. BMI>30, CAD, and COPD were associated with the highest risk of postoperative complication. Tobacco use (current and former) was associated with a longer LOS than never using tobacco. Patients with BMI>30 and patients with tobacco use had the highest risk for ileus. Interestingly, having more than one comorbidity did not appear to increase complication risk, nor did diabetes, renal impairment, or immunosuppressants.

Conclusions/Discussion: When evaluated by comorbidity, some patients appear to be at higher risk for poor outcome with ERAS, particularly those with BMI>30 and tobacco use. Implementation of a prehabilitation program for these patients may reduce their risk, though the program timeline may present a challenge in cancer patients. Our study population was small, and no statistical significance was identified. We hope that as our study population grows, our data will become more robust. Lastly, we did not anticipate that 18% of patients would have had ERAS protocol not adhered to during their hospital stay: this will be the focus of further quality study.

TRENDS IN BOWEL PREPARATION IN PATIENTS UNDERGOING ELECTIVE COLECTOMY: A LACK OF STANDARD OF CARE IN MINORITY POPULATIONS.

P1195

A. Ostapenko, S. Stroever, M. Casasanta
Danbury, CT

Purpose/Background: Mechanical bowel preparation (MBP) and antibiotic bowel preparation (ABP) prior to colorectal surgery has been extensively investigated with noted benefits including reduction of surgical site infections, anastomotic leaks, and post-operative ileus. The ASCRS Practice Guidelines support both MBP and ABP for all elective colorectal surgeries as the standard of care. Nonetheless, many colectomies are still performed with a single type (ABP or MBP) or no bowel preparation at all. The objectives of this study were to 1) assess trends in bowel preparation from 2012 to 2018 by type (i.e. none, ABP only, MBP only, both), and 2) assess patient-related factors predictive of bowel preparation use or lack thereof.

Methods/Interventions: We conducted a retrospective analysis of the targeted colectomy subset of the National Surgical Quality Improvement Program database for 2012 to 2018. We excluded emergent operations, patients greater than 90 years, and those with missing or unknown bowel preparation. A time trend analysis was performed for ABP alone, MBP alone, dual preparation, or none. We used univariate logistic regression to determine significant predictors of bowel preparation among patients who had any bowel prep and those who had none. Subsequently, we used multivariate logistic regression to determine the independent effect of relevant variables on any bowel preparation.

Results/Outcome(s): After applying exclusion and inclusion criteria, 145,201 patients were used for analysis; 62,701 (43.2%) had dual bowel preparation, 41,677 (28.7%) had MBP or ABP, and 40,823 (28.1%) had no bowel preparation. The time trend analysis demonstrated statistically significant linear trends for all groups from 2012 to 2018. The rates of dual preparation and ABP alone increased, while rates of MBP alone and no bowel preparation decreased. On univariate analysis, lower BMI ($p<0.001$), female sex ($p<0.0001$), African American race ($p<0.0001$), Hispanic ethnicity ($p<0.0001$), and abnormal kidney function ($p<0.0001$) were identified as significant predictors of a lack of bowel preparation. Multivariate logistic regression confirmed these predictors were consistently significant after controlling for confounding factors (Table).

Conclusions/Discussion: Our analyses demonstrated a significant linear increase in dual ABP and MBP and a reciprocal decline in the group with no bowel preparation from 2012 to 2018. These trends are encouraging as there is strong evidence that bowel preparation can prevent negative post-operative outcomes. However, important disparities remain, particularly among minority populations, who are significantly less likely to complete the standard of care for bowel preparation. Further studies are needed to determine the best approach to increasing bowel preparation in these populations.

P1193 Table 1: Frequency of comorbidities in patients with complications n = 52

	With Comorbidity	Without Comorbidity
	Percentage	Percentage
CAD	25%	75%
Diabetes	13.5%	86.5%
Renal Impairment	1.9%	98.1%
COPD	23.1%	76.9%
Anticogaulation	11.5%	55.8%
Immunosuppressents	3.8%	96.2%
Tobacco use	32.7%	67.3%

Table: Results from the multivariate analysis to identify relevant predictors of bowel preparation among colectomy patients from 2012-2018 in the National Surgical Quality Improvement Project (NSQIP)

	Outcome: Pre-operative bowel preparation			
Covariates[a]	N(%)=145,201 (100)	OR	95% CI	P-value
Age (mean)	60.9	0.998	0.997-0.999	0.001
BMI (mean)	28.4	1.01	1.009-1.012	0.0001
Female Sex	69,736 (48.0)	1.03	1.006-1.06	0.015
Race				
White	109,132 (75.2)	Reference		
African American/Black	13,033 (9.0)	0.86	0.82-0.90	0.0001
Asian, American Indian, Alaskan, Hawaiian/ Pacific Islander	5,450 (3.8)	1.04	0.97-1.11	0.29
Unknown/Unreported	17,586 (12.1)	0.74	0.70-0.79	0.0001
Ethnicity				
Non-Hispanic	122,900(85.1)	Reference		
Hispanic	6,996 (4.8)	0.78	0.75-0.80	0.0001
Dialysis	1122 (0.8)	0.61	0.54-0.70	0.0001
Kidney Disease	8,025(5.5)	0.68	0.64-0.71	0.0001
CHF	1,338 (0.9)	0.80	0.71-0.91	0.0001
Operative Year				
2012	10,450 (7.2)	Reference		
2013	13,978 (9.6)	0.98	0.92-1.04	0.55
2014	16,978 (11.7)	0.88	0.83-0.93	0.0001
2015	21,472 (14.8)	0.93	0.87-0.98	0.007
2016	25,263 (17.4)	1.07	1.01-1.13	0.021
2017	27,607 (19.0)	1.30	1.22-1.37	0.0001
2018	29,453 (20.)	1.30	1.23-1.38	0.0001
Indication				
Non-malignant polyp	13,558 (9.3)	Reference		
Chronic Diverticular Disease	22,391 (15.4)	1.33	1.25-1.41	0.0001
Colon Cancer	57,057 (39.3)	1.06	1.00-1.11	0.038
Other ICD-10 or ICD-9	21,521 (14.8)	0.48	0.46-0.511	0.0001
Acute Diverticulitis	9,208 (6.43)	0.59	0.56-0.63	0.0001
Colon cancer with obstruction	5,853(4.0)	0.44	0.41-0.47	0.0001
Crohn's Disease	9,312(6.4)	0.55	0.51-0.59	0.0001
Other	6,184 (4.26)	0.40	0.37-0.43	0.0001
Unknown/Unreported	117 (0.08)	0.34	0.22-0.51	0.0001
Approach				
Open	41,890 (28.9)	Reference		
Laparoscopic/NOTES	89,027(61.3)	1.83	1.78-1.88	0.0001
Robotic/Other MIS	12,966(8.9)	3.17	2.99-3.37	0.0001
Other	1,303(0.9)	3.84	3.25-4.54	0.0001
Unknown	15(0.01)	4.98	1.06-23.4	0.042

[a] All variables included in analysis had p<0.05 on univariate analysis

AT WHAT BODY MASS INDEX DOES THE BENEFIT OF LAPAROSCOPY OUTWEIGH THE RISKS IN COLORECTAL SURGERY?

P1196

D. Mistrot, S. Hann, M. Luchtefeld, J. Ogilvie
Grand Rapids, MI

Purpose/Background: As the obesity epidemic continues worldwide, its effects on cost and patient safety in surgical care is expected to be substantial. Analysis of its impact on colon and rectal surgery has so far been mixed. While the shift towards more minimally invasive surgery reduces surgical complications, these benefits may be offset at a higher BMI. Using the American College of Surgeons National Surgical Quality Improvement Project database, our aim was to characterize the effects of BMI on patients undergoing elective colon and rectal resections and to compare outcomes between laparoscopic, open, and converted to open cases.

Methods/Interventions: A retrospective review of all colectomies contained in the NSQIP database was undertaken from the years 2014-2017. CPT codes were used to determine colectomy and proctectomy cases. Conversion from laparoscopic to open approach was defined by an open colectomy CPT code as the primary code and a laparoscopic code as the secondary. BMI categories were divided according to the National Institute of Health (NIH) obesity scale. Primary outcomes included surgical site infections (SSI) as defined by the NSQIP user guideline definitions and a composite of any 30-day complications. Logistic regression models for open and laparoscopic cases were created to predict perioperative complications and Receiver Operating Characteristic (ROC) analysis was used to determine clinically relevant probability cutoffs.

Results/Outcome(s): From a cohort of 163,130 patients, 58.7% were purely colectomies and 41.3% involved the rectum, which did not change with time. Over the course of the study, there were small (<1%) increases in the percentage of cases in each BMI category while the percentage of normal weight cases correspondingly decreased (29.1% to 28.2%). The rate of SSI was increased across each BMI group (overweight 7.3%, class I 8.5%, class II 10.1%, class III 11.8%, super obese 14.1%). Overall complication rate also uniformly increased across BMI groups (overweight 16.6%, class I 17.1%, class II 19.8%, class III 21.4%, super obese 25.9%). Although overall conversion rates from laparoscopic to open dropped from 0.35% to 0.24%, rates in each weight class were between 0.41-0.48%, except for super obese (0.82%) and underweight (0.65%). Although BMI was a significant predictor for overall complications and conversion, the Area Under the Curve for stratified and continuous BMI could not identify a BMI cutoff that would increase open or laparoscopic complications or conversions.

Conclusions/Discussion: With rising obesity, there is a notable increase in surgical site infections and other complications after surgery. Although the obesity epidemic does not appear to be slowing down, its impact on conversion from laparoscopic to open only appears to affect the super obese. We were unable to identify a cutoff BMI that would suggest situations where a laparoscopic approach would be of increased risk.

NODES AND POSITIVE NODES- A COMPARISON OF LYMPH NODE LAPAROSCOPIC VS ROBOTIC RESECTIONS FOR RECTAL CANCER FROM THE NATIONAL CANCER DATABASE(NCDB).

P1197

T. Reif de Paula, R. Kiran, H. Simon, M. Profeta, P. Gorroochurn, D. Keller
New York, NY

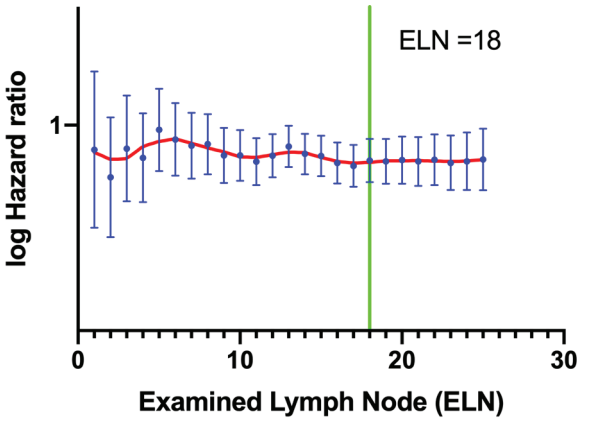
Purpose/Background: Robotic colorectal surgery continues to grow for rectal cancer resections but use of the platform has been contentious, with consistent reports of comparable oncologic outcomes amidst longer operative times and higher costs. As surgeons ascend the learning curve, operative times and costs are declining, and there is new focus on the comparative benefits. One reported benefit is a higher lymph node(LN) yield. LN status is a key predictor of survival in locally advanced rectal cancer,

with a relationship between the number of lymph nodes retrieved and survival reported in open surgery. However, this has never been evaluated across the minimally invasive (laparoscopic and robotic, MIS) platforms or in a national sample. The clinical significance of procuring more nodes, and the optimal cutoff value, needs to be elucidated. Our goal was to compare the total of examined lymph-nodes(ELN) and positive lymph-noded(PLN), to determine the minimal and optimal ELN thresholds of clinical impact, and respective association with survival across MIS platforms in rectal cancer surgery.

Methods/Interventions: Review of the NCDB for all stages I, II or III rectal adenocarcinomas undergoing MIS with curative intent from 2010-2016 were analyzed. The association of ELN count with stage migration and survival were evaluated using logistic regression and Cox regression models. The series of Odds Ratios(OR) and Hazard Ratios(HR) were used to determine structural breakpoints via Chow test, and minimal and optimal cutoffs were determined.

Results/Outcome(s): The total of 27,693 cases met inclusion criteria, 67.5%(18,703) had laparoscopic approach and 32.5%(8,990) had robotic approach. The median ELN was 15(11-20) laparoscopic and 15(12-20) robotic. The median PLN was 0(0-1) laparoscopic and 0(0-1) robotic. Increase in stage migration from <4 to ≥4 PLN(OR 1.023; 95%CI 1.017-1.029), increase in stage migration from N0 to N+(OR 1.019; 95%CI 1.016-1.023; p<.001) and improved survival(HR .987; 95%CI .980-.994; p<.001) were observed per increase in ELN when adjusted for confounders. The minimal and optimal threshold for ELN were 12(HR .807; 95%CI .703-.927; p<.002) and 18 lymph-nodes(HR .788; 95%CI .697-.891; p<.001), respectively, adjusted for patients, disease and intervention factors.

Conclusions/Discussion: In a national evaluation, patients stage I, II and III rectal cancer, more lymph nodes retrieved were associated with stage migration, possibly meaning more accurate pathologic staging, and improved overall survival. There was no difference in LN yield or OS across MIS approaches, showing the oncologic equivalence across approaches in MIS.



Association of Examined Lymph Nodes number and hazard ratio for survival with the 95% Confidence Interval for each hazard estimate (in blue). LOWESS smoothing curve with medium effect (10 points in smoothing window) is displayed in red. The structural breakpoint in the ELN number for association with the hazard ratio, adjusted for patient, disease and intervention factors, determined by the F test (Chow test) at 18 ELN, is displayed in green, in the cohort of patients undergoing minimally invasive surgery for rectal cancer between 2010 and 2016 in the US.

HAS MICROSATELLITE INSTABILITY TESTING CHANGED CLINICAL PRACTICE IN MANAGEMENT OF COLON CANCER?

P1198

P. Cavallaro, C. Stafford, C. Cauley, R. Goldstone, D. Berger, L. Bordeianou, H. Kunitake, R. Ricciardi
Boston, MA

Purpose/Background: In 2014, the National Comprehensive Cancer Network (NCCN) recommended evaluation of all colon cancers for microsatellite instability (MSI). Adherence to these recommendations and the effect on practice and outcomes is unclear. In this analysis, we describe trends in MSI testing before and after the 2014 NCCN MSI guideline while examining the relationship between rate of testing, quality measures, and cancer outcomes.

Methods/Interventions: Patients with stage I-IV adenocarcinoma of the colon in the National Cancer Database from 1/2010 through 12/2016 were included. Patients were excluded if they had previous cancers, missing staging data, treatment at a non-reporting facility, or unknown MSI testing status. Patients were categorized by MSI testing status and analysis was stratified into pre- and post-NCCN guidelines (2010-2013 and 2014-2016). We compared demographic, tumor characteristics, and outcome data across MSI testing periods and based on MSI test results. Lastly, we determined rate of MSI testing by hospital, categorized hospitals by quartile of MSI testing rate and compared outcomes for patients receiving treatment at hospitals across quartiles of testing.

Results/Outcome(s): We identified 218,763 colon cancer patients with known MSI testing status. Despite increased rates of MSI testing over the study period (23% in 2010 to 47% in 2016), both MS unstable and MS stable patients rarely underwent total colectomy (2.8% vs 2.8%, p=0.9). MS unstable and MS stable patients had similar rates of chemotherapy to untested patients for stage II cancers, and similar rates of single vs multi-agent chemotherapy use to untested patients for stage III cancers. MSI untested patients that underwent colectomy were more likely to have inadequate lymph node yield (<12 lymph nodes) than MSI tested patients (2014-2016: 11.9% vs 7.1%, p<0.001). Furthermore, 30- and 90-day mortality were lower in patients that had MSI testing (30 day = 2.1% vs 3.6%, p<0.001 and 90 day = 4.0% vs 6.3%, p<0.001). When stratifying hospitals by frequency of MSI testing into quartiles, patients treated at top quartile hospitals had lower rates of inadequate lymph node yields as well as lower 30- and 90-day mortality (p<0.001). Lastly, on Kaplan Meier analysis, patients treated at hospitals in the top quartile of MSI testing had better overall survival than patients treated at lower quartile hospitals (Figure).

Conclusions/Discussion: Rates of MSI testing have improved since the 2014 NCCN universal screening guidelines. Interestingly, we noted an association between hospitals with more routine testing for MSI and the quality of care provided, specifically in adequate lymph node yields, overall survival, and 30- and 90-day mortality. However, we identified minimal direct application of MSI testing results on colon cancer care. Overall, these data demonstrate the need for a broader implementation and application of MSI testing across cancer centers.

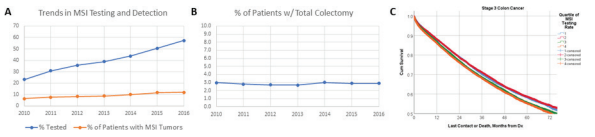


Figure 1. (A) Rate of microsatellite instability testing and proportion of all patients found to be MS unstable. (B) Percentage of patients that underwent resection of primary tumor with total abdominal colectomy. (C) Kaplan Meier analysis of overall survival in stage III colon cancer patients when stratified by hospital quartile of MSI testing rate (1=highest MSI testing rate quartile, 4=lowest MSI testing rate quartile)

COMPLETENESS OF PREOPERATIVE WORKUP AS A QUALITY MEASURE IS ASSOCIATED WITH IMPROVED OUTCOMES IN COLORECTAL CANCER.

P1199

K. Melstrom, M. Hanna, S. Sentovich, L. Lai
Duarte, CA

Purpose/Background: Colorectal cancer remains a prevalent but treatable disease when properly diagnosed and evaluated prior to treatment. To address issues regarding appropriate and adequate workup, national organizations such as the National Comprehensive Cancer Network have defined specific recommendations for a quality preoperative evaluation. The aim of this study was to assess our institutional compliance with and outcomes from standard preoperative workup for colorectal cancer patients.

Methods/Interventions: A retrospective review at a comprehensive cancer center was conducted. From January 2018 through September 2019, 121 consecutive patients from two surgeons with stage I-III colon or rectal adenocarcinoma who underwent curative surgery were identified. A complete workup included preoperative colonoscopy, CEA level, pathology review, CT scan, and for rectal cancer, MRI of the pelvis. Components of these tests were compiled and reported as a percentage of completion. Top and bottom quartiles were assigned based on testing completion percentages. Short-term outcome measures were compared between the quartiles. A multivariate analysis was completed to identify factors predictive of compliance with a complete preoperative workup.

Results/Outcome(s): The overall mean rate for completion of the preoperative workup was 85.9%. The top quartile mean was 95.5% while the bottom quartile mean was 70.7%. Age, sex, and diagnosis were evenly distributed between the quartiles. Patients in the top quartile were significantly more likely to be treated at the main campus cancer center as opposed to a satellite facility (71.2% vs. 11.8%, p < 0.01). Patients in the bottom quartile were more likely to have a deviation from the surgical plan (17.6% vs. 4.1%, p = 0.039), 30-day postoperative morbidity (32.4% vs. 14.3%, p = 0.05), and a 30-day readmission (20.6% vs. 4.1%, p = 0.017). On multivariate analysis, treatment at a satellite facility was predictive of having a workup score in the bottom quartile (OR = 0.042, 95% CI = 0.008, 0.212).

Conclusions/Discussion: Supporting the growing body of literature on guideline-based care, our study demonstrates that compliance with national standards in preoperative workup for patients with colorectal cancer results in better short-term outcomes, specifically adherence to surgical plans, decreased morbidity, and lower rates of readmission. In addition, we identify treatment at a satellite facility as being associated with decreased completion of preoperative workup. Further study is needed to better understand the disparities in the compliance of preoperative workup in the different outpatient settings.

IMPLEMENTATION OF A FOOD INSECURITY QUESTIONNAIRE FOR ERAS COLORECTAL PATIENTS.

P1200

D. Reilly[1], S. Kawak[1], A. DeMare[1], Y. Abdulla[2], M. Ziegler[1]
[1]*Royal Oak, MI;* [2]*Rochester, MI*

Purpose/Background: Food insecurity is defined as having limited or uncertain availability of nutritionally adequate and safe foods. This problem affects approximately 12% of U.S. households and may be an issue even in low poverty areas. Screening tools have been developed, but most apply to the pediatric population. The purpose of this study is to identify the prevalence of food insecurity in a population with a higher than average median income through implementation of a questionnaire for adult elective colorectal enhanced recovery after surgery (ERAS) patients.

Methods/Interventions: A food insecurity and malnutrition questionnaire was adapted from previous publications and added to the ERAS program preoperative appointment package. Patients completed the questionnaires during their initial ERAS visit.

Results/Outcome(s): A total of 217 colorectal ERAS patients were evaluated over a 6 month period. Nearly 94% of patients completed the questionnaire and twenty patients (9.2%) were identified as food insecure.

Conclusions/Discussion: Food insecurity can be a problem even in communities with median incomes above the national average. A food insecurity questionnaire can be implemented as an assessment tool to help identify patients at risk. These patients may benefit from a perioperative nutrition optimization plan.

LIDOCAINE INFUSION AS A PAIN CONTROL ADJUNCT IN THE SETTING OF ERAS FOR LAPAROSCOPIC COLECTOMY.

P1201

J. Bauman, S. Bergeron, H. Wasvary, M. Ziegler
Southfield, MI

Purpose/Background: Enhanced Recovery after Surgery Programs have continued to become a mainstay of modern surgical care. They have demonstrated improved costs, as well as a decrease in patient stay, decreased

P1201 Table 1: Overall Summaries

Characteristic	Overall N=207	ERAS N=120	ERAS+Lidocaine N=87	p-value
Age	63.6 (14.0)	64.4 (14.3)	62.6 (14.5)	0.383
Gender				0.382
Male	63 (44.9%)	57 (47.5%)	36 (41.4%)	
Female	114 (55.1%)	63 (52.5%)	51 (58.6%)	
BMI	28.4 (6.4)	28.5 (6.3)	28.2 (6.6)	0.717
Previous Abdominal Surgery				0.136
No	103 (49.8%)	65 (54.2%)	38 (43.7%)	
Yes	104 (50.2%)	55 (45.8%)	49 (56.3%)	
Smoking history				0.497
Never	112 (54.1%)	66 (55.0%)	46 (52.9%)	
Former	76 (37.7%)	41 (34.2%)	35 (40.2%)	
Current	19 (9.2%)	13 (10.8%)	6 (6.9%)	
Previous opioid use				0.112
no	174 (84.1%)	105 (87.5%)	69 (79.3%)	
yes	33 (15.9%)	15 (12.5%)	18 (20.7%)	
Surgical Procedure				
Ileocecectomy/Ileocolic	11 (5.3%)	5 (4.2%)	6 (7.0%)	
Right hemicolectomy	85 (41.3%)	62 (51.6%)	23 (26.7%)	
Transverse colectomy	4 (1.9%)	3 (2.5%)	1 (1.2%)	
Left hemicolectomy	25 (12.1%)	12 (10.0%)	13 (15.1%)	
Sigmoid colectomy	67 (32.5%)	36 (30.0%)	31 (36.0%)	
Extended right hemicolectomy	2 (1.0%)	2 (1.7%)	0 (0.0%)	
Extended Left hemicolectomy	1 (0.6%)	0 (0%)	1 (1.2%)	
APR	6 (2.9%)	0 (0%)	6 (7.0%)	
Total MME	8 (0 – 125)	12.5 (0 – 125)	6 (0 – 114)	<0.001

Comparison of variables for ERAS only group and ERAS with lidocaine group

morbidity, and an increase patient satisfaction. In addition to these benefits, a previous study from our institution demonstrated decreased opiod rates with ERAS protocols in the first 48 hours after surgery by 61%. Especially in the setting of the current opioid epidemic, working to decrease narcotic use continues to gain importance. To continue to improve care, a lidocaine drip was added to assist with post-operative pain control. The aim of this current study was to analyze the differences in opioid requirements in the first 48 hours after laparoscopic colectomy in ERAS patients after the addition of the lidocaine drip.

Methods/Interventions: This is a retrospective review of patients conducted at an academically-affiliated tertiary care hospital. The population included patients undergoing elective laparoscopic colon surgery enrolled in the ERAS program with the implementation of a lidocaine drip from June 2019 to October 2019. This was compared to the previous patient cohort of ERAS patients evaluated without the lidocaine drip intervention from September 2015 to May 2018.

Results/Outcome(s): The primary endpoint was postoperative opioid usage in the first 48 hours. Secondary outcomes were postoperative opioid usage based on the different procedures, age, BMI, previous abdominal surgery, and previous opioid use. A total of 207 patients were evaluated, 120 without lidocaine drip and 87 patients with the lidocaine drip. The population included all patients enrolled in the ERAS program at our institution. The IV morphine milligram equivalents were examined between groups. In the ERAS group, the median MME was 12.5 MME after surgery. The median MME of the lidocaine group was 6.0 MME after surgery, reducing opioid use by 52%. This was found to be significant (p-value 0.001). However, the confidence levels did overlap. There was a trend of previous abdominal surgery and opioid use having an effect, but this was not statistically significant. 26 patients had to stop the lidocaine drip early due to side effects, so only 70% of patients tolerated the lidocaine drip until the 48 hour mark. The study was performed at a single institution, had a retrospective design, and was limited in sample size.

Conclusions/Discussion: Our lidocaine drip intervention demonstrated a significant improvement in postoperative narcotic use compared to our previous ERAS patients. However, added side effects of the lidocaine drip were seen. Future studies can look at the dosage of the lidocaine drip in order to avoid complications.

IMPACT OF SURGICAL TREATMENT IN QUALITY OF LIFE IN ANAL FISTULA.

P1202

M. Abdul Manan
Wilayah Persekutuan, Malaysia

Purpose/Background: Anal fistula is a a disease with an abnormal tract formed between two epithelial lined surface of the anal canal and usually the perianal skin. Patient will present with perianal discharge and pain that will affect their daily activities. The surgical treatments has varying outcome of cure and complications such as incontinence and recurrence. Due to the complexity of the disease, treatment that have promising success rate such as non sphincter sparing fistulotomy have higher rate of incontinence. The chronicity of the disease and surgical outcome impaired and alter patients quality of life (QOL). Measurement of quality of life in these patients will help surgeons to understand the impact of the disease in patients' own perspective. The study is to assess and compare quality of life before and after surgery.

Methods/Interventions: It is a multi centre prospective study conducted in 3 hospital with colorectal surgeons between July 2017 to August 2018. A total of 143 patients with cryptoglandular anal fistula were included in the study. Patients were assessed before and after surgery using the RAND Short Form 36 (SF-36) questionnaire.

Results/Outcome(s): A total of 143 patients were involved in this study, 82% were male with median age of 37 years old (range 19-72 years). Sixty-five (45%) were newly diagnosed anal fistula and remaining 78 (55%) patients were recurrent cases. About 60% of the patients underwent sphincter sparing procedure. Thirty-eight (27%) patients developed incontinence after surgery. Anal fistula patients have lower QOL scores in all domains when compared to the Malaysian norms. However there was a significant improvement in the QOL when compared before and after surgery in all domains ($p < 0.05$) except for Role emotional domain (RLE). Before surgery QOL in Primary (45%) and recurrent (55%) cases did not showed any significant difference in all the domains. There is no difference in QOL in healed (63%) and recurrence (37%) after surgery. Patients with incontinence have significantly lower in majority of the QOL domains except in Vitality (VT), Mental Health (MH) and Bodily Pain (BP).

Conclusions/Discussion: Anal fistula is a chronic and morbid disease. SF-36 is a useful tool to assess QOL in anal fistula patients and should be use as an adjunct to help in the treatment. QOL is lower in anal fistula patients when compared to the normal population. However, there is significant improvement in QOL before and after surgery in these patients. Incontinence is a known complication in non sphincter sparing procedure. To prevent incontinence, sphincter sparing procedure should be offered to the patients. This study shows that, despite having persistent

symptoms or recurrence after surgery, QOL is not impaired as worst as having incontinence. Patient can be subjected to multiple surgery for the aim of cure however incontinence should be prevented for better QOL.

POSTOPERATIVE URINARY RETENTION AFTER ANORECTAL SURGERY DUE TO INABILITY TO RAISE INTRAABDOMINAL PRESSURE (IRIP)- A COMMONLY MISSED BENIGN CAUSE OF URINARY RETENTION.

P1203

P. Garg[1], D. Reddy[3], N. Garg[2]
[1]*Panchkula, India;* [2]*Chandigarh, India;* [3]*Hyderabad, India*

Purpose/Background: Urine retention(UR) after anorectal surgery is common and spinal anesthesia(SA) is the commonest cause. This usually requires urinary catheterization which has its morbidity and risks. However, our data analysis revealed that there is another simpler cause-inability to increase intraabdominal pressure(IRIP) due to fear of causing bleeding or pain in anorectal operative area. This cause is important to recognize because unlike other causes, catheterization is not required in retention due to this etiology. Only firm reassurance and encouraging the patient that it is absolutely safe for him to strain and increase intraabdominal pressure to pass urine is required. Whereas urinary retention due to spinal anesthesia would occur with in 24 hours of surgery, the retention or incomplete evacuation due to IRIP can happen for even upto a week after surgery.

Methods/Interventions: All patients who underwent anorectal(fistula-in-ano) surgery under SA were included in the study. The patients with known BPH, uretheral stricture or any known cause of urinary obstruction were excluded. When UR happened, then patient reassurance was tried for 1 hour. If this failed, single time urinary catheterization was undertaken (catheter removed after evacuating bladder).

Results/Outcome(s): 224 patients were operated for anal fistula over a period of 1 year. The mean age-37.1±11.2, M/F-179/45. 34/224 (15.1%) patients suffered from UR (urinary retention). 21/34 suffered UR on Day-0 (day of surgery). 10/21 of these required single-time evacuation by a catheter and 11/21 passed urine after reassurance. 13/34 patients suffered urinary retention/ incomplete evacuation after 24 hours of surgery (Day-1 to 7). None of them required catheterization and all passed urine after reassurance. In 21 patients in whom UR occurred on the day of surgery, it was difficult to ascertain as in how many patients UR happened due to spinal anesthesia and in how many IRIP was responsible. However, in all patients in whom UR occurred from Day- 1 to 7 post-surgery, the cause was likely to be IRIP in most of them. IRIP usually happened in apprehensive tense patients. Only 10/34 required catheterization.

Conclusions/Discussion: Urinary retention/incomplete evacuation commonly happens due to inability to increase intraabdominal pressure(IRIP) in the postoperative period. This usually happens in apprehensive patients. Unlike SA retention, IRIP retention can last for few days, improves on reassurance and doesn't usually require catheterization. Failure to recognize IRIP can increase morbidity due to unnecessary urinary catheterization.

FIGURE-1: RESULTS

	Anal Fistula cases operated over 1 year (n=224)
Age in years (Mean)	37.1±11.2
Sex ratio	M/F-179/45
URINARY RETENTION	**Total=34** **Day 0 (Day of Surgery)**=21/34→10/21 required single-time evacuation by a catheter →11/21 passed urine after reassurance **Day 1-7 after Surgery**= 13/34→ 13/13 passed urine after reassurance
In 21 patients in whom UR occurred on the day of surgery, it was difficult to ascertain as in how many patients UR happened due to spinal anaesthesia and in how many IRIP (inability to increase intraabdominal pressure) was responsible. However, in all patients in whom UR occurred from Day- 1 to 7 after surgery, the cause was likely to be IRIP in most of them. IRIP usually happened in apprehensive tense patients. Only 10/34 required catheterization.	

UTILIZING MACHINE LEARNING MODELS TO PREDICT ADVANCED COLORECTAL ADENOMAS AMONG YOUNG ADULTS.

P1204

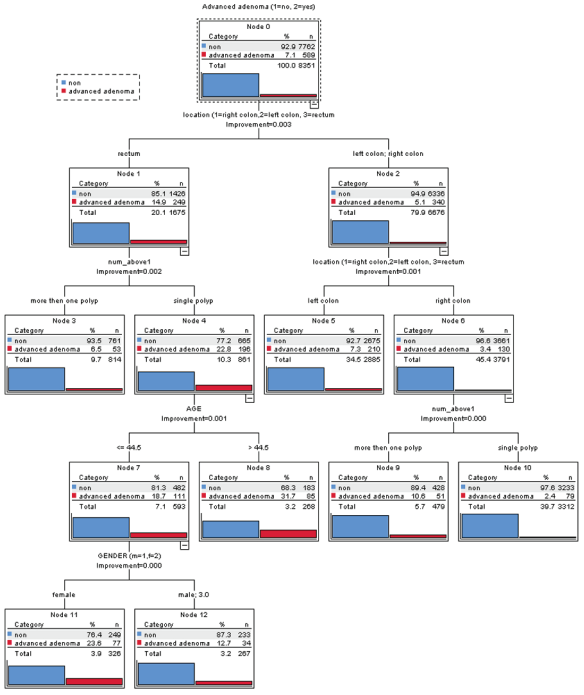
D. Assaf[1], L. Segev[1], E. Mor[1], M. Kalady[2], T. Plesec[2], A. Nissan[1], J. Church[2]
[1]*Ramat Gan, Israel;* [2]*Cleveland, OH*

Purpose/Background: The rising incidence of colorectal cancer (CRC) among patients under the age of 50 has led to increased awareness and recent modification of screening guidelines to start at age 45. Yet because average risk screening has not been carried out in patients under 50, little is known about pre-malignant lesions appearing before this age. However, a preponderance of evidence shows that a majority of young onset cancers are located in the left colon, and especially in the rectum. We hypothesized that in young patients the adenoma to carcinoma sequence is particularly active in the left colon and rectum. objective: this study aims to predict and identify the predictors for advanced adenoma (AA) among patients under 50 using machine learning decision tree algorithms.

Methods/Interventions: A prospectively maintained pathology database was used to perform a retrospective analysis of all benign colorectal polyps that were resected from patients below the age of 50 and that underwent pathology examination between 2006-2016. Patients with inflammatory bowel disease and hereditary polyposis syndromes were excluded. Machine learning classification and regression decision tree model was created to predict high risk as defined by advanced adenomas and >3 synchronous adenomas. Advanced adenomas were defined as adenomas >10mm diameter, adenomas with >25% villous architecture or adenomas containing high grade dysplasia.

Results/Outcome(s): 8347 lesions were examined from 5398 patients. 7.1% lesions were defined as advanced adenomas and 34.3% of the patients had multiple lesions. Multiple machine learning decision tree models were created in order to predict advanced adenoma, reaching accuracy of 87.3% with high specificity (91.4%) and low sensitivity (33.3%). Increases sensitivity (50.9%) was obtained at the cost of lower specificity (76.1%). Further analysis showed that location in the rectum, age over 44 years, multiple adenomas, and female gender were significant risk factors for advanced adenomas.

Conclusions/Discussion: Artificial intelligence models are of limited usefulness in predicting colorectal adenomas in the young, but are helpful in identifying risk factors for progressive carcinogenesis.



classification and regression tree machine learning model predicting advanced adenoma

SURGICAL APPROACH IN PERIANAL SEPSIS ON NEUTROPENIC PATIENTS WITH HEMATOLOGICAL MALIGNANCY: A CHALLENGE FOR COLORECTAL SURGEONS.

P1205

F. Alexandre, C. Chwat, G. Rosato, G. Lemme, D. Valli, M. Terres
Pilar, Argentina

Purpose/Background: Patients with hematological malignancy who undergo immunosuppression after bone marrow transplant or chemotherapy induction commonly present moderate to severe grades of neutropenia. Neutropenic patients are prone to infectious complications such as perianal sepsis, which occurs in approximately 5% to 10% of cases. Clinical features may be modified with impaired pus formation, and digital rectal examination is relatively contraindicated. Imaging can be of use, enabling surgical planning. We describe clinical and radiological manifestations, intraoperative findings, and morbimortality of perianal sepsis in these patients.

Methods/Interventions: Retrospective analysis of neutropenic patients with hematological malignancy diagnosed with perianal sepsis that required surgical treatment during hospitalization from 2010 to 2019. Data was obtained from computerized medical records. Preoperative diagnosis was made by clinical examination and imagining (contrast-enhanced pelvic magnetic resonance images -MRI- or soft-tissue ultrasonography). Any other potential sources of infection different from perianal sepsis were discarded. Surgical debridement and examination under anesthesia was performed in all patients. 30-day postoperative morbimortality was based on Clavien-Dindo's classification.

Results/Outcome(s): Seventeen neutropenic adult patients with hematological malignancy required surgical debridement due to perianal sepsis. Mean age was 39 years (19-58 years). Mean neutrophil count was 0,03 x10^3uL (0,01-314 x10^3uL). 12 patients were diagnosed with acute leukemia; 2 with chronic leukemia, and 3 with Non-Hodgkin's Lymphoma. All patients presented anal pain and fever. Perianal tenderness was the most common clinical finding (82.3%). Imagining was used in 88 % of cases, of which 80 % were contrast-enhanced pelvis MRI. Half of them informed inflammation. 75% reported presence of anal fistula, but fistula tract was identified in two patients during surgery. Mean time from the beginning of initial symptoms until surgical intervention was 1.2 days (0.5-4 days). Type IIIb complications occurred in seven patients (7/17). More than one reoperation was required in two patients to extend debridement, and one patient required a derivative colostomy. Type IVb complications occurred in three patients. 30-day postoperative non-specific mortality was 23.5%.

Conclusions/Discussion: Perianal sepsis diagnosis in neutropenic patients with hematologic malignancy is challenging due to altered clinical presentation. Images may aid in surgical decision, although there may be discordance with operative findings of fistula tract. Prompt diagnosis and treatment are crucial to reduce septic complications. Despite early surgical treatment, perianal sepsis in these patients may lead to life-threatening complications.

PAIN MANAGEMENT AFTER HEMORRHOIDECTOMY WARRANTS SPECIAL CONSIDERATION EVEN IN THE SETTING OF A MULTIMODAL PAIN PROGRAM.

P1206

D. Yoon, C. Wickham, K. Mirza, E. Noren, S. Lee, K. Cologne, G. Ault
Los Angeles, CA

Purpose/Background: Postoperative pain after surgical management of hemorrhoids remains a significant problem. Hemorrhoidectomy patients are reportedly prescribed greater quantities of postoperative opioid compared to patients who receive other anorectal procedures. As interventions are being developed with the goal to decrease excessive opioid prescription and optimize non-opioid medication use, the question remains as to whether pain after hemorrhoidectomy should be treated similarly to other anorectal procedures. Our study aim was to evaluate the impact of educational interventions on opioid prescribing following hemorrhoidectomy compared to other anorectal procedures.

Methods/Interventions: Patients undergoing ambulatory anorectal procedures at a county safety-net hospital were enrolled from July to November 2019 following the implementation of an educational intervention, which was developed based on the retrospective cohort analysis from the same institution. The intervention consisted of a presentation on recommended opioid and multimodal pain regimen during a weekly colorectal division meeting. The multimodal regimen consisted of around-the-clock acetaminophen, ibuprofen and gabapentin. A telephone survey was conducted one week postoperatively. Patient reported pain control satisfaction levels were measured by a five point Likert scale, from 0 (very unsatisfied) to 5 (very satisfied), and reported as mean ± standard deviation. A $P<0.05$ considered statistically significant.

Results/Outcome(s): A total of 70 patients were enrolled. The telephone survey response rate was 83% (n=58). Surgical indications consisted of hemorrhoid (n=18), fistula-in-ano (n=19), anal/rectal mass or ulcer (n=8), condyloma acuminata (n=9) and others (n=4), consisting of pilonidal cyst and anal fissure. There were a greater proportion of female patients in the hemorrhoidectomy group (67% vs 33%, P=0.016). All patients received postoperative education regarding appropriate opioid use and multimodal pain regimen. The hemorrhoidectomy group was prescribed more milligram morphine equivalents (MME) postoperatively (81.3 vs 70, P=0.032), used more MME (34.2 vs 13.8, P=0.014), and had fewer MME remaining (47.1 vs 60.7, P=0.079) compared to other anorectal procedures. Though both groups had similar rates of multimodal pain regimen compliance, the hemorrhoidectomy group also had a lower average pain score (2.6 ± 1.2 vs 4.5 ± 1.0 out of 5, $P<0.001$), higher incidence of ED visits (39% vs 3%, $P<0.001$), and required greater supplemental opioids use (6% vs 0%, P=0.310).

Conclusions/Discussion: Patients undergoing hemorrhoidectomy require more opioids than patients undergoing other anorectal procedures and may need to be considered as a distinct entity from other anorectal procedures when developing interventions aimed at reducing postoperative opioid prescription and use.

INVESTIGATING THE FEASIBILITY OF CO2 LASER ABLATION OF FISTULA TRACT IN THE MANAGEMENT OF FISTULA-IN-ANO.

P1207

C. Hoang[1], P. Sturrock[1], J. Maykel[1], J. Davids[1], H. Redkey[3], R. Rudko[2], S. Balcom[1], J. McDade[1], K. Alavi[1]
[1]Worcester, MA; [2]Milford, MA; [3]Gardner, MA

Purpose/Background: Fistula-in-ano represents a challenge for surgeons. For simple fistulas, fistulotomy by lay open technique is often successful in healing the fistula tract. However, fecal incontinence rates range from 0-45%. Complex fistulas present an even more challenging problem, as muscle preservation is key for retaining fecal continence. The purpose of this study was to use CO2 laser technology to ablate the fistula tract. Short-term outcomes included feasibility, safety and post-operative pain. Long term outcomes included fistula healing and recurrence.

Methods/Interventions: This is a pilot study using the UltraLase Flexible CO2 Laser Waverguide Probes, customized waveguide catheter, and the Ultra-MD Laser System. Subjects were treated between 2017-2019, and followed up to 1 year. This study was approved by the Institutional Review Board for treatment of 20 patients.

Results/Outcome(s): Nineteen subjects were enrolled (1 subject was treated twice). Mean age was 49. Fifteen (78%) were male, 14 (73%) were White. Eighteen had tran-sphincteric anal fistula and one had intersphincteric anal fistula. Fistula length ranged from 18mm to 80mm. Duration of time a seton had been in place ranged from 75 days to over 5 years. 18 subjects received laser ablation treatment of fistula tract, and did not have clinical complications or severe post-operative pain. 1 subject could not be treated due to angulation of fistula tract. 7 out of 15 treated subjects achieved complete healing (1 at 3 months, and 6 at 6 months). Results for 3 other subjects are pending.

Conclusions/Discussion: CO2 laser ablation of fistula tract in management of Fistula-in-Ano is feasible and safe. This pilot study has promising results. Complete, long-term data regarding healing is pending. Expansion of pilot study is on-going.

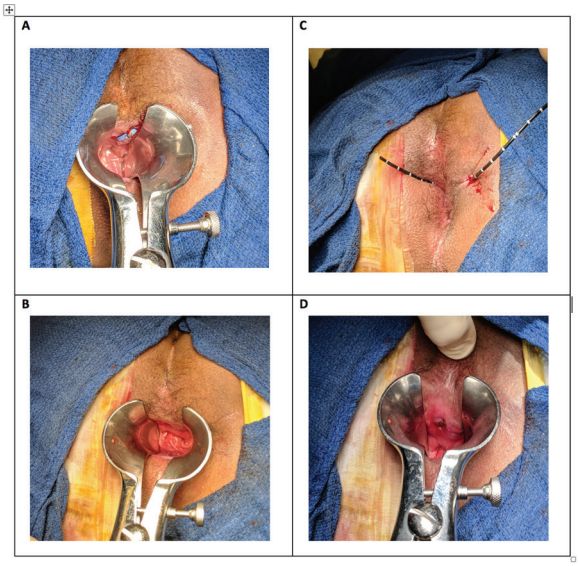


Figure 1. Before and after laser ablation
A) Pre-procedure with seton in place, B) Seton removed, C) Catheter in place, outlining the fistula tract, D) Internal opening after laser ablation

SPHINKEEPER® IS EQUALLY EFFECTIVE IN PATIENTS WITH OR WITHOUT SPHINCTER LESIONS.

P1208

C. Ratto, A. Parello, V. De Simone, R. Orefice, P. Campennì, A. Marra, M. Goglia, F. Litta
Rome, Italy

Purpose/Background: A new artificial anal sphincter, SphinKeeper® (SK), has been recently developed for the treatment of fecal incontinence (FI); a comparison on its outcome in patients (pts) with or without anal sphincter lesions (aSL) has not yet been described. Primary aim of this study was to assess the efficacy of SK implantation in pts with FI with or without aSL. Secondary endpoints were the evaluation of patients' quality of life, and the safety of implantation.

Methods/Interventions: Ten implants were placed into the anal intersphincteric space. Pts were evaluated pre- and postoperatively by clinical and physical examination, anorectal manometry, endoanal ultrasound, Wexner and Vaizey severity scores, SF36 and Fecal Incontinence Quality of Life (FIQL) questionnaires.

Results/Outcome(s): From March 2016 to October 2018, 42 patients (36 females, mean age 66.6±10.6 years) with FI underwent SK implantation. Fourteen pts (all females) had an aSL: the etiology of FI was related to an obstetric injury in 13 pts (92.9%), and previous hemorrhoidectomy in 1 case (7.1%). At the EAUS, 2 patients (14.3%) had a lesion of the internal anal sphincter (IAS), 9 patients (64.3%) of the external anal sphincter (EAS), and 3 patients (21.4%) of both IAS and EAS. Range of sphincter defect extension was 30-120° for IAS, and 30-120° for EAS. No morbidity due to the SK implantation was registered. All baseline clinical characteristics were similar between pts with or without aSL, as well as the mean postoperative follow-up. A similar >50% reduction of the total number of FI episodes/week was observed in 8/14 pts (57.1%) with aSL, and in 14/28 pts (50.0%) without aSL (p=0.457). Two patients in both groups became fully continent. Moreover, ability to defer defecation for >5min was reached in 64.3% and 71.4% of pts with or without aSL, respectively (p=0.322). FI severity scores significantly improved: the mean CCFIS changed from 11.1 to 7.4 (p=0.002) in pts with aSL, and from 12.5 to 7.8 (p=0.0001) in pts without aSL; mean Vaizey score was reduced from 14.7 to 10.6 (p=0.002) and from 14.6 to 10.0 (p=0.0001) in pts with or without aSL, respectively. All FIQL domains significantly improved in both groups, with the exception of the depression self-perception item. At the SF36 questionnaire, only the physical functioning item was significantly improved in both groups. At the anorectal manometry evaluation, both the pre- and post-operative maximum resting pressures were lower in pts with aSL (p=0.049 and p=0.009, respectively). In both groups the outcome was better when the majority of the prostheses (at least 6/10) were adequately placed.

Conclusions/Discussion: SK implantation was equally safe and effective in pts with or without aSL, with an improvement of patients' quality of life. A correct placement of the prostheses resulted in a good outcome.

LASER MODIFIED EPSIT: A NEW MINIMALLY INVASIVE PROCEDURE TO TREAT PILONIDAL SINUS.

P1209

L. Mori
Lavagna (Genova), Italy

Purpose/Background: EPSiT (Endoscopic PIlonidal Sinus Treatment), invented and published by Piercarlo Meinero in 2013 is an under vision endoscopic technique, published by Piercarlo Meinero in 2013 aimed to a complete removal of hair and debris with radiofrequency energy ablation of tissues within the involved tracts. In order to improve the healing rate and to obtain a faster obliteration by promoting granulation of the tracts we have modified EPSiT procedure: we used laser energy delivered by means of a specifc type radial emitting fibre to ablate the epithelium of pilonidal sinuses.

Methods/Interventions: A prospective observational study was conducted on fconsecutive patients suffering from primary or recurrent pilonidal disease that were first treated at our institution between January 2019 and October 2019. Technical main steps are 1) Probing of the

tracts via the pits or the fistula openings 2) Blind removal of most part of hairs 3) INsertion of the fistuloscope and endoscopic sinus exploration and accurate under vision complete hairs extraction. 4) The inflammatory tissue and epithelium lining the tracts are removed with a curette. 5) Under vision diathermy coagulation on active bleeding sites. 6) A radial fibre actying at 360° connected to a diode laser set at a wavelenght of 1470 nm is postioned, by the fistuloscope, on the tip of the sinus tract. 7) Fistuloscope is pulled out and the fiber is slowy (1 mm/sec) retracted. The laser energy is delivered in a continuos mode 8) Every secondary pit is treated with laser energy in the same tract. During the postoperative course no medications and no washing are needed. All patients out than two were treated under local anesthesia and were discharged on the same day of operation.

Results/Outcome(s): There were 59 patients, 46 males and 13 females, with a mean age of 23.9 years (range 15–58). Successful treatment (complete epithelization of cyst and tracts) was documented in 57 out of the 59 patients (96.6% success rate). VAS pain scores were low and no major complications were recorded. Healing was achieved in 25.4 days (range 17–40) and 53.3% of patients were able to return to work the same day (the rest within 3 days). Of the failures, four patients did not heal and one patient recurred after 5 months. *Of the two failures, one patient did not heal and one patient recurred after 5 months. Both failures were treated successfully with a second laser procedure.* Overall patient satisfaction reached 98%.

Conclusions/Discussion: Laser EPSiT seems to be very close to the ideal treatment of pilonidal disease, since it is safe, easy to perform, almost painless and highly effective.

RISK FACTORS FOR INCONTINENCE, POOR HEALING AND RE-OPERATION AFTER SURGERY FOR FISTULA-IN-ANO.

P1210

A. Kwok, C. Young, H. Bains, N. Aghostino
Camperdown, NSW, Australia

Purpose/Background: Perianal fistula disease carries a high burden of treatment cost and impacts significantly on quality of life. Various surgical techniques are described and numerous studies performed comparing differences in efficacy, incontinence and fistula recurrence. We aim to identify operative, patient and disease factors that contribute to these outcomes after surgery for fistula-in-ano.

Methods/Interventions: A retrospective analysis of all patients operated on for perianal fistula disease over 20.5 years by a single surgeon was performed. Outcome measures included healing, impaired continence and need to re-operate. Univariate and multivariate analyses were then performed with $p<0.05$ being considered statistically significant.

Results/Outcome(s): A total of 411 procedures were performed on 263 patients. Median age was 41.8 years (70% male). 14.4% had inflammatory bowel disease (IBD). Low trans-sphincteric fistulas (TS) were most common (39.9%) and fistulotomy was the most common index operation performed (58.9%). Completeness of follow-up was 89.0% at a median of 30.8 weeks. 77.9% of patients achieved complete healing. 9.5% of patients experienced some deterioration in continence postoperatively. 37.6% of patients required re-operation at a median time of 19.0 weeks. Poorer continence was associated with female sex, age >40 years, posterior location, suprasphincteric (SS) fistulas, seton insertion and having >3 subsequent procedures. Having a fistulotomy was associated with continence preservation. Poorer healing was associated with Crohn's disease, high TS fistulas, extrasphincteric fistulas and steroid usage. Superior healing was associated with low TS fistulas and the final operation being fistulotomy. Need to re-operate was positively associated with female sex, high TS fistulas, SS fistulas, IBD and previous operations for fistula-in-ano. Patients with inter-sphincteric and low TS fistulas were less likely to require re-operation. Need for permanent stoma was associated with female sex and IBD. Multivariate analysis revealed poorer continence was associated with female sex, age >40 years, SS fistulas and seton insertion. Healing was superior in healthy individuals and for low TS fistulas, while it was poorer in patients with Crohn's disease. The only significant factor associated with a need to re-operate was fistulotomy being the index operation.

Conclusions/Discussion: Minimizing fistula recurrence and preservation of continence can be competing management goals. We found over one-third of patients required re-operation, 22.1% failed to heal completely and 9.5% suffered some impairment of continence after surgery. Awareness of the factors that contribute to these outcomes is crucial to the process of informed consent and managing patient expectations before surgery.

AGGRESSIVE SURGICAL MANAGEMENT OF GIANT CONDYLOMA ACUMINATUM OF BUSCHKE AND LöWENSTEIN: LONG-TERM RESULTS OF 11 CASES.

P1211

S. Leventoglu, A. Yildiz, A. Yildiz, B. Mentes
Ankara, Turkey

Purpose/Background: Buschke-Löwenstein tumor (BLT) of the anal margin is a rare and histologically benign tumor. Wide local excision with anoplasty has been shown to be an effective treatment for BLT. The aim of this study was to report our experienceafter wide local excision for BLT.

Methods/Interventions: From 2002 to 2018, 11 patients (9 males) with a mean age of 33.45 years (19-24) were operated for a BLT. This is a retrospective analysis of a prospectively maintained database complemented by chart review.

Results/Outcome(s): Two patients had a history of anal intercourse while all patients were HIV negative. All patients underwent wide local excision and VY flap anoplasty. While the mean tumor size was 15.54 +/- 1.34 (10-26) cm; 6 patients had HPV6, 3 had HPV11, 1 had HPV15 and 1 had HPV33 positive. There was separation in the wound in two patients, while anal stenosis, mucosal ectropion and local recurrence was not observed in the mean follow-up period of 50.45 +/- 1.75 (range, 4-190) months.

Conclusions/Discussion: Anorectal BLT is characterized by an exophytic cauliflower-like mass surrounding the perianal region with an irregular surface. Improper conduct or disruption of the perianal wart treatment may cause the lesions to repeat, encircle the perianal region, and reach giant dimensions. In patients with anal BLT, wide local excision and V-Y flap anoplasty reduce the risk of relapse and prevent the development of complications such as anal stenosis and mucosal ectropion.

APPLICATION OF PLATELET-RICH PLASMA FOR THE MANAGEMENT OF PILONIDAL SINUS DISEASE: A RANDOMIZED CLINICAL TRIAL OF DIFFERENT TREATMENT MODALITIES.

P1212

C. Boztug, T. Karaagac Akyol, C. Benlice, M. Koc, B. Doganay Erdogan, O. Ozcebe, A. Kuzu, C. Akyol
Ankara, Turkey

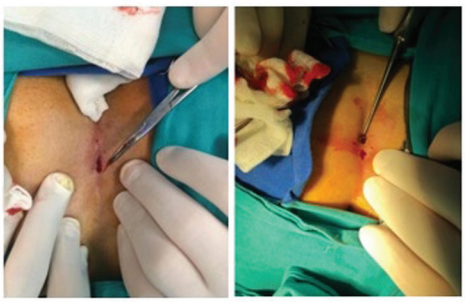
Purpose/Background: Surgical excision is the standard treatment modality for pilonidal sinus disease (sacrococcygeal sinus), but all excisional techniques are associated with tissue loss, risk of wound infection, and chronic healing problems. Controversy still exists regarding the best surgical technique for the treatment of pilonidal disease in terms of minimizing disease recurrence and patient discomfort. In this study, we aimed to evaluate the impact of autologous platelet-rich plasma (PRP) on pain reduction and wound healing after open excision and secondary closure by comparing with minimally invasive technique.

Methods/Interventions: Forty-nine patients with pilonidal sinus disease who underwent traditional open excision and secondary closure of the surgical wound (n = 19) or additional local postoperative infusion of PRP (n = 21) or minimally invasive technique (hair excision + curettage +PRP injection) (n = 9) were randomized and assessed between April/2017-December/2018. Duration of total wound healing time, VAS scores and wound volume were evaluated. Preoperative quality of life of patients in each group was assessed and compared with postoperative period.

Results/Outcome(s): The study groups were comparable in terms of age (p=0.8), gender (p=0.4), family history (p=0.75) and other preoperative comorbidities (p=0.15). Wound healing process was completed within the 3 months. Wound closure time was significantly lower in the minimally invasive group (11 days) compared to the other study groups for traditional open excision and secondary closure of the surgical wound (48 days) and PRP infusion group (34 days). Healing process (recovery time per the cavity – day/cc) was significantly faster for the PRP infusion group (1.56) compared to the traditional closure (2.93) and minimally invasive group (3.5) (p <0.001). The overall postoperative pain scores and were significantly lower for PRP infusion and minimally invasive groups compared to the traditional technique closure group (p <0.001). The time to return to daily activity was significantly shorter for PRP infusion and minimally invasive groups compared to the traditional technique closure group (p <0.001). Overall quality of life scores was significantly higher for the PRP infusion compared to the other study groups.

Conclusions/Discussion: The use of PRP for post operation wound dressing of pilonidal sinus disease with healing by secondary intention should be considered for the management of pilonidal disease in the surgeon's armamentarium.

Excision and PRP infusion



Minimally invasive procedure before PRP injection

DOPPLER GUIDED INTERNAL HEMORRHOIDAL ARTERY LIGATION: A SINGLE INSTITUTION EXPERIENCE.

P1213

W. Sang, J. Millen, K. Luberice, T. Bourdeau, H. Browning, H. Massarotti, A. Chudzinski
Tampa, FL

Purpose/Background: Surgical treatment of benign hemorrhoidal disease has historically been associated with some degree of post-operative morbidity. Doppler guided internal hemorrhoidal artery ligation provides a minimally invasive treatment alternative. This is a descriptive study of our institutional experience and outcomes with this procedure at a newly developed colon and rectal surgery center.

Methods/Interventions: We performed a retrospective chart review of patients undergoing doppler-guided internal hemorrhoidal artery ligation for grade 2,3, and 4 symptomatic internal hemorrhoidal disease. These were performed over the time period 2016 - 2019 at our tertiary care hospital with 2 board certified colon and rectal surgeons. Patient characteristics, procedural details and postoperative outcomes are reported.

Results/Outcome(s): Over the 3 year study period, this procedure was performed on 62 patients. All patients had 4-6 ligations performed, with 80% of our patients requiring at least 3 concomitant mucopexies per procedure. The median operative duration was 30 minutes. Fifty-three percent of our patients were female, with an median age of 53 and BMI of 30. The postoperative complication rate was 8.0% with 1 patient experiencing postoperative bleeding, 2 developing urinary retention requiring foley catheterization, and 2 with postoperative thrombosed hemorrhoids managed expectantly. There was no recurrence of internal hemorrhoidal disease monitored over a 90 day period.

Conclusions/Discussion: Doppler guided internal hemorrhoidal artery ligation is a safe procedure to treat internal hemorrhoids with low morbidity to the patient. Future studies will be aimed at comparing outcomes with those of patients undergoing conventional open hemorrhoidectomy and post operative pain assessment.

ORAL HEALTH AND COLORECTAL CONDITIONS: THERE IS A CORRELATION.

P1214

A. Studniarek[1], D. Borsuk[2], E. Saint-Victor[1], G. Gantt[1], A. Mellgren[1], J. Nordenstam[1]
[1]*Chicago, IL;* [2]*Park Ridge, IL*

Purpose/Background: Oral bacteria can spread through the gastrointestinal tract (GI) and have been associated with a variety of systemic diseases. It has been shown that the microbiomes of the oral cavity and the colorectal region overlap in nearly half of patients. The aim of this study was to explore whether patients' oral hygiene correlate with specific colorectal and anorectal conditions.

Methods/Interventions: A previously validated oral health questionnaire was administered to patients at a colon and rectal surgery outpatient clinic at a tertiary referral center, starting in July 2019. The questionnaire includes ten questions regarding a patient's frequency of teeth brushing and dental visits, the number of cavities, the presence of bad odor and bleeding gums after teeth brushing. A numeric oral hygiene score was calculated based on the answers provided to each question, ranging from 0 to 20. All diagnoses were categorized into five major groups including: benign conditions, malignant conditions, fistulas, inflammatory bowel disease and infectious conditions for the purpose of statistical analysis. Analysis of variance (ANOVA) regression model was used to evaluate variability between the groups.

Results/Outcome(s): A total of 210 patients (48.1% male) were included. The median age was 52 [range, 13-93] years and a mean body mass index (BMI) was 29.7±8.3 kg/m^2. Eighty-six (41%) patients were African-American, forty-three (20%) were white, twenty (10%) were Hispanic, five (2%) were Asians, and fifty-six (27%) declared their race as other. Thirty-four patients (16.2%) were active tobacco users, 8 (3.8%) were former tobacco users, while the remaining 168 (80%) were non-tobacco users. The most commonly seen conditions were benign anorectal (40.4%), followed by infectious conditions (15.7%). Patients seen for benign conditions had a mean oral hygiene score of 3.22 ± 3.32 whereas patients with malignant conditions had a mean score of 5.37 ± 3.34. An ANOVA test analysis comparing the means of benign, infectious and malignant groups was significant ($p= 0.003$). When comparing individual groups, the patients with malignant conditions had a higher score and worse oral hygiene than patients with benign conditions ($p=0.008$). Additionally, patients with infectious conditions had a higher score and worse oral hygiene than patients with benign conditions ($p=0.051$).

Conclusions/Discussion: Oral health may be associated with the presence of specific colorectal conditions. Our results demonstrate that patients with malignant and infectious colorectal and anorectal conditions have worse oral health than patients with benign diseases. Further research is necessary to better understand these relationships and their clinical implications.

EXAMINING SURGICAL APPROACHES TO INTESTINAL ENDOMETRIOSIS.

P1280

A. Christiansen
Akron, OH

Purpose/Background: The aim of this study was to review the surgical approaches to managing intestinal endometriosis to help understand the treatments which improve outcomes and reduce complications. Endometriosis involving the bowel is managed in a variety of methods, including bowel resection, partial thickness excision or full thickness excisions. Due to the well-documented complications known to bowel surgery and variable severity in presentation of intestinal endometriosis, the approach to these cases can be a challenge to the surgeon.

Methods/Interventions: IRB-approval Single-institution, retrospective, electronic medical records review Patients were initially selected who met four criteria: diagnosis name (endometriosis), surgical management of disease, intestinal involvement, and date of intervention 2013—2018. Clinical and surgical outcomes were examined, including length of stay, complication rate, and post-operative symptom improvement.

Results/Outcome(s): Of 2,681 cases of endometriosis, 252 had intestinal involvement Most cases, 98.4%, are successfully approached laparoscopically. Complication rates are low, 3% at 30 days, even in interventions that required bowel resection. Overall improvement in symptoms is consistent across the various approaches to management.

Conclusions/Discussion: Despite the lack of consensus on management of intestinal endometriosis, overall outcomes for surgical resection of intestinal endometriosis are positive. Patient factors and disease severity vary greatly but are necessary variables to consider when preparing for surgery. Still, these cases are often best managed by a multidisciplinary group to ensure the optimal intervention is performed and provide the best outcome for the patient.

IS THE HARTMANN'S PROCEDURE FOR DIVERTICULITIS OBSOLETE? NATIONAL TRENDS IN COLECTOMY FOR DIVERTICULITIS IN THE EMERGENCY SETTING FROM 1993-2015.

P1281

H. Alsulaim, M. Alqahtani, R. Garfinkle, S. Al-Masrouri, C. Vasilevsky, N. Morin, M. Boutros
Montreal, QC, Canada

Purpose/Background: Historically, Hartmann's procedure (HP) has been the operation of choice for diverticulitis in the emergency surgery. However, recent evidence has demonstrated the safety of primary anastomosis (PA) with or without diverting ileostomy in this setting. The purpose of this study was to evaluate the trends and predictors in HP versus PA for diverticulitis in the emergency surgery over two decades.

Methods/Interventions: Using the National Inpatient Sample database, we identified adult patients ≥18 years-old who underwent emergency surgery for diverticulitis (HP or PA) between January 1993 and October 2015 using ICD-9 codes. Patients with non-primary admission for acute diverticulitis, gastrointestinal cancer, or surgery in an elective setting were excluded. Trends in HP were analyzed using multivariable linear regression, and predictors associated with HP were assessed with multiple logistic regression.

Results/Outcome(s): Of 90,815 patients who underwent colectomy in the emergency setting for acute diverticulitis, 49,259 (54.2%) had a HP and 41,556 (46.8%) had a primary anastomosis (PA). Median age was 62 years (IQR: 50-73), 52.8% were women, and 69.4% were of white race. Patients who had HP were more likely to be older (median 62 years (51-73) vs. 57 years (47-68), p<0.001)) and have major or extreme severity of illness index (69.5% vs 41.4%, p<0.001). The overall likelihood of HP did not differ significantly over time – HP comprised 51.2% of included cases in 1993 and 53.0% of cases in 2015 (p-trend=0.319). On multiple logistic regression, age (45-64 years: OR 1.16; 95% CI 1.09-1.22, 65-74 years: OR 1.21; 95% CI 1.12-1.30, ≥ 75 years: OR 1.25; 95% CI 1.15-1.35], male sex (OR 1.18 95%CI 1.12-1.22), severity of illness [moderate illness OR 1.89 95%CI 1.76-2.03; major illness OR 4.17 95%CI 3.88-4.48; and extreme illness OR 8.73 95% CI 8.03-9.50], and weekend admission (OR 1.42, 95%CI 1.35-1.48) were independent predictors of HP.

Conclusions/Discussion: Despite recent trials supporting the use of sigmoid colectomy with primary anastomosis for diverticulitis in the emergency setting, rates of Hartmann's procedure have not changed significantly over time.

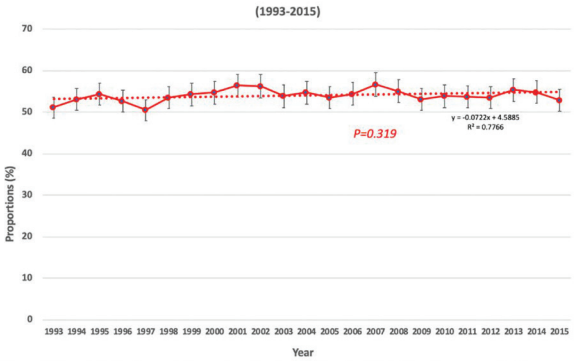


Figure 1. Trends in Hartmann's Procedure for Acute Diverticulitis in The Emergency Setting (1993-2015)

BLUNT COLONIC INJURY IN THE GERIATRIC TRAUMA POPULATION: A RETROSPECTIVE STUDY.

P1282

J. Malat, G. Yankelevich
Philadelphia, PA

Purpose/Background: Advanced age is a significant risk factor for complications and poor outcomes following trauma. However, age alone does not explain this risk. Increased medical comorbidities, fragility and risk for multi-trauma may be a better representation of this patient population. By the year 2030, 20% of the United States population will be considered geriatric (age ≥65). With this growing population comes the need to better understand their unique physiology and anticipate their complications and outcomes. Although studies have looked separately at outcomes in the geriatric trauma and blunt colonic injuries, very few have looked at outcomes following blunt colonic injury specifically in the geriatric population.

Methods/Interventions: This is a retrospective cohort study looking at the geriatric trauma population diagnosed with blunt colonic injuries using the National Trauma Data Bank (NTDB). The primary objective of this study is to evaluate mortality following blunt colonic injury stratified by age, medical comorbidities and injury severity score (ISS) compared to traumatic injuries not involving the colon. In addition, complications such as cardiac events, surgical interventions and re-admissions will also be studied. A total of 430,473 patient charts were reviewed using electronic medical records from 2003 to 2017. Using chi square and logistic regression, odds ratios were obtained.

Results/Outcome(s): In comparison with all other traumatic injuries, mortality was increased among patients presenting with blunt colon injury (AOR: 1.75, 95%CI 1.41-2.16, p<0.001) when adjusted for age, ISS and the following pre-existing conditions: hypertension, diabetes and CAD.

Conclusions/Discussion: In conclusion, a significant correlation exists between age, ISS and comorbidities as predicted in the trauma population diagnosed with blunt colonic injury. Further studies are indicated to better understand identifying risk factors to guide surgical and medical management of this specialized patient population.

PREDICTORS OF FAILURE OF NONOPERATIVE MANAGEMENT OF ACUTE DIVERTICULITIS COMPLICATED BY ABSCESS.

P1283

M. Gachbayov, W. Stupalkowska, S. Di Saverio, R. Bergamaschi
Valhalla, NY

Purpose/Background: There is an ongoing dilemma regarding the role of nonoperative management and surgery in the treatment of acute diverticulitis complicated by abscess. The aim of this study was to evaluate the risk factors of failure following nonoperative management for acute diverticulitis complicated by abscess.

Methods/Interventions: Patients admitted for nonoperative management of acute diverticulitis with abscess and/or extraluminal air between 2012 and 2018 were included in this retrospective study. Nonoperative management was defined as a combination of the following interventions: nil per os, IV fluids, IV antibiotics, CT-scan guided percutaneous drainage, and total parenteral nutrition. Failure of nonoperative management was defined as any situation in which a patient who was initially admitted for nonoperative management later required surgery; symptoms and/or abscess failed to resolve. Multivariate logistic regression was utilized to identify independent predictors of failure.

Results/Outcome(s): Twenty-one of 123 patients included in this study failed nonoperative management. Mean age was 54.8±15.5. Male-to-female ratio was 14:7. Mean abscess size on CT scan was 5.6±3.2 cm. Mean number of separate air locules was 0.5±0.6. Mean size of largest air locule was 1.4±2.3 cm. Size of largest air locule was the only independent predictor of failure at multivariate logistic regression (p<0.001).

Conclusions/Discussion: Size of largest air locule is an independent predictor of failure following nonoperative management of acute diverticulitis complicated by abscess.

ROBOTIC VERSUS LAPAROSCOPIC COLORECTAL SURGERY: AN INSTITUTIONAL VALUE COMPARISON OF OUTCOMES AND COST.

P1315

A. Cannon, J. Young, K. Woodman, T. Pickron
Salt Lake City, UT

Purpose/Background: Utilization of a robotic surgical platform by colorectal surgeons in the United States is increasing; both in absolute volume as well as case variety. Robotic systems are inherently more costly than laparoscopic approaches; however, proponents cite improved visualization, a shorter learning curve, decreased rates of open conversion, and shorter lengths of stay compared to laparoscopic approaches. Conversely, other studies have

shown longer operative times, higher costs, and little evidence of improvement in outcomes. To study these issues better and provide more granularity to drivers of cost, we retrospectively compared institutional costs and outcomes of patients who underwent robotic versus laparoscopic colorectal operations.

Methods/Interventions: This study examined patient outcomes and costs derived from an experienced colorectal surgeon operating in an academic setting. Inclusion criteria were patients undergoing elective laparoscopic or robotic colorectal surgery within the three prior years. Clinical data for each patient were compiled using the NSQIP database. Hospital costs for each admission were obtained through the University of Utah Value Driven Outcomes project. Individual contributors to total admission cost included imaging, lab, pharmacy, facility utilization, OR supply, and OR utilization costs. All costs were calculated and reported as cost ratios. Significant differences between groups were calculated using Chi Square and Mann Whitney U tests.

Results/Outcome(s): There were 232 total patients; 167 laparoscopic and 65 robotic. There were no significant differences in the indications for intervention or operation received between the two groups. The robotic group experienced significantly longer operative times (mean 199.9 min vs 141.3 min $p<0.001$). There was a decreased rate of open conversion in the robotic group (4.5% vs 10.2% $p=0.177$), however this was non-significant. There was no difference in total length of stay (2.97 days vs 3.32 days $p=0.208$), nor were there any significant differences in complications, return to OR, or readmissions between groups. On cost-analysis, the robotic group incurred significantly higher overall and operative costs when compared to the laparoscopic group; with a total cost ratio (robotic to laparoscopic) of 1.37 and operative cost ratio of 1.81 (p values <0.001).

Conclusions/Discussion: Patients undergoing robotic colorectal surgeries had similar clinical outcomes to the laparoscopic group. While there was a non-significant trend toward decreased rates of conversion to open in the robotic group, operative times were significantly longer and there was no difference in overall length of inpatient stay. The robotic group experienced significantly higher total admission costs, which were found to be driven primarily by the increased costs associated with use of the robotic platform.

P1315 Patient Characterisitcs & Clinical Outcomes

Characteristic	Laparoscopic	Robotic	P-Value
Number of Patients	167	65	
Mean Age	57.5	61	0.12
Male	69 (41.3)	30 (46.2)	0.50
Operation Performed			
Ileocecectomy	21 (12.6)	5 (7.7)	0.506
Right Hemicolectomy	49 (29.3)	15 (23.1)	
Left Hemicolectomy	6 (3.6)	2 (3.1)	
Sigmoidectomy	73 (43.7)	32 (49.2)	
Low Anterior Resection	18 (10.8)	11 (16.9)	
Indication for Operation			
Neoplasm	108 (64.7)	38 (58.5)	0.159
Diverticular Disease	36 (21.6)	20 (30.8)	
Inflammatory Bowel Disease	20 (12.0)	4 (6.2)	
Other	3 (1.8)	3 (4.6)	
ASA Class			
1	2 (1.2)	2 (3.1)	0.112
2	83 (49.7)	26 (40.0)	
3	75 (44.9)	37 (56.9)	
4	6 (3.6)	0 (0.0)	
Clinical Outcomes			
OR Time (mean)	141.3	199.9	<0.001
Conversion to Open	17 (10.2)	3 (4.6)	0.177
Mean Length of Stay	3.32	2.97	0.208
Return to OR	6 (3.6)	3 (4.6)	0.720
Post-operative Leak	6 (3.6)	3 (4.6)	0.720
Readmission within 30 days	10 (6.0)	5 (7.7)	0.638

MIMICKING ACUTE APPENDICITIS: REVIEW OF CT CHARACTERISTICS WITH PRIMARY APPENDIX NEOPLASM VERSUS CONTROLS.

P1316

A. Hill, T. Downes, H. Simon, P. Klepchick, P. Williams, T. Schroeder, R. Schorr, J. McCormick
Pittsburgh, PA

Purpose/Background: Primary appendiceal neoplasms (AN) are rare, accounting for roughly 1% of all appendectomies. A majority are detected incidentally on final pathology for presumed acute appendicitis. Preoperative identification can impact operative decision making and overall treatment plan. We hypothesize that there are certain features on preoperative CT to suggest a neoplasm is present.

Methods/Interventions: Using our network's cancer database, 86 patients with primary AN were identified from 2008-2018. A 1:2 case control design was chosen to properly power the study. Benign acute appendicitis controls were matched based on gender and age. Clinical and pathological data was reviewed. Preoperative CT scans were de-identified and randomized. Scans were analyzed by 3 board certified radiologists specializing in body imaging. The radiologists were blinded to the patient diagnosis and exact study design, but familiar with the general aim of the project. Scans were independently reviewed, and each evaluator commented on fixed criteria. Univariate analysis compared patient and CT demographics across appendiceal diagnoses. Univariate logistic regression determined variables associated with AN. All models were controlled for by reader and repeated nature of the scans. Primary outcome measures were preoperative patient and CT factors associated with AN.

Results/Outcome(s): 27 of the 86 AN patients presented with acute abdominal pain and had preoperative CT imaging available. 54 control patients were included for 1:2 case control study. There was no significant difference in age, gender or family history of cancer between the groups. The majority (96%) of controls had appendectomy as the primary operation vs 74% in the AN group. Patients with AN treated with appendectomy underwent subsequent operation for right colectomy in 40% of cases, possibly higher (20% lost to follow up after appendectomy). Patients with a personal history of cancer had a 7.8 fold higher odds of having an AN when compared to those without (OR[CI]: 1.3 [1.5, 16]), p=0.017. The likelihood of having an AN was significantly increased in patients whose CT scan was remarkable for absence of mucosal hyperenhancement, intraluminal gas, and appendicolith. Presence of soft tissue mass, increased wall thickness, organized fluid, lymphadenopathy, and peritoneal disease were each independently associated with increased odds of having AN.

Conclusions/Discussion: Approximately 30-50% of AN present with secondary appendicitis. Our data suggests absence of mucosal enhancement, intraluminal gas and appendicolith, as well as presence of soft tissue mass, wall thickening, organized fluid, lymphadenopathy, or peritoneal disease on CT scan can be suggestive of an underlying AN. Preoperative detection can guide decision making, advise avoidance of percutaneous drainage, and potentially eliminate the need for a second operation, reducing patient morbidity and healthcare costs.

Variable	OR [95% CI]	p-value
Age, years	1.0 [0.99, 1.1]	0.16
Sex, male	1.0 [0.38, 2.7]	0.99
Personal history of cancer, yes	7.8 [1.5, 16]	0.017
Family history of cancer, yes	2.4 [0.89, 6.3]	0.086
Prior abdominal Surgery, yes	1.8 [0.68, 4.7]	0.24
Primary Operation, laparoscopic appendectomy	0.14 [0.034, 0.58]	0.0069
PO contrast, yes	3.0 [1.0, 85]	0.035
IV contrast, yes	0.67 [0.24, 1.8]	0.45
Max Diameter group[a]	1.5 [0.98, 2.2]	0.059
Wall Thickness, mm[b]	1.3 [1.1, 1.5]	0.0004
Enteric Contrast, yes	3.2 [1.5, 6.7]	0.0018
Intraluminal / intramural calcification, yes	1.9 [0.69, 5.0]	0.22
Cystic fluid, yes	1.0 [0.58, 1.9]	0.91
Intraluminal gas, yes	0.27 [0.12, 0.61]	0.0015
Appendicolith, yes	0.56 [0.31, 0.99]	0.047
Appendix soft tissue mass, yes	3.1 [1.7, 5.7]	0.0004
Mucosal hyperenhancement, yes	0.48 [0.27, 0.86]	0.014
Stratified wall appearance, yes	0.61 [0.29, 1.3]	0.19
Periappendiceal fat stranding, yes	1.4 [0.57, 3.5]	0.46
Free fluid, yes	0.85 [0.50, 1.4]	0.57
Organized fluid, yes	3.8 [1.3, 10]	0.013
Lymphadenopathy, yes	3.1 [1.5, 6.4]	0.0022
Regional colonic or small bowel disease, yes	2.1 [1.0, 4.4]	0.050
Peritoneal Disease, yes	6.7 [1.3, 14]	0.022
[a] maximum diameter on axial image grouped 0-4mm, 5-9mm, 10-14mm, 15mm+; [b] mean (SD) wall thickness is 3.9mm (1.8) for the controls and 5.1mm (2.7) for appendix neoplasm		

Univariate logistic regression to determine odds ratios (OR) for each clinical and radiography independent variable's effect on appendix neoplasm. Regression model is controlled with the reference to the acute appendicitis group. All models are controlled for by reader and repeated nature of the scans.

IMPACT OF COLORECTAL FELLOWSHIP TRAINING ON BUNDLE COMPLIANCE.

P1317

P. Addison, A. Pihokken, J. Agnew, J. Martz
New York, NY

Purpose/Background: Colorectal surgery has one of the highest rates of surgical site infections (SSIs), affecting between 5 and 30% of patients. A bundle uses a standardized set of interventions aimed at reducing the SSI rate. We hypothesize that fellowship-trained colorectal surgeons as compared to non-colorectal fellowship trained surgeons will have increased rates of enrollment and compliance with the bundle that may correlate with a decreased SSI rate.

Methods/Interventions: Patients undergoing emergent and elective colorectal surgery between January 2017 and June 2019 at a large healthcare network encompassing 27 hospitals were retrospectively reviewed. Bundle adherence and compliance were prospectively tracked by nursing staff and collected in an administrative database. For descriptive analysis, median and ranges were calculated. To compare the effect of fellowship training, a univariable analysis with a negative binomial regression model with offset was performed.

Results/Outcome(s): Of 4575 patients, 3827 (84%) underwent elective cases and 748 (16%) emergent. These were performed by a total of 108 surgeons, including 31 (29%) colorectal surgeons and 77 (71%) non-colorectal fellowship trained surgeons. SSIs occurred in 133 elective cases (3.5%) and 61 emergent cases (8.2%). Colorectal surgeons were more likely than non-colorectal fellowship trained surgeons to enroll their patients in the bundle (43% vs 30%), with a 28% increase in enrollment (95% confidence interval 5-56%, p = 0.01). When their patients were enrolled in the bundle, colorectal surgeons had an overall compliance rate of 93% (range 94-100%) and non-colorectal fellowship trained surgeons 92% (range 67-100%). Colorectal surgeons were more compliant with wound protector use (90% vs 74%, p = 0.001) and chlorhexidine prep use (96% vs 88%, p = 0.02). However, there was insufficient evidence to conclude that overall bundle compliance differed between colorectal and non-colorectal fellowship trained surgeons. There was also insufficient evidence to conclude that SSI rates were correlated with bundle enrollment or compliance.

Conclusions/Discussion: Fellowship-trained colorectal surgeons were more likely than non-colorectal fellowship trained surgeons to enroll their patients in a bundle, but once patients were enrolled, compliance rates were similar. As we were unable to demonstrate that this increased enrollment decreased SSI rates, further studies are necessary to determine if colorectal surgeons are more likely to operate on patients with an increased SSI risk.

THE SURGEON'S ROLE: SURGICAL FACTORS AND THE LIKELIHOOD OF CHEMOTHERAPY AFTER COLECTOMY.

P1318

S. Jochum, L. DeCesare, S. Majeed, T. Beck, H. Govekar, A. Bhama, T. Saclarides, D. Hayden
Chicago, IL

Purpose/Background: Adjuvant chemotherapy (CT) has been shown to improve survival of stage III and some high-risk stage II colon cancers. However, some patients who are eligible for chemotherapy receive CT in a delayed manner or not at all. The aim of our study was to identify perioperative factors associated with the administration of adjuvant chemotherapy for patients undergoing colectomy for stage III colon cancer.

Methods/Interventions: After obtaining IRB approval, a single center retrospective review was conducted of adult patients with stage III colon cancer from January 2012-December 2018. Patients were excluded if they had concurrent operations or if the surgery was emergent. Univariate and multivariate analyses were performed to compare perioperative factors between patients who did and did not receive adjuvant CT

Results/Outcome(s): A total of 120 patients met inclusion criteria. The mean age was 61.3 (27-89 years) with a female predominance (59.3%). Most patients were white (54.5%), while 33.9% were black, and 4.2% were Asian. 76.3% of the study population received adjuvant CT. Patients who had minimally invasive surgery (MIS) were more likely to receive chemotherapy than those with an open approach (p=0.0038). On multivariate analysis, patients who underwent attempted MIS which required conversion were nine times less likely to undergo chemotherapy compared to those who had completed MIS surgery (p = 0.0127). Patients who had a colorectal surgeon perform the colectomy were 4.5 times more likely to receive CT when compared to colectomy performed by a general surgeon (p=0.019). Those who required reoperation were less likely to be administered chemotherapy; in fact, no patient who had an unexpected return to the operating room received CT (p=0.0112). Similarly, patients readmitted within 30 days were less likely to get adjuvant CT (p=0.0095). Patients who had a surgical site infection (SSI) or surgery before 2015 were more likely to undergo CT in a delayed manner (p=0.041 and 0.031, respectively).

Conclusions/Discussion: The majority of stage III colon cancer patients received chemotherapy following colectomy. Some factors were amenable, including MIS approach and colorectal specialization. Patients with unplanned reoperation and readmission were also less likely to receive CT. Wound complications delayed chemotherapy administration. Due to the known survival benefits of CT for stage III colon cancer, administration of chemotherapy should be optimized through commitment to minimally invasive surgery and colorectal specialization for cancer surgery as well as vigilant efforts to decrease conversion rates and postoperative infections.

THE VALUE OF CLINICAL VARIABLES BEYOND ADMINISTRATIVE VARIABLES FOR PREDICTING ADVERSE OUTCOMES IN PATIENTS UNDERGOING SURGERY FOR COLORECTAL CANCER.

P1319

C. Cheney, A. Crispin, U. Mansmann
Munich, Germany

Purpose/Background: Improved risk-prediction is a priority in surgical research for informing individual patient decisions, as well as quantifying hospital performance. There are two main data sources from which such risk prediction models are developed. The first are administrative databases, which include sources such as billing and claims data. Clinical data on the other hand, are collected from medical records at the point of care and come from sources like chart reviews, clinical registries,

and electronic medical records. We set out to examine the extent to which clinical variables improve prediction for adverse outcomes following colorectal cancer surgery.

Methods/Interventions: Regression models for predicting postoperative *mortality*, *major complication*, *surgical site infection*, *anastomotic leakage*, *bleeding*, and *readmission* were developed using data including 6,107 patients with colorectal cancer who had surgery at 102 German hospitals. We approximated "administrative" models for the six outcomes using comorbidity variables plausibly available in administrative datasets. Then, we added clinical variables to this model to create an "administrative-clinical" models. To assess the predictive power of these models we compared the discrimination, calibration, and overall predictive accuracy (Brier score) between the two models.

Results/Outcome(s): During model development, ASA class, operation technique (eg. partial versus total colectomy), and serum albumin level were important predictors for many of the outcomes. The model discrimination for the outcome of *mortality* improved most after adding clinical variables (0.06 increase in AUC). *Surgical site infection* was the least affected by the addition of clinical variables (0.03 increase in AUC). There was a statistically significant improvement in AUC with the addition of clinical variables for all six outcomes (p<0.001). Estimating overall predictive accuracy, the Brier score for *major complication* was most improved by the added clinical variables (decreased by 0.004), while the Brier score for *readmission* was the least improved (decreased by 0.0005).

Conclusions/Discussion: Models including additional clinical variables showed improved discrimination and overall prediction accuracy across all six surgical outcomes. However, calibration was consistently better in the smaller "administrative" models. Identification of the most predictive variables could help develop simplified databases and models, reducing the burden of data collection. Considering the improved prediction accuracy, clinical data collection seems justified.

Event rates and model performance statistics comparing the administrative and administrative-clinical models across postoperative outcomes (n = 6,107). The metrics reported were calculated using probabilities obtained from 10-fold cross-validation. This was done to reduce the amount of overfitting reflected in the metrics.

Postoperative Outcome	Events, N (%)	AUC[a]	Discrimination Slope[b]	Calibration (Slope / Intercept)	H-L Test[c]	Brier Score
Mortality	177 (2.9)					
Administrative		0.810 (0.782-0.839)	0.0623	1.11 / 0.32	p=0.407	0.0263
Administrative-clinical		0.868 (0.845-0.891)	0.1039	1.23 / 0.67	p=0.003	0.0248
		diff=0.058 p<0.001	IDI=0.0416			diff=0.002
Major Complication	980 (16.0)					
Administrative		0.647 (0.628-0.666)	0.0388	1.14 / 0.22	p=0.313	0.129
Administrative-clinical		0.690 (0.672-0.708)	0.0582	1.29 / 0.45	p<0.001	0.125
		diff=0.043 p<0.001	IDI=0.0194			diff=0.004
Surgical Site Infection	846 (13.8)					
Administrative		0.639 (0.619-0.660)	0.0296	1.21 / 0.37	p=0.076	0.115
Administrative-clinical		0.670 (0.650-0.690)	0.0390	1.41 / 0.71	p<0.001	0.114
		diff=0.031 p<0.001	IDI=0.0094			diff=0.001
Anastomotic Leakage	461 (7.5)					
Administrative		0.695 (0.672-0.719)	0.0334	1.09 / 0.20	p=0.849	0.0674
Administrative-clinical		0.748 (0.726-0.769)	0.0493	1.30 / 0.67	p<0.001	0.0657
		diff=0.053 p<0.001	IDI=-0.0159			diff=0.002
Bleeding	210 (3.4)					
Administrative		0.727 (0.692-0.762)	0.0290	1.26 / 0.79	p=0.302	0.0320
Administrative-clinical		0.772 (0.742-0.804)	0.0418	1.45 / 1.37	p<0.001	0.0313
		diff=0.045 p<0.001	IDI=0.0128			diff=0.0007
Readmission	342 (5.6)					
Administrative		0.632 (0.602-0.662)	0.0087	1.47 / 1.31	p=0.184	0.0523
Administrative-clinical		0.687 (0.659-0.715)	0.0141	1.80 / 2.18	p<0.001	0.0518
		diff=0.055 p<0.001	IDI=0.0054			diff=0.0005

[a] The confidence intervals and p-values for AUC were calculated using DeLong's method. [66]
[b] IDI stands for integrated discrimination index. It is the difference between the two discrimination slopes of the compared models.
[c] The Hosmer-Lemeshow statistic was calculated using 10 risk deciles.

ELEVATED CARCINOEMBRYONIC ANTIGEN AT THE TIME OF RECURRENCE AS A POOR PROGNOSTIC FACTOR IN COLORECTAL CANCER: A PROPENSITY SCORE MATCHING ANALYSIS.

P1320

J. Huh, J. Shin, Y. Park, Y. Cho, H. Kim, S. Yun, W. Lee
Seoul, Korea (the Republic of)

Purpose/Background: Serum carcinoembryonic antigen (CEA) is one of the most widely tumor markers for screening test, predicting treatment response and survival and detecting recurrence in colorectal cancer patients. Although CEA is not a disease-specific marker, it is widely used as a tumor marker to monitor recurrence. However, the prognostic impact of CEA level at the time of recurrence in recurrent colorectal cancer has not been addressed. Thus, the objective of this study was to investigate the prognostic impact of elevated CEA level at the time of recurrence on survival in patients with recurrent stage I-III colorectal cancer who underwent curative surgery.

Methods/Interventions: Between 2007 and 2014, 962 consecutive recurrent patients for colorectal cancer were analysed. These patients were classified into two groups according to CEA level at the time of recurrence (r-CEA): high r-CEA (≥ 5 ng/ml) (n = 428) and normal r-CEA (< 5 ng/ml) (n = 534). We used 1:1 propensity score matching (PSM) to adjust for potential baseline confounders between groups.

Results/Outcome(s): A total of 778 patients were matched, with 389 in each group. Before PSM, the high r-CEA group showed adverse histologic features such as high initial preoperative CEA level, advanced stage, the presence of lymphatic/perineural invasion and tumor budding positive. After PSM, there were no significant difference in factors described above between the two groups. Patients with an elevated r-CEA level showed significantly poorer survival than those with normal levels. The 5-year overall survival rate was 56.5% in the high r-CEA group and 66.0% in the normal r-CEA group (P = 0.008). The 5-year cancer specific survival rate was 61.7% in the high group and 67.5% in the normal group (P = 0.035). In multivariate analysis of prognostic factors, high preoperative CEA level at the time of recurrence, poor histologic grade and lymphatic invasion were associated with poorer overall survival.

Conclusions/Discussion: Patients with colorectal cancer who have an elevated r-CEA level show significantly poorer prognosis than those with normal levels of r-CEA. Therefore, r-CEA level can be used as an additional prognostic indicator of poor outcomes in colorectal cancer. Aggressive adjuvant treatment need to be considered for patients with initially high CEA level and lymph node positive who are prone to recurrence.

PROGNOSIS OF EARLY COLON CANCER: PATHOLOGIC T2N0 VS. T3N0.

P1321

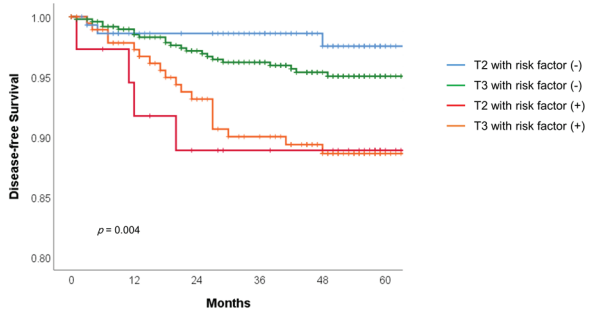
S. Lee, S. Yeom, C. Kim, H. Kim
Hwasun, Korea (the Republic of)

Purpose/Background: Stage I colon cancer has good prognosis, and therefore, no chemotherapy is given for stage I colon cancer. However, the prognostic factors for pathologic T2N0 colon cancer has not been well studied. The aim of this study was to compare the prognoses of pathologic T2N0 and T3N0 colon cancers, and to find out prognostic factors for pathologic T2N0 colon cancer.

Methods/Interventions: We retrospectively reviewed primary colon cancer patients who underwent curative resection between January 2007 and December 2015, and included 889 patients who were classified as postoperative pathologic stage T2-3N0M0. Clinicopathologic characteristics were analyzed to identify independent prognostic factors.

Results/Outcome(s): Among patients included, 185 (20.8%) had T2 tumors, and 704 (79.2%) had T3 tumors. Patients with T2 and T3 tumors showed no difference in 3-year disease-free survival (3Y DFS) (96.6% vs. 94.5%, $p = 0.257$). Univariate survival analysis showed that perineural invasion (3Y DFS, 90.8% vs. 96.0%, $p = 0.013$) and retrieved lymph nodes < 12 (3Y DFS, 86.2% vs. 95.5%, $p = 0.014$) were associated with DFS. Multivariate Cox regression analysis showed that perineural invasion (adjusted hazard ratio [HR] = 2.041, 95% confidence interval [CI] 1.122–3.712, $p = 0.019$) and retrieved lymph nodes < 12 (adjusted hazard ratio [HR] = 2.994, 95% confidence interval [CI] 1.327–6.753, $p = 0.008$) were independent prognostic factors for DFS. Pathologic T2 tumors with poor prognostic factors showed similar oncologic outcome compared with T3 tumors with poor prognostic factors (3Y DFS 88.9% vs. 90.0%, $p = 0.916$), while they had a tendency of poorer oncologic outcome compared with T3 tumors without any prognostic factor (3Y DFS 88.9% vs. 96.2%, $p = 0.089$).

Conclusions/Discussion: Pathologic T2N0 and T3N0 tumors showed similar oncologic outcomes. Patients with T2N0 tumors with poor prognostic factor should carefully be followed considering relatively high risk of recurrence.



EFFECT OF ADJUVANT CHEMOTHERAPY ON SURVIVAL BENEFIT IN STAGE III COLON CANCER PATIENTS STRATIFIED BY AGE: A REAL-WORLD COHORT STUDY.

P1322

H. Kawamura[1], T. Morishima[1], A. Sato[1], M. Honda[2], I. Miyashiro[1]
[1]*Osaka, Japan;* [2]*Fukushima, Japan*

Purpose/Background: The benefits of adjuvant chemotherapy for Stage III colon cancer in older patients remain unclear. The aim of this study is to assess the effect of age on survival benefit of adjuvant chemotherapy in Stage III colon cancer patients.

Methods/Interventions: In this multi-center, retrospective cohort study, we analyzed patient-level information on clinical conditions and vital status. We performed a record linkage of population-based cancer registry data from the Osaka Cancer Registry and administrative data produced under the Diagnosis Procedure Combination (DPC) system. The study population comprised patients who received curative surgery and pathological diagnosis of Stage III colon cancer between 2010 and 2014 at 36 designated cancer care hospitals in Osaka. Patients were divided into two groups based on age at diagnosis: those aged <75 and those aged 75 years. The effect of adjuvant chemotherapy on overall survival was analyzed using Cox proportional hazards regression models for all-cause mortality with inverse probability weighting (IPW) of propensity scores (PS). Adjusted hazard ratio was compared between these groups.

Results/Outcome(s): A total of 783 patients with a median follow-up duration of 1,495 days were analyzed. Median age was 72 (interquartile range (IQR): 65-78) years: 307 (39.2%) patients were aged 75 years and 476 (60.8%) were aged <75 years. The proportion of older patients who received adjuvant chemotherapy was lower than younger patients (36.8% vs 73.3%, P<0.001). The effect of adjuvant chemotherapy was different among two groups: adjusted hazard ratio of younger patients was 0.56 (95% confidence interval (CI): 0.33-0.94, P=0.027) and older patients 1.07 (95%CI: 0.66-1.74, P=0.78).

Conclusions/Discussion: The benefit of adjuvant chemotherapy is smaller in older patients with Stage III colon cancer.

CASE OF MIXED GOBLET CELL CARCINOID-ADENOCARCINOMA WITH MSH-2/MSH-6 LOSS OF EXPRESSION.

P1323

E. Bevier-Rawls
Sandy Springs, GA

Purpose/Background: Malignant neoplasms of the appendix are rare tumors and consist of less than 1% of gastrointestinal cancers. Mixed carcinoid-adenocarcinoma are a specific subset of appendiceal tumors that usually behave differently than appendiceal neuroendocrine or primary adenocarcinoma tumors. These tumors usually present in equal distribution of males and females during the fifth decade of life. DNA mismatch repair deficiency can lead to an accumulation of microsatelite instability. This instability allows for accumulation of mutations which can lead to adenoma and cancer formation. Several DNA mismatch repair (MMR) genes have previously been identified that have a role in colon cancer and have been linked to hereditary cancers. These are MLH1, MSH2, MSH6 or PMS2. Here we present a rare case of an appendiceal tumor with both goblet cell carcinoid -adenocarcinoma and MSH2/MSH6 loss of expression.

Methods/Interventions: Our patient was a fifty-six year old female with a past medical history significant for peripheral vascular disease, COPD, extensive tobacco use initially presented to her primary care physician with abdominal pain. Laboratory values significant for anemia <6 Hb and CT scan with large pelvic mass, closely involving the right colon, right ovary and sigmoid colon. Colorectal surgery and gynecologic oncology were consulted for evaluation. CEA and CA-125 levels were 9.9 and 44 respectively. There was no significant family history of colon or gynecologic malignancies. A colonoscopy was attempted, however it was aborted secondary to extrinsic compression in the pelvis. The patient was taken during that same hospitalization for an exploratory laparotomy. There was a large, greater than 20 cm, mass in the pelvis, adherent and involving the right colon, appendix, sigmoid colon, uterus and right ovary. An en bloc resection was performed. The patient tolerated the procedure well, had a routine post-operative course and discharged home on post-operative day seven.

Results/Outcome(s): Pathology revealed the tumor of appendiceal origin. A mixed goblet cell carcinoid adenocarcinoma measuring twenty-two centimeters in size. There was lymphovascular invasion, zero of thirteen lymph nodes negative for cancer. The final stage pT4bN1cM1b. At our institution, identification of MMR genes is routinely checked on all specimens suspected of gastrointestinal origin. In our specimen there was loss of expression in MSH2 and MSH6 genes. This loss of expression, favors a possible genetic component. The patient has been referred for full genetic work up, results remain pending at this time.

Conclusions/Discussion: This was an interesting pathology case in a patient who has an appendiceal origin mixed goblet carcinoid adenocarcinoma along with loss of expression of MSH2 and MSH6. Once the final genetic panel is complete, we hope to gain insight on the potential connection these mixed appendiceal tumors have with DNA MMR genes mutations.

DEVELOPING AN ESD PRACTICE FOR THE COLORECTAL SURGEON: GRADUAL EXPANSION OF VOLUME AND PRACTICE LOCATION.

P1324

K. Guyton, I. Sapci, A. Bhatt, D. Liska, M. Valente, J. Church, S. Steele, E. Gorgun
Cleveland, OH

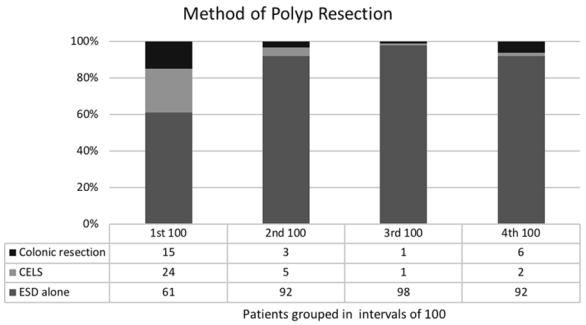
Purpose/Background: Endoscopic submucosal dissection (ESD) can be utilized to completely remove large colorectal polyps. Advanced endoscopic skills are required with prior research suggesting proficiency is reached after 100 cases. Due to the unique skill set and learning curve to become proficient in endoscopic resection of challenging polyps, few surgeons currently perform ESD. Here we aim to describe a model for successful initiation and expansion of a surgical colorectal ESD practice.

Methods/Interventions: We queried an IRB-approved prospectively-maintained database of ESDs performed by a high-volume colorectal surgeon between 2011 and 2019. This surgeon had extensive pre-ESD experience with conventional colonoscopy and standard snare polypectomy. While the initial 100 cases were all performed in the operating room (OR), subsequent cases were selectively performed in the endoscopy suite (ES) based on polyp and patient factors following review of colored images from prior colonoscopies. ESD characteristics were compared over the first 400 patients, analyzed in four intervals of 100 patients. Data points analyzed included procedure location, need for colonic resection or combined endoscopic-laparoscopic surgery (CELS), polyp size, location within the colon, pathology, and complications.

Results/Outcome(s): 400 patients underwent resection of large colorectal polyps. Frequency of cases increased gradually; when dividing in three year periods, the number of cases per period increased from 20 to 104 to 236. As planned, the first 100 ESDs were performed in the OR. 63% of the subsequent ESDs were performed in the ES, including half of the second 100 cases and 70% of the 3rd and 4th. After the first 100 patients, polyp resection utilizing ESD alone increased significantly (figure). One patient in each subsequent interval of 100 required transfer from the ES to OR for formal resection due to incomplete resection; on final pathology one was a malignancy. Patient demographics were comparable between the 4 interval groups. Overall, median polyp size was 30mm,

62% were located in the right colon, 43% removed by ESD were removed *en-bloc*, and 8% had malignancy on final pathology. Per interval, rate of colectomy for benign final pathology decreased from 9% in the first interval to 1%, 0% and 2% in subsequent intervals. Overall ESD complication rate was 13% and did not differ significantly between intervals.

Conclusions/Discussion: This series demonstrates successful implementation of a model of gradual acquisition of ESD skills with incremental increase in volume and transition from the OR to endoscopy suites. Initial proficiency can safely be attained while in a controlled environment where an alternative plan is readily available. With increasing experience, ESD can be performed safely and effectively with decreased utilization of laparoscopic assistance and OR resources, facilitating an efficient growth in volume.



MERITS AND DEMERITS OF IMATINIB FOR RECTAL GIST: A CASE SERIES.

P1325

T. Kurokawa, G. Tsurita, Y. Azuma, Y. Kanemoto, K. Yazawa
Tokyo, Japan

Purpose/Background: We encountered three patients who manifested various phenomena to imatinib therapy for rectal gastrointestinal stromal tumor (GIST), and we report herein on the merits and demerits of imatinib.

Methods/Interventions: Case 1:A 31-year-old female visited a nearby physician with bloody stool. A submucosal mass was found on the right side of the rectum by rectal examination. CT findings: A 60mm-long elliptical tumor was found in the right upper and lower rectum. The center was hypodense and mild enhancement was seen throughout the tumor. Case 2:A 83-year-old woman was diagnosed by detailed examinations for dyschezia and tenesmus approximately one year before the surgery. The tumor tended to shrink with imatinib therapy from 53mm to 33mm, but gradually renal dysfunction began to develop. MRI findings: Signals and a slightly enhanced area observed in region caudal to the lesion believed to show microbleeding, but the enhancement effect of the lesion was unclear overall. Case 3:A 80-year-old man had bleeding during bowel movements and dyschezia one year before diagnosis. He visited a local physician for a sense of distension in the lower abdomen, which started approximately two weeks before diagnosis. The patient was referred to our hospital for a mass palpable in the lower rectum in a rectal examination. CT findings: 90mm irregularly shaped tumor in the cavity of the lesser pelvis. Multiple liver and bone metastases. CF findings: 75%-circumference type 2 lesion with lower margin at 3cm of AV. Fistula in the mound on the anal side.

Results/Outcome(s): Case 1: Preoperative imatinib adjuvant chemotherapy was given. The tumor shrank to 33mm and then transanal rectal excision was performed. Approximately 5 years have passed without recurrence. Case 2: Miles' operation was performed. Approximately four years have passed without recurrence thereafter. Case 3: Imatinib therapy initiated while fasting and Total Parenteral Nutrition. WBC and CRP increased the next day. SpO2 decreased from the third day of imatinib therapy. Forced breathing started, and the level of consciousness also gradually decreased. He was intubated during the day and administered catecholamine and albumin, but the level of consciousness did not improve. He went into CPA in the 4th day.

Conclusions/Discussion: Surgical resection is effective, but recently, c-KIT-positive GISTs have shown complete response to imatinib. Case 1 and 2 both showed a complete response to neoadjuvant therapy and have followed a good postoperative course without recurrence. However, Case 2 has been observed with renal dysfunction, and Case 3 had sudden changes in conditions suggesting tumor lysis syndrome. Tumor lysis syndrome is relatively rare and only occurs in 0.3% of solid tumors, but given its high 40% mortality, it is extremely important to pay attention to this side effect directly related to the complete responses seen in patients treated by imatinib.

Patient demographics and GIST characteristics

	Age/Sex	Chief complaint	Tumor volume	Metastasis	Opereation	MIB-1 index	Prognosis	c-kit	CD34	α-SMA	S-100	Desmin
Case 1	31/F	Bloody stool	60mm	none	Transanal rectal tumor excision	1-2%	5 years more	+	+	+	-	-
Case 2	83/F	Dyschezia, tenesmus	53mm	none	Miles'operation	Low	4 years more	+	+	+	-	-
Case 3	80/M	Bleeding during bowel movements, dyschezia	90mm	multiple liver, bone	none	20-30%	4 days after administration	+	+	N/A	N/A	N/A

'3-PASS' ANAL PAPANICOLAOU TEST FOR PATIENTS WITH HPV IMPROVES SAMPLING.

P1326

C. Fong, A. Kim
New york, NY

Purpose/Background: Human papillomavirus (HPV) is the most common sexually transmitted infection in the United States. At-risk populations such as those with HIV or immune-compromise may have persistent HPV infection. A persistent HPV infection is strongly associated with anal cancer and anorectal warts. These skin changes may

be detected early through the use of the anal Pap smear screening method. The standard method is a 'one pass' (1P) brush method. In our study, we wanted to look at the outcomes of our anal Pap tests with a 'one pass' method compared to a 'three pass' (3P) method.

Methods/Interventions: An anal Pap smear screening was performed on all patients who have been sexually active and have had a history of anal intercourse. A total of 100 patients who were over 18 years of age and visited the colorectal clinic of the Department of Surgery at Mount Sinai Hospital, New York, NY were recruited for the study. The sample was collected using a cytology brush which was afterwards immersed into a thin prep Pap Test solution. For each procedure, the cytology brush was passed into the anus of the patient one time (1P), as per some hospital protocols, and three times (3P), as recommended by the product manufacturer. Subsequently, a clinical examination, a digital rectal exam followed by a visual examination using an anoscope, was performed.

Results/Outcome(s): The Pap smear test had an adequate number of cells in 91% of all samples. 9% of all samples with results had inadequate cells. Of these, 3% occurred in the 3P method versus 6% in the 1P method. The test was negative for any lesions or malignancies for 11% of the patients (5% 3P versus 6% 1P). A total of 86% of all the patients in both groups had an abnormal result. Of these abnormal results, 45% of the patients had atypical squamous cells of undetermined significance (ASCUS). Low-grade squamous intraepithelial lesions (LSIL) were detected in 30%. High-grade squamous epithelial lesions (HSIL) were detected in 3%. Patients with a positive Pap smear test were advised to undergo High Resolution Anoscopy (HRA).

Conclusions/Discussion: While the number of inadequate cell specimens were higher in the 1P group than in the 3P group, the number of negative results in both groups were similar (7% vs 6%). There was no difference between the distribution of resultant pathologies. The 3P method may be beneficial in not having to repeat an anal Pap smear, which may cause the patient significant stress and discomfort. A pap smear is a simple, noninvasive and cost-effective tool for the early detection of precancerous lesions in high-risk patients. To prevent the delay of detection and treatment of possible pre-cancerous lesions, we should utilize a method that leads to a errorless result. According to this study, although the 3P method does show evidence of obtaining more accurate results, the difference between the two methods is not large enough to come to a definitive conclusion.

PREOPERATIVE USE OF OPIOIDS AND SEDATIVES IS INDEPENDENTLY ASSOCIATED WITH INCREASED COST OF COLORECTAL SURGERY.

P1327

N. Jackson, T. Gan, D. Davenport, B. Evers, A. Bhakta
Lexington, KY

Purpose/Background: Colorectal resection operations are increasing as are the number of medications patients take preoperatively. Preoperative use of opioid (OPD) and sedatives (SDT) has been found to increase risk of poor outcomes following colorectal surgical resections. Limited literature exists on how the preoperative use of these medications affect the cost of colorectal surgery. The purpose of this study is to evaluate the impact of preoperative use of OPD and SDT on cost of care related to colorectal resections.

Methods/Interventions: The American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) database was queried for all patients undergoing a colorectal resection at a single tertiary care hospital from January 1, 2013 to December 31, 2016. Those under the age of 18 and those admitted for trauma were excluded. Retrospective chart review of the admission medicine reconciliation was performed to gather preoperative use of OPD and SDT. Preoperative characteristics and lab values, intraoperative variables and postoperative outcomes were collected from the NSQIP data. Hospital costs data was obtained from the financial accounting system. Stepwise regression models were utilized to assess the impact of preoperative OPD and SDT use on cost of care.

Results/Outcome(s): The query yielded 1185 patients meeting inclusion criteria. The mean total hospital cost was $25,700 for patients undergoing colorectal resection. Patients preoperatively prescribed OPD (30.1%) and SDT (18.5%) had significantly higher costs in all cost categories, including ICU costs and pharmacy costs. Preoperative factors associated with increased cost include emergency operation status, non-home transfer status, higher ASA classification, septic shock, dyspnea at rest, medical comorbidities, open procedure, dirty/infected wound class, open abdomen, transfusion requirement and ostomy creation. Multivariable analysis adjusting for preoperative and operative cost drivers revealed opioids and sedatives were associated with increased costs (opioids: 7% increase above mean, 95% C.I. 1% - 14%; sedatives: 11%, 95% C.I. 3% - 19%).

Conclusions/Discussion: Prescription opioid and sedative use was identified to be an independent risk factor for increased hospital cost following colorectal resection surgery. Preoperative evaluation and optimization of OPD and SDT use should be considered with evaluating resource utilization in patients undergoing colorectal resections.

OUTCOMES IN AN AGING POPULATION AND EFFECTS ON SURGICAL DECISION MAKING: A MULTI-INSTITUTION RETROSPECTIVE REVIEW.

P1328

E. Hagen, L. Gerson, A. Shah, J. Scanlan, E. Bailey, D. Pollock, J. Griffin
Seattle, WA

Purpose/Background: The octogenarian patient population is consistently increasing and their operations typically portend higher risk. Our goal was to compare surgical outcomes of >80 years old to younger patients. Additionally, we examined different surgical approaches (robotic, laparoscopic, and open) to see if those approaches resulted in different outcomes.

Methods/Interventions: A multi-institution retrospective database included colorectal surgical patients accrued over a three year period (2017-2019). Multiple surgical procedures (right, left and total colectomies, colostomy reversal, LAR, and APR) and three different approaches (open, laparoscopic, and robotic) were included in the database. T tests and ANOVA were used to evaluate outcome differences. SPSS 22 was the statistical program employed, and P<.05 was our significance criterion.

Results/Outcome(s): 560 patients were included (415 less than 80 yrs old, mean age=59.4; 139 were > 80 yrs old, mean age=85.5). The old and younger cohorts differed significantly on case mix index (CMI), percent transfused, length of stay (LOS), malnutrition, and total cost (all P<.05). However, when results were segmented by surgical approaches used, a consistent pattern emerged: octogenarians showed no differences in total costs ($24,766 vs. $24,376) or LOS (3.59 vs 3.44 days) when a robotics approach was used, and highly significant differences (all P<.002) in costs ($25,004 vs. 16,746) and LOS (7.98 vs 4.51 days) when an open approach was used. Subset investigation showed difference between robotic and open LOS in patients under 70 yrs old (23%), increasing LOS difference in patients 70-79 years of age (39%), and large LOS differences (132%) in the octogenarians. Conversely, robotic vs laparoscopic LOS comparisons showed no difference in patients under 70 yrs old (1%) or in patients 70-79 years old (6.5% difference), but a suggestive trend in the octogenarians (38% difference).

Conclusions/Discussion: Improved medical care extends lifespan and surgery is being performed on increasingly older patients. Surgical approaches that perform adequately for younger patients may be less suitable for the elderly, particularly those above 80 years of age. The large outcome differences between robotic and open approaches seen in our octogenarian population suggests that the robotic approach results in better outcomes. Robotic and laparoscopic outcomes appear very similar in patients under 80, but might start to diverge in the octogenarian population.

TRANSVERSUS ABDOMINIS PLANE BLOCK (TAP) IN PATIENTS UNDERGOING LAPAROSCOPIC COLORECTAL SURGERY: A RANDOMIZED CONTROLLED TRIAL.

P1330

C. Hawes, D. Vinter, J. Parker, B. Smith, K. Kendrick, M. Honaker
Macon, GA

Purpose/Background: Transversus abdominis plane (TAP) blocks are a form of pain control in which a local anesthetic is given between the internal oblique and the transversus abdominal muscle. This type of pain management is used in an attempt to decrease narcotic use and its subsequent consequences. The primary goal of this study was to see if TAP blocks decreased narcotic use in patients undergoing laparoscopic colorectal surgery.

Methods/Interventions: A randomized controlled trial was conducted at a single institution over an approximate 2-year period. Patients undergoing laparoscopic colorectal resections where randomized using a sealed envelope technique to either the TAP block group or the no TAP block group. Amount of narcotic used, amount of acetaminophen and nonsteroidal anti-inflammatory drugs was collected for the first 4 post-operative days (POD). Demographic data, length of stay (LOS), readmission rate and 90-day mortality was also examined. Narcotic amounts were converted to milligram morphine equivalents (MME). Continuous variables were reported as means and standard deviations or medians and interquartile ranges and were analyzed with the unpaired t-test or Mann-Whitney U test. Categorical variables were reported as frequencies and percentages and were analyzed with the Chi-square test or Fisher's exact test. Statistical significance was determined with a p<0.05. All analyses were conducted using SAS version 9.4 (SAS Institute, Cary, NC).

Results/Outcome(s): 153 patients were initially eligible for enrollment. After exclusions a total of 88 patients were included. 47 were randomized to the TAP group and 41 to the no TAP group. There was no difference in age (62.2 vs 61.9;p=0.92), race (p=0.068), gender (p=1.0), indication for operation (p=0.75), or Charlson Comorbidity Index (1.0 vs 1.0; p=0.72) between the two groups. The amount of acetaminophen and nonsteroidal anti-inflammatory drugs (NSAIDS) also did not differ between the two groups (p>0.05) for each postoperative day. The MME for each POD was similar for POD 1 (22.5 vs 37.5; p=0.054), POD 3 (15 vs 22.5; p= 0.48), and POD 4 (22.5 vs 10.5; p=0.42). The only difference was on POD 2 the TAP group had significantly less narcotic intake than the no TAP group (17.5 vs 30; p=0.047). Median LOS was 3 days for both groups. Readmissions, post-operative complications, and mortality was also similar between the two groups (p>0.05).

Conclusions/Discussion: Our findings indicate that TAP blocks only offer a benefit in decreasing narcotic use on POD 2 and do not offer an advantage in LOS. Therefore, TAP blocks may not be a cost effective form of pain control in laparoscopic colorectal surgery.

A COMPARISON OF RESECTIONAL PROCEDURES FOR RECTAL PROLAPSE: IMPACT OF APPROACH, AGE AND COMORBIDITY.

P1331

D. Thompson, P. Goffredo, G. Steers, K. Freischlag, I. Gribovskaja-Rupp, J. Hrabe, M. Kapadia, I. Hassan
Iowa City, IA

Purpose/Background: Depending on patient comorbidities as well as surgeon preference, rectal prolapse can be managed by rectopexy alone or by resectional procedures such as resection with rectopexy or proctosigmoidectomy. These resectional procedures can be performed through the abdomen by open, laparoscopic and robotic techniques or by a perineal approach. However, there is limited data regarding perioperative outcomes comparing these approaches particularly in high risk patients. Our aim was to evaluate the 30-day postoperative outcomes of patients undergoing resectional procedures for rectal prolapse and comparing different operative approaches.

Methods/Interventions: The Proctectomy Targeted Participant Use File (PUF) database from the American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) for 2016-2018 was queried for the primary ICD code of rectal prolapse and CPT codes (45130, 45402, 45550) for resection with rectopexy (RR) or perineal proctosigmoidectomy (PS). RR was further stratified into open, laparoscopic, and robotic categories. A subset of high-risk patients ≥ 75 years old with ASA ≥ 3 were identified for further analysis. Patient characteristics, operative variables, and disease factors were analyzed using univariate and multivariate analyses.

Results/Outcome(s): Overall 1,608 patients were identified of which 30% were high-risk. Seventy-seven percent of patients underwent a PS while among patients undergoing RR, 38% were open, 36% laparoscopic, and 26% robotic. In the high-risk group, 95% patients underwent a PS. The incidence of any Clavien-Dindo complications was 22%, 9%, 9%, and 11% in open, laparoscopic, robotic RR, and PS respectively ($p = 0.002$). Major complications, readmission, or return to the operating room were not different between RR by any approach and PS ($p > 0.05$). After adjusting for available confounders, there were fewer overall complications associated with laparoscopic, robotic RR and PS compared to open RR (Table 1). In a direct comparison between laparoscopic and robotic RR, no significant differences in outcomes were observed (all $p > 0.05$). In the high-risk group undergoing PS, the incidence of overall and major complications was 9% and 3% respectively, which was not significantly different from patients <75 years and/or ASA 1-2 (12% and 5% respectively).

Conclusions/Discussion: Perineal proctosigmoidectomy continues to be a safe procedure for managing rectal prolapse, particularly in elderly, sick patients. Minimally invasive resectional procedures are associated with less morbidity compared to an open approach in healthy and/or younger patients, with no difference between laparoscopic and robotic techniques. Ultimately, the treatment approach for rectal prolapse should be individualized based on patient age, comorbidities and clinical judgment.

Table 1. Multivariable Logistic Regression for Clavien-Dindo Complications

	All Patients (n = 1,608)			High-Risk Group (n = 475)		
	Odds Ratio	95% CI	P Value	Odds Ratio	95% CI	P Value
Approach						
Open	Reference	-	-	Reference	-	-
Laparoscopic	0.38	0.18-0.77	0.008*	1.83	0.22-15.33	0.576
Robotic	0.34	0.15-0.78	0.011*	Null	Null	Null
Perineal	0.44	0.28-0.70	< 0.001*	0.37	0.10-1.36	0.133

*Significance Determined at p < 0.05

LONG TERM OUTCOMES OF COMPOSITE ANTROPYLORIC VALVE TRANSPOSITION WITH GLUTEUS MAXIMUS / GRACILIS MUSCLE WRAP FOR NEOANAL RECONSTRUCTION.

P1332

A. Chandra, N. Kumar, A. Pai, P. Rajan, V. Gupta, P. Joshi, A. Dangi, P. Kumar
Lucknow, India

Purpose/Background: Techniques of Composite Antropyloric valve transposition with Gluteus Maximus / Gracilis Muscle wrap for end stage fecal incontinence have been reported previously with encouraging initial results. We now report the long term follow up results for these patients.

Methods/Interventions: This study was conducted at a single tertiary care institution. 8 patients underwent Gracilis Muscle wrap and 11 patients underwent Gluteus Maximus Muscle Wrap after Antropyloric valve transposition. Patient groups included Post traumatic perineal injury, Post Abdominoperineal Resection for Carcinoma Rectum and Adult patients of High Anorectal Malformation. All patients were on permanent colostomy for intractable fecal incontinence. Outcome measures included St Mark's Incontinence Score, Anal Manometry, Frequency of bowel movements and personal interviews.

Results/Outcome(s): Composite Antropyloric valve transposition with Gracilis Muscle Wrap This group included 8 patients with a median follow up of 59 months (range, 55- 63 months). Anal Manometry showed a mean resting pressure of 24.4 mm hg and squeeze pressure of 85.6 mm hg. The mean SMIS score was 5.5. Median frequency of defecation was 4 times per day. All patients needed 2-3 pads per day for mucous discharge from the transposed pylorus and all were satisfied with the procedure. **Composite Antropyloric valve transposition with Gluteus Maximus Muscle Wrap** This group included

11 patients with a median follow up of 36 months (range, 30-48 months). Anal Manometry showed a mean resting pressure of 26.2 mm hg and squeeze pressure of 102.3 mm hg. The mean SMIS score was 3.5. Median frequency of defecation was 3 times per day. All patients needed 2-3 pads per day for mucous discharge from the transposed pylorus and all were satisfied with the procedure. Outcomes after Composite Antropyloric valve transposition with Gluteus Maximus Muscle wrap were found to be better than after Gracilis Muscle wrap in both short and long term follow up.

Conclusions/Discussion: Composite Antropyloric valve transposition with Gluteus Maximus / Gracilis Muscle wrap provides a continence mechanism after Neoanal reconstruction in patients of end stage fecal incontinence and the results are satisfactory in long term.

PARARECTAL HEMATOMA: A POSSIBLE COMPLICATION AFTER STAPLED TRANSANAL RECTAL RESECTION (STARR).

P1333

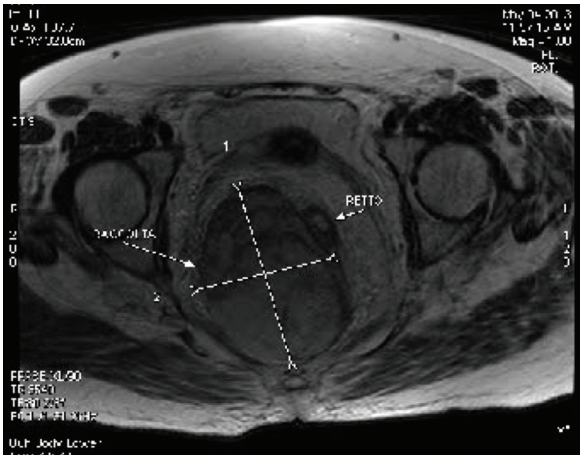
G. Giarratano[1], M. Shalaby[2], C. Toscana[1], P. Sileri[1]
[1]*Rome, Italy;* [2]*Mansoura, Egypt*

Purpose/Background: Treatment of rectal prolapse and obstructed defaecation with the stapled transanal rectal resection (STARR) technique is becoming increasingly popular between patients and surgeons. Unfortunately, serious complications have been reported in the literature

Methods/Interventions: We report two cases of severe bleeding developed in 2nd and 3nd PO day after modified STARR procedure performed with only single stapler in two women affected by rectal prolapse and ODS.

Results/Outcome(s): The first case was a 66-years old female who underwent a modified STARR procedure for ODS. On the 2nd POD, the patient presented with continuous endorectal pain, a moderate rectal bleeding, and dysuria. Blood test revealed a HB decrease reaching 7.23 g/dl and leukocytosis. Pelviabdominal US first then MRI were performed revealing a right pararectal hematoma of 96.3 x 85.7 mm. Serial HB test was ordered on a daily basis combined with a follow-up pelviabdominal US indicating the gradual spontaneous resolution in the hematoma documented by decreasing in size. On the 13th POD, the hematoma was resolved completely. The patient was discharged on the 14th POD after a follow-up US was performed revealing the complete resolution of the hematoma. The second case; was a 38-years old female who offered a modified STARR procedure for external full-thickness complete rectal prolapse. Similarly to the previous case, on the 3rd POD the patient presented with continuous endorectal pain, a moderate rectal bleeding and dysuria. Blood test revealed a HB decrease reaching 6.1g/dl. CT scan was performed and a posterior pararectal hematoma of 11.2 x 9.3 mm was diagnosed. On 11th POD the hematoma was spontaneously resolved which was confirmed by a follow-up CT showing the complete resolution. The patient discharged on the 12th POD. Both cases were followed-up in the outpatient's department with no recurrence of their initial symptoms or worsening in their functions.

Conclusions/Discussion: The modified STARR procedure represents a safe and effective option for the treatment of ODS and external rectal prolapse by restoring the anatomy which in turn improve function. However, it could result in major complications like acute bleeding and hematoma; it should always be performed by experienced surgeons. This hematoma could be avoided by making the parachute sutures superficial and allowing 20 seconds after closing the stapler before firing and another 20 seconds after firing before opening the stapler. Routine blood test on the 1st POD is recommended and in case if decrease by 2g/dl combined with postoperative dysuria and endorectal pain we prefer to perform pelviabdominal CT scan. Conservative treatment should be offered first specially in hemodynamically stable patients with no active bleeding or expanding hematoma on imaging



ACUPUNCTURE WITH BIOFEEDBACK PRACTICE AND RESULT IN FUNCTIONAL ANORECTAL PAIN: A FIVE YEARS' REPORT FROM A PELVIC FLOOR CENTER IN CHINA.

P1334

S. Ding
Nanjing, China

Purpose/Background: *To observe the short and long-term efficacy of acupuncture combined with biofeedback in the treatment of functional anorectal pain(FARP).*

Methods/Interventions: *Clinical data of 142 patients who met the functional gastrointestinal disorders and functional anorectal pain based on criteria of Rome III undergoing acupuncture with biofeedback therapy from August 2010 to November 2015 in retrospectively analyzed. Telephone and outpatient clinic recheck was used as a standard follow-up.*

The clinical effect of short-term and long-term data collected from the diseased- based database was evaluated with a visual analog pain scale(VAS) (0-10 points), short-form health survey questionnaire(SF-36) (0-148 points) and Glazer's surface electromyography (sEMG). The overall satisfaction and effectiveness (VAS was >30%) were evaluated at the end of treatment (short-term) and during follow-up (long-term).

Results/Outcome(s): *The effective follow-up data were obtained from 71.1%(101/142) of patients and the median follow-u time was 28 (3-67) months. The VAS of 101 cases was 6.09 ±1.78, 1.99±1.89 and 3.55± 2.60 before treatment, at the end of treatment and during follow-up respectively. Though the VAS during follow-up was higher than that at the end of treatment, but still significantly lower than that before treatment (P< 0.05). The SF-36 score of 31 patients was 82.0 ±16.9, 94.0 ± 15.1 and 88.1 ± 15.3 before treatment, at the end of treatment and during follow-up respectively (P<0.05). The effective rates were 85.9% (122/142) at the end of treatment and 75.2% (76/101) during follow-up, and the patients' satisfactory rates were 92.3% (131/142) and 84.2 (85/101), respectively. The differences of the surface electromyography(sEMG) between pre-treatment and on follow-up, In Pre-baseline process, the mean amplitude(AVG)on follow-up was lower than pre-treatment(P<0.01), In flick contraction process, in tonic contraction and Endurance processes, the peak AVG was higher (P<0.01), the Coefficient of Variance(CV) was lower (P<0.01) compared follow up to pre-treatment.*

Conclusions/Discussion: *Acupuncture with biofeedback has significant short-term and long-term efficacy in treating functional anorectal pain, and its degree of satisfaction is high. It can reduce the pelvic floor muscle overactivity and function. The existing defecation and urinary dysfunction symptoms improved simultaneously after treatment. It is promising and needs further study.*

CLINICAL OUTCOMES AND PROGNOSTIC FACTORS OF R0 RESECTED COLORECTAL CANCER WITH SYNCHRONOUS PERITONEAL METASTASIS.

P1284

K. Fukata, Y. Fukunaga, T. Mukai, T. Yamaguchi, T. Nagasaki, T. Akiyoshi, T. Konishi, S. Nagayama
Koto-ku, Tokyo, Japan

Purpose/Background: Peritoneal metastasis is one of the poor prognostic factors in patients with colorectal cancer (CRC) and so it was categorized to M1c (metastasis to the peritoneum with or without other organ involvement) in tumor-node-metastasis (TNM) classification (8th ed published in 2017). Several studies to improve prognosis of patients with peritoneal dissemination by surgical intervention with no excessive invasiveness. The aim of this study is to investigate clinical outcomes and prognostic factors of R0 resected CRC with synchronous peritoneal metastasis.

Methods/Interventions: We analyzed data from a retrospectively recorded database of 250 CRC patients with stage IV due to peritoneal dissemination who underwent surgery between January 2004 and December 2016 at Cancer Institute Hospital of the Japanese Foundation for Cancer Research, Tokyo, Japan. These patients were classified into three groups by type or surgery: Non-resected group (N group; 32 cases) whose primary tumor was had not resected (bypass and stoma), palliative primary tumor resection (P group; 164 cases), and R0 resection group (R0 group; 54 cases). Clinicopathological findings and long-term outcomes were investigated.

Results/Outcome(s): The 3-year overall survival (OS) of this series was 29.1%. The 3-year OS was 57.2%, 22.3%, and 13.7% in R0, P, and N group, respectively. R0 group was significantly better 3- year OS than P and N group (p=<0.0001). Compared with peritoneal metastasis grading(P1-P3) according to the Japanese classification, the 3-year OS was P1:45.8%, P2:32.7%, and P3:20.2%(p=<0.0001). Univariate analysis for predictors of OS identified histological type, lymphatic and venous invasion, liver metastasis, peritoneal metastasis grading, R0 resection, and perioperative chemotherapy as significant prognostic factors. Multivariate analysis of these factors revealed that histological type, lymphatic and venous invasion, liver metastasis, R0 resection, and perioperative chemotherapy was independent prognostic factor. The 3-year recurrence free survival (RFS) in R0 group was 28.6%. Although there was no significant difference in 3- year RFS among the peritoneal metastasis gradings, that in patients with one peritoneal metastasis was better than that with 2 or more peritoneal metastases (one peritoneal metastasis:42.1%, two or more peritoneal metaitasis:10.8%, p=0.0489). The type of recurrence was the most in local recurrence followed by liver metastasis.

Conclusions/Discussion: R0 resection of colorectal cancer with synchronous peritoneal metastasis should be considered especially for patients for whom perioperative chemotherapy would be possible to give. The number of peritoneal dissemination is likely to influence RFS.

ROBOTIC RESECTION FOR COLORECTAL ADENOCARCINOMA: A RETROSPECTIVE ANALYSIS OF A 5 YEAR FOLLOW-UP, RECURRENCE, AND SURVIVAL RATES AT A SINGLE INSTITUTION.

P1285

S. Parascandola[1], S. Hota[2], S. Smith[1], M. Tampo[3], V. Obias[1]
[1]Washington, DC; [2]Norfolk, VA; [3]Manilla, Philippines

Purpose/Background: Robotic-assisted techniques are becoming increasingly more prevalent in the management of colorectal malignancy. While large database studies offer insight on survival outcomes, few studies have examined

both recurrence rate and survival in their analyses. The purpose of this study was to evaluate the 5-year overall and disease-free survival rates after robotic colon resection for invasive colon adenocarcinoma by a single surgeon. This is largest single surgeon analysis to date.

Methods/Interventions: A total of 236 patients underwent consecutive robotic resection for colon and rectal adenocarcinoma between December 2009 and November 2018 January by a single surgeon at a single institution. Records were retrospectively reviewed and follow-up data was obtained.

Results/Outcome(s): The study population comprised 139 patients who underwent robotic resection of colon and rectal adenocarcinoma with > 5 years of follow-up. Of these cases, 5 year follow up data was available for 86 patients (62.8%). In these patients, the 5-year overall survival for colon and rectal cancer was 80.2%. The disease-free survival rate at 5 years post-operatively was 62.0%. The survival data were as follows for 5-year overall survival, respectively stage I (n = 37) 83.8%; stage II (n = 22) 81.8%; stage III (n = 21) 81.0 %; stages I-III combined, (n = 66), 82.5%; stage IV (n=5), 40%. In those with recurrences, distant recurrence was the most common pattern, with 70.8% of cases.

Conclusions/Discussion: Strict maintenance of a single institution database can be challenging but can provide valuable insight into morbidity and mortality rates, rates of follow up, and oncologic results. In this case series, available follow up data demonstrated similar overall survival and recurrence patterns to the currently published outcomes. While further outcomes-based research within the field of robotics is needed, this study contributes to the growing body of literature regarding robotic-assisted techniques.

A COMPARATIVE ANALYSIS OF RIGID PROCTOSIGMOIDOSCOPY, COLONOSCOPY, AND ABDOMINAL COMPUTED TOMOGRAPHY IN DETERMINING TUMOR HEIGHT AMONG PATIENTS DIAGNOSED WITH RECTAL CANCER.

P1286

S. Tan, G. Maranon, M. Chan, R. Cabantac, R. Azores
Quezon City, Philippines

Purpose/Background: The accurate measurement of rectal tumor height (distance from the distal edge of a rectal cancer lesion from the anal verge) permits treatment stratification for sphincter preservation and benefit from neoadjuvant therapy. Three widely used tools in the assessment of a patient with rectal cancer are colonoscopy, abdominal computed tomography (CT), and rigid protosigmoidoscopy. All three, have the ability to determine rectal tumor height. Colonoscopy however, has a tendency to bend and its lack of a precise metric reference contribute to its inaccuracy. CT on the other hand, relies on combined measurements based on approximations from digital images. Despite strong recommendations from several panels, there is still weak evidence gathered from observational studies on the significance of rigid proctosigmoidoscopy. It is not consistently used in clinical practice, and is currently replaced by colonoscopy and/or abdominal CT. This study provides a comparison of rectal tumor height with the use of rigid proctosigmoidoscopy, colonoscopy, and CT scan.

Methods/Interventions: This comparative analysis is a retrospective study of 101 patients who underwent rigid proctosigmoidoscopy, colonoscopy, and abdominal computed tomography for the investigation of rectal cancer from 2013 to 2018 at St. Luke's Medical Center, Philippines. Paired t-test was used to compare differences in mean rectal tumor height between rigid proctosigmoidoscopy versus colonoscopy, rigid proctosigmoidoscopy versus CT scan, and colonoscopy versus CT scan. Bland-Altman analyses were done to determine the agreement of the different modalities. STATA 14 was used for data analyses with results considered significant at $p < 0.05$.

Results/Outcome(s): There is a significant difference between mean tumor heights measured by rigid proctosigmoidoscopy (6.98 ± 3.89 cm) and colonoscopy (8.45 ± 4.23 cm). Colonoscopy overestimates tumor height by 1.37 ± 2.35 cm ($p < 0.001$). Also, there is a significant difference between mean tumor heights measured by rigid proctosigmoidoscopy (6.98 ± 3.89 cm) and CT scan (7.90 ± 4.24 cm). CT scan overestimates tumor height by 0.92 ± 2.14 cm ($p < 0.001$). There is no significant difference between mean tumor heights measured by colonoscopy (8.45 ± 4.23 cm) and CT scan (7.90 ± 4.24 cm) ($p = 0.0785$). The level of agreement is slightly higher between proctosigmoidoscopy and CT scan as differences in mean tumor heights ranged from -5.20 cm to 3.36 cm, as compared to proctosigmoidoscopy and colonoscopy (-6.07 cm to 3.37 cm).

Conclusions/Discussion: This study demonstrates that rigid proctosigmoidoscopy yields significantly different tumor height measurements from colonoscopy and abdominal CT, which can alter treatment plans for patients with rectal cancer. Rectal tumor height measurements of colonoscopy and abdominal CT shows no significant difference.

PRIMARY TUMOR LOCATION IMPACTS SURVIVAL IN COLORECTAL CANCER PATIENTS WITH LIVER METASTASES.

P1287

K. Bingmer, A. Ofshteyn, J. Bliggenstorfer, W. Kethman, J. Ammori, R. Charles, S. Stein, E. Steinhagen
Cleveland, OH

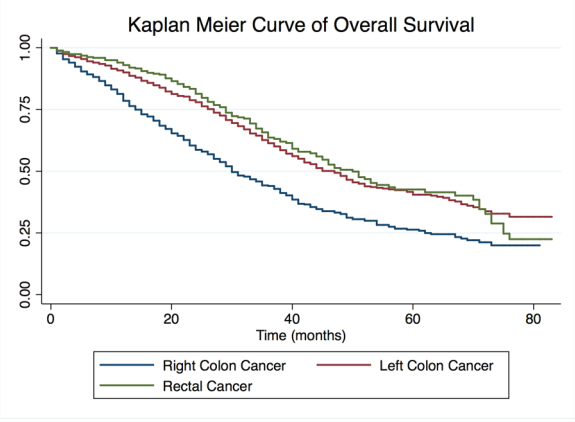
Purpose/Background: Recent literature has shown that right-sided colon cancers are associated with worse outcomes compared to left-sided cancers. However, these

studies typically exclude patients with metastatic disease. We hypothesize that right-sided cancers with synchronous liver metastases who undergo resection of primary and metastatic sites have worse overall and cancer-specific survival compared to left-sided cancers.

Methods/Interventions: The Surveillance, Epidemiology, and End Results (SEER) database from years 2010-2016 was used to identify colorectal cancer patients with liver metastases who underwent surgical resection of both primary and metastatic disease. Patients with metastatic disease of other organs were excluded. Patients were divided into three cohorts by primary diagnosis: right-sided colon cancer (RCC), left-sided colon cancer (LCC), and rectal cancer (ReC). Demographic and clinical characteristics were compared using chi-squared analysis. Overall and cancer-specific survival were analyzed by multivariate cox regression adjusted for demographic and pathologic features.

Results/Outcome(s): There were 2,275 patients who met inclusion criteria; 861 (38%) RCC, 1,059 (46%) LCC and 355 (16%) ReC. Patients with RCC were more likely to be female, older at diagnosis, and black (all $p<0.001$). RCC primary tumors were more likely to be larger than 5cm, higher grade, and mucinous (all $p<0.001$). Compared to patients with RCC, both LCC and ReC, respectively, had improved overall (HR 0.72, $p<0.001$; HR 0.75, $p=0.006$) and cancer-specific (HR 0.71, $p<0.001$; HR 0.73, $p=0.008$) survival. There was no difference in overall or cancer-specific survival between LCC and ReC. Kaplan-Meier curve of overall survival is shown in Figure 1.

Conclusions/Discussion: Overall and cancer-specific survival varies based on primary tumor location for colorectal cancer patients with isolated liver metastases who undergo complete resection. Patients with RCC have significantly worse survival than LCC or ReC. This provides additional evidence that RCC tumors are different from LCC and ReC tumors. Future studies should determine factors responsible for this disparity, and potentially identify targeted treatment strategies based on primary tumor location.



THE LURKING BUG? CLOSTRIDIOIDIES DIFFICILE FOLLOWING STOMA CLOSURE.

P1288

J. Martinolich, A. Perez-Tamayo, M. Abdulhai, S. Rangarajan, J. Harrison, V. Chaudhry
Chicago, IL

Purpose/Background: *Clostridioides difficile-* associated colitis (CDAC) is an acute infectious colitis with increasing prevelance in our health care system. In 2011, an estimated 453,000 patients were diagnosed with CDAC, nearly twice the estimated incidence a decade earlier. Multiple studies have identified colorectal surgery patients as a subset of patients at increased risk for contracting CDAC, with a rate of 2.2-6%. It has been speculated that destruction of the normal bacterial flora of the intestine in the peri-operative period predisposes the colon to overgrowth of *Clostridioides difficile* and spore production. No study has evaluated the rate of CDAC in patients undergoing ostomy reversal, in which previously defunctionalized bowel is re-introduced into continuity with the gastrointestinal tract. We hypothesize that the diverted bowel will have a higher rate of *CDiff* contraction due altered bacterial content and the abnormal mucosa of disused bowel. This study aims to determine the incidence of CDAC in patients following ostomy reversal, and to identify risk factors for contraction of the infection.

Methods/Interventions: This is a retrospective analysis evaluating consecutive ostomy closures (ileostomy and colostomy) at a large county hospital from January 2012 to December 2017. The incidence of CDAC was documented. Pre-operative demographics were assessed including age, gender, time-lapse since ostomy creation, current diagnosis of diabetes, coronary artery disease, hypertension, or history of clostridium difficile, hospital admissions, and use of proton pump inhibitors. Post-operative outcomes included length of stay and additional procedures. Differences between the CDAC and non-CDAC group were compared. The primary outcome was incidence of CDAC.

Results/Outcome(s): Ninety-eight patients undergoing ostomy closure (72 ileostomy, 26 colostomy) were evaluated. Three patients (3.1%) were diagnosed with CDAC; all were managed conservatively with antibiotics. A total of 22 patients (22.4%) were tested for *CDiff* post-operatively, thus 13.6% of tested patients were positive for *CDiff*. All patients in the CDAC group were female, while only 48.4% in the non-CDAC group were female. There were no significant differences in age, time-lapse since ostomy creation, ASA score, ostomy type, or post-operative hospital admissions between groups. Rates of comorbidities and PPI use were higher in the non-CDAC. The length of stay was higher in the CDAC group (17.7 vs 7.9 days). All CDAC cases occurred within 35 days of reversal.

Conclusions/Discussion: Incidence of CDAC following ostomy closure in this single center population is 3.1%. This is within the described rate of this disease following all colorectal surgeries. Reintroduction of defunctionalized bowel into the gastrointestinal tract does not increase in the rate of CDAC.

SURGICAL MANAGEMENT OF COLONIC INJURIES IN THE TRAUMA PATIENT AND RESTORATION OF BOWEL CONTINUITY.

P1289

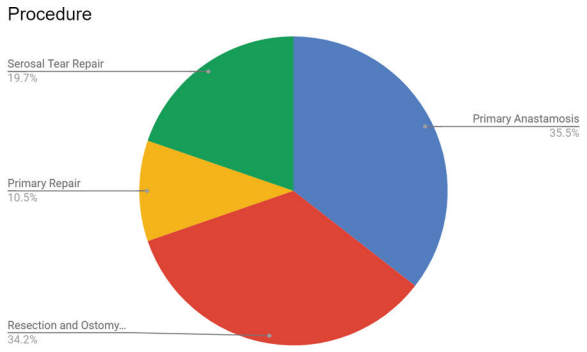
R. Friedman, M. Wozniak, M. Kwiatt
Camden, NJ

Purpose/Background: Patients suffering blunt and penetrating abdominal trauma may require bowel resection with anastomosis or stoma creation. While there is some debate about the need for and safety of reversal, it is a standard practice to reverse stomas in an effort to improve the quality of life and limit morbidity associated with the presence of a stoma. The purpose of our study is to establish the rate of primary anastomosis, stoma creation, and rate of subsequent stoma reversal. Additionally we sought to find factors associated with initial primary anastomosis and stoma reversal in the trauma population.

Methods/Interventions: A retrospective review of Cooper University Hospital's trauma registry was performed from January 2008 to December 2017. Patients who were documented to have colon injuries and went to the operating room were included. Pregnant women and patients 17 years of age and younger were excluded. Individual charts were reviewed to confirm the injury and procedure performed. Patient characteristics including age, race, injury severity score (ISS) and body mass index (BMI) was recorded. T-test was utilized to compare factors associated with those who underwent primary anastomosis versus stoma creation and to compare those whose stomas were reversed by any Cooper surgeon and those with permanent stomas.

Results/Outcome(s): 76 patients were found to have colonic injuries upon exploration. 27 patients (35.5%) underwent resection and primary anastomosis while 26 (34.2%) underwent resection and stoma creation. 8 (10.5%) patients underwent primary repair of their injury and 15 (19.7%) patients underwent repair of serosal tears (**Figure 1**). 21 patients (80.8%) who underwent stoma creation were subsequently reversed while 5 (19.2%) patients did not get reversed. When comparing patients who underwent a primary anastomosis to patients who underwent stoma creation, there was no significant difference ISS [(13.4, 17) p=0.09] or patient age [(34.6 years, 35.0 years) p=0.42]. Those who underwent stoma reversal were more likely to be younger [(33.2 years, 44.6 years) p=0.04] and to have a lower BMI [(27.4, 34.7) p=0.01]. There was no difference in ISS between the reversed and permanent stoma [(17.3, 16) p=0.41].

Conclusions/Discussion: Trauma patients are a unique cohort who commonly require bowel resection with anastomosis or stoma creation. While nearly half of the patients requiring colonic resection underwent stoma creation, the majority of patients were eventually reversed. Obesity may be a modifiable risk factor for permanent stoma status among the trauma population. Providing dietary and lifestyle modification education to this population may increase stoma reversal rates.



META-REGRESSION ANALYSIS OF PRIMARY ANASTOMOSIS VERSUS NONRESTORATIVE RESECTION FOR PERFORATED DIVERTICULITIS WITH PERITONITIS.

P1290

R. Essani[1], M. Gachabayov[2], H. Lee[2], A. Rojas[2], R. Bergamaschi[2]
[1]*Temple, TX;* [2]*Valhalla, NY*

Purpose/Background: The aim of the study was to assess the impact of bias in randomized trials comparing primary anastomosis (PRA) to nonrestorative resection (NRR) for perforated diverticulitis with peritonitis.

Methods/Interventions: Pubmed, MEDLINE via Ovid, EMBASE, CINAHL, Cochrane Library, and Web of Science databases were systematically searched. Postoperative morbidity following emergency resection was the primary endpoint. Quality assessment of the included studies was performed using Cochrane Quality Assessment Tool including recruitment bias, crossover with intention-to- treat analysis. Haenszel-Mantel method with odds ratios (OR (95%CI)) and inverse variance method with mean difference (MD (95%CI)) as effect measures were utilized for dichotomous and continuous outcomes, respectively. Ad-hoc meta-regression was performed to assess the impact of bias.

Results/Outcome(s): Four randomized controlled trials totaling 382 patients (180 PRA vs. 204 NRR) were included. Morbidity rates following emergency resection did not differ [OR(95%CI)=0.99 (0.65, 1.51); p=0.95; NNT=96]. Organ/space SSI rates were 3.3% in PRA vs. 11.3% in NRR [OR(95%CI)=0.29 (0.12, 0.74); p=0.009; NNT=13]. Postoperative morbidity rates

following ostomy reversal were significantly lower in PRA [OR(95%CI)=0.31 (0.15, 0.64); p=0.001; NNT=7]. Pooled ostomy non-reversal rates were 16% in PRA vs. 35.5% in NRR [OR(95%CI)=0.37 (0.22, 0.62); p=0.0001; NNT=6] with high heterogeneity (I 2 =63%; Tau 2 =8.17). Meta-regression analysis revealed significant negative correlation between PRA-to- NRR crossover rate and ostomy non-reversal rate (p=0.029).

Conclusions/Discussion: This meta-regression found that crossing over to NRR and analyzing as intention-to-treat patients randomized to PRA was the most prevalent bias to favorably impact the postoperative morbidity of PRA.

EARLY COLONOSCOPIC IRRIGATION CAN BE A SAFE AND FEASIBLE TREATMENT IN UNCOMPLICATED RIGHT-SIDED COLONIC DIVERTICULITIS: A RETROSPECTIVE PILOT STUDY.

P1291

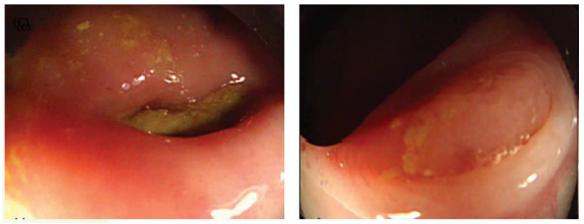
H. Kim[1], B. Kye[1], Y. Lee[2], I. Lee[2]
[1]Suwon-si, Korea (the Republic of); [2]Seoul, Korea (the Republic of)

Purpose/Background: Traditionally, colonoscopy has not been performed in patients with acute phase of colonic diverticulitis to avoid worsening of the disease. Repetitive mechanical damages by fecal fragments in the diverticulum may be one of the important causes of prolonged symptoms and disease recurrence. So eliminating fecal materials in the diverticulum can relieve the symptom and reduce its duration, probability of recurrence and use of antibiotic. This study aimed to identify the safety and efficiency of early colonosocpic irrigation (CI) for the removal of fecal materials compared with conservative care (CC) in right-sided colonic diverticulitis (RCD).

Methods/Interventions: This was a retrospective cohort study in patients diagnosed with uncomplicated RCD at Seoul St. Mary's hospital, The Catholic University of Korea. The CI group consisted of 20 patients who underwent early CI during hospitalization from October 2017 to May 2018. The CC group was selected from August 2016 to June 2017 and included twice as many patients as the experimental group (40 patients) after two-to-one propensity score matching. The right-sided colon was defined as the length from the cecum to the hepatic flexure colon. RCD was diagnosed on the basis of abdominal computed tomography findings, and CI was performed within 2 days after the diagnosis.

Results/Outcome(s): There were no cases of complications or deterioration of the disease during or after CI in the CI group. The duration of intravenous antibiotic was 3.2 days in the CI group, and 4.1 days in the CC group ($p=0.024$), and the duration of oral antibiotic use was 6.9 days in the CI group and 8.8 days in the CC group ($p=0.001$). The total frequency of pain-killer use was 0.9 in the CI group, 1.5 in the CC group ($p=0.039$). In the laboratory test, with respect to the tendency of C-reactive protein (CRP), we observed a steady decline in the CI group. Especially, the CRP level increased during hospitalization in the CC group, whereas decreasing CRP level after early CI was observed in the CI group. In the subgroup analysis of the CI group, the time to colonoscopy was 1.50 (± 0.89) days and performing colonoscopy within 1 day of admission was significantly related to less use of pain killers ($p=0.011$).

Conclusions/Discussion: This study showed the possibility that early CI can be a safe procedure and feasible treatment that can be reduce the use of antibiotics in uncomplicated RCD. Also, early CI for uncomplicated RCD may be useful for relieving symptoms and accurate diagnosis to differentiate other colonic disease in the early period of symptom.



Colonoscopic Irrigation (before and after)

COMPUTED TOMOGRAPHY VERIFIED FREQUENCY OF INCISIONAL HERNIA ONE YEAR POSTOPERATIVELY AFTER COLORECTAL CANCER RESECTION.

P1292

P. Buchwald[1], N. Karlsson[1], S. Zackrisson[2]
[1]Malmö, Sweden; [2]Malmö, Sweden

Purpose/Background: A common complication to colorectal cancer (CRC) resections, both open and minimal invasive surgery (MIS), is incisional hernia (IH). The aim of the study was to determine computed tomography (CT)-verified IH frequency one year after CRC surgical resection in patients sutured with 1:4 aponeurosis closure, identify risk factors for IH and assess to what extent IH required surgical correction.

Methods/Interventions: From the Swedish Colorectal Cancer Registry (SCRCR) all patients who had undergone resectional CRC surgery during 2012-2016 at Skåne University Hospital Sweden were identified. The one-year follow-up CT was re-evaluated to determine the presence of an IH. Clinical data were collected from SCRCR and the patients' medical records were reviewed to determine whether an existing IH was corrected surgically (last follow-up January 1 st 2019). Non-parametric tests and binary logistic regression analysis were used for statistical analysis.

Results/Outcome(s): 1744 tumors were identified resulting in 1238 patients meeting the inclusion criteria. In total 26.3% (n=326) had IH at the one-year follow-up CT. 13.1% (n=162) of the CRC resections were MIS and there was no significant difference in IH frequency between open and MIS resections. However, for converted vs non-converted MIS the IH frequencies were 43.9% (n=18) and 24.1% (n=39) respectively (p=0.012). Significant risk factors for IH were age (≥55 years), body mass index (≥28 kg/m^2), procedure time (<3 hours) and wound rupture. During the follow-up time, 13.8% (n=45) had corrective surgery for IH.

Conclusions/Discussion: CT-verified IH after CRC surgery is common despite 1:4 aponeurosis closure but few IHs are corrected surgically. IH is equally frequent after open surgery and MIS. However, the risk of having IH is considerably higher after MIS conversion. Previously described risk factors, i.e. age, body mass index, procedure time and wound rupture, were established.

DISPARITIES IN SURGICAL RESECTION OF SYNCHRONOUS LIVER METASTASES IN COLON CANCER PATIENTS.

P1293

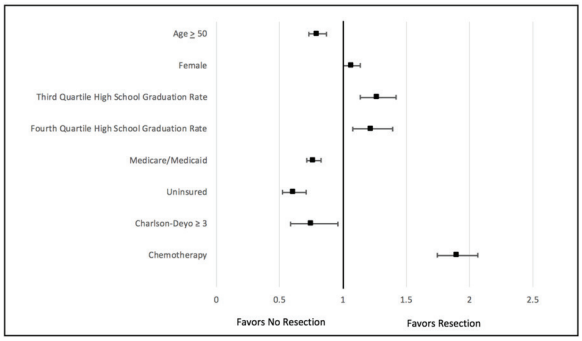
K. Bingmer, S. Kishawi, J. Bliggenstorfer, A. Ofshteyn, W. Kethman, J. Ammori, S. Stein, E. Steinhagen
Cleveland, OH

Purpose/Background: Research in healthcare disparities demonstrates that socioeconomic and racial inequities are more common when treatment guidelines require personalized decision making. Despite the proven benefits of metastectomy, the surgical treatment of synchronous liver metastases in stage IV colon cancer is often personalized. We hypothesized that there are disparities in which patients undergo surgical resection of their liver metastases.

Methods/Interventions: The National Cancer Database from 2010-2016 was queried to identify patients with colon adenocarcinoma with isolated liver metastases. This population was divided into two cohorts: those who underwent liver resection (LR) and those who were not resected (NR). Patients who were treated with palliative intent or did not undergo resection of their primary tumor were excluded. The two cohorts were compared by univariate analysis. Multivariate logistic regression of the entire population was performed to assess factors associated with LR.

Results/Outcome(s): A total of 23,685 patients were included: 6,286 (26.7%) underwent LR. On univariate analysis, patients who underwent LR were more likely to be <50 years of age (21% LR vs 14% NR), have private insurance (49% LR vs 37% NR), live in an area of higher household income and higher rates of high school graduation (all p<0.001). Those undergoing LR were also significantly more likely to have received chemotherapy (83% LR vs 70% NR, p<0.001). On multivariate logistic regression, patient factors predictive of LR were female gender (1.07, p=0.048), living in areas with the highest quartile of high school graduation rates (OR 1.23, p=0.002) and receipt of chemotherapy (OR 1.36, p<0.001). Patient factors associated with decreased rate of LR were age ≥50 (OR 0.80, p<0.001), government insurance (OR 0.77, p<0.001) and no insurance (OR 0.61, p<0.001) (Figure 1). Clinical factors associated with decreased rates of LR were T4 tumors (OR 0.76, p=0.001), and N1 or N2 disease (OR 0.89, p=0.009; OR 0.63, p<0.001).

Conclusions/Discussion: Disparities exist among individuals who undergo metastectomy for isolated liver metastases in colon cancer. Patients who are male, 50 years of age or older, with government or no insurance, and who live in less educated areas are less likely to undergo resection of their liver metastases. Further investigation into the inequity in management of metastatic colon cancer is needed to understand whether these disparities are related to patients, providers, or the disease itself.



Demographic, socioeconomic and clinical factors significantly associated with liver metastasis resection in patients with colon cancer.

DO NEOADJUVANT THERAPY FOR ANAL-RECTAL CANCER PATIENTS HAVE EXPECTATION LONG-TERM OUTCOMES OR JUST MEANINGLESS— A REAL WORLD RESEARCH BASED ON DATABASE FROM COLORECTAL CANCER.

P1294

J. Liu, Y. You, X. Lv, S. Zhang, X. Wang, L. Li
Chengdu, China

Purpose/Background: For anal-rectal cancer patients (tumor located ≤3cm to dentate line), neoadjuvant therapy may lower the stage and increase the probability of preserving anus which can promote the life quality on the basis of acceptable tumor regression. It's not clear enough whether neoadjuvant therapy can improve the long-term survival of these patients and study based on huge sample size is required. This real world research reports the long-term survival of anal-rectal cancer patients after neoadjuvant therapy based on a Database from Colorectal Cancer (DACCA) in Western China.

Methods/Interventions: DACCA was built since 1995 and is still under being updated. The data was collected simultaneously when patients came to a regional medical center in Western China. After filtering the data from DACCA (Aug 15th,2019 Version), we included these data columns: 'pathologic property' (adenocarcinoma, mucinous adenocarcinoma and signet-ring cell carcinoma), 'distance to the dentate line' (≤3cm), 'neoadjuvant therapy', 'TNM stage', 'obstruction', 'tumor location', 'latest date of follow-up', 'date of surgery' and 'outcome of follow-up'. Two new columns were defined: 'months of survival' ('latest date of follow-up' minus 'date of surgery') and 'recommended or not' (according to the NCCN guideline). SPSS 23.0 was applied. The methods were Kaplan-Meier, Log Rank and Breslow. α=0.05. DACCA has passed the ethical review in West China Hospital, Sichuan University.

Results/Outcome(s): A total of 893 available data were analyzed. The surgery date ranged from Jan 1st,2007 to Jun 9th,2019. 505 and 388 data appeared as 'received neoadjuvant' and 'no neoadjuvant'. The overall survival (OS) curve had no statistical difference whether receive neoadjuvant therapy or not (Log Rank-P=0.682, Breslow-P=0.794) while the disease free survival (DFS) curve had short-term difference statistically (Log Rank-P=0.071, Breslow-P=0.023). In 355 data appeared as received neoadjuvant therapy and 'recommended or not' is not null, 305 and 50 were in 'conform to the recommendation' and 'off-label application', the OS curve had no statistical difference (Log Rank-P=0.529, Breslow-P=0.910) while the DFS curve had statistical difference (Log Rank-P=0.011, Breslow-P=0.012).

Conclusions/Discussion: The application of neoadjuvant therapy may not promote the long-term survival of anal-rectal patients, though it does have acceptable short-term outcome. At existing preoperative evaluation, the recommendation of neoadjuvant therapy shows limited guiding significance when considering the long-term survival in China. More studies and real world data from more medical centers should be carried out for revealing whether neoadjuvant improves the surgery quality or not.

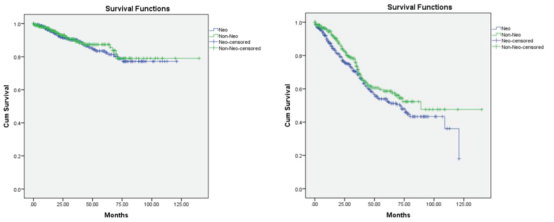


Fig. 1 OS (left) & DFS (right) survival curve of patients received neoadjuvant therapy or not

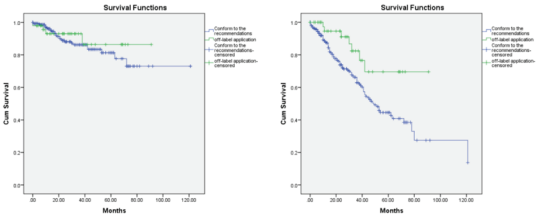


Fig. 2 OS (left) & DFS (right) survival curve of conforming to the recommendation or not

SIGNET VS NON - SIGNET ADENOCARCINOMA RECTUM - IS THERE ARE SURVIVAL DIFFERENCE? A PROPENSITY MATCHED ANALYSIS.

P1295

P. Shetty, A. Desouza, A. Saklani
Mumbai, India

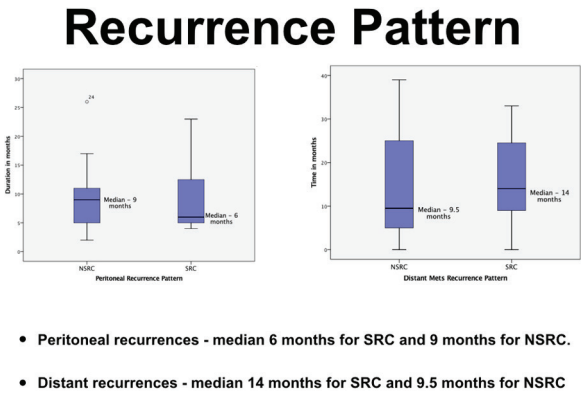
Purpose/Background: Signet ring cell carcinoma (SRC) although a rare variant of adenocarcinoma of rectum, is on an increasing trend in the recent years and accounts for 15% of all colorectal patients in our institute. It is also known to be associated with poor prognosis and has increased risk of recurrence when compared to the non - signet cell histology. This paper was thus to analyse differences in the recurrence patterns and survival outcomes of SRC and non-SRC operated rectal cancer patients.

Methods/Interventions: This is a propensity matched analysis of the prospectively maintained database of rectal cancer patients operated with curative intent between January 2013 and November 2018. The patterns of recurrence, recurrence free survival and overall survival analysis data were computed and compared.

Results/Outcome(s): During the period of January 2013 to November 2018, 1769 rectal primary patients were operated with curative intent. Amongst these signet ring adenocarcinoma patients were 96 (5.4%). The propensity score matched analysis was done for age, stage and gender in a 1:2 ratio. 282 matched pairs were analysed for comparison of signet vs non signet histology. The peritoneal recurrences were 15.4 % in the signet group compared to

5.9% in the non-signet group. Similarly the local recurrences were more common 25.3 % vs 9.1 % respectively among the two groups. Distant recurrences were however more often seen in the non signet group (12.6% vs 22.2 % respectively). The recurrence free survival were 36 months (95% CI: 29 -42) and 49 months (95% CI: 44 -53) for signet and non - signet histology respectively (p = 0.005). The overall survival were 63 months (95% CI: 57 - 68) and 68 months (95% CI: 65 - 71) respectively (p=0.32).

Conclusions/Discussion: There is an increased risk of peritoneal and local recurrences and statistically significant recurrence free survival in patients with signet ring histology of rectal adenocarcinoma. A more aggressive treatment strategy such as preemptive intraperitoneal chemotherapy may hence benefit these patients, although prospective studies need to be performed to establish this as therapy of choice.



Time to recurrence - SRC vs NSRC

1) Peritoneal recurrence

2) Distant recurrence

IS LAPAROSCOPIC SURGERY FEASIBLE FOR ELDERLY COLORECTAL CANCER PATIENTS BASED ON SURGICAL RESULTS AND PROGNOSIS?

P1296

M. Takahashi, K. Sakamoto
Bunkyo-ku, Japan

Purpose/Background: The number of elderly patients with colorectal cancer (CRC) is increasing year by year in Japan, and laparoscopic surgery for CRC is also increasing. Consequently, laparoscopic surgeries for elderly patients for CRC is also increasing. In this study, we surveyed prognosis of elderly CRC patients. So, the aim of this study is to evaluate the results and prognosis of surgical treatment for elderly CRC patients, and we investigated the validity of surgical treatment for elderly CRC patients.

Methods/Interventions: The subjects were 245 patients aged≧80 years old who underwent surgery of primary resection for CRC at Juntendo hospital in Japan between 2003 and 2017. Stage4, multiple cancers, palliative surgery, and resection with other organs were excluded. The patients were divided into two groups with the laparoscopic colectomy group (LAC, N=147), and the open colectomy group (OC, N=98). We compared the groups by age, sex, body mass index (BMI), Glasgow prognostic score (GPS), tumor site, previous abdominal surgery, American Society of Anesthesiologists (ASA), operative duration, blood loss, days to solid diet, duration of hospital stay after surgery, and postoperative morbidity. Next, we examined the overall survival (OS) of 157 patients whose 5-year survival rate (5YSR) was surveyable.

Results/Outcome(s): Between LAC and OC, there was no difference in age and sex, but in the tumor site, LAC had more left sides and OC had more right sides significantly (p = 0.042). Previous abdominal surgery was significantly less in LAC (p = 0.001). As for preoperative patient status, GPS showed mulnutrition patients were significantly more in OC (p = 0.001), and ASA showed higher anesthesia risk cases were significantly more in OC (p = 0.001). Operative duration was significantly longer in LAC (p = 0.001), but blood loss, days to solid diet, duration of hospital stay, and postoperative morbidity were all good results in LAC (all p = 0.001). Next, whole patients 5YSR was 65.3%, and there was no difference between LAC and OC (63.4% & 65.3%). For tumor site, the prognosis for right-sided colon cancer was significantly poor at 58.0% (p = 0.005). In GPS, there was no difference in 5YSR, but in ASA, the group with a high anesthetic risk had a poor prognosis (p = 0.029). There was no difference in prognosis about postoperative morbidities.

Conclusions/Discussion: In the past, OC was often performed for elderly because pneumoperitoneum and operative duration, but recently, LAC for elderly CRC is increasing, and there are few complications and hospital stays. Prognosis is also good. This reason may be the improvement of LAC techniques, anesthesia, and the introduction of ERAS. So, LAC for elderly CRC seems to be a feasible procedure. In addition, tumor site and the evaluation of preoperative patient tolerance are thought to be very important.

SAFETY AND SHORT-TERM EFFECT OF LAPAROSCOPIC RADICAL RESECTION IN NOSES PROCEDURE COMBINED INTRAPERITONEAL CHEMOTHERAPY WITH RALTITREXED T4A STAGE UPPER RECTAL AND SIGMOID COLON CANCER.

P1297

Z. Zhu, C. Fu
Shanghai, China

Purpose/Background: To evaluate the safety and short-term effect of laparoscopic radical resection in natural orifice specimen extraction surgery procedure combined intraperitoneal chemotherapy with Raltitrexed for T4a upper rectal and sigmoid cancer.

Methods/Interventions: Clinical and follow-up data of 40 cases with rectal or sigmoid cancer underwent laparoscopic radical resection from October 2017 to March 2019 were analyzed retrospectively, 20 cases with intraperitoneal chemotherapy with Raltitrexed during the surgery as observation group(Raltitrexed group), 20 cases with thermal distilled water irrigation as control group(Water group). Surgical safety, oncologic safety and short-term outcomes were compared between two groups.

Results/Outcome(s): There were no significant differences in gender, age, first flatus, postoperative complications, rate of recurrence and metastasis between the two groups (all $P>0.05$); Postoperative fever in observation group was more than that in control group($P<0.05$).

Conclusions/Discussion: Intraperitoneal chemotherapy with Raltitrexed canbe tolerable and safe for patients during laparoscopic radical resection in NOSES procedure for T4a upper rectal and sigmoid cancer.

RECTAL GRANULAR CELL CARCINOMA REQUIRING ABDOMINOPERINEAL RESECTION: A CASE REPORT.

P1298

M. Sunderland, A. Dakwar, S. Rasheid
Tampa, FL

Purpose/Background: Granular cell tumors, derived from neural crest cells, are rare tumors infrequently found in the colon or rectum. In this report, we will discuss a patient who presented with a rectal granular cell tumor invading the anal sphincters requiring an abdominoperineal resection.

Methods/Interventions: A 56-year-old male, with mainly symptoms of anal pain for six months, was found to have a perirectal mass. On physical exam, the anus and surrounding tissue appeared normal, however a large firm region was appreciated on the right side of the anal canal. Anoscopy and colonoscopy did not reveal any intraluminal masses or mucosal changes. Computed tomography scan demonstrated asymmetric soft tissue thickening of the right levator ani and right lateral wall of the anus. On transrectal ultrasound, a large mass was identified distal to the prostate at the level of the upper anal canal, involving the right aspect of the puborectalis, levator ani, as well as the anterior anal sphincter complex. Pathology from ultrasound-guided transrectal biopsy demonstrated low grade granular cell tumor.

Results/Outcome(s): The patient underwent a laparoscopic abdominoperineal resection with perineum reconstruction using right gracilis myocutaneous flap. Pathology demonstrated a granular cell tumor of 4.5 centimeters with tumor invasion of the muscularis propria including anal sphincter musculature. Surgical margins were free of neoplasia. Nine lymph nodes identified, no malignancy present.

Conclusions/Discussion: Granular cell tumors are typically benign tumors of Schwann cell origin. Management involves surgical resection to clear margins. In the colorectal literature, the majority are asymptomatic submucosal tumors identified on screening colonoscopy, managed by polypectomy, endoscopic mucosal resection, and recently transanal endoscopic resection. Given the tendency towards benign pathology, surgical resection is rarely extensive. Malignant tumors may have benign histologic appearance but clinically aggressive behavior or have congruently aggressive histology and behavior. Once distant disease occurs, it is associated with poor prognosis and short survival. On review of current literature, this is the only documented case of a colorectal granular cell tumor that required an abdominoperineal resection. On histology, it was considered low grade but its behavior was more consistent with a malignant process. Unfortunately, there is not much data currently available on malignant

P1297 Patient Characteristics and Postoperative Clinical Indexes for Raltitrexed And Water Groups

Characteristics and Postoperative Clinical Indexes	Raltitrexed group(n=20)	Water group(n=20)	P-value
Age,mean(SD), y	60.1±7.2	62.9±7.7	0.227
Sex			0.744
Male	7	8	
Female	13	12	
Anal exhaust after surgery(h)	27.9±7.7	24.8±7.4	0.193
Total Surgical Complications	11	6	0.110
Fever	8	2	0.028
Anastomotic leakage	0	0	/
Abdominal cavity infection	0	1	/
Diarrhea	1	1	1.000
Abdominal pain	0	1	/
Abdominal distention	2	1	1.000
Recurrence and metastasis	1	1	1.000

Compared with Water group, P<0.05

colorectal granular cell neoplasms. Additional research on malignant granular cell tumors is necessary to help improve treatment options, prevent recurrence, and improve overall survival. His medical course will be followed to see if he develops recurrence or metastatic disease.

Figure 1: CT anal mass

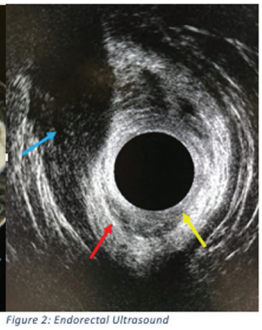


Figure 2: Endorectal Ultrasound

Blue Arrows: anal mass; Red Arrow: external sphincter; Yellow Arrow: distal aspect internal sphincter

MANAGEMENT OF INCIDENTALLY-DETECTED ENLARGED PARAAORTIC LYMPH NODE DURING COLORECTAL CANCER SURGERY.

P1299

J. Lee, S. Yeom, S. Lee, C. Kim, H. Kim
Hwasun, Korea (the Republic of)

Purpose/Background: Paraaortic lymph node metastasis (PALNM) is known to be a poor prognostic factor for patients with colorectal cancer. However, there have been very few studies regarding treatment strategy of incidentally-detected enlarged paraaortic lymph node (PALN) during colorectal cancer surgery. The purpose of this study was to investigate the benefit of lymph node dissection in patients with incidentally-detected enlarged PALN during colorectal cancer surgery.

Methods/Interventions: We retrospectively reviewed primary colorectal cancer patients who underwent surgical resection between January 2010 and December 2018, and included 263 patients with left-sided colon and rectal cancer patients who underwent PALN dissection. Predictive factors for pathologic PALNM were analyzed, and survival analyses were conducted to find out prognostic factors.

Results/Outcome(s): Among patients included, 19 (7.2%) showed pathologic PALNM. Fourteen (73.7%) had clinical diagnosis of PALNM in preoperative radiologic examination, while PALN enlargement was detected incidentally during surgery in 5 (26.3%) patients. Patients with higher clinical T stage ($p < 0.001$), higher clinical N stage ($p < 0.001$), radiologic PALNM (42.4% vs. 2.2%, $p < 0.001$), radiologic distant metastasis other than PALNM (31.8% vs. 5.0%, $p < 0.001$) were associated with higher incidence of pathologic PALNM. In multivariate analysis, radiologic PALNM (odds ratio [OR] = 12.737, 95% confidence interval [CI] 3.472–46.723, $p < 0.001$) and radiologic distant metastasis other than PALNM (OR = 4.090, 95% CI 1.011–16.539, $p = 0.048$) and were independent predictive factors for pathologic PALNM. On Kaplan-Meier survival analysis, pathologic PALNM was associated with poor overall survival (5-year overall survival [5Y OS], 54.0 vs. 78.6%, $p = 0.002$). However, in patients with PALNM, patients with R0 resection showed much better overall survival compared with R2 resection (5Y OS, 90.0 vs. 0.0%, $p = 0.014$). In patients with R0 resection, patients with pathologic PALNM showed poorer 3-year disease-free survival (52.5 vs. 82.7%, p = 0.020) but similar 5Y OS (90.0 vs. 82.2%, p = 0.896) compared with those without pathologic PALNM.

Conclusions/Discussion: The incidence of pathologic PALNM in patients with incidentally-detected PALN enlargement during colorectal cancer surgery was not low enough to be negligible (2.2%). When we could achieve R0 resection, patients with PALNM showed relatively good prognosis. Therefore, the dissection of incidentally-detected enlarged PALN should be considered.

VENTRAL PELVIOANAL RECONSTRUCTION FOR FECAL INCONTINENCE - A PRELIMINARY REPORT.

P1300

F. Pakravan, E. Karakas, C. Spyrou
Krefeld, Germany

Purpose/Background: Fecal incontinence (FI) is a distressing condition that may lead to complete social isolation. If conservative treatment is unsuccessful, surgical intervention may be needed. This study examines the results of Ventral pelvioanal reconstruction(VPAR), a preliminary report in patient's with severe fecal Incontinence.

Methods/Interventions: The porposed percedure is as fallows: a) a transvers incision is made in perineum seprating the rectum from the vagina for a depth of 3-4 cm. b) blunt dissection is done in the ischiorectalfossa and the lateral limit of the disection is the Ischial tuberosities and the sacrospinous ligments are felt at the depth the incision. c) a 2 cm wide u-shaped mesh(AMI trade mark Austria)® is placed anteriorly and secure with four 00 vicryl ®sutures. d) The medial, tendinous segment of sacrospinal ligament is palpated and I-stich(AMI trade mark Austeria)® passed through the ligament and attacht to the Mesh bilaterally. e) When the sutures are tied, the anterior portion of the anal canal is compressed and narrowed the anterior anal canal, living the posterior canal free. f) The incision closed in layers in usual fashion. Data were collected prospectively with the focus on changes in Cleveland Clinic Incontinence Score (CCIS) FI quality of life scores (FIQoL). Manometry and bowel diary information were also collected.

Results/Outcome(s): Between Juni 2018 and October 2019, 15 patients (14 females and 1 male)mean age of 69 (31-85) years with severe FI were treated with VPAR.

Follow-up ranged from 45-400 days. Prior treatment consisted of peripheral nerve evaluation (PNE) test in 10 (66%) patients, 2 (13%)patients with prior permanent sacral nerve stimulation (SNS) and 2(13%)prior implantation of an artificial bowel sphincter (ABS)and one male (6%) for congenital anomaly. The operations was successful in all patients. No Implants were explanted during the follow-up. Only one patient had swelling and erythema in wound regions for three days after the VPAR, which resolved with conservative treatment. CCIS decreased from a mean of 17.5 (14-20) to 7.5 (4-10) and FIQoL improved in all 4 domains.

Conclusions/Discussion: VPAR shows consistent results for the treatment of severe FI in this patient group. The surgical procedure is straight-forward as compared to other implantable percedurs. VPAR is a simple and effective new technique which deserves further studies.

TOTAL INTESTINAL FAILURE DUE TO ANTIPSYCHOTIC MEDICATION.

P1301

J. Simon, H. Wady, P. Denoya
Coram, NY

Purpose/Background: We present a 63M with PMH severe schizophrenia and serated polyposis syndrome with prolonged intestinal failure after a subtotal colectomy. He eventually regained bowel function after cessation of medications and creation of ileostomy. The patient was a resident of a psychiatric institution. He was prescribed benztropine, an anticholinergic, and clozapine, an atypical antipsychotic. While antipsychotic medications are thought to have less severe motility issues compared to anticholinergics, they can produce serious and sometimes fatal ileus. Side effects are worsened when the medications are combined.

Methods/Interventions: He underwent an laparoscopic subtotal colectomy with post-operative course complicated by severe ileus. He required prolonged hospitalization with repeated NGT and rectal tube placement for decompression. On his medications, he had no return of bowel function and was unable to tolerate oral intake. He required parenteral nutrition. Imaging showed distention of small bowel with patent anastomosis and no obstruction. Erythroycin, reglan, and relistor were started and narcotics were discontinued with no improvement in bowel function over weeks. Studies showed no delayed gastric emptying. Psychiatry initially did not feel he would tolerate being off of his medications. Finally, after organic causes of ileus were ruled out, psychiatric medications were held and haldol was started. There was no observed improvement in symptoms, but he did have severe change in demeanor with flat affect, intermittent agitation, aggressive behavior, and severe symptoms of tremors and decreased mobility. There was ongoing discussion that ileostomy creation may help, but off his psychiatric medications the patient was unable to provide informed consent. His HCP would not consent without the patient's full understanding. He was restarted on benztropine and clozapine.

Results/Outcome(s): With stabilization of his mood, the patient regained capacity and agreed to surgery. Intraoperatively he was noted to have dilated small bowel, high liquid stool burden, and no visible peristalsis. He continued to require NGT decompression for 10 days. Eventually, clozapine was stopped and he was started on Geodon. His ostomy functioned and he tolerated a regular diet, while in good psychiatric health.

Conclusions/Discussion: This patient required hospitalization for 11 weeks before discharge. He underwent outpatient manometry which revealed pelvic floor dysfunction and started pelvic PT. Interval CT showed resolution of bowel distention. He is planned for reversal of his ileostomy after completion of PT. Paralytic ileus is a rare side effect of atypical antipsychotic medications, which can be much more severe in combination with anitcholinergics. Previously reported cases have been treated with cessation of psychiatric medication and prolonged parenteral nutrition. No documented case describes the use of ileostomy to manage intestinal failure.

Top Left: Postoperative abdominal x-ray
Top Right: Postoperative abdominal CT scan
Bottom: Interval outpatient CT scan

SACRAL NERVE STIMULATION FOR FECAL INCONTINENCE: CAN DEMOGRAPHICS AND DIAGNOSIS PREDICT SUCCESS? RESULTS OF A RETROSPECTIVE CHART REVIEW.

P1302

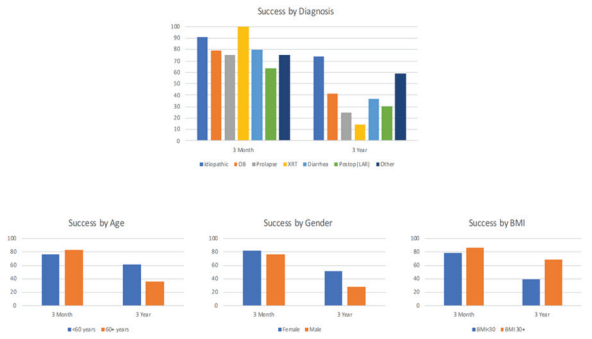
D. Murken, R. Straker, P. Hernandez, E. Paulson, J. Bleier
Philadelphia, PA

Purpose/Background: Fecal incontinence (FI) is a common and devastating functional disorder. Sacral Nerve Stimulation (SNS) has been shown to be an effective treatment for FI. It remains challenging, however, to identify predictors of success on a per-patient level, as the existing body of literature on this subject is small. We conducted a retrospective study of a single surgeon's series of SNS in order to better characterize predictors of success, focusing on patient demographics and diagnosis.

Methods/Interventions: This study is a retrospective chart review of 135 patients who underwent SNS full-system implantation by a single surgeon between January, 2011 and July, 2016. Patient demographics, FI etiology, and outcomes for SNS were recorded. A successful outcome was defined by ≥50% reduction in episodes of FI from baseline at a given point in time. Uni- and multivariable analyses were performed using STATA.

Results/Outcome(s): A total of 130 patients underwent full system implantation and had post-operative follow-up. Of these patients, the mean age was 63.3 years (range 19-92), the mean BMI was 26.6 (range 14-50), and 96 (73.8%) were female. 122 patients had 3-month follow-up and 103 patients had 3-year follow-up. The overall 3-month success rate was 80%, while the 3-year success rate was 45.6%. On univariate analysis of 3-year outcomes, younger age (<60 yrs), female gender, and obesity (BMI ≥30) were associated with higher rates of success (p=0.01, p=0.04, p=0.02, respectively). Diagnosis also correlated with success. Patients with idiopathic causes of FI experienced the highest rates of success at 3 years (73.7%), while patients with radiation (XRT) induced FI (14.3%) and prolapse (25%) had the lowest rates (p=0.03) (Figure 1). Multivariable analysis, adjusting for age, BMI, gender and diagnosis, is limited in significance due to the small sample size. Although not statistically significant, the odds of a patient with BMI ≥30 experiencing success at 3-years were over two times as high as a patient with a lower BMI (OR 2.01, p=0.22). Patients who were ≥60 years old (OR 0.36, p=0.06) and male (OR 0.33, p=0.09) were less likely to have 3-year success compared to older and female patients, respectively. Prolapse (p=0.02) and XRT (p=0.06) had the lowest odds of success on multivariable analysis compared to idiopathic diagnoses.

Conclusions/Discussion: Sacral nerve stimulation is an established safe treatment for FI. In our series, the 3-month success rate was high, but the 3-year success rate was less encouraging. Diagnosis appears highly related to future success, as do basic patient demographics. We can use these results to have more realistic, patient-specific discussions regarding the possibility for success in our FI patients.



COMPARING WATER PERFUSED ANORECTAL MANOMETRY WITH THE THD® ANOPRESS: A PROSPECTIVE OBSERVATIONAL STUDY.

P1303

A. Leo[1], E. Cavazzoni[2], J. Murphy[3], G. Thomas[1], J. Hodgkinson[1], C. Vaizey[1]
[1]*Harrow - Middlesex, United Kingdom;* [2]*Perugia, Italy;* [3]*London, United Kingdom*

Purpose/Background: Anorectal physiology tests provide a functional assessment of the anal canal and these are considered part of the standard of care for patients with pelvic floor disorders. The aim of this study was to compare the results generated by the standard high-resolution water perfused manometry (WPM) with the newer THD® Anopress manometry system.

Methods/Interventions: This was a prospective observational study. Conventional manometry was carried out using a water perfused catheter with high resolution manometry and compared to the Anopress system with air filled catheters. All patients underwent the two procedures successively in randomized order. Time to arrive at the resting pressure plateau, resting, squeeze and straining pressures, VAS scores for pain and discomfort were recorded. A qualitative analysis of the daily use was performed.

Results/Outcome(s): Between 2016 and 2017, 60 patients were recruited in our centre. The time from insertion of the catheter to arriving at the resting pressure plateau was significantly lower in Anopress compared to WPM; 12 seconds (interquartile range 10 to 17 seconds) versus 100 seconds (IQR 67 to 121 seconds, p < 0.001). A strong correlation between the manometric values of the WPM and the Anopress was observed with a correlation coefficient of 0.84 for resting pressure, 0.97 for voluntary squeeze increment, 0.90 for endurance in 5 seconds, 0.96 for involuntary squeeze increment and 0.91 for straining pressure. Both procedures were well tolerated, although the VAS of insertion of the WPM catheter was significantly higher. The THD was easier to use and more time efficient compared to the WPM.

Conclusions/Discussion: The pressure values obtained with Anopress correlated well with conventional manometry. The Anopress has the advantage of being less time consuming, user friendly, and better tolerated by patients. Anopress may have also overcome many of the disadvantages of water perfused manometry.

PRE AND POSTOPERATIVE SYMPTOMS AFTER TRANSVAGINAL RECTOCOELE REPAIR FOR OBSTRUCTIVE DEFAECATION SYNDROME.

P1304

K. Cuiñas, L. Ferrari, A. Schizas, A. Darakhshan, A. Williams
London, United Kingdom

Purpose/Background: Symptomatic rectoceles can cause a variety of symptoms such as obstructive defaecation syndrome (ODS), feeling of vaginal bulging and pelvic pressure, or symptoms related to sexual or urinary dysfunction. Primary aim of rectocele repair surgery is to correct the posterior vaginal wall prolapse, improve symptoms of bulge and ODS. The standard repair performed in our Pelvic Floor Unit for women with medium-large rectocele associated with ODS symptoms, has been a native-tissue transvaginal approach. The aim of this study is to assess postoperative symptom improvement after transvaginal rectocoele repair (TVRR) in our tertiary pelvic floor centre.

Methods/Interventions: Retrospective review of TVRR cases operated from October 2006 until November 2018 by 3 pelvic floor surgeons on a recorded database. All patients had a symptomatic rectocele leading to ODS symptoms and majority had conservative treatment before surgery to improve their defaecatory function. The results of their investigations were discussed in a multidisciplinary meeting (MDM).

Results/Outcome(s): 215 patients had a TVRR during this period. 182 (86.5%) patients had pre-operative conservative treatment with a mean number of sessions of 2.7 (range 1-9). Indications for surgery were failure to achieve satisfactory improvement with conservative treatment associated with radiological and clinical finding of a rectocoele. Patients' symptoms were recorded before and after surgical procedure, with a length of follow-up of 12.7 months (range 1.4-71.5). Global post-operative symptoms improvement was registered in 188 (87.4%) and no change in 18 patients (8.4%). 9 patients (4.2%) were lost on follow-up. Overall, 209 patients had symptoms of ODS pre-operatively (97.2%), which has been reduced to 38.6% post-operative. There has been improvements in feeling of incomplete emptying (98.6% before and 39.1% after), post-defaecatory soiling (67.9% before and 4.7% after), multiple attempts to evacuate (38.6% before and 10.7% after), need for vaginal splitting (46% before and 0.5% after), need for anal digitation (26% before and 6% after), feeling of vaginal bulge (81.4% before and 1.4% after), and dyspareunia was present in the same percentage of patients before and after (7.9%).

Conclusions/Discussion: Pre-operative counselling and patients' expectations management is an important part of current surgical practice for pelvic floor disorders. Most pelvic floor patients have multiple symptoms, which might improve with a balanced combination between conservative and surgical treatment. Surgery has unfortunately inevitable and irreversible risks, which should be carefully considered. Transvaginal rectocoele repair is a valid option for treatment of patients with a variety of ODS symptoms and feeling of vaginal bulge and might be considered when patients cannot achieve satisfactory improvements through conservative measurements.

P1303 Comparison of outcomes between methods, giving the median or mean and the correlation between measurements, and p-values indicating the significance of the association

Measurement	THD	WPM	Correlation coefficient	P-value
Time to resting pressure	Median 12 sec, IQR 10-17	Median 100 sec, IQR 67-121	0.84 *	
Resting pressure	Mean 37.5 mmHg ± 17.0 SD	Mean 44.3 cmH2O ± 15.8 SD	0.97 **	<0.001
Voluntary squeeze increment	Median 64 mmHg IQR 29-101	Median 57 cmH2O, IQR 31-102	0.97 **	<0.001
Endurance at 5 seconds	Mean 44.7 mmHg ± 35.1SD	Mean 43.7 cmH2O ± 39.3 SD	0.90 **	<0.001
Involuntary squeeze increment	Mean 61.0 mmHg ± 35.7 SD	Mean 54.3 cmH2O ± 33.1 SD	0.96 **	<0.001
Straining pressure	Mean 20.0 mmHg ± 31 SD	Mean 21 mmHg ± 32 SD	0.91 **	<0.001

(*) Analysis using Pearson correlation (normally distributed)

(**) Analysis using Spearman's rank correlation (not normally distributed)

MULTIMODAL MANAGEMENT OF SYMPTOMATIC RECTOCOELES IS THE KEY FOR SUCCESS.

P1305

L. Ferrari, K. Cuiñas, A. Schizas, A. Darakhshan, A. Williams
London, United Kingdom

Purpose/Background: Obstructed defecation syndrome (ODS) includes a spectrum of abnormal evacuation syndromes including incomplete emptying, post-defaecatory soiling, splinting (through vagina or perineal route), and manual evacuation/digitation. Bowel retraining with multimodality approach should be considered as first line treatment even in patients with significant anatomical abnormalities such as medium-large rectocoele and high grade intussusception. Surgery should be considered as an option of last resort when first line treatment has failed to achieve satisfactory results. The aim of this study is to audit the efficacy of combined conservative and surgical treatment in the form of transvaginal rectocoele repair (TVRR) in patients with ODS in our tertiary pelvic floor referral centre.

Methods/Interventions: Retrospective review of TVRR cases operated from October 2006 until November 2018 by 3 pelvic floor surgeons on a recorded database created by our Pelvic Floor Unit. All patients had a symptomatic rectocele leading to ODS symptoms and majority had conservative treatment before surgery to improve their defaecatory function. The results of their investigations were discussed in a multidisciplinary meeting (MDM) with consultant colorectal surgeons, colorectal clinical nurse specialists, clinical scientists, specialist physiotherapists, clinical and research fellows.

Results/Outcome(s): In total, 215 patients had a TVRR during this period. A total of 182 (86.5%) patients had pre-operative conservative treatment with a mean number of sessions of 2.7 (range 1-9). Indications for surgery were failed to achieve satisfactory improvement after first line treatment. Patients' symptoms were recorded before and after surgical procedure, with a length of follow-up of 12.7 months (range 1.4-71.5). Global post-operative symptom improvement was registered in 188 (87.4%), with no change in 18 (8.4%) patients. 9 patients (4.2%) were lost on follow-up. Main improvement has been registered for feeling of vaginal bulge (81.4% before and 1.4% after), need for vaginal splitting (46% before and 0.5% after), post-defaecatory soiling (67.9% before and 4.7% after). In addition, 144 patients (67%) had additional conservative treatment after TVRR to improve residual symptoms.

Conclusions/Discussion: Management of obstructive defaecation continues to be a challenge for the pelvic floor multidisciplinary teams. Finding of a rectocoele during the investigations might be just the tip of the iceberg of this complex problem. Conservative treatment should be first line, and a rigorous patient selection for surgical repair is paramount. Several open questions remain about when patients with ODS might be suitable for surgery and what surgical approach should be considered. Multi-centric randomized studies are needed to answer these questions and create future guidelines for patients with ODS and symptomatic rectocele.

NOVEL APPROACH TO ILEAL POUCH PROLAPSE REPAIR USING FIBRIN SEALANT.

P1306

C. Provenza[1], C. Poulos[1], R. Scott[2], R. Lewis[2], A. Ayers[2], S. Banerjee[2]
[1]*Farmington, CT;* [2]*Bloomfield, CT*

Purpose/Background: The ileal pouch anal anastomosis is a commonly accepted neorectum after total proctocolectomy for familial adenomatous polyposis and ulcerative colitis. Generally patients have decent bowel control, but ileal pouches are not without complications. One relatively uncommon complication is ileal pouch prolapse. Prolapse can be either mucosal or full thickness, similar to rectal prolapse. There is limited literature detailing the frequency and management of ileal pouch prolapse. The methods described are generally suture repairs with or without mesh. Fibrin glue has been described for sutureless mesh fixation in total extraperitoneal hernia repairs with good results. Similar sutureless approaches have been applied to laparoscopic rectopexy. To date, there are no reports of this technique being used in ileal pouch prolapse. Using the theory behind fibrin use in hernia repairs, here we describe a fibrin glue ileal pouch pexy to treat prolapse after total proctocolectomy with ileal pouch anal anastomosis.

Methods/Interventions: Our patient is a 56-year-old woman who underwent a total proctocolectomy with ileal J pouch secondary to ulcerative colitis 11 years prior who presented with pouch prolapse, originally treated as pouchitis. Initial treatment failure prompted urgent operative reduction without surgical repair. Symptoms persisted and she was taken for definitive repair. Due to concern of pouch fragility, suture repair was not attempted. Instead, the pouch was mobilized within the pelvis and fibrin sealant was applied to the pouch and sacrum.

Results/Outcome(s): The patient tolerated the procedure well. She was discharged on post op day five. In the five months since repair, she has had nighttime incontinence but no evidence of recurrent prolapse.

Conclusions/Discussion: IPP is an uncommon complication after total proctocolectomy with ileal pouch. Fibrin glue is an alternative to mesh or suture pexy to repair IPP. There has been no recurrence in five-month follow up. The longterm durability of such a repair is yet to be determined.

CT-DETERMINED AREA OF THE PELVIS OCCUPIED BY AN UPPER RECTAL TUMOR AS A PREDICTOR OF SURGICAL DIFFICULTY IN PATIENTS UNDERGOING LAPAROSCOPIC RECTAL RESECTION.

P1307

Y. Tsukamoto, R. Makizumi, Y. Ogura, T. Otsubo
Kawasaki, Japan

Purpose/Background: Laparoscopic surgery is widely used for treatment of colorectal cancer. However, due to the restricted operating space in patients with rectal cancer, the degree of surgical difficulty is greater than that in patients with colon cancer. For assistance in planning the surgery, we have calculated the pelvic volume, rectal volume, and tumor volume to derive occupancy of the rectum and tumor in the pelvic cavity. In the study described herein, we calculated the rectal tumor area and pelvic area by measuring the maximum diameter of the rectal tumor and the diameter of the pelvis on selected computed tomography (CT) slices and the analyzed these areas in relation to surgical outcomes.

Methods/Interventions: Sixty-three patients diagnosed with upper rectal cancer at St. Marianna university school of medicine between October 2012 and December 2018 were included in the study. All were treated by laparoscopic surgery, having undergone computed tomography colonography (CTC) preoperatively. We calculated the rectal volume occupancy and rectal area occupancy and performed statistical analyses to determine whether a relation exists between these measurements and surgical difficulty encountered or the incidence of anastomotic leakage

Results/Outcome(s): Significant positive correlation ($r = 0.646$, $p < 0.01$) was found between area occupancy and volume occupancy. Surgical difficulty, as evidenced by a relatively high blood loss volume, was significantly greater among patients with a area occupancy ≥ 52.54% ($p = 0.0127$). The incidence of anastomotic leakage was significantly high among patients with high area occupancy ($p = 0.008$) and particularly high in those with area occupancy ≥ 52.54%

Conclusions/Discussion: The rectal area occupancy determined by means of CTC is a useful predictor of the frequency of complications and level of surgical difficulty in patients with upper rectal cancer treated laparoscopically.

PERIOPERATIVE MANAGEMENT OF CARDIOVASCULAR DISEASE IN PATIENTS UNDERGOING 3D LAPAROSCOPIC NOSES.

P1308

Q. Jiang, C. Fu
Shanghai, China

Purpose/Background: To explore the perioperative management of patients with cardiovascular disease during the 3D laparoscopic NOSES operation

Methods/Interventions: According to ACC / AHA guidelines for perioperative cardiovascular evaluation of non cardiac surgery, 110 cases of colorectal cancer patients with cardiovascular disease who underwent gastrointestinal anorectal surgery in Shanghai East Hospital Affiliated to Tongji University from January 2017 to October 2019 were divided into three levels: high risk, medium risk and low risk.

Results/Outcome(s): There were 20 cases of high risk, 18 cases of medium risk, 72 cases of low risk, 30 cases of frequent atrial fibrillation and arrhythmia, 6 cases of congestive heart failure, 7 cases of angina pectoris, 5 cases of acute myocardial infarction, 2 cases of death due to heart disease, 3 cases of incision infection, 2 cases of serious lung infection, 2 cases of acute renal failure, 6 cases of anastomotic leakage.

Conclusions/Discussion: Preoperative cardiovascular disease significantly increased the risk of surgery, but preoperative and cardiovascular physicians to fully assess cardiac function, strengthen perioperative management can significantly improve the safety of surgery, reduce the incidence of complications and mortality

REAL WORLD STUDY FROM DACCA: THE RISK FACTORS OF THE COMPLICATIONS AFTER TEMPORARY STOMA CLOSURE FOLLOWING LOW ANTERIOR RESECTION.

P1309

R. Yu, Q. Zhang, L. An, X. Wang, L. Li
Chengdu, China

Purpose/Background: Temporary stoma has been used to reduce the risk of anastomotic leakage and reoperation, however, postoperative complications of closure still be a new coming questions, which especially in study supported from real world study by Chinese data. Therefore, we hope to get the incidence of postoperative complications and risk factors by extracting the DACCA database information and postoperative follow-up.

Methods/Interventions: We retrospectively recruited patients who had undergone the closure of ostomy following low anterior resection in 2019 from the November 25, 2019 edition of the West China Hospital Colorectal Cancer

Database (DACCA). Then we conducted a follow-up telephone call within 4 days to get the complications of the patients. Lost follow-up and death patients were excluded. SPSS 22.0 was used analysis.

Results/Outcome(s): Totally 139 patients were enrolled according to the inclusion criteria, and 10 cases were excluded because could not be followed. The overall incidence of complication was 38.8%. Gastrointestinal reaction was major (28.7%), and SSI was also common (13.2%). Besides, Intestinal obstruction occurred in 4 cases (3.1%). The majority of complications could be treated by conservative treatment. The readmission rate was 10.1%, and only 1 case was admitted to ICU. As for univariate analysis, the incidence of complications of colostomy patients was significantly higher than that of ileostomy patients (P = 0.037). Besides, the incidence of complications was higher in patients who received neoadjuvant treatment than those who did not (P = 0.003). The number of patients who had complications after the first operation was too small, so the statistical results were not credible. In addition, the gender, age, BMI, tumor staging, medical comorbidities (diabetes, hypertension, heart disease), time between operations, hematocrit, hemoglobin and albumin were not significantly related to the postoperative complications rate, as shown in Graph 1. Multivariate analysis revealed that neoadjuvant therapy was the only independent risk factor associated with complication (p=0.013; OR 2.648; 95% CI 1.228–5.707).

Conclusions/Discussion: Colostomy is more susceptible to postoperative complications than ileostomy. The incidence of complications was also higher in neoadjuvant patients. Therefore, it can be considered that patients who undergo preventive colostomy or choose neoadjuvant treatment should prevent complications in advance and follow up actively in order to take timely measures.

	Complication	No complication	χ^2 value	*P* value
Number	50（38.8）	79（61.2）		
Gender				
Female	22	24	1.342	0.247
Male	31	52		
Mean age				
≤59	30	39	1.392	0.238
>59	20	40		
BMI				
≤ 23.81kg/m²	22	42	1.029	0.310
> 23.81kg/m²	28	37		
Stage				
Class I-II	23	44	1.153	0.283
Class III-IV	27	35		
Diabetes				
No	39	58	0.345	0.557
Yes	11	21		
Hypertension				
No	25	40	0.005	0.944
Yes	25	39		
Heart disease				
No	34	54	0.002	0.966
Yes	16	25		
Stoma position				
Ileostomy	40	73	4.337	0.037
Colostomy	10	6		
Time between operations				
≤100d	31	47	0.080	0.777
>100d	19	32		
Neoadjuvant therapy				
No	23	57	8.890	0.003
Yes	27	22		
Complications after the first operation				
No	50	73	3.983	0.046
Yes	0	6		
Hematocrit				
Normal	26	35	0.728	0.394
Abnormal	24	44		
Hemoglobin				
Normal	38	51	1.874	0.171
Abnormal	12	28		
Albumin				
Normal	35	54	0.039	0.844
Abnormal	15	25		

Variable	P value	OR	95 % confidence interval
Stoma position	0.167	2.223	0.717-6.898
Neoadjuvant therapy	0.013	2.648	1.228-5.707

ASSESSING THE STATUS FOR COLORECTAL CANCER PATIENTS: A MODEL BASED ON THE VALUE OF IMMUNE-RISK SCORE.

P1310

Y. Lu, W. Wang, X. Zhou, W. Fu
Beijing, China

Purpose/Background: Heterogeneity in patients of colorectal cancer (CRC) puts forward different strategies in clinical decision-making. Identifying distinctive subgroups in patients can improve the positive screening rate of CRC and reduce the cost of tests.

Methods/Interventions: Data was extracted and integrated from several databases including The Cancer Genome Atlas (TCGA), Immunology Database and Analysis Portal (ImmPort) and other databases. The model was built based on prognosis-related immune genes and verified through survival curve, receiver operating characteristic (ROC) curve and risk curve. Prognostic factors of CRC patients were also analyzed.

Results/Outcome(s): A novel prediction model was constructed about prognosis of CRC patients based on the value of risk score combing of expression status of immune-related genes and coefficients. The model was well fit and the risk score could be an independently predictive factor for CRC patients.

Conclusions/Discussion: This model was suitable for CRC patients and has high application value in clinic.

PARA-AORTIC LYMPH NODE DISSECTION IN COLORECTAL CANCER: EXPERIENCE FROM A TERTIARY CANCER CENTER IN INDIA.

P1311

V. Sharma[1], S. Kumar[2], A. Desouza[1], A. Saklani[1]
[1]*Mumbai, India;* [2]*New Delhi, India*

Purpose/Background: Para-aortic lymph nodes have been considered a poor prognostic factor in colorectal adenocarcinoma. The role of para-aortic lymph nodal dissection in colorectal cancer remains controversial and data regarding the same is limited. We performed our study to identify outcomes in our patients and to study patient and disease related factors contributing to the outcome.

Methods/Interventions: A retrospective analysis of a prospectively maintained database was done. All consecutive patients who underwent para-aortic lymph nodal dissection for colorectal adenocarcinoma (CRC) between May 2013 to March 2019 were considered. The patient demographics, treatment details, surgical outcomes, associated morbidity, overall and disease free survival (OS and DFS) were studied. OS and DFS were calculated using Kaplan Meir analysis, log rank test for univariate and Cox regression was used for multi-variate analysis using the IBM SPSS software v24.0

Results/Outcome(s): Out of 1636 patients who underwent surgery for CRC, 29 patients underwent para-aortic lymph nodal dissection. 55 % of the patients were males and the median age was 46 years. 79 % of the patients suffered from a rectal primary and 31 % patients developed the para-aortic lymph nodes metachronously. Median nodal harvest was 19 lymph nodes and no. of positive nodes were 2. 31% patients developed recurrence after para-aortic lymph nodal dissection and the median disease free interval to second recurrence was 80 days.

Conclusions/Discussion: Para-aortic lymph nodal dissection in colorectal adenocarcinoma can offer modest survial benefit in carefully selected patients in experienced centres.

OUTCOME OF ROBOTIC VS LAPAROSCOPIC VS OPEN RESECTION FOR RECTAL CANCER IN A CENTER WITH A BEGINNING ROBOTIC COLORECTAL SURGERY PROGRAM.

P1312

M. Tampo, B. Viray, M. Lopez, H. Monroy
San Pedro, Philippines

Purpose/Background: Robotic surgery for rectal malignancies in the Philippine is emerging. Evidence has shown promising results for robotic (R) surgery when compared to the laparoscopic (L) and open (O) surgical approach. This study discussed the clinicopathologic outcomes of the first robotic rectal resections versus laparoscopic and open rectal procedures at the Philippine General Hospital (PGH).

P1310 Prediction model for survival

Immune gene	Coefficient	HR (95%CI)	P-value
SLC22A17	-0.288	0.750 (0.497-1.131)	0.170
UMODL1	0.730	2.076 (1.268-3.397)	0.004
FABP4	0.054	1.056 (1.015-1.098)	0.006
ADIPOQ	-0.238	0.788 (0.583-1.065)	0.121
FGF2	0.384	1.468 (1.090-1.976)	0.011
CD19	0.780	2.182 (0.990-4.806)	0.053
CR2	0.215	1.240 (1.043-1.475)	0.015
CD22	-1.271	0.281 (0.105-0.753)	0.012
PLCG2	0.404	1.498 (0.949-2.366)	0.083
IGKV1-33	0.070	1.072 (1.004-1.145)	0.038
CHGB	0.021	1.021 (1.002-1.041)	0.032
GRP	0.084	1.087 (0.993-1.191)	0.070
UCN	0.273	1.314 (1.131-1.525)	<0.001
VIP	0.055	1.056 (1.030-1.083)	<0.001
NGFR	-0.314	0.731 (0.488-1.094)	0.127
NR3C2	-0.265	0.767 (0.648-0.908)	0.002

HR: hazard ratio; CI: confidence interval

Methods/Interventions: This is a cohort of 45 consecutive surgical resections for rectal malignancy done at the PGH from March 2019 to October 2019 comparing the outcomes of the first 15 robotic procedures versus laparoscopic (n=15) and open (n=15) operations performed during the same time period

Results/Outcome(s): This study included 45 patients with a mean age of 56.04 years (range-19-81, SD± 13.45); with 27 (60%) males (R–8; L-7; O-12) and 18 (40%) females (R-7; L-8; O-3). There was no significant difference (p value 0.79; F comp-0.23) in the age distribution among the groups. Most of the tumors were in the low rectum (total 60.00%- 27/45; R 73.33%-11/15, L 53.33%-8/15, O 53.3 3%-8/15). Most were locally-advanced (with 60% - 27/45 at least Stage IIIB). Forty-two (93.33%) patients underwent neoadjuvant treatment (LCCRT-36/45-80.00%; SCRT-5/45-11.11%). No conversion in both laparoscopic and robotic subgroups were noted. The R group had the longest operating time-438.07mins (range 238-650mins; SD±124.57). This was significantly different from the operating time of L (mean 217 mins, range 175-300 mins; SD±32.47) and O (mean 151.33 mins; range 100-350 mins; SD±32.47). The operating time for O was significantly faster than (T-value 3.10, T-crit 20.4) and R (T-value 4.87; T crit 2.04). Blood loss was comparable among the groups (p-value 0.38 F value 2.1). There was no statistically significant difference with the O and L-group in terms of proximal margin and distal margin. Most cases had a negative circumferential resection margin (R-9/15-60.00% O 15/15 100%). Most cases had R0 resection (R-13/15-86.67%; L -15/15 -100%; O-15/15-100%). There were 2 rectal perforation in the R group during dissection. The specimen concordance rate between the surgeons' and pathologists' was 75.56% (R-8/15 53.33%, L-13/15 86.67%, O-13/15 86.67%). Total hospital length of stay (p value–0.78; F-comp 0.24) and post operative length of stay (p value 0.65, F comp 0.43) had no significant difference among the groups. Thirty-day morbidity revealed L (ileus 2/15 13.33%) the the least complications. The overall morbidity rate was 20% (9/45). One patient needed re-operation for an anastomotic dehiscence in the R-group. There was no reported mortality

Conclusions/Discussion: Initial experience with robotic rectal surgeries at the PGH had similar clinicopathologic outcomes when compared with the laparoscopic and open approaches.

Table 1:Table 1 : Comparative clinocopaathologic outcomes of initial robotic surgery versus the last 15 consecutive cases laparoscopic and open rectal surgeries

	PARAMETER	ROBOT	LAPAROSCOPIC	OPEN
	N (15)			
DEMOGRAPHICS	Sex			
	Male	8 (53.33%)	7 (47.67%)	12 (80.00 %)
	Female	7 (47.67%)	8 (53.67%)	3 (20.00%)
	Age	Mean 54.73 Range 37-76 SD±10.08	Mean 58.00 Range 26-75 SD±14.79	Mean 55.40 Range 19-81 SD±15.49
		ANOVA: P value-0.79; F comp-0.23		
	Distance from the anal verge			
	Low rectal (0-5cms)	11 (73.33%)	8 (53.33%)	8 (53.33%)
	Mid rectal (6-10cms)	4 (26.67%)	7 (46.67%%)	5 (33.33%)
	High rectal (11-12cms)	0 (0%)	0 (0%)	2 (13.33%)
	Clinical stage			
	I (T2N0M0)	0 (0%)	2 (13.33%)	2 (13.33%)
	IIA (T3N0M0)	2 (13.33%)	6 (40.00%)	6 (40.00%))
	IIIB (T3N1M0)	13 (86.67%)	6 (40.00%))	4(20.00%)
	IIIC (T3N2M0)	0 (0%)	1 (6.67%)	1 (6.67%)
	IV (T3N1M1)	0 (0%)	0 (0%)	2(13.33%)
	Neoadjuvant treatment			
	LCCRT	11 (73.33%)	11 (73.33%)	14 (93.33%)
	SCRT	2 (13.33%)	2 (13.33%)	1 (6.67%)
	None	2 (13.33%)	2 (13.33%)	0 (0%)
	Procedure			
	AR	0 (0%)	2 (13.33%)	3 (20.00%)
	LAR	6 (40.00%)	10 (66.67%)	6 (40.00%)
	ATAR	4 (26.67%)	0 (0%)	2 (13.33%)
	APR	4 (26.67%)	3 (20.00%)	4 (26.67%)
	Total proctocolectomy	1 (6.67%)	0 (0%)	0 (0%)
INTRAOPERATIVE	Positioning time (mins)	Mean 17.25 Range 2-28 SD ±8.08	NA	NA
	Docking time (mins)	Mean 13.13 Range 6-25 SD ±5.87	NA	NA
	Console time (mins)	Mean 233.47 Range 83-400 SD ±94.44	NA	NA
	Total surgery time (mins)	Mean 438.07 Range 238-650 SD ±124.57	Mean 217 Range 175-300 SD ±32.47	Mean 151.33 Range 100-350 SD ± 68.68
		ANOVA: P value – 0.0000043 F comp 51.97 T-Test ROBOT vs LAP: T-Value 3.09; T crit 2.04 T-Test ROBOT vs OPEN: T-Value 4.87; T crit – 2.04 T-Test OPEN vs LAP: T-value 3.10; T-crit2.04		
	Blood loss (cc)	Mean 399.2 Range 200-585 SD ±133.07	Mean 216 Range 150-250 SD ± 32.47	Mean 221.33 Range 100-250 SD ±68.68
		ANOVA: P value-0.38 F value 2.1		
PATHOLOGIC OUTCOMES	Lymph node harvest	Mean 11.4 Range 3-20 SD ±4.40	Mean 15.2 Range 3-27 SD ±7.27	Mean 16.93 Range 2-34 SD ±10.65
		ANOVA: P value-0.16; F comp-1.94		
	Positive lymph node harvest	Mean 9.21% Range 0%-50% SD ±15.85%	Mean 9.09% Range 0%-80% SD ± 7.27%	Mean 8.00% Range 0%-33% SD ±12.29
		ANOVA: P value-0.97; F comp—0.92		
	Resection margin			
	RO	13 (86.67%)	15 (100%)	15 (100%)
	R1	2 (13.33%)	0 (0%)	0 (0%)
	R2	0 (0%)	0 (0%)	0 (0%)
	Lymphovascular invasion			
	Yes	3 (20.00%)	12 (80.00%)	10 (66.67%)
	No	10 (66.67%	3 (20.00%)	5 (33.33%)
	Undetermined	2 (13.33%)	0 (0%)	0 (0%)
	Perineural invasion			
	Yes	2 (13.33%)	1 (6.67%)	3 (20.00%)
	No	11 (73.33%)	14 (93.33%)	12 (80.00%)
	undetermined	2 (13.33%)	0 (0%)	0 (0%)
	Circumferential resection margin			
	Positive (Less than 1mm)	4 (26.67%)	1 (6.67%)	0 (0%)
	Negative	9 (60.00%)	14 (93.33%)	15 (100%)
	Undetermined/Not reported	2 (13.33%)	0 (0%)	0 (0%)
	Proximal resection margin (cms)	Mean 11.10 Range 2-16.5 SD ±4.77	Mean 11.10 Range 2-16.5 SD ±4.77	Mean 5.36 Range 2.5-11 SD ± 2.71
		ANOVA: P value 0.00009; F comp-11. 56		
	Distal resection margin (cms)	Mean 2.45 Range 0.1-5 SD ±1.78	Mean 2.55 Range 0-8 SD ±1.99	Mean 3.96 Range 1-7.5 SD ± 1.88
		ANOVA: P value-0.00004 F comp 3.21		
	Gross specimen grading			
	Complete	12 (80.00%)	15 (100%)	15 (100%)
	Incomplete	1 (6.67%)	0 (0%)	0 (0%)
	Partially complete	2 (13.33%)	0 (0%)	0 (%)
	Pathologic specimen grading			
	Complete	8 (53.33%)	13 (86.67%)	13 (86.67%)
	Incomplete	2 (13.33%)	0 (0%)	0 (0%)
	Partially complete	5 (33.33%)	2 (0%)	2 (0%)
	Specimen grading concordance	8/15 (53.33%)	13/15 (86.67%)	13/15 (86.67%)
	Histology			
	Adenocarcinoma	15 (100%)	15 (100%)	15 (100%)
	Well differentiated	8 (53.33%)	7 (46.67%)	7 (46.67%)
	Moderately differentiated	5 (33.33%)	8 (53.33%)	7 (46.67%)
	Poorly differentiated	2 (13.33%)	0 (0%)	1 (6.67%)
CLINICAL OUTCOMES	Length of stay (days)	Mean 9.53 Range 4-18 SD ±3.42	Mean 10.00 Range 5-19 SD ± 3.48	Mean 10.47 Range 7-25 SD ±4.69
		ANOVA: P value-0.78; F comp-0.24		
	Post of length of stay (days)	Mean 6.80 Range 3-16 SD ±2.26	Mean 6.90 Range 3-18 SD ±3.59	Mean 7.2 Range 5-13 SD ±2.40
		ANOVA: P value- 0.65; F-comp-0.43		
	Post op morbidity (30 days)			
	Ileus	3 (20.00%)	2 (13.33%)	2 (13.33%)
	UTI	1 (6.67%)	0 (0%)	1 (6.67%)
	Leak	1 (6.67%)	0 (0%)	1 (6.67%)
	None	10 (66.67%)	13 (86.67%)	11 (73.33%)
	Reoperation rate	1/15 (6.67%	0 (0%)	1/15 (6.67%)
	Conversion rate to open	0 (0%)	0 (0%)	NA
	Post-op mortality (30 days)	0 (0%)	0 (0%)	0 (0%)

A COMPARISON OF QUALITY OF TOTAL MESORECTAL EXCISION AFTER ROBOTIC AND LAPAROSCOPIC SURGERY FOR RECTAL CANCER: A MULTICENTER, PROPENSITY SCORE MATCHED STUDY.

P1313

S. Kim, S. Bae, S. Baek, S. Kim, W. Jeong
Daegu, Korea (the Republic of)

Purpose/Background: The aim of this study was to evaluate and compare the quality of total mesorectal excision (TME) between robotic and laparoscopic surgery for rectal cancer

Methods/Interventions: From January 2015 to December 2018, 234 patients underwent curative robotic or laparoscopic surgery for rectal cancer at two centers in Korea. Thirty-three patients who underwent simultaneous multiple organ resection combined with rectal cancer, had stage IV rectal cancer, or simultaneous other cancers were excluded. Ultimately, 201 patients were enrolled. To control for different demographic factors in the two groups, propensity score case matching was used at a 1:1 ratio. Propensity scores were generated with the baseline characteristics, including age, sex, body mass index, American Society of Anesthesiologists score, previous abdominal surgery, tumor location, preoperative chemotherapy, and preoperative radiation. Finally, 134 patients were matched with 67 patients of the robotic surgery group and 67 patients of the laparoscopic surgery group.

Results/Outcome(s): Positivity of circumferential resection margin was not different between robotic and laparoscopic surgery groups (4.5 vs. 1.5%, respectively; $p = 0.619$). Incomplete and nearly complete TME quality was higher in robotic surgery group (23.9% vs.10.4%, respectively; $p = 0.039$). Incomplete TME quality (8/67, 11.9% vs. 7/67, 10.4%, respectively) and complete TME quality (51/67, 76.1% vs. 60/67, 89.6%, respectively) were similar. But nearly complete TME quality was only in robotic surgery group (8/67, 11.9%).

Conclusions/Discussion: The quality of TME following robotic surgery was poorer than that of laparoscopic surgery in this study. The large, multicenter, prospective studies are needed to validate the advantages of robotic surgery system used in rectal cancer.

BMI EFFECT ON PATHOLOGIC RESPONSE AFTER NEOADJUVANT CHEMORADIATION FOR LOCALLY ADVANCED RECTAL CANCER IN THE RIO GRANDE VALLEY OF TEXAS.

P1314

D. Luebbers, A. Pena
Edinburg, TX

Purpose/Background: Obesity has become an epidemic and has been correlated with a worse response to neoadjuvant treatment in mid to low rectal cancers. A study of 753 patients done by Parke et al showed the rate of pCR to neoadjuvant chemoradiation was significantly lower among obese patients with an OR of 1.6. Given this we set out to analyze the pathologic response of neoadjuvant chemoradiation in relation to BMI and other controversial variables, such as age, diabetes, hyperlipidemia, in a predominantly Hispanic population of the Rio Grande Valley of Texas.

Methods/Interventions: A retrospective chart review was performed of patients age 18 or older who underwent neoadjuvant chemoradiation for mid-low rectal cancer followed by oncologic resection. We analyzed 83 Hispanic patients using descriptive statistics and logistic regression backward stepwise ($p<0.1$ was considering significant) considering statins treatment, BMI, T2DM, race, age and sex.

Results/Outcome(s): The sample was analyzed with a logistic regression adjusting by BMI, sex and age. In our study population of 83 patients, 89% of whom are Hispanic with mean age of 61.1 (SD 13.5), 18 subjects had a complete response to treatment (22%) and 65 showed a non-response (78%). Adjusted OR for obesity was 3.8 (95%CI: 1, 14.8; $p=0.05$) The treatment outcome was independent of sex, race or T2DM.

Conclusions/Discussion: Our study was consistent with current data on the negative effect of obesity on the response to neoadjuvant. Interesting is that our data was significant in the fact that obese individuals of the Rio Grade Valley had a 3.8 times higher risk of non-response compared to patients with a BMI < 29.9. Our higher OR of 3.8 encourages the need for further investigation to assess if the Hispanic population and patients of the Rio Grade Valley are at a higher risk of non-response to neoadjuvant treatment.

A GREAT MIMICKER AND THE IRONY OF DEVELOPMENT – REVISITING AN ETIOLOGY OF INFECTIVE COLITIS THAT'S OFTEN NOT APPRECIATED IN DEVELOPED COUNTRIES.

P1500

D. Yen, F. Koh, F. Foo, W. Tan, A. Chong, M. Chew
Singapore, Singapore

Purpose/Background: Amoebic colitis is prevalent in developing countries and is the second leading cause of death by parasitic infection in the world. However, access to medical care in these countries is limited. Amoebic colitis is much less seen in the developed world where there is a lot better access to colonoscopy. With society being more affluent, travel to developing nations and exotic destinations has becomes more rampant. This case series of amebic colitis in Singapore, a developed country and a renown medical hub, to serve as a reminder of the great mimicking ability of ameobic colitis to more common conditions seen in developed countries.

Methods/Interventions: We reviewed all cases of amoebic colitis in a single tertiary institution over an 18 month period, July 2018 to December 2019. Clinical assessments and endoscopic images and histopathological slides were reviewed.

Results/Outcome(s): All 3 cases had presented with nonspecific symptoms (haematochezia, abdominal discomfort and weight loss). Due to the suspicious nature of the combination of these symptoms, colonoscopy was performed for all these cases. Colonoscopic examination revealed features favoring pathologies, ie infective colitis, inflammatory bowel disease and colonic malignancy, all of which are more common in a developed country. Histopathological examination of biopsies taken from all 3 patients reveals single-cell organisms favouring amoebic colitis. These patients were then seen by the Infectious Disease department and were treated with a course of oral metronidazole 400mg three times a day and paromomycin 500mg twice a day. All recovered well after anti-parasitic treatment. On retrospective review, all patients had positive contact or travel histories associated with travel to developing countries.

Conclusions/Discussion: Ameobic colitis remains rare in developed countries. However, with endoscopy being readily available, identification of amoebic colitis might be more common in the developed world. One should be aware of the varied and non-specific clinical presentation for this easily treated condition. Its ability to mimic other pathologies, more common in developed countries, may result in erroneous treatment which may even involve surgery without treating the root cause. Travel and contact history remain critical in keeping our guards up for amoebic colitis.

COMBINED LAPAROSCOPIC ENDOSCOPIC RESECTION OF POLYP (CEL).

P1501

A. Ky, J. Mai, M. Plietz
New York, NY

Purpose/Background: Colonoscopies are the best and ideal method to remove benign polyps. There are some larger and flap polyps that may not be amenable to resection endoscopically especially when they are on the right side. For these patients, they may end up with a colon resection. A formal resection does have a with a higher morbidity associated with it. We may also be be over treating these polyps because of the cancer risk associated with polyps. A combined approach of laparoscopy and endoscopy have been used on selected patients who had unresectable endoscopic polyps. This method of combined approach offers patients another option to have a full thickness excision of a colonic polyps without full bowel resection. However, if a formal resection is needed, this can be performed without a return visit. The endoscopic combined with laparoscopic full thickness resection allows patients to have a same day procedure without the complications of a formal resection.

Methods/Interventions: We present a total of 7 patients who underwent this combined procedure. This is a prospective study on all patients who present with large colonic benign polyps for surgical resection. All of the patients had colonoscopies by their gastroenterologist and was sent to surgery for resection.

Results/Outcome(s): 6/7 patients had right side unresectable polyps. 1/7 had a large polyp in the transverse colon. 6/7 had successful endoscopic laparoscopic resection completed. 1/7 needed a formal resection as the polyp was too big to be resected safely without compromising the lumen. The pathology on all of the 7 patients were benign tubulovillous adenoma. There were no diagnosis of cancer in the final pathology. 4 of the 7 already had a followup colonoscopy without evidence of polyps.

Conclusions/Discussion: CEL allows for a safe and complete method of removing a potentially cancer causing polyps without a formal resection. It also allows the option for a formal resection if the CEL option cannot completely remove all of the polyp without having the patient return again with yet another bowel prep for formal resection. It will also allow for repair primarily if an injury was to be sustained. This allows options for patients with larger polyps especially in the right side of the colon.

CLINICAL EVALUATION OF LAPAROSCOPIC RIGHT HEMICOLECTOMY IN ILEOCECAL KOCHS VERSUS MALIGNANCY.

P1502

A. Chandra, A. Pai, V. Gupta, N. Kumar, P. Rajan, V. Gupta, P. Joshi, A. Dangi
Lucknow, India

Purpose/Background: Ileocecal tuberculosis (ICT) is among the leading causes of intestinal obstruction requiring surgery in the Indian subcontinent. Laparoscopic right hemi-colectomy (LRH) is the standard procedure for benign as well as malignant lesions of ileocecal region. Literature is scant on the intra-operative problems encountered during LRH for ICT.

Methods/Interventions: Perioperative data was recorded prospectively in a standardized format during the period of study to evaluate the technical difficulties encountered during LRH for ICT as compared to LRH for malignancy. All patients who underwent LRH for intestinal obstruction due to ICT or right colon malignancy, from May 2012 to June 2019 were analyzed. LRH was performed using standard four port technique with additional ports placed during technical difficulties.

Results/Outcome(s): Sixty five patients (median age 45 years (range 19-68); males =39, females =26) were operated. Indications were ICT in 35 patients and malignancy in 30 patients. Mean duration of surgery was significantly longer in ICT group as compared to malignant group (208±21.34 minutes vs. 189.83±9.14 minutes; p<0.01) with two conversions each in both groups. Patients with ICT had more intra-operative technical difficulties in the form of adhesions (25/35 vs. 5/30), need for extra port (11/35 vs. 2/30), lateral to medial approach (7/35 vs. 2/30), and higher mean intra-operative blood loss (91.91±7.63ml vs. 77±12.57ml; p=0.01). Post operative morbidity (Clavien–Dindo score) was similar in both groups. There was no post operative mortality.

Conclusions/Discussion: Intraoperative difficulties during LRH are mainly attributable to the adhesions encountered frequently in these patients. However, LRH for ICT seems to be a technically feasible option, often requiring a lateral to medial approach.

PERITONEAL LOOSE BODIES.

P1503

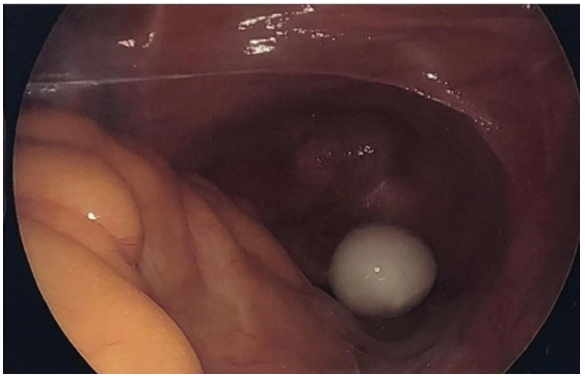
Y. Yurko, J. Mayfield, M. Devane, D. Schammel, C. Schammel
Greenville, SC

Purpose/Background: Peritoneal loose bodies (PLBs) have been sparingly documented throughout literature with less than 30 cases reported, and remain a diagnostic mystery without surgical excision

Methods/Interventions: A 67-year-old male initially presented to urology for a management of a nocturia, urgency and abnormal prostate findings on digital rectal examination. A multiparameter MRI was completed to further evaluate the prostate for potential malignancy.

Results/Outcome(s): The MRI identified an 8 mm focus of intermediate suspicion of the prostate; also a 3.4 cm well marginated left lower quadrant mass was noted with suspected small fatty core, possibly arising from the sigmoid colon. Patient was otherwise asymptomatic. Endoscopic colonic evaluation showed no abnormalities. Decision was made to observe. Obtained CT pelvis six months later revealed a stable 3.4 cm well-defined rounded mass but now in the pelvis, likely arising from a single loop of the small bowel. The imaging was strongly suggestive of a benign lesion comprised of soft tissue, fat and calcifications, suggestive of a desmoids. Surveillance with CT scan was recommended in 6 months. Follow-up CT noted an increase in size of the lesion. The patient was evaluated by colorectal surgeon. Due to a concern that the growing mass was malignant, decision was made to proceed with surgical evaluation. During the laparoscopic evaluation, a firm free floating round mass was found in the pelvis. Pathological evaluation revealed a 3.5 x 3.1 x 2.9 cm tan-yellow circumscribed nodule with a firm smooth surface and a central area of necrotic material. Permanent sections showed cellular hyalinized material with a small amount of necrotic fat dystrophic calcifications with no neoplasia.

Conclusions/Discussion: Based on the observations reported above and current literature, it should be concluded that characterization of unknown abdominal and pelvic masses is not always possible utilizing noninvasive means only and sometimes may require abdominal exploration (diagnostic laparoscopy).



Peritoenal body

TRANSANAL TOTAL MESORECTAL EXCISION (TaTME) WITH DELAYED COLO-ANAL ANASTOMOSIS VERSUS TaTME WITH IMMEDIATE COLOANAL ANASTOMOSIS AND TEMPORARY DIVERSION IN MIDDLE AND LOW RECTAL CANCER: COHORT STUDY.

P1536

K. Madbouly[1], W. Omar[2]
[1]*Alexandria, Egypt;* [2]*Mansoura, Egypt*

Purpose/Background: To compare laparoscopic transanal total mesorectal excision with immediate coloanal anastomosis and protective ileostomy (TaTME-IA) versus laparoscopic transanal total mesorectal excision with with Turnbull–Cutait pull-through procedure and delayed coloanal anastomosis (TaTME-TC) as regard anastomotic complications, rate of permanent stomas, continence, and quality of life.

Methods/Interventions: Study included all patients who had TaTME from 2015 till 2018 at Alexandria University hospitals and health insurance institutes. Patients were divided into 2 groups; TaTME- IA group and TaTME-TC group. Occurrence and degree of anastomotic leakage were evaluated according to criteria developed by the International Rectal Cancer Research Group. Anastomotic strictures and their management were analyzed. After 1 year, all patients were assessed as regard: rate of permanent stomas, continence using Wexner incontinence score (WIS) and quality of life using Cleveland Global Quality of life score (CC-QOL)

Results/Outcome(s): TaTME-IA group had 26 patients versus 21 patients in TaTME-TC group. In TaTME-IA stoma was closed after 8 weeks if no leak. Clinical data of both groups are summarized in table 1. TaTME-IA had significantly longer mean operative time (OR) (p=0.04). However, mean postoperative length of stay (LOS) was 7.5 days in TaTME-IA vs. 11.4 days in TaTME-TC (p= 0.001). All readmissions were due to pelvic sepsis. Readmission rate within 30 days was 15.4% in TaTME-IA group compared to 4.7% in TaTME- TC group (p= 0.02) In TaTME-IA group, 3 patients (11.5%) had anastomotic leak, including 2 cases of grade C leak, who underwent abdomino perineal resection 2 months after operation and 1 case of grade B anastomotic leak, who improved after conservative treatment. In TaTME-TC group, one patient had grade B leakage (4.7%) and was treated conservatively. Anastomotic stenosis was found in 2 patients in each group. In TaTME-TC both cases were successfully treated by balloon dilatation. While in TaTME- IA, stenosis was so tight due to pelvic sepsis and stomas were not closed in these patients. After 1 year, 21 patients (81%) in TaTME-IA were stoma free versus 19 patients (91%) in TaTME-TC (p= 0.44). WIS, didn't show significant difference between groups; p= 0.09. On the contrary after 1 year quality of life was significantly higher in TaTME-TC group (p=0.04).

Conclusions/Discussion: TaTME-TC is a good alternative to TaTME-IA that saves the patient from stoma with much less rate of readmission and better quality of life. TaTME-TC needs less operative time, yet, longer length of hospital stay compared to TaTME-IA. Rate of anastomotic leak, permanent stoma and continence after one year were more or less similar after both techniques. Larger prospective randomized study is still needed to avoid any selection bias.

IMPACT OF NEOADJUVANT CHEMOTHERAPY ON POSTOPERATIVE LOW ANTERIOR RESECTION SYNDROME IN RECTAL CANCER PATIENTS: A PROSPECTIVE STUDY (FOLLOW-UP UPDATE OF THE 2019 CSCO POSTER).

P1537

Q. Zhang, R. Yu, L. An, X. Wang, L. Li
Chengdu, China

Purpose/Background: Neoadjuvant radiotherapy impairs postoperative anal function. Neoadjuvant chemotherapy alone might reduce the negative effect of radiotherapy. The impact of neoadjuvant chemotherapy alone on low anterior resection syndrome (LARS) has not been investigated continuously. Here, we assess the impact of neoadjuvant chemotherapy on LARS.

Methods/Interventions: Till October 30, 2019, 91 rectal cancer patients treated by total mesorectal excision (TME) without stomy between June 30, 2018-September 24, 2019 were studied prospectively. Among them, 20 patients were followed up to 12 months, 34 patients were followed up to 6 months, 13 patients were followed up to 3 months, and 24 patients were followed up to 1 months. 18 patients underwent neoadjuvant chemotherapy, 36 patients didn't undergo neoadjuvant treatment. This report will include the 54 patients that have reached 6 months of follow-up. The neoadjuvant chemotherapy protocol is 4 cycles of CapeOX combined with Apatinib. Anal function was assessed by the LARS score, which was taken at 1 month, 3 months, 6 months and 12 months after surgery via phone call interview. Patients were divided into two groups, the neoadjuvant chemotherapy group (n=18) and the no neoadjuvant chemotherapy group (n=36).

Results/Outcome(s): There was no significant difference between the LARS scores at 1 month (median 15.5 [0-31] vs. 11 [0-39], P=0.465), 3 months (7 [0-41] vs. 11 [0-41], P=0.574) and 6 months (8 [0-32] vs. 0 [0-42], P=0.400) of both groups. The LARS score at 6 months showed a significant decrease from that of 1 month in the neoadjuvant chemotherapy group (P=0.037) and in all patients included in the analysis (P=0.016), but no significant difference was found between the scores

P1536 Clinical Data of TaTME-IA and TaTME-TC

Variable	TaTME- IA (n=26)	TaTME- TC (n= 21)	P value
Males	18	16	0.75
Age in years (Mean ±SD)	58.2 ± 18.7	56.1± 15.1	0.81
BMI kg/m2 (Median & range)	27 (23-34)	26 (24- 31)	0.88
Distance from Anal verge in cm (Median & range)	6 (5-9)	6 (5-10)	0.91
Operative time in minutes (Median & range)	300 (225- 360)	270 (200- 300)	0.04
Anastomotic leak	3	1	0.61
Mortalities	0	0	NA
Perioperative morbidities	7 (27%)	7 (33%)	0.75

Significance if p ≤ 0.05

at 1 month and 3 months (neoadjuvant chemotherapy group P=0.096, all patients P=0.290) or 3 months and 6 months (P=0.037, P=0.178). No significant difference was found between the LARS scores in the no neoadjuvant chemotherapy group at 1 month, 3 months and 6 months (P=0.156).

Conclusions/Discussion: Neoadjuvant chemotherapy alone did not have a negative impact on LARS and the progress of anal functional recovery. Overall, the anal function after TME with no preventive stoma didn't show much recovery during the first 3 months after surgery, and showed improvement at 6 months after surgery. The study will continue the follow-up and include more patients in the future to further discuss the changes of anal function over the 12 months follow-up period.

CLINICAL APPLICATION OF AUTOMATIC DIAGNOSIS PLATFORM FOR RECTAL CANCER T-STAGING WITH DEEP NEURAL NETWORK.

P1538

Q. Wu, Y. Lu
Qingdao, China

Purpose/Background: Rectal cancer is one of the most common malignant tumors of the digestive tract, seriously decreasing the average life expectancy and affecting the quality of life of human beings. Comprehensive surgery-based treatment has greatly prolonged the life expectancy and improved the quality of life of patients with rectal cancer. Accurate preoperative staging plays an important role in the selection and determination of treatment options for patients with rectal cancer. So it is very necessary to introduce a method to improve both the efficiency and the accuracy for preoperative T-staging of rectal cancer patients. With the help of the deep learning, we can analyze many images in short time and get the right results. And we decide to establish an automatic diagnostic platform for preoperative T staging of rectal cancer by learning MRI images combined with postoperative pathological T staging through the deep neural network based on Faster R-CNN.

Methods/Interventions: Methods: 183 rectal cancer patients were collected from the CCCD database,and were treated in Affiliated Hospital of Qingdao University from July 2016 to July 2017 were retrospectively studied. We choose the T2-weighted images, DISTANCE reports of the MRI examination, and the postoperative pathological diagnosis as research objects. And we randomly divided the objects into learning group (80% of the objects) and verification group (20% of the objects). The images were marked by the Labelimage software, So that they can be used for machine learning. The Faster R-CNN algorithm is used to build the software for learning the images of the learning group. In addition, we use the verification group to verify the learning results of the platform. The diagnostic platform is evaluated according to the receiver operating characteristic curve.

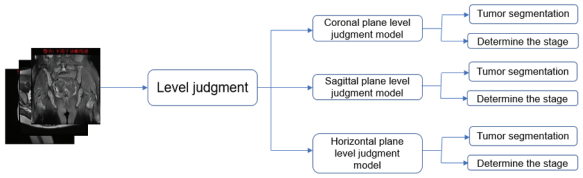
Results/Outcome(s): Through the study of MRI images at three levels, an automatic diagnosis platform for T staging of rectal cancer was initially established, and through the test of the validation group, the corresponding area under the ROC curve was: horizontal, AUC=0.99. Sagittal plane, AUC=0.97; Coronal, AUC=0.98. All were

P1537

	LARS Score [P50 (P25, P75)]			P-value	
	1 month	3 months	6 months	Overall (1 month vs. 3 months vs. 6 months)	Pairwise Comparisons [1 month vs. 3 months/ 3 month vs. 6 months/ 1 month vs. 6 months]
Neoadjuvant Chemotherapy (n=18)	15.5 (7.75, 21)	7 (0, 18.75)	8 (0, 16.25)	0.037	0.096/0.677/0.037
No Neoadjuvant Chemotherapy (n=36)	11 (0, 22)	11 (0, 27)	0 (0, 15)	0.156	
Overall (n=54)	12.5 (1.5, 21.25)	9 (0, 27)	5 (0, 15)	0.018	0.290/0.178/0.016
P-value (neoadjuvant chemotherapy vs. no neoadjuvant chemotherapy)	0.465	0.574	0.400		

higher than the 86% accuracy of artificial MRI diagnosis. And we further collated the data and found that the platform performances well in every plane.

Conclusions/Discussion: Through the results of the evaluation, The diagnostic platform based on Faster R-CNN of the rectal cancer T staging reached the level of the high qualification radiologist in the diagnosis of gastrointestinal tumor for the preoperative imaging staging of rectal cancer patients. And on the various stages of different exposure level of MRI image T staging diagnosis have reached a high level.



The learning process for the establishment of the automatic diagnosis platform for rectal cancer T-staging: We input the images of training group into the software. The learning process is divided into 2 major steps, and a total of 4 learning models were established to insure that we can judge the images from which planes, sketches the ROIs and give the conclusion of T stage.

SAFETY AND FEASIBILITY OF LAPAROSCOPIC SURGERY FOR CT4B COLORECTAL CANCER PATIENTS.

P1539

Y. Mizuuchi[1], S. Nagai[1], Y. Tanabe[2], K. Nagayoshi[1], H. Fujita[1], M. Sada[2], Y. Kitaura[2], K. Ohuchida[1], T. Ohtsuka[1], T. Nakano[2], M. Nakamura[1]
[1]Fukuoka, Japan; [2]Kitakyushu, Japan

Purpose/Background: Laparoscopic surgery (LS) is minimally invasive surgery because of less incision, less postoperative pain and early bowel motility recovery. In the surgery for colon cancer, various RCT showed non-inferiority of LS in perioperative complications and recurrent rate. In these RCT, the subjects of the trial exclude transverse colon cancer, the locally advanced colorectal cancer (CRC) with other organ invasion. In Japan, about 70% of CRC patients underwent LS, and LS for locally advanced CRC were on the increase, but safety and feasibility of LS for cT4b CRC patients remain controversial.

Methods/Interventions: We retrospectively review the cT4b CRC patients and examined the recurrence and clinicopathological factors. The patients with StageIV, double cancer, preoperative chemoradiation were excluded. 151 patients were enrolled in this study. Indication for open surgery (OS) in our institutes is as follows; huge mass, unable to keep a view of surgical site, massive urinary bladder invasion without urinary diversion and severe intraperitoneal adhesion.

Results/Outcome(s): The gender was 65 male and 86 female and median age was 68.9 (41-88). LS was performed 94 patients (62.2%). Tumor was located in the right side colon 53 (V3, C9, A29, T12), the left side colon 75 (D12, S39, Rs24), and the rectum 23 (Ra7, Rb16), respectively. Surgery time was 298 (129-1255) min and blood loss was 175 (55-11010)g. Postoperative complication (Clavian-Dindo>2) was 54/151 (35.8%). Sixty five patients showed pathologically invaded other organs (1 stomach, 1 duodenum, 9 small intestine, 9 colon, 7 uterine, 4 ovary, 7 vagina, 12 UB, 1 ureter, and 13 abdominal wall and 2 pelvic cavity including duplication). Number of pathologically T4b patients is 32/94 (34.0%) in LS and 33/57 (57.9%) in OS, suggesting that the patients performed OS is more progressed than those of LS. Five year recurrence free survival (RFS) rate was 70.4% in LS and 61.6% in OS. Univariate analysis showed that rectal cancer ($p=0.037$), pathological T4b ($p<0.0001$), pathological N2 ($p=0.019$), positive surgical margins ($p=0.007$) are significantly associated with worse RFS. Multivariate analysis indicated that pathological T4b (HR = 3.57, 95%CI = 1.90-6.73, $p<0.0001$) and positive surgical margins (HR = 3.41, 95%CI = 1.50-7.73, $p=0.0033$) were independent predicting factor for recurrence. Surgical procedure (open surgery) was not prognostic factor in spite of high pT4b rate. To investigate the survival impact of surgical procedure on UB invasion, we classified CRC patients with UB invasion as LS group and OS group. It was indicated that LS group was significantly poorer RFS than OS group ($p=0.0391$).

Conclusions/Discussion: LS might be invalid for the patients with UB invasion. Indication for LS should be reconcidered especially in the patients with UB invasion. OS was preferred for the patients with massive urinary bladder invasion without urinary diversion. It is necessary to conduct a larger study.

PRACTICE PATTERN OF COLONIC STENT USE IN BENIGN AND MALIGNANT COLONIC OBSTRUCTION: A REGIONAL DATA ANALYSIS.

P1541

A. Akhtar, J. Somerville, A. Shmelev
Elkridge, United States Minor Outlying Islands

Purpose/Background: Colonic stents are effective in the management of acute colonic obstruction for benign and malignant conditions. Stents may be used for palliation or as a bridge to surgery. Small studies have suggested that colonic stent may reduce the need for ostomy creation and increase successful laparoscopic resection. This study was conducted to analyze the practice patterns of colonic stent use in benign and malignant colon obstruction.

Methods/Interventions: All patients who underwent colonic stenting during a hospitalization between 2012 and 2017 were identified from State Inpatient Database of Maryland and included in analyses. Retrospective review of these records and subsequent admissions was performed.

Results/Outcome(s): A total 374 unique patients underwent colonic stenting. Mean patient age was 64 years, 54% were male. Of 374 patients, 251 (67%) underwent stenting for benign colorectal conditions, while 123 (33%) had stent placement for colorectal malignancies. Distribution of age and sex were similar between these two groups. Seventeen patients underwent stenting on two separate hospitalizations, and one patient had three stenting procedures. Over six years, between 33 and 67 colonic stent placement were performed in Maryland annually for benign conditions and 21 to 27 were performed annually for malignancies. Colectomies were performed in 22 (5.1%) of 432 hospitalizations among 251 patients requiring stent placement for a benign condition; 16 of these colectomies were performed following stent placement during the initial hospitalization and 5 during the subsequent hospitalization. In 246 hospitalizations of 123 cancer patients requiring stent placement, colectomy was performed in 22 (8.9%) patients; 11 of these were performed during the same hospitalization following stent placement and 9 were performed during the subsequent hospitalization. Colectomy was performed more frequently when stent was placed for a malignancy compared to benign indiation (p-value 0.024). Of all patients undergoing colonic stenting, only three (2 malignancies, 1 benign) patients subsequently required a colostomy. Readmission rates after colonic stenting were not statistically different among patients with malignant versus benign indications (50% vs. 41%, P-value 0.055).

Conclusions/Discussion: Colonic stents are predominantly placed for palliation rather than bridge to colectomy. Although colonic stenting is performed more frequently for benign indications, it is followed by a colectomy more frequently in setting of malignancies. Among patients who had colectomy after stent placement, surgery was predominantly performed during the same or subsequent elective admission. During the follow-up period of this study, low rate of colostomy was observed after colonic stenting. Besides palliation, colonic stenting can be a useful tool before definitive colectomy and should be explored further in national studies.

IS THERE AN IDEAL TECHNIQUE OF DOING RIGHT COLONIC ANASTOMOSIS TO REDUCE ANASTOMOTIC LEAK?

P1542

A. Arachchi
Melbourne, VIC, Australia

Purpose/Background: There are many choices of anastomotic technique after a right hemicolectomy. However, there is no clear discrepancy which technique is better and which leads to a reduced amount of anastomotic leaks nor which leads to the better functional outcome. The purpose of this study was to evaluate how different anastomotic techniques (End-to-Side, End-to-End and Side-to-Side anastomosis) utilised post a right hemicolectomy is associated with postoperative anastomotic leaks or bleed.

Methods/Interventions: This is a retrospective study between 2008 to 2019 looking at different techniques for right colonic anastomosis. Patient Age, admission and discharge dates, technique of anastomosis used, and anastomotic bleeding and/or leaking were recorded. The frequency of a bleeding and/or leaking complication for each of the three techniques of anastomosis were analysed using Chi-Squared tests and the risk assessed using logistic regression.

Results/Outcome(s): The records from a total of 1350 patients were examined. Each anastomosis was associated with a different incidence of leak or bleed. The most common anastomosis technique was End-to-side followed by a Side-to-Side anastomosis and some surgeons utilised the End-to-End technique. On logistical regression analysis, End-to-Side anastomosis was found to have the lowest leak rate (0.5%) as compared to a Side-to-Side (2.6%); whereas in the End-to-End technique, the risk of anastomotic leak was demonstrated to be 1.3%. In comparison, the incidence of bleeding was 1.1% for End-to-Side, followed by 2.2% for Side-to-Side and 0% in End-to-End anastomosis. However, assessing patient age as an independent risk factor did not demonstrate any correlation with incidence of anastomotic leak or bleed.

Conclusions/Discussion: Although there is no right technique to do right colonic anastomosis in our hands an end to side anastomosis denoted to show the lowest leak rate and post anastamotic bleeding

TRIMODAL TESTING OF COLORECTAL ANASTOMOSIS: RESULTS OF A PILOT TRIAL.

P1543

M. Kryzauskas, M. Jakubauskas, U. Imbrasaite, A. Dulskas, A. Bausys, K. Strupas, E. Poskus, T. Poskus
Vilnius, Lithuania

Purpose/Background: Anastomotic leak is one of the most severe complications of colorectal surgery associated with significant morbidity and high mortality. The aim of the study is to report results of the pilot trial using the trimodal intraoperative colorectal anastomosis testing technique.

Methods/Interventions: This is a multi-centre prospective pilot trial. 30 consecutive patients underwent standard laparoscopic assisted sigmoid or rectal resection. An end to end stapled colorectal anastomosis was created at or below 15 cm from the anal verge. Trimodal anastomosis testing that included indocyanine green (ICG) fluorescence imaging for the evaluation of the vascular perfusion and intraoperative air-leak and additional methylene blue testing for the mechanical integrity of the anastomosis were performed for all patients.

Results/Outcome(s): ICG fluorescence imaging confirmed good perfusion of proximal and distal bowel ends and colorectal anastomosis for 27 out of 30 patients (90%). Remaining patients (3 out of 30 patients (10%) experienced bad perfusion and the resection of the colon was extended for these patients. Intraoperative air-leak test and additional methylene blue test for 24 patients (80%) were negative. One patient (3.33%) had a positive air-leak test and the methylene blue test was not performed. The leakage of methylene blue occurred in 5 out of 29 tested patients (17.24%) after normal air-leak test. Detected anastomotic defects were closed with handsewn interrupted laparoscopic sutures and/or preventive ileostomy was created for these patients. There were no detected untoward effects. Two patients (6.66%) experienced postoperative anastomotic leak – one required reoperation with ileostomy and the second one healed with conservative management. The overall ileostomy rate was 50%.

Conclusions/Discussion: Trimodal testing of colorectal anastomosis could be a safe and comprehensive technique that allows evaluating the blood supply of colorectal anastomosis and detecting minimal integrity defects intraoperatively. This method could help to prevent postoperative clinically significant leaks after colorectal surgery.

PREDICTORS OF EMERGENT SURGERY AMONG PATIENTS WITH INFLAMMATORY BOWEL DISEASE – ANALYSIS OF THE ACS-NSQIP DATABASE.

P1544

U. Phatak, N. Kim, J. Favuzza, J. Hall
Boston, MA

Purpose/Background: About 50% of patients diagnosed with Crohn's disease and 30% of patients with Ulcerative Colitis will undergo surgery. The purpose of this study is to identify predictors of emergent surgery among patients with inflammatory bowel disease.

Methods/Interventions: This was a retrospective review of the National Surgical Quality Improvement Project database from 2010 to 2016. We identified patients with inflammatory bowel disease by ICD9 and ICD10 codes. We further identified patients who underwent colectomy or proctectomy by CPT codes. Data were collected regarding demographics, elective or emergent surgery, operative approach, morbidity, length of stay, and mortality. Univariate analyses were performed to compare characteristics between patients treated emergently versus electively. A multivariable analysis was conducted to identify significant predictors of receipt of emergent surgery. All analyses were performed using STATA.

Results/Outcome(s): Among those with IBD, 11,514 (61%) had Crohn's disease, 7382 (39%) had Ulcerative Colitis and 9489 (50.2%) were male. The median age was 41 years (IQR 29-55.5). The most common elective operation was minimally invasive ileocecectomy (N=3450, 19.6%) while the most common emergent operation was open total colectomy with or without anastomosis (N=307, 24.6%). The second most common emergent operation was open ileocecectomy (N=274, 21.9%). Patients who had elective surgery had a significantly shorter length of stay in days (8.4 vs. 15.9, p<0.001), were more likely to receive a minimally invasive operation (OR 0.18, 95%ci 0.15-0.21, p<0.001). Those who had emergent surgery had increased odds of returning to the operating room (OR 2, 95%CI 1.6-2.5, p<0.001) and 30 day mortality (OR 17.7, 95%CI 12.6-24.2, p<0.001). On multivariable analysis factors associated with emergent surgery included male sex, >10% weight loss in preceding 6 months, functional status, race, smoking and diabetes.

Conclusions/Discussion: Emergent surgery is associated with increased morbidity, mortality and increased odds of having an open operation. Patients should be counseled regarding the risks posed by smoking, poor diabetic control, and weight loss. Early identification and intervention in at-risk IBD patients may help improve outcomes and increase utilization of minimally invasive approaches.

P1544 Multivariable Analysis of Factors Associated with Emergent Surgery in IBD

Variables	Odds Ratio	95% Confidence Interval	p-value
Female	0.86	0.76 - 0.96	0.008
>10% Weight Loss in 6 Months	1.79	1.52 - 2.10	<0.001
Functional Status	3.26	2.78 - 3.82	<0.001
Non-Caucasian Race	1.24	1.21 - 1.28	<0.001
Smoking	1.21	1.05 -1.4	0.008
Diabetes	1.72	1.41 - 2.11	<0.001

UNDESIRED PERMANENT ILEOSTOMY AFTER ILEAL-POUCH ANAL ANASTOMOSIS FOR ULCERATIVE COLITIS, WHICH WAS ASSOCIATED WITH POUCH FISTULA.

P1545

N. Shimada, H. Ohge, Y. Watadani, S. Uegami, K. Yoshimura, K. Uemura, Y. Murakami, S. Takahashi[1]
[1]*Hiroshima, Japan*

Purpose/Background: Restorative proctocolectomy and ileal-pouch anal anastomosis (IPAA) is standardized technique. However, in some case, temporary ileostomy

closure after IPAA had been failed for pouch related complications. The aim of this study was to determine the risk of the permanent ileostomy after restorative total proctocolectomy with mucosectomy.

Methods/Interventions: Two hundred and twenty four patients with ulcerative colitis who underwent restorative proctocolectomy with IPAA between 2000 and 2018 was retrospectively analyzed. Rectal mucosectomy and hand-sewn anastomosis was performed for all cases, and temporary diversion ileostomy was placed for every anastomosis. Main outcome is the rates of permanent ileostomy after IPAA, and secondary outcome is the risk factor for that. Permanent ileostomy was defined as excision of pouch or irreversible stoma with pouch dysfunction, whether or not prophylactic ileostomy was closed.

Results/Outcome(s): In 224 patients, which included 131male (58%), the indication of surgical therapy for ulcerative colitis was refractory to medication (n=169), cancer / high grade dysplasia (n=43), and stricture disease (n=12). During a median 75 (30 - 138) month follow up, 13 patient (5.8%) failed to the permanent ileostomy, 3 of those patients couldn't close the temporary ileostomy. The cumulative risk of the permanent ileostomy was 3.38% at 5 years, and 6.4% at 10 years. The most common reasons for permanent ileostomy were the pelvic abscess with pouch fistula in 5 patients, and perianal abscess in 2 patients. Two patients removed the pouch because of the continuous anal pain. There was each one cases for chronic pouchitis, pouch-vaginal fistula, anal dysfunction, and pelvic recurrence of rectal cancer. As the postoperative complications after IPAA, the pelvic sepsis was 27 (12 %), anastomosis leakage was 11 (4.9%). As chronic IPAA related complications, pouchitis was 47 (5.8%), stricture at anastomosis site was 18 (8 %), and perianal abscess was 7 (3.1%). By logistic regression analysis, three risk factor for the permanent ileostomy was detected, which were the preoperative steroid use (Odds ratio6.1, 95% CI: 1.4-33, p= 0.012), the pouch fistula just after IPAA (95% CI: 35.3-, p< 0.001), and perianal abscess (Odds ratio 15, 95% CI: 1.8-113, p= 0.018). Sub-analysis about the pouch fistula at surgery, preoperative biological agents was indicted as risk factor (p=0.04).

Conclusions/Discussion: The rate of the permanent ileostomy after IPAA in this study was low, but 5.8% patients need the permanent ileostomy. To avoid the permanent ileostomy, total colectomy with 3-staged procedure may be feasible strategy for patients received preoperative steroid or biological therapy.

WHAT IS THE IMPACT OF DIFFICULTIES IN HAND-SEWN ILEAL POUCH-ANAL ANASTOMOSIS FOR ULCERATIVE COLITIS?

P1546

R. Matsunaga, Y. Sato, T. Oshiro, T. Kitahara, Y. Yoshida, T. Urita, R. Takagi, S. Okazumi
Chiba, Japan

Purpose/Background: Restorative proctocolectomy with ileal pouch-anal anastomosis (IPAA) has been the standard surgery for ulcerative colitis (UC). However, the construction type, hand-sewn or stapled IPAA, still remains controversial. There were some cases in which hand-sewn IPAA could not be performed, resulting in permanent stoma. We evaluated the factors that affected the difficulty of hand-sewn IPAA for UC.

Methods/Interventions: We retrospectively investigated 110 consecutive patients with UC who underwent two-stage laparoscopic restorative proctocolectomy between July 2008 and September 2018. In our hospital, hand-sewn IPAA was used in principle. We compared the cases in which hand-sewn IPAA could not be performed because of difficulty during operation and endo-ileostomy was performed instead (EI group) with the IPAA cases (IPAA group). The interspinous and intertuberous distances were measured on axial CT images. The visceral and subcutaneous fat volumes were analyzed with SYNAPSE VINCENT (Fujifilm).

Results/Outcome(s): Of the 110 patients, 7 and 26 indicated for stapled IPAA and endo-ileostomy, respectively, were excluded. 77 patients, 71 in the IPAA group and 6 (8%) in the EI group, were evaluated. 61% (43/77) in the IPAA group and 83% (5/6) in the EI group were male (p = 0.269). The median body mass index (BMI; kg/m^2) was 19.3 (13.9–36.1) in the IPAA group and 22.5 (15.8–31.6) in the EI group (p = 0.342). The median interspinous distance (mm) was 97 (75–132) in the IPAA group and 89 (86 – 106) in the EI group (p = 0.128). The median intertuberous distance (mm) was 101 (73–191) in the IPAA group and 92 (73–108) in the EI group (p = 0.077). The median visceral fat volume (cm^2) was 49 (5–218) in the IPAA group and 93 (45–142) in the EI group (p = 0.050). The median subcutaneous fat volume (cm^2) was 76 (3–450) in the IPAA group and 95 (15–351) in the EI group (p = 0.661).

Conclusions/Discussion: Of the patients, 8% could not undergo restorative proctocolectomy with hand-sewn IPAA for UC. The visceral fat volume was significantly greater in the EI group than in the IPAA group. The BMI tended to be higher and pelvis outlet tended to be smaller in the EI group. These factors should be considered when planning hand-sewn IPAA.

PRIMARY AND DE NOVO ANAL TRANSITIONAL ZONE CANCER WITH ULCERATIVE COLITIS.

P1547

Y. Horio, M. Uchino, T. Bando, T. Minagawa, R. Kuwahara, H. Sasaki, H. Ikeuchi
Nishinomiya, Japan

Purpose/Background: There are two techniques of ileal pouch-anal anastomosis (IPAA) for ulcerative colitis (UC): the double stapling technique and mucosectomy with a hand-sewn anastomosis. Performing a mucosectomy from the dentate line and a hand-sewn IPAA theoretically reduces the risk of arising carcinoma from the anal transitional zone (ATZ). However, no evidence to affirm an oncologic advantage of mucosectomy and hand-sewn IPAA over stapled IPAA exists. We aimed to investigate the incidence of ATZ/pouch cancer.

Methods/Interventions: A total of 1970 UC patients who underwent a laparotomy between April 1987 and December 2018 were included in this study. We retrospectively analysed the incidence of primary ATZ cancer in the original operative specimen and de novo ATZ/pouch cancer after surgery. We aimed to investigate the incidence of ATZ and pouch cancer. Possible risk factors for ATZ cancer and the 5-year cumulative survival rate of UC-colorectal cancer (CRC) between mucosectomy and stapled IPAA were also analysed.

Results/Outcome(s): Fourteen(6.4%) primary ATZ cancersdeveloped in 220 UC-CRC cases. Multiple cancers (OR=8.79, 95% CI 2.77-27.83, p<0.01) and rectal cancer (OR=6.48, 95% CI 1.41-29.7, p=0.01) were identified as independent risk factors for primary ATZ cancer. Four of 1970 (0.2%) patients who had de novo ATZ/pouch cancer and dysplasia underwent pouch excision. The 20-year estimated cumulative incidence of de novo ATZ/pouch cancer and dysplasia was significantly higher in stapled IPAA than hand-sewn IPAA (8.58% and 0.06%, $p<0.01$). The 5-year cumulative survival rate was 89.9% in all UC-CRC patients. The 5-year cumulative survival rate was 89.9% in all UC-CRC patients. The 20-year cumulative survival rate was 100% in the stapled IPAA group and 94.2% in the hand-sewn IPAA group. There was no significant differences between the stapled IPAA group and the hand-sewn IPAA group (p=0.63).

Conclusions/Discussion: The relatively high incidence of primary ATZ cancer suggests that mucosectomy are recommended in rectal cancer and multiple cancers of UC-CRC cases. Although the incidence of de novo ATZ/pouch cancer and dysplasia-required pouch excision was rare, the 20-year estimated cumulative incidence was significantly higher among patients who underwent stapled IPAA.

TEDUGLUTIDE ASSOCIATED POLYP FORMATION IN PATIENT WITH SHORT BOWEL SYNDROME.

P1548

E. Munding, A. Bhama
Chicago, IL

Purpose/Background: Teduglutide is a glucagon-like peptide 2 analog used in the treatment of short bowel syndrome. It is theorized to increase fluid and nutrient absorption in the small bowel and proven to decrease dependence on parenteral nutrition (PN) in patients with short bowel syndrome (SBS). Initial studies demonstrate an increased incidence of benign colon polyps with its use. These results guide current prescribing information, which recommends routine colonoscopic surveillance in teduglutide users. Although the increased risk of benign colonic polyps with teduglutide use is recognized, there is little data informing ideal polyp screening and management. A case of teduglutide-associated polyps is described.

Methods/Interventions: A 62 year old woman with a history of Crohn's disease and rectal cancer presented to clinic for management of polypoid lesions on her colostomy. Her history included small bowel Crohn's disease requiring multiple resections and rectal cancer treated with APR. She received postoperative chemoradiation with development of an enterocutaneous fistula and radiation cystitis. She then underwent enterocutaneous fistula takedown, total cystectomy, further colectomy, and ureteral implantation into the colostomy (creation of a "wet colostomy"). Initially PN was required to maintain nutrition. After a year of teduglutide use, PN was able to be discontinued. After 2 years of use, patient developed parastomal growths and teduglutide dosing was decreased. Despite this reduction in dosing, the polypoid lesions persisted and she was limited from further dosage decreases due to high ostomy output. Biopsy of the polypoid lesions in clinic were performed, ruling out invasive cancer, after which formal excisional was performed.

Results/Outcome(s): Pathology demonstrated benign polypoid fragments with inflammatory granulation tissue. Patient underwent a complete excisional biopsy of 2 tan polyps- 1.8 x 1.5 x 1.0 cm and 2.0 x 1.6 x 0.8 cm in size. Final pathology demonstrated benign granulation tissue with reactive squamous epithelial hyperplasia. Of note, colonoscopy was performed at the time of excision, demonstrating 20 cm of residual colonic mucosa, which was healthy. Patient did well after the procedure and is continued on teduglutide.

Conclusions/Discussion: Careful evaluation of medical and surgical history in context of current symptoms is important in determining treatment of polyps in patients using teduglutide. There is little data currently to guide evaluatiion of risk of malignancy in teduglutide-related polyps. Additionally, in a patient with a history of Crohn's disease, rectal cancer, and a wet colostomy, suspicion

for malignancy was high. More information is warranted to determine the long-term effects of teduglutide and patients on the medication should undergo appropriate surveillance.

IMMUNE PROFILING OF ANORECTAL MELANOMA ACCORDING TO RECURRENCE.

P1549

Y. Kim, I. Park, S. Hong, S. Lim, C. Yu, J. Kim
[1]*Seoul, Korea (the Republic of)*

Purpose/Background: Anorectal melanoma (ARMM) is a rare disease that carries a poor prognosis. Prognosis prediction is difficult owing to the lack of proper staging, and treatment cannot be clearly suggested. Immunotherapy has been proved effective in cutaneous melanoma and with rising interest in immunotherapy in ARMM, we evaluated immune profiling of ARMM and tried to find out differences according to recurrence.

Methods/Interventions: We included 22 patients with anorectal melanoma. Immune profiling was evaluated using nCounger ® PanCancer Immune Prolifiling Panel and immunohistochemical statining. Candidate gene mRNAs were isolated from formalin-fixed paraffin-embedded tumor specimens and analyzed using the NanoString nCounter gene expression assay. Immunohistochemical staining (IHC) was done for CD3, CD8, FOXP3, CD68, CD163, and PDL1. Gene expression and immune cell infiltration were compared according to recurrence.

Results/Outcome(s): In differential expression, 229 genes were downregulated and 1 (IL13) was upregulated in non-recurrence melanoma (NRM). According to pathway score analysis, 15 pathway scores (adhesion, cell function, cell cycle, B-cell function, chemokine, cytotoxicity, cytokines, complement, interleukin, NK cell function, Macrophage function, leukocyte function, pathogene defense, senescence, regulation) were lower in recurrence melanoma (RM). In TIL score analysis, total TIL score was higher in NRM. In subtype analysis, proportion of macrophage was higher in RM but T cell and B cell were higher in NRM.

Conclusions/Discussion: Melanoma with recurrence presented different immune profiling compared to melanoma without recurrence. It could be possible to use immune profiling as prognosis prediction. Further study is required for clinical application of these findings.

INCIDENTAL DIAGNOSIS OF ANAL DUCT CYST BY ULTRASONOGRAPHY IN PATIENT WITH HEMORRHOIDS.

P1550

G. Seo, H. Cho, R. Kim
Gwangju, Korea (the Republic of)

Purpose/Background: Anal duct cyst is thought to be retention cyst in the anal gland which arise when obstruction of the anal duct, because glandular epithelial tissue is observed in the lumen of cyst. It is rare and seen in only 0.05% of patients undergoing anal operation. It can occur in presacral, precoccygeal, and retrorectal spaces or anal canal. It present most commonly in the third decade of life with a higher incidence in male than in female. Here we describe the case of anal duct cyst incidentally detected by endoanal ultrasound in patient with hemorrhoids

Methods/Interventions: An 81-year-old man presented to our clinic with anal bleeding during defecation. His past medical history was significant for hypertension, hyperlipidemia, and multiple myeloma. Routine blood tests were within normal limits. On proctoscopy, his internal hemorrhoids were enlarged, were they prolapsing. Endoanal ultrasound showed a well circumscribed, hypoechoic and homogenous lesion measuring 2 x 1 cm in diameter (Figure 1). Under caudal block, he underwent stapled hemorrhoidectomy and excisional biopsy of the lesion.

Results/Outcome(s): Histopathological examination showed a subepithelial cyst lined by squamous cells with columnar cells without mitoses or atypia. These findings were consistent with anal duct cyst. Postoperative course was uneventful and the patient was discharged on postoperative day 2.

Conclusions/Discussion: Endoanal ultrasound may be useful in detection of anal mass and it should be included in preoperative work-up in patients with hemorrhoids. Proctologists should consider the possibility of anal duct cyst in the differential diagnosis of perianal tumors. Surgical excision is necessary for diagnosis and rule out of malignancy.

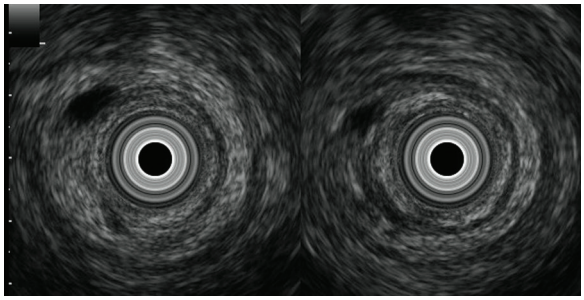


Figure 1. Endoanal ultrasound of anal duct cyst.

DISTANT PROSTATE ADENOCARCINOMA IN PRESACRAL TUMOR.

P1551

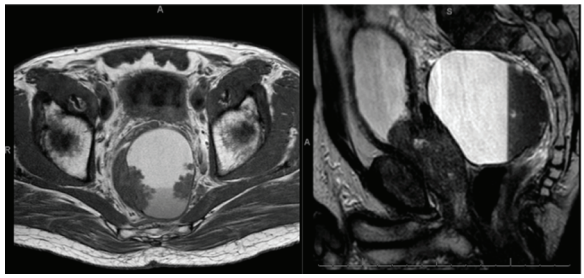
N. Aihie, M. Jeraq, S. Swain, L. Sands, V. Hui
Miami, FL

Purpose/Background: Presacral tumors are rare lesions occurring approximately in 1 in 40000-60000 admissions per year. They are heterogeneous lesions, both benign and malignant in nature, with a variety of etiologies including congenital, inflammatory, neurogenic, and osseous. In this case study, we review an 80 year-old man with a past medical history of hypertension and benign prostatic hyperplasia, with an initial chief complaint of urinary retention.

Methods/Interventions: Initial work up included a CT pelvis which illustrated a large rounded soft tissue presacral mass measuring approximately 6.6 x 6.2 x 6.6 cm. The mass demonstrated mixed densities, comprising both soft tissue and fluid components with an internal fluid-fluid level. Subsequent colonoscopy was remarkable for a large non-obstructing extraluminal bulge in the posterior rectum. MRI pelvis depicted a pre-sacral complex cystic heterogenous mass spanning from S1 to coccyx in the midline that did not appear to originate from prostate, with an internal fluid- fluid level and abnormal polypoid tissue along the wall. Pre-operative labs were significant for a PSA of 264.1 and CEA of 5.8. After extensive imaging review and multidisciplinary discussion between the colorectal and radiology departments, the recommendation was made for the patient to undergo a trans-abdominal excision of the presacral tumor. Intraoperatively, we noted that the top of the presacral tumor was abutting and adherent to the bladder as well as the rectum. The prostate was visualized and there was no connection with the tumor. There was a significant part of the tumor wall that was adherent to the rectum with no accessible plane between the two, necessitating a proctectomy with a handsewn colo-anal anastomosis and diverting loop ileostomy.

Results/Outcome(s): Upon gross pathologic review, the presacral cyst was described as a focally disrupted fibrotic cyst measuring 6 x 4.5 x 3 cm with an attached 3 x 3 x 0.2 cm segment of rectum with unremarkable light brown mucosa. Upon microscopic review, the presacral lesion was identified as Gleason 4+4=8 prostatic ductal adenocarcinoma, with involvement of the mesorectum into the rectal muscularis propria. Diagnosis of prostatic ductal adenocarcinoma was supported by positive NKX3.1 and negative CK7 immunostains, as well as PSA and Prostein positivity on immunoprofile. Moving forward the patient will require a urology work up that includes a prostate biopsy and post-operative PSA to confirm whether the presacral mass was a primary or metastatic lesion, a bone scan for staging, and immediate initiation of androgen deprivation therapy while awaiting radiation therapy.

Conclusions/Discussion: This case is a presentation of prostate carcinoma not previously described in the literature. While malignancies are not unexpected in this setting, they are more commonly congenital, neurologic or osseous in nature. This highlights the potential and varied differential diagnoses when encountering a patient with a presacral mass.



SINGLE-INCISION LAPAROSCOPIC RIGHT COLECTOMY VS MULTIPORT ROBOTIC RIGHT COLECTOMY: PERIOPERATIVE, SHORT TERM AND LONG-TERM OUTCOMES.

P1552

S. Pandey[2], R. Kundan[1], R. Rimal[1]
[1]*Glendale, AZ;* [2]*Sun City, AZ*

Purpose/Background: Single-incision laparoscopic right colectomy (SILRC) has advantages over open right colectomy in terms of better cosmesis, less pain, less length of stay and postoperative complications. It has limitation with vision, surgical precision, dexterity of instrumentation, inability of operate in narrow space. These limitations may negatively affect outcomes after surgery. Multiport Robotic right colectomy (MRRC) surgery may overcome these limitations and has better outcomes after right colectomy. The aim of this study was to compare patient's variables and both the short-and long-term outcomes after Single-Incision Laparoscopic Right Colectomy (SILRC) and Multiport Robotic Right Colectomy (MRRC) for the treatment of benign and malignant disease of right colon.

Methods/Interventions: This is a retrospective study of consecutive elective Single-Incision Laparoscopic Right Colectomy (SILRC) and Multiport Robotic Right Colectomy (MRRC) from sept 2011 to Dec 2018. All surgery was performed by board-certified colon and rectal

surgeon. All data were collected from hospital medical records and office documentation, and phone call, whenever necessary. Data from two different groups (SILRC vs MRRC) were compared in respect to patient 's variables and short term and long term outcomes. We have used Chi-square test with continuity correction, Fisher exact test for categorical variables and t-test with equal variance for continuous variable. If all the cell frequency> 5 then we used Chi-square test. When at least one of the cell frequencies < 5 then we used Fisher Exact test.

Results/Outcome(s): A total of 151 patients underwent SILRC (Laparoscopic group) and 112 patients underwent MRRC (robotic group) during the study period. Table 1 : The robotic group (MRRC) showed a statistically significant reduction in intraoperative blood loss and length of hospital stay but a longer operative time compared with the laparoscopic group (SILRC). Oveall total complications, wound infections and cardiovascular complications in robotic group (MRRC) was statistically significantally lower compared to the laparoscopic group (SILRC).

Conclusions/Discussion: Robotic right colectomy (MRRC) is a safe and feasible surgical approach compared single-incision laparoscopic right colectomy(SILRC). Despite longer operative time, robotic right colectomy has significantly low intraoperative blood loss, shorter length of stay in hospital and, decreased short-term complications and wound infection. Randomized control trials with longer follow up are needed to validate our findings.

ROBOTIC SURGERY IS ASSOCIATED WITH A LOWER UNPLANNED CONVERSION TO OPEN RATE FOR PATIENTS UNDERGOING ELECTIVE COLECTOMY.

P1554

S. Nguyen, D. Russell, S. Gillern, C. Yheulon
Honolulu, HI

Purpose/Background: Despite the advent of advancing minimally invasive techniques, there still remains a significant risk for unplanned conversion to open surgery for patients undergoing elective colectomies. The American College of Surgeon National Surgical Quality Improvement Program (ACS-NSQIP) targeted procedure database for colectomy began tracking this outcome in 2012. The purpose of this study is to identify patient and procedure specific risk factors for conversion to open in the setting of elective colectomy.

Methods/Interventions: The ACS-NSQIP Participant Use Data Files and Target Procedure data was queried for patients undergoing non-emergent laparoscopic and robotic colectomies from 2012-2017. Multivariate analysis was performed to identify patient specific (demographics, comorbidities, etc.) and operative specific (anastomosis location, adjunctive procedures, surgical pathology, etc.) risk factors for unplanned conversion to open.

Results/Outcome(s): 79,775 overall patients were identified with 7,334 cases required an unplanned conversion to open (9.2%). On multi-variate analysis, the most predictive markers for unplanned conversion to open were: Laparoscopic over robotic approach (OR 1.68, 95% CI 1.61-1.75), presence of disseminated cancer (OR 1.61,

P1552 Table 1: Perioperative, Short-term and Long-term outcomes

	SILRC (Total patients: 151)	MRRC (Total patients: 112)	p-value
Age in years: mean (SD)	73(10.62)	69(10.41)	
Sex:male%, female %	42%, 58%	47%,53%	
BMI: mean(SD)	27.40(6.02)	27.04(4.08)	0.583
ASA score: mean	3	3	NA
Benign/Malignant: Benign %, malignant %	38%, 62%	44%, 56%	0.456
Conversion to Open Surgery: n(%)	11(7.3%)	3(2.7%)	0.171
Length of Surgery in minutes: mean(SD)	86.03(22.97)	149.69(24.14)	<0.001*
Intraoperative blood loss in ml: mean(SD)	56.06(53.35)	25.22(39.35)	<0.001*
Length of Stay in hospital in days: mean(SD)	5.70(2.69)	2.69(2.00)	<0.001*
Total Complications : n (%)	36(23.8%)	12(10.7%)	0.01*
Ileus: n (%)	10(6.6%)	3(2.7%)	0.241
Wound Infections: n (%)	11(7.3%)	1(0.9%)	0.031*
Anastomotic Leak: n (%)	0(0%)	0(0%)	NA
Cardiovascular Complications: n (%)	9(6%)	3(2.7%)	0.036*
Respiratory Complications: n (%)	6(4%)	1(0.9%)	0.251
Wound Hernia: n (%)	9(6%)	5(4.5%)	0.797

*significant at 5% level

95% CI 1.48-1.73), pre-operative weight loss (OR 1.58, 95% CI 1.44-1.72), steroid use (OR 1.40, 95% CI 1.30-1.49), and obesity (OR 1.39, 95% CI 1.34-1.47).

Conclusions/Discussion: For elective colectomy, the robotic approach is independently associated with lower rates of unplanned conversion to open surgery. As approach is a modifiable risk factor for colorectal surgery, patients who are otherwise at high risk for conversion to open surgery may benefit from an initial robotic approach.

ENHANCED RECOVERY AFTER SURGERY (ERAS) IMPLEMENTATION IN NONELECTIVE COLORECTAL SURGERY.

P1555

J. Miller-Ocuin[1], L. Ocuin[2], G. Waters[1], P. Shen[1], J. Ashburn[1]
[1]Winston-Salem, NC; [2]Charlotte, NC

Purpose/Background: Enhanced recovery after surgery (ERAS) pathways have been widely adopted for colorectal surgery with improvement in patient outcomes as well as hospital length of stay. We sought to determine the impact of applying an ERAS pathway to nonelective colorectal operations at our institution.

Methods/Interventions: Our institution implemented an ERAS pathway for both elective and nonelective colorectal surgery in 2018. Patients undergoing colorectal operations were identified in the institution's National Surgical Quality Improvement Program (NSQIP) database 18 months prior to and 18 months following ERAS implementation. Patient demographics, comorbidities, and postoperative outcomes were compared.

Results/Outcome(s): 424 patients were included from August 2016 until August 2019. Of those, 114 patients underwent nonelective colorectal procedures. We identified 58 patients pre-ERAS and 58 patients post-ERAS. There were no differences in patient baseline characteristics including age (59.5 vs. 59.5 years), BMI (28.9 vs. 28.6), preoperative albumin (3.3 vs. 3.2 g/dl), diabetes (19 vs. 23%), smoking (26 vs. 30%), disseminated cancer (9 vs. 13%), or steroids (24 vs. 23%). There were more males included in the post-ERAS group (59 vs. 40%). There were no differences in the rate of postoperative superficial surgical site infections (9 vs. 9%) or wound disruption (9 vs. 7%). There was a trend toward increased organ site infection (17 vs 30%, p= 0.1). There was a decrease in urinary tract infections (UTIs) post-implementation (7% vs. 0, p=0.045). There was no significant difference in rates of sepsis (12 vs 16%), mortality (14 vs. 14%), 30-day readmission (14 vs. 20%), or reoperation (19 vs 23%). There was a trend toward decreased length of stay (14.6 vs. 11.8 days, p=0.192).

Conclusions/Discussion: It appears ERAS can be safely applied to patients undergoing nonelective colorectal operations. There may be an association with higher rates of organ space infections but this is offset by a significant decrease in postoperative UTIs and length of stay.

CLINICAL CORRELATION IMPROVES DIAGNOSTIC ACCURACY OF MRI DEFECOGRAPHY IN RECTAL PROLAPSE.

P1504

A. Lee, L. Neshatian, V. Sheth, B. Gurland
Stanford, CA

Purpose/Background: The accuracy of MRI defecography (MRD) to diagnose posterior compartment prolapse is not well established. Our aim was to utilize interdisciplinary conferences with radiology to assess the level of agreement between MRD rectal prolapse grading and clinical exam.

Methods/Interventions: We performed a retrospective analysis of a prospectively maintained, IRB approved registry of patients with clinically significant external (ERP) or internal (IRP) rectal prolapse. ERP and IRP were categorized based on the visualization of circumferential rectal folds beyond the anal verge on exam or anoscopy. Consecutive patients with clinical prolapse were referred for MRD for multicompartment evaluation. Prolapse was graded radiographically using Oxford scoring (Grade I-II for intrarectal; Grade III-IV, intra-anal; and Grade V, external prolapse). Following initial read, select MRD were reviewed at multidisciplinary meetings and thereafter, all MRDs were reread by a single radiologist for consistency. Cleveland Clinic Fecal Incontinence (CCFI) and Obstructed Defecation Syndrome (ODS) validated scores were collected on all patients. Patients with clinically determined ERP and IRP were compared using student t-tests. Kappa coefficients were used to evaluate level of agreement between exam and radiographical findings with perfect agreement equaling to 1.

Results/Outcome(s): 37 patients underwent MRD, 23 (62.2%) with clinically visualized ERP and 14 (37.8%) with IRP on anoscopy. Clinical findings are summarized in Table 1. Despite clinically determined ERP and IRP patients having similar symptom severity, as measured by CCFI and ODS, a significantly higher proportion of patients with clinical ERP reported prolapse with defecation (p=0.03). MRD images were reviewed with a radiologist and following interdisciplinary meetings, addenda were made to 10 (27%) reports. Clinical and radiological disagreement persisted for 2 patients, both of whom had ERP on exam and intra-anal IRP on MRI review. Overall, there was slight agreement between clinical exam and MRD grading (Kappa= 0.023). For the diagnosis of IRP, there was slight correlation between clinical exam and MRI Oxford grades 1 through 4 (Kappa=0.154). Agreement between ERP and Oxford grade 5 was also slight (Kappa= 0.166). The majority of patients, both with clinical ERP and IRP, had concomitant bladder prolapse visualized (78.3% and 71.4%, respectively, p=0.64). The presence of vaginal prolapse, enteroceles, sigmoidoceles, peritoneoceles, and rectoceles was similar between groups (p>0.05).

Conclusions/Discussion: There appears to be significant disagreement between MRD grading and clinical evaluation of IRP and ERP. This could be due to the nature of rectal prolapse, which can be intermittent, positional, or not easily visualized on straining. An interdisciplinary conference with collaborative image review, as well as an experienced radiologist, may improve clinical and radiographic correlation.

CORRELATION OF SYMPTOMS AND PELVIC FLOOR DYSFUNCTIONS WITH LEVATOR ANI MUSCLE DEFECT IN FEMALE PATIENTS AFTER VAGINAL DELIVERY.

P1506

S. Murad-Regadas, A. Vilarinho, L. Veras, L. Borges, F. Regadas Filho, D. Lima, M. Macedo, M. Oliveira
Fortaleza, Brazil

Purpose/Background: The prevalence of levator ani defect after vaginal birth and the association with symptoms and dysfunctions are controversies by images. The aim of this study is to identify the anatomic and functional abnormalities of the pelvic floor and anal canal muscles in women with previous vaginal delivery and determine the correlation between the levator ani muscles defect and symptoms, anatomic abnormalities of sphincter muscles, hiatus dimension and pelvic floor dysfunctions on dynamic anorectal and endovaginal 3D ultrasound.

Methods/Interventions: Consecutive female with pelvic floor dysfunctions and previous vaginal delivery were assessed by symptoms of fecal incontinence with Cleveland Clinic continence score, obstructed defecation symptoms and urinary incontinence. All of them underwent dynamic anorectal and endovaginal 3D ultrasonography and were distributed in G1:levator ani muscles defect and G2:levator ani muscles intact. The symptoms, anatomic abnormalities (sphincter muscles defect, hiatus dimension) and dysfunctions (cystocele, rectocele, intussusception, anismus, perineal descent and entero-sigmoidocele) were correlated with levator ani defect. The data were assessed by means of the Student *t* test and the Mann-Whitney U test.

Results/Outcome(s): 92 women were included, 31(34%) had levator ani defect (GI), of them 08(26%) bilateral defect and 61(66%) had levator ani intact (G2). The mean age and parity were similar in both groups. The incontinence symptoms and median FI score was higher in GI and the obstructed defecation symptoms were higher in GII. The urinary incontinence symptoms were

P1504 Table 1. Patient Demographics and Pelvic Floor Characteristics

	External Rectal Prolapse	Internal Rectal Prolapse	P-value
	N=23	N=14	
Demographics			
Age, median (IQR)	63 [53.3, 67.8]	62 [57.0, 67.0]	
Sex, female, n (%)	22 (95.7)	14 (100)	0.44
BMI, mean (kg/m^2)	25.1	27.9	0.32
Initial Evaluation			
Initial Cleveland Clinic Fecal Incontinence score (CCFI)	12.3	11.6	0.72
Initial Obstructed Defecation score (ODS)	7.9	8.1	0.89
Rectal Prolapse Clinical Descent			
With defecation, n (%)	18 (78.3)	6 (42.9)	0.03
With exercise, n (%)	1 (4.3)	0 (0)	0.44
With walking, n (%)	6 (26.1)	2 (14.3)	0.40
All the time, n (%)	2 (8.7)	1 (7.1)	0.86
MRI Findings			
Bladder descent, n (%)	18 (78.3)	10 (71.4)	0.64
Vaginal descent, n (%)	4 (17.4)	2 (14.3)	0.81
Enterocele, n (%)	10 (43.5)	4 (28.6)	0.37
Sigmoidcele, n (%)	5 (21.8)	0 (0)	0.06
Peritoneocele, n (%)	3 (13.0)	3 (21.4)	0.51
Rectocele, n (%)	16 (69.6)	12 (85.7)	0.27
No Rectal Prolapse, n (%)	3 (13.0)	2 (14.3)	0.91
Grade I-II Intrarectal Rectal Prolapse, n (%)	1 (4.3)	2 (14.3)	0.29
Grade III-IV Intraanal Rectal Prolapse, n (%)	11 (47.8)	8 (57.1)	0.59
Grade V External Rectal Prolapse, n (%)	8 (34.8)	2 (14.3)	0.18

similar in both groups. However, the presence of sphincter defect (EAS-external anal sphincter and/or IAS- internal anal sphincter) was similar in both GI (21/31,68%) and GII (28/61,46%). In GI, 10/31, 32%) had only levator ani defect without sphincter defect, of them 7 had fecal incontinence symptoms. The mean levator hiatus area in GI was significantly larger at rest and during the Valsalva maneuver comparing with GII. However, there was no significant difference regarding to cystocele, rectocle, intussusception, anismus, perineal descent and entero-sigmoidocele between both groups(Table).

Conclusions/Discussion: Defects of the levator ani and sphincter muscles were identified in 34% and 53% respectively and combined defects in 23% of women after vaginal delivery. Despite of the similar distribution of sphincter defects in both groups, there was correlation between the levator ani defect and incontinence symptoms severity as well as enlargement of the levator hiatus at rest and during Valsalva maneuver. There was no correlation between the pelvic floor dysfunctions and levator ani defect on dynamic anorectal and endovaginal 3D ultrasound.

ARE WE DOING TOO MANY ALTEMEIERS FOR RECTAL PROLAPSE?

P1507

K. Donohue, A. Kuhnen, D. Kleiman, E. Breen, P. Roberts, D. Schoetz, P. Marcello, J. Saraidaridis
Atlantic Highlands, NJ

Purpose/Background: With the advent of minimally invasive surgery (MIS), surgical options for the repair of rectal prolapse have expanded. Potentially, MIS techniques have broadened the availability of abdominal repair due to its decreased physiologic stress while providing the same benefits of an open abdominal repair. The aim of this study was to assess whether the incidence of perineal repair for rectal prolapse has decreased over time with the increased adoption of MIS techniques.

Methods/Interventions: The ACS NSQIP database was queried to identify all patients who underwent surgical repair of rectal prolapse from 2007-2017. Patients were divided into MIS (including laparoscopic and robotic), open, or perineal approaches. The data was assessed for trend over the time period examined.

Results/Outcome(s): 10,936 patients underwent surgery for rectal prolapse during the study period. 91% were female and 51.5% were over the age of 70. The majority of patients over the decade underwent repair via a perineal approach (54.3%). The rest of patients underwent an abdominal approach with 26.3% undergoing MIS repair and 19.5% undergoing an open repair. Patients who underwent an abdominal approach had a younger mean age (MIS: 58.8 yrs, open: 60.1 yrs) when compared

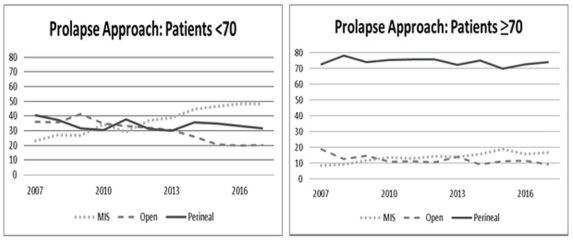
P1506 Characteristics of 92 women with pelvic floor dysfunctions with previous vaginal delivery in relation to presence of levator ani muscle defect. EAS- external anal sphincter / IAS - internal anal sphincter

Data	Levator ani muscle defect n = 31 (34%)	Levator muscle ani intact n = 61 (66%)	p
Age mean (SD) range	61 (±12)	60 (±13)	0.48
	33 – 77	28 – 80	
Number of vaginal deliveries, median (range)	3 (1–10)	3 (1–10)	0.51
Fecal incontinence symptoms n (%)	27 (87%)	24 (39%)	0.00
CCF incontinence score median (range)	5 (0 – 13)	0 (0 – 11)	0.00
Obstructed defecation symptoms n (%)	21 (68%)	56 (92%)	0.00
Urinary Incontinence symptoms n (%)	08 (26%)	14 (23%)	0.79
Sphincter defect (EAS or EAS/IAS) n (%)	21 (68%)	28 (46%)	0.07
Levator hiatus area (cm2) At rest mean (SD)	19 (±4)	17 (±3)	0.00
Levator hiatus area (cm2) Valsalva manuever mean (SD)	23 (± 6)	18 (± 3)	0.00
Cystocele n (%)	16 (52%)	29 (48%)	0.83
Rectocele n (%)	07 (23%)	25 (27%)	0.10
Intussusception n (%)	17 (55%)	34 (56%)	1.00
Anismus n (%)	23 (74%)	33 (54%)	0.07
Perineal descent n (%)	21 (68%)	29 (48 %)	0.07
Entero-sigmoidocele n (%)	02 (6%)	02 (3%)	1.00

with perineal repairs (74.6 yrs) (p<.001). They were also healthier with less co-morbid conditions including COPD, HTN, CHF, and ESRD (p<.001). The use of MIS techniques increased over the study period from 16.1% in 2007 to 31.6% in 2017; this increase was at the expense of open repair which decreased from 27.8% to 14.4%. The incidence of perineal approach remained largely unchanged during this time (56.2% to 54.0%). In the age group <70, there was an increasing adoption of MIS techniques over the decade, with 23.2% undergoing MIS repair in 2007 up to 48.1% in 2017. However, 33.6% still underwent perineal repair. These young patients who underwent perineal repair had excellent performance status with 51.6% of these patients categorized as ASA 1/2 and 92.5% as functionally independent. In the age group >70, there was a very small increase in MIS techniques (8.5% to 16.9%) over the study period. 73.8% underwent perineal repair. Of this group, 28.8% were ASA 1/2 and 86% were functionally independent.

Conclusions/Discussion: From 2007-2017, in the overall population, the incidence of MIS repair for rectal prolapse has increased and perineal repair has held constant. In a younger population, patients are increasingly undergoing MIS repair; however, still 1/3 of this group underwent perineal repair (and had good performance status). Given this data, there is perhaps an opportunity to expand the population of patients whom are offered MIS rectal prolapse repair.

Figure 1: Approach to Rectal Prolapse Over Study Period a. Patients <70, b. Patients ≥70



IMPACT OF SURGICAL SPECIALIZATION ON RIGHT COLECTOMY OUTCOMES.

P1508

C. Tat, C. Kabir, S. Zhang, J. Estrada, J. Kaminski
Chicago, IL

Purpose/Background: An association between sub-specialization and improved outcomes has been shown in colorectal surgery. However, limited number of studies assess outcomes specifically in right colectomies between specialists and non-specialists. Our study aims to analyze the impact of surgical specialization on right colectomy outcomes between non-specialists and colorectal specialists.

Methods/Interventions: All right colectomies performed between January 2012 to November 2017 at two hospitals in Illinois were retrospectively reviewed. Data on surgical outcomes were abstracted from the National Surgical Quality Improvement Program (NSQIP). The primary endpoint was overall complications. Secondary endpoints included re-admission, re-operation, length of stay, and mortality.

Results/Outcome(s): From a total of 417 right colectomies, 147 right colectomies were performed by non-specialists and 270 colectomies were performed by colorectal specialists. At baseline, there were 48.98% males in non-specialist cohort and 42.22% males in the specialist cohort (p=0.18). However, non-specialists performed more emergent cases (28.57% vs. 1.11%, p<0.0001) and more open cases (68.03% vs. 30.37%, p<0.0001). Patients in the non-specialist cohort had higher American Society of Anesthesiologists (ASA) classification (12.24% categorized as ASA 5 in non-specialists vs. 5.19% in specialists, p=0.02). In univariate analysis, specialists had a statistically significant lower overall complication rate (10.37% specialists vs. 31.97% non-specialists, p<0.0001). Specialists had lower mortality (0.74% vs. 5.44%, p=0.003) and shorter length of stay (4 vs. 6 days, p<0.0001). There was no difference in re-admission rates (8.89% for specialists and 10.88% for non-specialists, p=0.51) and re-operation (1.85% for specialists and 3.40% for non-specialists; p=0.32). After controlling for emergency case status, open surgery, ASA, age, and body mass index (BMI), specialists were 50% less likely to be associated with any complication compared to non-specialists (adjusted odds ratio: 0.50, 95% confidence interval: 0.26 -0.96; *P*= 0.04).

Conclusions/Discussion: In our study, non-specialists operate on more emergent cases and on patients with higher ASA classification. After adjusting for potentially confounding variables, our findings suggest that surgeon specialization is associated with better outcomes for right colectomies.

Table: Perioperative Outcomes of Non-specialists and Colorectal Specialists

	Specialist N=270	Non-Specialist N=147	P-Value
Any Complication**	28 (10.37%)	47 (31.97%)	<0.0001
Mortality	2 (0.74%)	8 (5.44%)	0.003
Readmission	24 (8.89%)	16 (10.88%)	0.51
Reoperation	5 (1.85%)	5 (3.40%)	0.32
Length of Stay, median (IQR)	4.0 (3.0)	6.0 (6.0)	<0.0001

** Complications included superficial incisional surgical site infection, deep incisional surgical site infection, deep space surgical infection, wound disruption, pneumonia, unplanned intubation, pulmonary embolism, ventilator greater than 48 hours, acute renal failure, urinary tract infection, cerebrovascular accident, cardiac arrest requiring cardiopulmonary resuscitation, myocardial infarction, transfusion, vein thrombosis, *Clostridioides difficile* infection, sepsis, and septic shock.

THE IMPACT OF FRAILTY IN THE ELDERLY UNDERGOING EMERGENCY COLORECTAL SURGERY: AN EVALUATION FROM THE NATIONAL SURGICAL QUALITY IMPROVEMENT PROGRAM (NSQIP).

P1509

H. Simon, R. Kiran, T. Reif de Paula, M. Profeta, D. Keller
New York, NY

Purpose/Background: The United States population is aging, and the elderly constitute the largest percentage of high-risk emergency cases. Factors such as frailty, which consider the individual's vulnerability to stressors, influence length of stay, postoperative complications, mortality, and costs. Given the impact, further study of how frailty affects emergency colorectal surgery in elderly patients is warranted. Our goal was to determine the incidence and impact of frailty on postoperative outcomes in emergent elderly colorectal patients.

Methods/Interventions: The ACS-NSQIP database was reviewed from 2012-2016 to identify elderly(≥age 65 years) patients who underwent emergency major colorectal resections. Using the validated 5-factor frailty index(mFI-5), a frailty measure was calculated for each patient. Cases were then stratified by Frailty Score(0, 1, 2). Univariate analysis compared patient demographics, surgical characteristics, and 30-day postoperative outcomes across frailty scores of increasing severity. Logistic regression identified variables associated with postoperative outcomes in elderly patients undergoing emergent colorectal surgery. Our main outcome measures were the rate and impact of frailty on 30-day mortality, major morbidity, prolonged length of stay(LOS), discharge disposition, and readmission.

Results/Outcome(s): 10,131 patients were included. 23.1%(n=2,345) had a Frailty Score of 0, 44.9%(n=4,551) of 1, and 31.9%(n=3,235) of 2. Overall, our cohort was 58.1% female, with mean age and BMI of 75.7 and 25, respectively. The majority of patients had an ASA score of 3 or greater(87.7%), were independent(88%), and living at home(73.5%). An open approach was used 85.8% of the time. Perforation was the most common indication for emergent surgery(49.8%). Overall rate of 30-day mortality, major morbidity, prolonged LOS, discharge to place other than home, and readmission was 16.8%, 35.3%, 51.7%, 54.8%, and 11%, respectively. On logistic regression, significant odds of having major morbidity, prolonged LOS, and discharge to place other than home were associated with increasing frailty score after adjusting for patient and surgical characteristics(Table 1). Additionally, a frailty score of 2 was independently predictive of mortality and readmission. Frailty score of 2 was the only variable independently predictive of all five postoperative outcomes.

Conclusions/Discussion: Elderly patients who required emergent colorectal surgery differed in frailty severity. Our study demonstrated that the presence of frailty was significantly associated with worse 30-day postoperative outcomes. Given these results, mFI-5 scoring should be considered in risk assessment and the consent process to optimize the surgical process for elderly patients undergoing emergent colorectal surgery.

Table 1. Odds ratio of 30-day postoperative outcome predictors in the elderly undergoing emergent colorectal surgery with 95% confidence intervals, NSQIP 2012-2016

Variable (Reference)	Mortality	Major Morbidity*	Prolonged Length of Stay[b]	Discharge to place other than Home	Readmission
Age	1.029* [1.020-1.038]	1.003 [0.996-1.009]	1.001 [0.995-1.008]	1.064 [1.057-1.072]*	0.997 [0.987-1.006]
Female Gender (Male)	0.978 [0.872-1.097]	0.920 [0.843-1.005]	0.808* [0.743-.878]	1.233* [1.125-1.651]	1.049 [0.921-1.196]
BMI	1.002 [0.997-1.007]	1.006* [1.002-1.011]	1.009* [1.005-1.013]	1.023* [1.018-1.027]	1.002 [0.996-1.009]
Frailty Score[a] (0)					
1	1.113 [0.941-1.316]	1.166* [1.036-1.312]	1.144* [1.027-1.275]	1.191* [1.060-1.338]	1.185 [0.994-1.413]
2	1.481* [1.250-1.753]	1.365* [1.203-1.5247]	1.209* [1.074-1.361]	1.756* [1.545-1.997]	1.383* [1.145-1.670]
ASA Score (Mild [1-2])					
Severe [3]	4.001* [2.627-6.091]	1.978* [1.663-2.356]	1.965* [1.707-2.263]	2.698* [2.293-3.175]	1.283* [1.026-1.604]
Life Threat/ Moribund [4-5]	14.474* [9.556-21.923]	3.958* [3.20-4.718]	3.097* [2.674-3.586]	8.320* [7.024-9.855]	1.115 [0.882-1.409]
Procedure (Partial Colectomy)					
Right Colectomy	0.860* [0.745-0.992]	1.088 [0.976-1.212]	1.177* [1.062-1.305]	1.186* [1.060-1.327]	0.885 [0.751-1.042]
Hartmann's	0.881 [0.748-1.037]	1.032 [0.913-1.167]	0.922 [0.822-1.034]	0.783* [0.692-0.887]	1.114 [0.938-1.323]
TAC[c]	1.207* [1.010-1.444]	1.488* [1.278-1.733]	1.476* [1.263-1.725]	2.016* [1.683-2.414]	0.886 [0.679-1.105]
LAR[d]	0.733 [0.531-1.012]	0.915 [.737-1.136]	1.162 [0.957-1.411]	0.844 [0684-1.042]	0.883 [0.646-1.207]
Open Surgical Approach (MIS[e])	1.976* [1.595-2.448]	1.674* [1.456-1.926]	1.487* [1.316-1.679]	1.923* [1.683-2.197]	0.933 [0.77-1.121]

*Indicates significant at $p < 0.05$. * Composite variable = myocardial infarction, pneumonia, failure to wean off ventilator, reintubation, renal failure, stroke, urinary tract infection, cardiac arrest, shock, sepsis, pulmonary embolism, deep vein thrombosis, anastomotic leak, and wound dehiscence. [b]Defined as hospitalization length of stay ≥50th percentile, 50th percentile = 11 days. [a] Frailty scores converted and consolidated secondary to low sample size in higher frailty scores: mFI-5 0.00 = 0, mFI-5 0.20 = 1, mFI-5 ≥0.40 = 2. [c]TAC = total abdominal colectomy. [d]LAR = low anterior resection. [e]MIS = minimally invasive surgery [laparoscopic and robotic].

PREDICTORS OF POSITIVE CIRCUMFERENTIAL RESECTION MARGIN IN RECTAL CANCER: A CURRENT AUDIT OF THE NATIONAL CANCER DATABASE (NCBD).

P1510

H. Simon, R. Kiran, T. Reif de Paula, M. Profeta, D. Keller
New York, NY

Purpose/Background: Circumferential resection margin (CRM) status is a prognostic factor, with a positive CRM a predictor of local recurrence and worse survival in rectal cancer. Since 2011, the Consortium for Optimizing the Treatment of Rectal Cancer (OSTRiCh) has worked to create rectal cancer multidisciplinary management standards in the United States. A high rate of positive CRM was a driver for the creation of OSTRiCh, and remains a goal in the evolving National Accreditation Program for Rectal Cancer (NAPRC). The impact of these programs on CRM has not been fully evaluated on a national scale. We aimed to determine the current rate of positive CRM after curative rectal cancer resection, and predictors of positive CRM across patient, provider, and tumor characteristics in the United States.

Methods/Interventions: The NCDB was reviewed for pathologic stage I-III rectal adenocarcinoma patients that underwent proctectomy from 2011-2016. Univariate analysis compared patient and provider characteristics across CRM status((-) negative or (+) positive). Multivariate analysis investigated variables predictive of positive CRM. The main outcome measures were positive CRM rate and predictors of a positive CRM.

Results/Outcome(s): 52,620 eligible cases were identified; 90% (n=47,331) had CRM status reported and were included in the analysis. A +CRM was noted in 18.4%(n=8,719). Positive and negative CRM cohorts were comparable in age, race, co-morbidity, income, geographic setting, and facility case volume. In the unadjusted analysis, patients with a +CRM were more often

male, had non-private insurance, underwent total proctectomy via open and robotic approaches, and were treated in Southern and Western regions at CoC-accredited centers (all p<0.005). In the adjusted multivariate model, a positive proximal and/or distal margin on the resected specimen had the strongest association with +CRM (OR 15.6, 95% CI 13.5-18.0, p<0.005). Perineural invasion, total proctectomy, neoadjuvant chemoradiation, CoC-accredited facility, higher pathologic T stage, larger tumor size, worse tumor grade, and Black race were associated with increased risk of +CRM (all p<0.025). Laparoscopic approach, surgery in the North, South, and Midwest US regions, lower clinical T stage, and higher income were associated with decreased risk of +CRM (all p<0.025) (Table 1).

Conclusions/Discussion: Despite the recent drive for standardization of rectal cancer care to improve surgical quality, positive CRM rates remain high. CRM was impacted most by surgical and tumor factors rather than demographic and hospital variables. Predictors and rate of +CRM are consistent with those reported prior to implementation of OSTRiCh, showing the need for further education, targeted quality improvement assessments, and publicized auditing to improve outcomes of rectal cancer care in the United States.

Table 1. Multivariate logistic regression model for significant factors predictive of positive circumferential resection margin after resection for rectal adenocarcinoma in adults, NCDB 2011-2016

Factor (reference field)	Odds Ratio[a]	95% Confidence Interval	*p*-value[b]
Positive Proximal or Distal Margin	15.635	13.575-18.007	<0.005
Perineural Invasion	1.381	1.237-1.542	<0.005
Total Proctectomy[g]	1.354	1.250-1.467	<0.005
Surgical Approach (Open)			
Laparoscopic	0.853	0.783-0.931	<0.005
Neoadjuvant CRT[f]	1.124	1.027-1.230	0.011
US Location (West)			
North	0.651	0.569-0.744	<0.005
South	0.829	0.738-0.931	<0.005
Midwest	0.745	0.658-0.842	<0.005
Cancer Facility Type (Community)			
CoC-Accredited[d]	1.162	1.040-1.298	0.008
Clinical T Stage (4)			
0	0.756	0.640-0.894	<0.005
1	0.858	0.750-0.981	0.025
2	0.861	0.776-0.955	0.005
Pathologic T Stage (4)			
3	2.574	1.249-5.302	0.010
Tumor Size (>5 cm)			
≥3, <5	1.359	1.132-1.632	0.001
Tumor Grade (Well Differentiated)			
Poorly Differentiated/Undifferentiated	1.277	1.081-1.510	<0.005
Income (<$48,000/year)[c]			
>$48,000	0.893	0.811-0.983	0.021
Race (Caucasian)			
Black	1.208	1.053-1.386	0.007

[a] Positive CRM compared to Negative CRM. [b] A multivariate binary logistic regression was performed adjusting for all variables from univariate analysis via Enter Method, significance level $p<0.05$. Our model was reproducible using Best Subset and Forward Stepwise generalized linear models. [d] CoC =Commission on Cancer. [f] CRT = chemoradiation therapy. [g] Total Proctectomy = abdominoperioneal resection, total proctectomy with coloanal anastomosis

DISPARITIES IN TREATMENT FOR RECTOSIGMOID JUNCTION CANCER: A NATIONAL CANCER DATABASE (NCBD) STUDY.

P1511

M. Profeta, R. Kiran, H. Simon, T. Reif de Paula, D. Keller
New York, NY

Purpose/Background: The treatment of middle and low rectal cancer is well established, but optimal management of rectosigmoid junction (RSJ) cancer remains controversial. The varied definition may lead to misclassification, overtreatment, or undertreatment, with attendant risks. Variables other than tumor location may impact the treatment choice, and the subsequent oncologic outcomes. Our goal was to investigate the patient and provider factors that may impact the treatment approach for RSJ cancer in the United States.

Methods/Interventions: The NCDB was reviewed for locally advanced rectosigmoid junction adenocarcinoma cases from 2010-2016. Cases were stratified by treatment approach: neoadjuvant chemoradiotherapy(nCRT) or upfront surgery. Multivariate analysis investigated variables associated with the nCRT apporoach. A 1:1 Propensity Score Match was performed to balance the groups on sex, age, comorbidities and clinical stage. Univariate analysis compared patient and provider demographics across treatment approaches. Overall survival(OS) was calculated using Kaplan-Meier and logistic Cox regression. The main outcome measures were factors associated with nCRT use and overall survival.

Results/Outcome(s): Of 6,646 included patients, 2,419 (36.39%) received neoadjuvant chemoradiation (nCRT) and 4,227 (63.61%) upfront surgery. In the univariate analysis, there were significant differences in nCRT use by patient demographics, geographic area, metropolitan status, and treatment facility type (all p<0.05). Multivariate analysis revealed treatment at academic (OR 1.40, 95%CI 1.122-1.622, p<0.005) and Commission on Cancer (CoC)-accredited (OR 1.34, 95%CI 1.113-1.624, p<0.005) centers and greater than 10 mile distance travel for treatment (OR 1.31, 95%CI 1.160-1.498 p<0.005) were associated with greater use of nCRT. High-volume centers (OR 0.61, 95%CI 0,488-0,773 p<0.005) were associated with less use of nCRT. On Cox-regression, nCRT was not significantly associated with OS (p=0.188). Treatment at an academic center (HR 0.830, CI 95% 0.695-0.992, p=0.040) was associated with greater OS, while poor tumor characteristics and open approach (HR 1.264, CI 95% 1.487-1.074, p-0.005) were associated with worse OS.

Conclusions/Discussion: Over a third of patients received nCRT for RSJ cancer. Disparities in travel distance, facilty case volume, and cancer-center accreditation impacted use of nCRT for RJS cancer. However, nCRT did not significantly impact OS. Treatment at academic centers, tumor characteristics, and surgical approach did significantly contribute to OS. Despite any disparities, the importance of surgical quality and treatment at high-volume specialty centers remains paramount in improving survival in RSJ cancer.

Factor (reference field)	Hazard Ratio[a]	95% Confidence Interval	p-value[b]
Cancer Facility (Community)			
Academic/NCI-designated[f]	0.830	0.695 – 0.992	**0.040**
CoC-accredited[g]	0.926	0.726– 1.180	0.535
Treatment (Upfront Surgery)			
Neoadjuvant Chemoradiation	1.128	0.943 – 1.349	0.188
Operative Approach (MIS)			
Open	1.243	1.056 – 1.464	**<0.005**
Pathologic T Stage (pT0/pT1)			
pT2/pT3	1.413	0.967 – 2.064	0.074
pT4	2.136	1.392 – 3.279	**<0.005**
Node Status (Negative)			
Positive	1.320	1.104 – 1.578	**<0.005**
Lymphovascular Invasion (Not Present)			
Present	1.445	1.206 – 1.730	**<0.005**
Margins (R0 resection)			
R1/R2 resection	1.785	1.388 – 2.296	**<0.005**

[a] Risk of death. [b] A Cox regression was performed. [f] NCI= National Cancer Institute. [g] CoC = Commission on Cancer.

SAFETY OF TRANSANAL TOTAL MESORECTAL EXCISION (TaTME) FOLLOWING TRANSANAL ENDOSCOPIC SURGERY (TES): PERIOPERATIVE AND ONCOLOGIC OUTCOMES.

P1512

F. Rouleau Fournier, A. Karimuddin, T. Phang, M. Raval, C. Brown
Vancouver, BC, Canada

Purpose/Background: Total mesorectal excision (TME) following transanal endoscopic surgery (TES) is technically challenging. Interest in transanal total mesorectal excision (TaTME) has grown in the recent years, particularly in potentially difficult pelvic dissection. Our goal was to investigate the perioperative and oncologic outcomes of patients undergoing TaTME after TES.

Methods/Interventions: All patients who underwent TaTME after TES between 2014 and 2019 in our center were included. A retrospective review of a prospectively maintained database was performed to collect demographic, perioperative and oncologic data. The main perioperative outcomes reviewed were conversion rate, complications and anastomotic leak rate. Reviewed oncologic outcomes were margin status, quality of the TME pathology specimen (complete, near complete or incomplete), and tumor recurrence (local or distant).

Results/Outcome(s): 25 patients were identified with median follow-up of 22 months (range 1-60). All patients underwent laparoscopic low anterior resection using a TaTME approach, and 23 had diverting loop ileostomy. 2 patients (8%) were converted to laparotomy. No major intra-operative complications were found. Median length of stay was 6 days. Ileus was seen in 6 patients (24%). Clinical anastomotic leak occurred in 3 patients (12%); all patients had a pre-existing diverting ostomy and leaks were managed successfully by surgical drainage and antibiotics. All patients had negative resection margins. 24 patients (96%) had complete (n=22; 88%) or near-complete (n=2; 8%) TME specimen. 1 patient with incomplete TME specimen had no residual cancer. 19 (76%) patients have had GI continuity restored, 4 patients have planned stoma closure and 4 (16%) patients had subsequent abdominoperineal resection (APR) for the following reasons: 1 chronic anastomotic leak and 3 poor functional outcomes. No patient developed local or distant recurrence.

Conclusions/Discussion: This study demonstrates that TaTME following TES is safe and is associated with satisfactory perioperative and oncologic outcomes. Further follow-up is required to confirm acceptable disease-free survival.

P1512 Table 1: Patient and tumor characteristics (n = 25)

Mean age, years (range)	64	(33-75)
Male gender (%)	14	(56%)
Mean BMI (range)	26.8	(20.8-48.2)
Median tumor height, cm (range)	5	(1-12)
Neoadjuvant radiation therapy (%)	7	(28%)
	ASA score (%)	
II	17	(68%)
III	8	(32%)
	Final diagnosis and cancer stage (%)	
Giant villous adenoma	2	(8%)
Stage I	12	(48%)
Stage II	4	(16%)
Stage III	7	(28%)

THE EFFECT OF LOW ANTERIOR RESECTION SYNDROME ON QUALITY OF LIFE IN PATIENTS WITH TREATED RECTAL ADENOCARCINOMA.

P1513

F. Abdul Raheem, J. Renaud, J. Fiore Jr., L. Feldman, P. Charlebois, B. Stein, A. Liberman, L. Lee
Montreal, QC, Canada

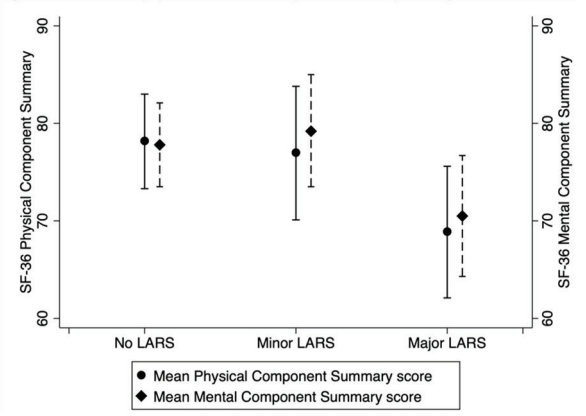
Purpose/Background: Low anterior resection syndrome (LARS) is common in patients undergoing therapy for rectal cancer. However, the effect of LARS on health-related quality of life (HRQOL) is unclear. With increased emphasis on patient-reported outcomes, it is important to determine the clinical relevance of the current LARS instruments. Therefore, the objective of this study is to determine the effect of LARS on HRQOL in patients with treated rectal cancer.

Methods/Interventions: All patients who underwent definitive therapy for rectal adenocarcinoma with primary oncologic resection with reconstruction or organ preservation (defined as local excision or clinical complete response after neoadjuvant (chemo)radiation) at a single high-volume referral centre between 2010-2018 were invited to participate at their follow-up visit. Patients awaiting surgery and those with a permanent or temporary stoma were excluded. HRQOL was measured using the SF-36 and reported as the physical component (PCS) and mental component (MCS) summary scores (range 0-100). LARS was measured using the LARS score (5 items, range 0-42 points) and categorized as none (0-20), minor (21-29), and major (30-42) as originally described. Multiple linear regression determined independent mean differences in PCS and MCS between LARS categories adjusting for potential confounders.

Results/Outcome(s): A total of 149 patients were included in this study (mean age 62.0 years (SD10.9), 70% male, mean distance from anal verge 8.9 cm (SD3.7), 20% organ preservation, and 62% neoadjuvant (chemo) radiation). The median interval from definitive therapy to questionnaire administration was 14.7 months [IQR 30.8]. The overall mean LARS score was 19.8 points (SD12.9), with 46% reporting no LARS, 21% minor LARS, and 32% major LARS. Mean PCS and MCS values by LARS score are reported in Figure 1. There were no differences in PCS ($p=0.774$) or MCS ($p=0.701$) between patients with no and minor LARS. Patients with major LARS reported significantly lower PCS ($p=0.017$) and MCS ($p=0.021$) compared to patients with no/minor LARS. After adjusting for age, gender, tumor height, radiotherapy, resection vs. organ preservation, and follow-up time, patients with severe LARS had significantly lower PCS (mean difference -9.7, 95%CI -18.2, -1.3) and MCS (mean difference -7.9, 95%CI -15.4, -0.5) compared to patients with no LARS. Minor LARS had no adjusted effect on PCS or MCS compared to no LARS. Exclusion of patients undergoing organ preservation produced a similar effect.

Conclusions/Discussion: The effect of LARS on HRQOL is not linear. Only major LARS significantly affected HRQOL, whereas minor LARS did not. These results suggest that only severe LARS symptoms are clinically relevant. Future studies may use major LARS as the primary outcome when investigating anorectal function.

Figure 1 – Mean SF-36 physical and mental component summary score by LARS score



TOTAL NEOADJUVANT TREATMENT FOR RECTAL CANCER: PRELIMINARY EXPERIENCE.

P1514

H. Gilshtein, A. Ghuman, A. Nagarajan, S. Wexner
Weston, FL

Purpose/Background: Rectal cancer treatment has changed significantly in the last few decades. Full chemotherapeutic regimens consisting of modified 5 Flurouracil and Oxaliplatin (mFOLFOX6) or Capecitabine and Oxaliplatin (CAPOX) upfront with radiation in the preoperative setting, "Total Neoadjuvant Therapy (TNT)" are gaining popularity. TNT should ensure patients receive appropriate full treatment prior to surgery. Emerging data on increased rates of complete pathological response in these patients has been associated with better disease-free survival. Moreover, TNT increases complete clinical response rates with the potential to eliminate need for rectal resection in select patients who can be followed in a "watch and wait" protocol. TNT was recently added as a treatment option in the National Comprehensive Cancer Network (NCCN) guidelines. We assessed our initial implementation of TNT for patients with locally advanced rectal cancer.

Methods/Interventions: A retrospective cohort analysis was performed using our IRB-approved database. All patients treated with TNT since its implementation in 2017 at our institution were included. Patient demographic information, including pre and posttreatment MRI, physical exam and chemotherapy regimen, and operative and pathology reports were reviewed. Complete pathological response was our primary outcome and assessed using a chi squared test. A secondary outcome was identification of factors predisposing to complete pathological response using univariable and multivariable logistic regression analysis.

Results/Outcome(s): Thirty patients met the inclusion criteria, 14 (46.6%) of whom had complete pathologic response. There was no difference in baseline demographic characteristics between patients who achieved a complete pathological response and those who did not. Surgical pathology review revealed a 92% intact mesorectum rate in the complete pathologic response group and a mean of 24 harvested lymph nodes in the entire study cohort. Both univariable and multivariable logistic regression analyses failed to demonstrate any statistically significant factors predicting complete pathologic response. However, increased tumor size and higher T stage on pretreatment MRI showed a trend towards worse pathologic outcome. Side effects of chemotherapy were minor and limited to neutropenia treated with granulocyte-macrophage colony-stimulating factorin 7 (23.3%) patients.

Conclusions/Discussion: TNT for patients with locally advanced rectal cancer holds great promise. In our initial experience the complete pathological rate, approaching 50%, is considerably higher than with traditional chemoradiation therapy. Longer follow up is required to determine impact on local recurrence and survival. Furthermore, a larger cohort is needed to identify potential factors predicting favorable pathologic outcomes and thus potentially selecting patients for a watch and wait path and deferring proctectomy.

PREOPERATIVE ORAL ANTIBIOTICS, IN CONJUNCTION WITH A MECHANICAL BOWEL PREPARATION IS ASSOCIATED WITH SIGNIFICANTLY LOWER LEAK RATES AFTER LAR AND PARTIAL COLECTOMY; HOWEVER, THEY ARE NOT EFFECTIVE FOR RIGHT COLECTOMY, COPD, OR MALNOURISHED PATIENTS.

P1515

H. Miyagaki[1], H. Shantha Kumara[2], X. Yan[2], V. Cekic[2], R. Whelan[2]
[1]Ikeda, Japan; [2]New York, NY

Purpose/Background: Postoperative (postop) anastomotic leakage after colorectal resection (CR) is a major complication. Preoperative oral antibiotics (POA), usually given together with a mechanical prep (MP), is viewed as a means of decreasing the leak rate. The efficacy of this practice in different subpopulations as regards co-morbidities and the specific type of CR being done has not been well studied. This study's purpose is to assess the impact of POA in colorectal cancer patients (pts) undergoing a variety of resections.

Methods/Interventions: The NSQIP database was queried for colorectal cancer pts undergoing elective low anterior resection (LAR), partial colectomy (PC) and right hemicolectomy (RC) between 2012 and 2016. Exclusion criteria were: totally or partially dependent health status, ventilator dependence, sepsis, emergency cases and ASA 5 status. Cases with missing data were excluded. Demographic parameters, comorbidities, postop complications and anastomotic leak data in the Procedure Targeted and Standard Patient User File were assessed. Log regression analysis was used for multivariate analyses regarding risk factors for leakage, surgical and non-surgical interventions as well as demographic and operative data.

Results/Outcome(s): 17,048 pts met the inclusion criteria (LAR, 5,946; PC, 6,514; RC, 4588). The surgical methods used were: MIS, 6,356 pts (37.3%); MIS assist, 5,438 (31.9%); MIS with conversion, 1,203 (7.1%); and Open, 4,051 (23.8%). Mechanical bowel preparation was given to 12,411 (73%) and POA to 8,040 pts (47%); 91% of POA pts also got mechanical prep. The overall leak rate was 3.9% (LAR 3.5%, PC, 2%; RC, 2%). In multivariate analysis, independent risk factors for postop leakage that required intervention or surgery included LAR (H.R. 1.368, $p=0.0185$), absence of POA (HR 0.599, $p<0.0001$), preop chemotherapy (HR 1.451,$p=0.0097$), Open surgical methods (HR 0.788, $p=0.0282$), and BMI >30 (HR 0.791, $p=0.0384$. Subclass analysis as regards POA revealed that although effective in LAR and partial colectomy patients they were not effective for RC pts malnourished pts, COPD pts, or pts on steroids.

Conclusions/Discussion: The overall leak rate was 3.9% (significantly greater for LAR and Open pts). A total of 43% got POA; 91% of these pts also got a mechanical prep. POA was associated with a significantly lower risk of leak in LAR and PC pts; this was not true in RC pts, COPD pts, malnourished pts, and those on steroids. Mechanical bowel prep pts (40% of whom got no POA) did not manifest a reduced leak risk. These data suggest that the combination of p/o antibiotics and mechanical prep reduces the leak risk in LAR and partial colectomy pts but are not effective in right colectomy pts.

THE IMPACT OF PATIENT AGE ON ROBOTIC COLORECTAL SURGERY OUTCOMES.

P1516

S. Hota[1], S. Parascandola[2], M. Tampo[3], K. Cavallo[4], V. Obias[4]
[1]Norfolk, VA; [2]Bethesda, MD; [3]Manila, Philippines; [4]Washington, DC

Purpose/Background: Robotic-assisted surgery is gaining popularity in the field of colorectal surgery. Patient selection based on comorbidities, body habitus, age, and anatomical considerations have historically guided surgeons in offering robotic-assisted surgery to selected patients. As the benefits of minimally-invasive surgery such as enhanced post-operative recovery are demonstrated, it behooves the colorectal surgeon to expand the patient population that robotic surgery is offered to in order to improve patient outcomes.

Methods/Interventions: This study is a retrospective review of a single-surgeon's experience with robotic colorectal surgery. The patients were separated into two groups based on age (above and below 65 years old). Subsequently, the patients were case-matched based on BMI and surgical procedure performed. Each group consisted of 137 patients and their peri- and post-operative outcomes were compared. Two-sample t-tests and Chi-Square tests were used for statistical analysis and a p-value <0.05 was considered statistically significant.

Results/Outcome(s): The patients in each group had an average BMI of 27.6 kg/m^2 and there were no significant differences between operative times (p=0.226) or length of hospital stay (p=0.148). The group of patients that were older than 65 had significantly more hospital re-admissions (p=0.013) and a higher cancer recurrence rate (p=0.03) compared to the case-matched younger group. There were no significant differences in the conversion rates, wound infections, leak rates, or incidence of post-operative hernias between the two groups.

Conclusions/Discussion: Patient selection for robotic-assisted colorectal surgery is important for reducing morbidity. When considering the age of the patient, this retrospective review suggests that there are very similar short-term post-operative outcomes between patients that are older and younger than 65. This allows us to confidently offer robotic-assisted surgical options to older patients who are otherwise good candidates for minimally-invasive surgery.

SURVIVAL IN STAGE IV COLON CANCER FOR PATIENTS RECEIVING NEOADJUVANT VS ADJUVANT CHEMOTHERAPY.

P1517

S. Hota[1], S. Parascandola[2], M. Tampo[3], A. Sparks[4], V. Obias[4]
[1]Norfolk, VA; [2]Bethesda, MD; [3]Manila, Philippines; [4]Washington, DC

Purpose/Background: The management of stage IV colon cancer is controversial as there are no prospective trials evaluating the possible approaches. Typically, the course of treatment depends on whether the primary tumor is symptomatic and whether the metastatic disease is potentially curable. There is currently no consensus on the timing of chemotherapy in patients receiving surgical resection. Neoadjuvant chemotherapy delays surgical management but may improve the chances of a curative resection. Adjuvant chemotherapy may be difficult for the post-operative patient to endure.

Methods/Interventions: The National Cancer Database (NCDB) was surveyed for patients with stage IV colon cancer who underwent resection of the primary tumor between 2006 and 2016 and who also received either adjuvant or neoadjuvant chemotherapy. The neoadjuvant and adjuvant groups underwent propensity score matched analysis based on age, sex, race, Charlson score, socioeconomic status, pathological stage, and type of surgery in order to compare only the most clinically similar patients. A total of 2,996 patients were included in each group. The mortality rates at 30 and 90 days after surgery were compared between the patients receiving neoadjuvant chemotherapy and those who received adjuvant chemotherapy. SAS (version 9.4, Cary, NC) was used for data analysis with $p < 0.05$ considered statistically significant.

Results/Outcome(s): Patients with stage IV colon cancer who received neoadjuvant chemotherapy in our cohort comparison had significantly lower odds of positive margin status (p=0.04) and higher odds of 30- and 90-day mortality (p<0.0001). There was no difference noted in the ability to obtain 12 or more lymph nodes at the time of surgery or the 30-day unplanned readmission rates. Patients who had adjuvant chemotherapy had a median overall survival of 30.6 months while those who underwent neoadjuvant chemotherapy had a median overall survival of 28.6 months.

Conclusions/Discussion: Currently there is no consensus on the optimal sequence of treatment for patients with stage IV colon cancer who undergo surgical resection of the primary tumor along with chemotherapy. In the cohort of patients analyzed in this study, patients who undergo neoadjuvant chemotherapy experience shorter overall survival compared to clinically similar patients who get adjuvant chemotherapy.

NATURAL ORIFICE SPECIMEN EXTRACTION SURGERY VERSUS CONVENTIONAL LAPAROSCOPIC-ASSISTED RESECTION IN THE TREATMENT OF COLONRECTAL CANCER: A PROPENSITY-SCORE MATCHING.

P1519

Q. Tang
Harbin, AE

Purpose/Background: To investigate and demonstrate the feasibility of natural orifice specimen extraction surgery(NOSES)in colonrectal cancer by contrasting with laparoscopic-assisted resection.

Methods/Interventions: In this research, 297 cases of colonrectal cancer which specimens were resected transanally using a prolapsing technique (NOSES) and 285 cases of colonrectal cancer which specimens were resected through a conventional abdominal wall small incision were included. A propensity score matching method was used to select 203 pairs of matched patients, and their data were analyzed.

Results/Outcome(s): After the psm of the basic information of the two groups of patients, from the perioperative information and postoperative follow-up of the two groups, the blood loss in the NOSES group was less

(55.0±64.4ml vs 75.0±83.8ml, p=0.007), less protective ileostomy (6.8% vs 12.8%, p=0.046), shorter first venting time (52.1±32.6h vs 60.1±31.1 h, p=0.012), shorter initial intake time (70.6±40.6 VS 96.6±55.7, p<0.001), with fewer postoperative analgesics (30.5% vs 51.7%, p<0.001), postoperative pain scores were also lower (day 1: 2.52) ±0.87 vs 3.79±1.24, day 3: 1.71±0.65 vs 2.88±0.98, day 5: 1.30±0.46 vs 1.81±0.63, P<0.001), lower postoperative complication rate (4.4% vs13.8%, p<0.001), and the satisfaction of the appearance of the abdominal wall after surgery was higher (100% vs 38.4%, p<0.001).

Conclusions/Discussion: For colonrectal cancer, NOSES has advantages in reducing postoperative pain, recovery of gastrointestinal function, and improving patient satisfaction with abdominal wall aesthetics. In addition, in terms of long-term survival, this method is no-inferior to conventional laparoscopic surgery, has a good application prospect, and is a safe and reliable minimally invasive surgery technique.

INCIDENCE AND PREDICTORS OF THE PROLONGED POSTOPERATIVE ILEUS AFTER ABDOMINAL SURGERY FROM A MULTI-CENTER PROSPECTIVE STUDY IN CHINA.

P1520

Y. Yang, Y. Yang, H. Yao, G. Wu, J. Li, Z. Zhang
Beijing, China

Purpose/Background: Post operative ileus (POI) has been considered to be one of the most common complications after abdominal operation. However, currently there is no standardized diagnostic criteria for prolonged postoperative ileus (PPOI) in China. Moreover, the incidences of PPOI were varied greatly from other reports, with little clinical evidence for related factors. The aim of this study was to assess the incidence and predictors of PPOI after abdominal surgery in China.

Methods/Interventions: Patients who underwent an abdominal open surgery (including radical resection like gastric or colorectal cancer and pancreatoduodenectomy) from 22 hospitals in China, between August 2016 and November 2017, were enrolled. Data were retrieved from our prospective multi-center database. Then the patient demographics, treatment characteristics, and perioperative outcomes were evaluated.

Results/Outcome(s): A total of 1925 patients underwent an abdominal open surgery during the study period were included. PPOI was reported from 272 (14.13%) patients, which male (172, 13.92%) was lower than female (100, 14.51%). Among those cases, the patients with median age ≥65(16.74% vs 11.83%, P= 0.003), without using sodium aescinate (anti-edema) (15.75% vs 9.54%, P= 0.001), or without combined organ resection (14.66% vs 8.72%, P= 0.038)have significant higher chance to be PPOI after surgery. Logistic regression analysis showed the age, incision length, surgical risk assessment, anti-edema treatment and combined organ resection were independent risk factors of PPOI (P<0.05).

Conclusions/Discussion: Our study suggests that it is necessary to enhance perioperative management, intervene the relevant risk factors, and apply anti-edema treatment to patients with abdominal open surgery, which may avoid PPOI and promote the ealy recovery of gastrointestinal function.

DESPITE INCREASED MEDICAL MANAGEMENT OF DIVERTICULITIS, RESECTION RATES ARE UNCHANGED AND STOMA RATE HAS INCREASED.

P1521

A. Ofshteyn, K. Bingmer, J. Bliggenstorfer, S. Stein, E. Steinhagen
Cleveland, OH

Purpose/Background: Significant debate exists regarding role of resection and stoma creation in the operative management of acute diverticulitis. The aim of this study was to use a large national database to identify trends within surgical management of diverticular disease. Given increases in non-operative management and laparoscopic lavage, we hypothesized that rate of resection and stoma creation for diverticulitis has decreased over time.

Methods/Interventions: The National Inpatient Sample database was queried for patients 18 and older with primary ICD-9 diagnosis of diverticulitis between 2007 and 2014. Elixhauser and Charlson-Deyo comorbidity indices were used to determine concomitant disease burden. Colon resection, ileostomy or colostomy creation, and surgical approach were defined using ICD-9-CM. Main outcomes were risk of colon resection and stoma creation, adjusted for patient demographics, clinical factors and hospital factors using bivariate analyses and weighted logistic regression.

Results/Outcome(s): The analysis included 367,972 observations, representing a weighted national estimate of 1.8 million admissions; 84,995(23%) patients underwent resection, of whom 24,805(29%) received a stoma. On bivariate and adjusted multivariate analysis, the likelihood of colon resection did not change significantly over time. However, the odds of stoma creation for patients who underwent resection has increased significantly every year since 2008 (Table 1), with elective resection stoma rate increasing from 7.4% to 8.2% at its highest. Women (OR 0.86, p<0.001), non-white patients (Black OR 0.69, p<0.001, Hispanic OR 0.78, p<0.001, other race OR 0.74, p<0.001) and those undergoing minimally invasive (laparoscopic OR 0.20, p<0.001; robotic OR 0.18, p<0.001) or elective (OR 0.09, p<0.001) operations were less likely to receive a stoma. Older patients with higher comorbidity burden

(Charlson-Deyo score 1: OR 1.22, p<0.001; 2: OR 1.7, p<0.001), insured through Medicaid (OR 1.39, p<0.001) or self-pay (OR 1.50, p<0.001), who underwent surgery at urban teaching hospitals (OR1.14, p<0.001) were more likely to be discharged with a stoma. Resection with stoma was associated with a significantly longer length of stay (13.4 v 7.1 vs. days, p<0.001) and higher total charges (vs. $119,500 vs $67,400, p<0.001). On adjusted survival analysis, patients with stoma were more likely to die during admission (HR 1.6, p<0.001).

Conclusions/Discussion: Although the proportion of patients undergoing colon resection during admission for diverticulitis has not changed during the study period, the likelihood of receiving a stoma has increased significantly and is associated with worse outcomes. Many variables, including demographic, clinical and hospital factors also had a significant role in stoma creation. Future studies should assess if this increase in stoma rates is driven by changes in surgeon preference, diverticular acuity, or other factors.

P1521 Table 1: Multivariate analysis demonstrating likelihood of receiving a stoma over time, adjusted for patient demographic, clinical and hospital factors.

	Odds Ratio	95% C.I.	p value
Year of admission (Ref: 2007)			
2008	1.04	0.96-1.13	0.307
2009	1.38	1.27-1.5	<0.001
2010	1.38	1.27-1.5	<0.001
2011	1.47	1.35-1.59	<0.001
2012	1.42	1.31-1.54	<0.001
2013	1.66	1.53-1.81	<0.001
2014	1.64	1.51-1.79	<0.001
Gender (Ref: Male)			
Female	0.86	0.83-.9	<0.001
Age (Ref: 18-49 years old)			
50-59 years old	1.17	1.1-1.24	<0.001
60-69 years old	1.41	1.32-1.5	<0.001
70-79 years old	1.55	1.42-1.69	<0.001
80 or more years old	2.21	1.99-2.44	<0.001
Race/Ethnicity (Ref: White/Caucasian)			
Black/African-American	0.69	0.63-.75	<0.001
Hispanic	0.78	0.72-0.84	<0.001
Other	0.74	0.66-.83	<0.001
Primary Insurance (Ref: Medicare)			
Medicaid	1.39	1.25-1.54	<0.001
Private insurance	1	0.94-1.07	0.926
Self-pay	1.49	1.34-1.67	<0.001
Other	1.13	1-1.28	0.045
Charlson-Deyo Score (Ref: 0)			
1	1.23	1.17-1.29	<0.001
2	1.72	1.62-1.82	<0.001
Hospital location and academic status			
(Ref: Rural) Urban nonteaching	1.01	0.94-1.08	0.858
Urban teaching	1.15	1.07-1.23	<0.001
Surgical approach (Ref: Open resection)			
Laparoscopic resection	0.2	0.18-0.21	<0.001
Robotic resection	0.18	0.09-0.32	<0.001
Elective status (Ref: Non-elective case)			
Elective case	0.09	0.08-0.09	<0.001

Model also controlled for median household income for patient's ZIP code (quartiles), hospital bedsize (small, medium or large), and hospital region (Northwest, Midwest, South, West).

IS ESCHERICHIA COLI PATHOGENICALLY IMPLICATED IN DIVERTICULAR ABSCESS?

P1522

C. Stafford, H. Kunitake, C. Cauley, L. Bordeianou, R. Ricciardi
Boston, MA

Purpose/Background: A developing theory is that diverticular disease as with other inflammatory gastrointestinal conditions is a consequence of bacterial dysbiosis. We hypothesized that *E. Coli* is implicated in the pathogenesis of diverticular abscess

Methods/Interventions: First, we identified all patients with a discharge diagnosis of an intrabdominal abscess attributed to either colorectal cancer or diverticulitis. Next, we abstracted patient demographics, comorbidity, clinical findings, interventions, and abscess culture data for all patients. Then we reviewed abscess cultures for patients with diverticular disease and compared them to patients with colorectal cancer. Lastly, we assessed culture data for *E. Coli* in patients with first attack of diverticulitis as compared to patients with multiple attacks

Results/Outcome(s): From the cohort of over 10,000 patients with a diagnosis of either colorectal cancer or diverticulitis, we identified 124 patients with either diverticulitis (n=80) or colorectal cancer (n=44) There were no differences in patient demographics for colorectal cancer or diverticulitis cases. Laterality and size of abscess differed; diverticular patients were more likely to have an abscess located in the left lower quadrant (36% versus 9% in the cancer cohort p=0.002) and diverticulitis patients had a smaller mean abscess size 5.9+/-0.5 versus 6.8+/-0.9 cm ($p < 0.0001$). Though similar trends in culture results were noted in both cohorts, the presence of *E. Coli* was much more prevalent in patients whose abscess etiology was diverticulitis (55%) as compared to colorectal cancer (34%, p=0.04). In addition, the proportion of patients with history of multiple attacks of diverticulitis and diverticular abscess with culture evidence of *E. Coli* was higher than all other etiologies.

Conclusions/Discussion: Though *E. Coli* is common inhabitant of the intestinal tract, its increased presence in diverticular abscess as compared to abscess from colorectal cancer may point to the pathogenic nature of this organism in propagating diverticular disease. Patients with multiple prior attacks of diverticulitis were much more likely to have *E. Coli* abscess. These data describe the presence of microbial dysbiosis as inciting more severe diverticular disease leading to abscess.

COLONIC PERFORATION SECONDARY TO INCARCERATED LUMBAR HERNIA: A RARE PRESENTATION.

P1523

L. DeCesare[2], J. Favuzza[1]
[1]*Boston, MA;* [2]*Chicago, IL*

Purpose/Background: Background: Lumbar hernias are an unusual cause of abdominal wall hernias. Diagnosis may be difficult and often missed on physical examination. Computed Tomographic (CT) imaging is an invaluable tool for diagnosis. Surgery remains the only treatment option. We present a lifesaving case of an incarcerated lumbar hernia causing a colon perforation.

Methods/Interventions: Methods: An 86-year-old female with multiple comorbidities who was initially admitted for sepsis secondary to urinary tract infection developed severe abdominal and left flank pain. Physical exam was significant for abdominal peritonitis with edema and bullae over the left flank and lower abdominal wall. CT imaging demonstrated a lumbar hernia with incarcerated perforated descending colon with a large left flank abscess. (Image 1)

Results/Outcome(s): Outcomes: The surgical approach was with a midline incision where the descending colon was found to be incarcerated and perforated within a lumbar hernia defect. The perforated colon was transected and an end colostomy was performed. The lumbar hernia defect was closed primarily and patched with omentum. A left flank incision was also performed to debride the necrotic soft tissue. Her postoperative course was uneventful and the left flank wound was managed with vacuum-assisted closure device.

Conclusions/Discussion: Conclusion: Lumbar hernias are rare abdominal wall hernias with a high rate of incarceration. Careful examination and imaging are indispensable in their diagnosis. The management is surgical and requires an understanding of the anatomy of lumbar hernias when approached.

Image 1: Abdominal Computed Tomography imaging showing perforated descending colon within lumbar hernia communicating with flank abscess.

PREOPERATIVE SERUM CARCINOEMBRYONIC ANTIGEN LEVEL AS A PROGNOSTIC FACTOR FOR RECURRENCE IN CURATIVE COLON CANCER.

P1524

Y. Sato, T. Oshiro, T. Kitahara, R. Matsunaga, Y. Yoshida, T. Urita, R. Takagi, S. Okazumi
Sakura, Japan

Purpose/Background: Preoperative serum carcinoembryonic antigen (CEA) is a predictor of recurrence after curative surgery in patients with colon cancer. We investigated whether disease-free interval of patients with elevated preoperative CEA are shorter than patients with normal preoperative CEA.

Methods/Interventions: This was retrospective cohort analysis. Consecutive patients with colon cancer who underwent curative resection for stage II and III colon adenocarcinoma at our institution from January 2010 to October 2018 were identified. Patients were categorized into 2 groups according to the preoperative serum CEA level: low CEA (<5 ng/ml) and high CEA (>or=5 ng/ml) groups.

Results/Outcome(s): A total of 316 patients (183 [57.9%] male; mean age, 70.6 [34-93] years) were identified. During the median 38-month follow-up period, the recurrence rate for patients with a high CEA level was 26.1%, which was significantly higher than the rate for those with a low CEA level (11.2%; P=0.002). The low CEA group had significantly higher recurrence-free survival rate than high CEA group (P=0.006). The disease-free interval of patients with a high CEA level tended to be shorter than with a low CEA level among the patients who recurred (347 vs. 573 days; P=0.055).

Conclusions/Discussion: Elevated preoperative CEA might be an indicator of early recurrence after curative surgery in patients with stage II and III colon cancer.

FLAP RECONSTRUCTION OF PELVIC ONCOLOGY DEFECTS: HAVE PRACTICE PATTERNS CHANGED? ANALYSIS OF THE NATIONAL INPATIENT SAMPLE (NIS).

P1525

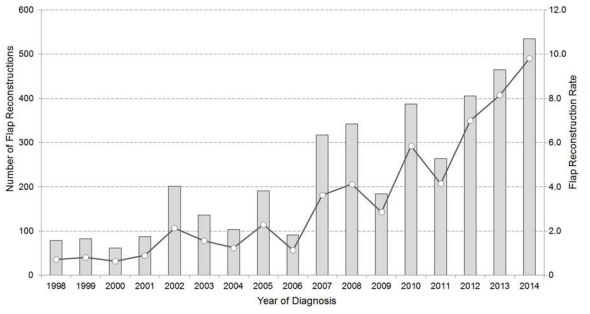
J. Abdelsayed[2], M. Zeiderman[1], M. Nuno[1], D. Sahar[1], L. Farkas[2]
[1]*Sacramento, CA;* [2]*Dallas, TX*

Purpose/Background: Irradiated pelvic oncologic defects have notoriously high rates of wound complications. Flap reconstruction has been shown to decrease perineal wound healing complications. Our objective is to provide a comprehensive evaluation of national trends in flap reconstruction procedures of pelvic oncologic defects, complications and length of stay using the National Inpatient Sample (NIS) Database.

Methods/Interventions: We studied trends in flap and primary closure procedures in patients with cancer of the rectum, anus, cervix and uterus with subsequent abdominoperineal resection (APR) or pelvic exenteration from 1998-2014. Differences in complications and length of stay were compared between patients treated with flap versus primary closure. Multivariable logistic regression model was implemented to evaluate the complication outcomes utilizing patient and hospital factors.

Results/Outcome(s): 137,015 adult patients underwent an extirpative procedure; 3,934 (2.9%) had flap reconstruction. Flap reconstruction rate increased nearly 14-fold from 0.72% in 1998 to 9.7% in 2014. (Figure 1) 40.5% of flap reconstructions had a complication, compared to 26.0% of patients primarily closed. However, from the time periods 1998-2009 to 2010-2014, flap reconstruction decreased risk of wound breakdown (OR 0.88, p=0.0027) and need for secondary closure of dehiscence (OR 0.83, p=0.0029). Most flaps were performed at large hospitals (79.0%), with 89.7% performed at urban teaching hospitals (p<0.0001). 43.2% of reconstructions were performed in the South. Median length of stay was higher for flap patients (median days, IQR; 10 [7-16] vs. 8 [6-12] p<0.0001) but decreased over time. Length of stay was shorter at rural (r = -1.51, p<0.001) and urban non-teaching hospitals (r = -0.65, p<0.001) compared to urban teaching hospitals.

Conclusions/Discussion: Our study demonstrates increasing rates of flap reconstruction of pelvic oncologic defects from 1998-2014. Length of stay concurrently decreased, likely due to implementation of enhanced recovery protocols and improved perioperative care. Following flap reconstruction wound complications of breakdown and dehiscence requiring re-closure decreased which may be attributed to increased experience with flap reconstruction. However, the NIS database does not collect data on radiation or flap type, both of which will influence complications and reconstructive success. Geographic regionalization of flap reconstructions may be due to training patterns but remains unclear. We anticipate with further improvement in perioperative care, and consequent improvement in perioperative morbidity, flap reconstruction rates of pelvic oncologic defects will continue to increase.



Number of flap reconstructions and reconstruction rate among all extirpative procedures by year.

COMPARISONS OF POSTOPERATIVE BOWEL FUNCTION BETWEEN PATIENTS UNDERGOING TRANSANAL TOTAL MESORECTAL EXCISION (taTME) AND LAPAROSCOPIC TME.

P1526

S. He, W. Sun, S. Luo, H. Wang, L. Kang, R. Dou
Guangzhou, China

Purpose/Background: Objective: To compare the effects of transanal total mesorectal excision (TME) and laparoscopic TME on patients' postoperative long-term bowel function.

Methods/Interventions: Methods: We analyzed the clinical data of 134 patients with locally advanced mid-low rectal carcinoma, who underwent transanal TME or laparoscopic TME in the TaLaR randomized controlled trial at the Sixth Affiliated Hospital, Sun Yat-sen University from April 2016 to November 2017. The effects of surgical procedures on postoperative bowel function were evaluated sequentially with LARS (low anterior resection syndrome) scale. Logistic regression model was used to determine the risk factors associated with major LARS.

Results/Outcome(s): Results: After a median follow-up of 17.2 (range, 12.1-30.4) months, a total of 107 patients were included. The baseline data were comparable between the transanal TME and laparoscopic TME groups ($P>0.05$), except for a lower diverting stoma rate in the transanal TME group (37.0% vs. 64.2%, $P=0.005$). Of the 107 patients included, 27 (25.2%) had no LARS, 32 (29.9%) had minor LARS, and 48 (44.9%) had major LARS. No significant difference was found between the two groups in overall bowel function (major LARS 48.1% vs 41.5%, $P=0.32$). Compared with the laparoscopic TME group, patients in the transanal TME group experienced worse clustered defecation ($P=0.02$). However, there were no significant differences between the two groups in terms of gas incontinence, liquid stool incontinence, frequency of bowel movements, and urgency of defecation ($P>0.05$). Multivariate analysis identified preoperative radiotherapy (odds ratio [OR] 5.79, 95% confidence interval [CI] 1.51-22.2, $P=0.01$) and anastomotic height (OR 0.72, 95% CI 0.52-0.99, $P=0.04$) as independent risk factors for major LARS.

Conclusions/Discussion: Conclusion: Compared with laparoscopic TME, transanal TME has similar outcomes on postoperative long-term bowel function. Preoperative radiotherapy and anastomotic height are likely independent risk factors on postoperative bowel function.

MELD-NA SCORE IS A NOVEL PREDICTIVE FACTOR FOR LIVER METASTASIS IN COLORECTAL CANCER.

P1527

T. Sasaki, K. Shigeta, M. Tsuruta, K. Okabayashi, R. Seishima, T. Ando, Y. Kitagawa
Tokyo, Japan

Purpose/Background: Colorectal cancer (CRC) is one of the most common cancer in the world and well-known that liver is one of the most common metastatic or recurrence site. The Model for End-Stage Liver Disease Sodium (MELD-Na) score has been widely used to rank the priority of patients awaiting liver transplantation. Because of the simplicity of the scoring system, there has been interested in applying MELD-Na to predict patient outcomes in the nocirrhotic surgical patients, and MELD-Na score has been shown to predict postoperative morbidity and mortality after elective colectomy. We hypothesized that MELD-Na would be able to predict the recurrence in liver after the resection of primary site. In this study, we assessed the pre-operative MELD-Na score and recurrence of liver metastasis has correlation in CRC patients after curative surgery.

Methods/Interventions: Stage I-III CRC patients who underwent curative resection between January 2002 and December 2012 were enrolled, retrospectively. MELD-Na score was calculated with the pre-operative data which was evaluated before surgery. Primary outcome was the RFS regarding as first liver metastasis and secondary outcome was the RFS. Cox hazard regression model and Kaplan Meier analysis were used for the statistical analysis.

Results/Outcome(s): A total of 1092 patients were enrolled in the study. The mean follow-up period was 63.4±36.1 months. Multivariate analyses revealed that MELD-Na score was one of the independent risk factor for RFS regarding as first liver meta (HR 1.1 (1.01-1.19), $p<0.01$), however in RFS MELD-Na is not an independent risk factor. In addition, optimal cut-off value of MELD-Na score was determined as 12.537. There was a significant difference in the RFS regarding as first liver metastasis between patients with MELD-Na>12.537 and those with MELD-Na%12.537 (15.7%, 4.11 %, respectively, Log-rank test: $p<0.01$).

Conclusions/Discussion: MELD-Na score is a novel predictor factor for liver metastasis in colorectal cancer with curative operation. MELD-Na score is an additional tool that surgeons may use to obtain a physiologic assessment of a patients. This method of physiologic stratification can be used as an adjunct to clinical judgment.

P1526 Table 3 Univariate and multivariate analysis of long-term postoperative LARS in 107 patients

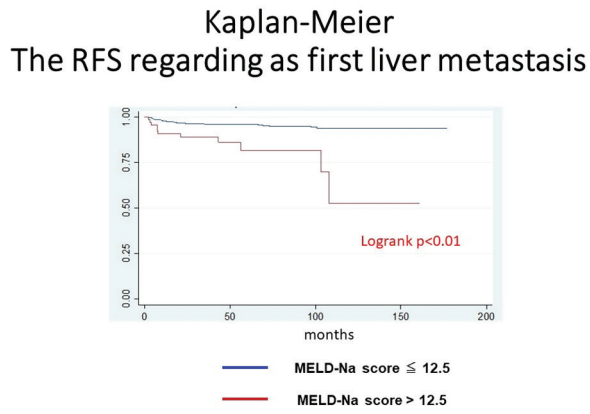
Characteristics[a]	No LARS n=27 (25.2)	Minor LARS n=32 (29.9)	Major LARS n=48 (44.9)	Univariate OR (95% CI)	*P*[c]	Multivariate OR (95% CI)	*P*[c]
Age (years)							
<59	14 (25.9)	17 (31.5)	23 (42.6)	1			
≧59	13 (24.5)	15 (28.3)	25 (47.2)	1.16 (0.57-2.34)	0.69		
Sex							
Female	10 (27.1)	12 (32.4)	15 (40.5)	1			
Male	17 (24.3)	20 (28.6)	33 (47.1)	1.25 (0.38-1.68)	0.56		
Tumor height (cm)[b]	6.0 (2.6-8.7)	5.8 (3.0-9.3)	4.4 (2.2-7.6)	0.65 (0.51-0.83)	0.001	1.15 (0.47-2.80)	0.75
Preoperative radiotherapy							
No	26 (29.5)	29 (33.0)	33 (37.5)	1			
Yes	1 (5.3)	3 (15.8)	15 (78.9)	6.36 (1.96-20.61)	0.002	5.07 (1.34-19.3)	0.02
Type of access							
Laparoscopic TME	16 (30.2)	15 (28.3)	22 (41.5)	1			
Transanal TME	11 (20.4)	17 (31.5)	26 (48.1)	1.43 (0.71-2.91)	0.32	1.44 (0.64-3.26)	0.38
Type of anastomosis							
Handsewn	1 (7.1)	2 (14.3)	11 (78.6)	1			
Stapler	26 (28.0)	30 (32.3)	37 (39.8)	0.18 (0.05-0.69)	0.01	2.12 (0.48-9.33)	0.32
Height of anastomosis (cm)[b]	4.0 (1.0-8.0)	4.0 (1.2-7.0)	2.0 (1.0-5.0)	0.61 (0.47-0.79)	<0.001	3.63 (1.50-8.80)	0.004
Months since protectomy/stoma	19.4 (12.3-29.5)	15.4 (12.1-30.4)	16.5 (12.1-30.4)	0.97 (0.90-1.04)	0.355		
Diverting stoma							
No	15 (28.3)	22 (41.5)	16 (30.2)	1			
Yes	12 (22.2)	10 (18.5)	32 (59.3)	2.44 (1.18-5.03)	0.02	1.48 (0.60-3.61)	0.39
Months before ileostomy reversal	3.6 (2.7-8.0)	4.3 (3.2-10.6)	3.7 (2.5-12.9)	1.00 (0.79-1.27)	0.99		
Anastomotic leak							
No	25 (26.0)	30 (31.3)	41 (42.7)	1			
Yes	2 (18.2)	2 (18.2)	7 (63.6)	2.15 (0.62-7.47)	0.23		
Anastomotic stenosis							
No	26 (26.0)	31 (31.0)	43 (43.0)	1			
Yes	1 (14.3)	1 (14.3)	5 (71.4)	3.09 (0.60-15.91)	0.18		

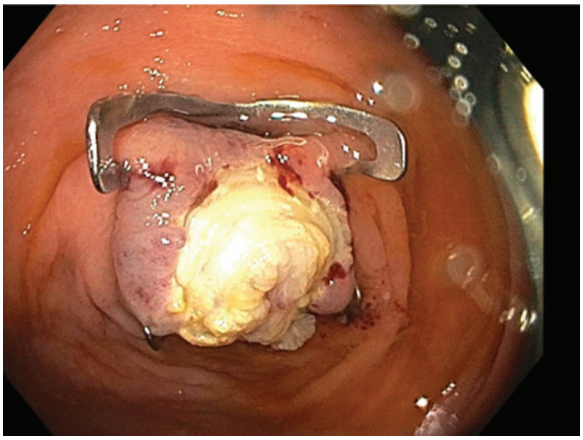
a Data are expressed as median (range) or n (%).

b The distance from the anal verge to anastomosis or inferior tumor border.

c Ordinal logistic regression analysis was performed.

LARS, low anterior resection syndrome; OR, odds ratio; CI, Confidence interval; BMI, body mass index; TME, total mesorectal excision.





SECONDARY APPENDICITIS FOLLOWING ENDOSCOPIC FULL THICKNESS RESECTION OF AN APPENDICEAL ORIFICE POLYP.

P1528

E. Changchien
Anaheim, CA

Purpose/Background: Endoscopic full thickness resections (EFTR) are increasingly being performed for polyps and early cancers of the colon and rectum. Resections involving the appendiceal orifice are particularly challenging, and traditionally require surgical intervention. The safety of performing EFTR at the orifice is unknown.

Methods/Interventions: A 61-year-old male underwent a screening colonoscopy and was found to have a 20mm sessile polyp at the appendiceal orifice, biopsies demonstrating a villous adenoma with focal high-grade dysplasia. He subsequently underwent EFTR with snare closure of the appendiceal orifice.

Results/Outcome(s): Less then 24 hours following resection and snare closure of the orifice, he began exhibiting symptoms of appendicitis, and was found to have a dilated appendix on radiographic imaging. An emergent appendectomy with partial cecectomy was performed without incident. Final pathology demonstrated a low-grade mucinous neoplasm extending into the body of the appendix.

Conclusions/Discussion: EFTR at the appendiceal orifice can put patients at risk for secondary appendicitis. Caution should be exercised and close follow-up is needed when performing resections around this area.

THE VALUE OF SURGERY IN DIFFERENT PATHOLOGY SUBTYPES OF PRIMARY MALIGNANT SMALL BOWEL TUMORS.

P1529

Y. Zhang
Shanghai, China

Purpose/Background: Small bowel tumors (SBT) are less common but the incidence is increasing. Few studies have been published focused on surgery of malignant SBTs and our knowledge about it is limited.

Methods/Interventions: Design: Single-center retrospective study. **Patients:** 278 patients underwent small bowel operations with definite pathological diagnosis of gastrointestinal stromal tumor (GIST), adenocarcinoma, or lymphoma at the Fudan University Shanghai Cancer Center between July 2006 and December 2016. **Main Outcome Measures:** We calculated overall survival time, operation information of SBT patients and performed Kaplan-Meier survival analysis between different sub groups.

Results/Outcome(s): 278 patients included 167 males and 111 females. Median age was 57 years. There were 133 stromal tumor, 107 adenocarcinoma and 38 lymphoma. The follow-up rate was 96.0%. 232 of 278 patients accepted complete resection (R0 resection) (120 of 133 in stromal tumor, 86 of 107 in adenocarcinoma and 24 of 38 in lymphoma), other patients underwent palliative resection, enteric bypass surgery or only biopsy. Patients of stromal tumor and adenocarcinoma had a better prognosis after R0 resection or primary lesion resection. There was a trend that patients of stromal tumor or adenocarcinoma could benefit from palliative resection. There was no statistical significance in lymphoma sub group.

Conclusions/Discussion: R0 resection of resectable tumor is necessary for patients of stromal tumor or adenocarcinoma and palliative resection of primary lesion in these two sub groups is also suggested. We do not suggest surgery treatment in lymphoma unless there is an emergency of anemia or obstruction.

Pathological subtypes	R0 resection	Palliative resection	BY-pass	Biopsy	Total
GIST	120	3	4	6	133
Adenocarcinoma	86	5	13	3	107
Lymphoma	24	9	3	2	38
Total	232	15	20	11	278

LARGE COLORECTAL HEMANGIOMA: AN UNCOMMON AND CHALLENGING CONDITION.

P1530

L. de Campos-Lobato[1], J. Alves Figueiredo[1], L. de Almeida Barroso[2], R. Cardoso Mollo[1], T. Navarro[1]
[1]Belo Horizonte, Brazil; [2]Nova Lima, Brazil

Purpose/Background: Colorectal hemangiomas are very rare but extremely challenging even for experienced surgeons. Although small hemangiomas might cause only a few symptoms, large hemangiomas can lead to severe bleeding before and during surgery. There is no consensus regarding its management. We described the clinical scenario of an 18-year-old male suffering from a large and diffuse colorectal hemangioma.

Methods/Interventions: This was an 18-year-old male with a history of large volume GI-bleeding over the past 2 years. The PE revealed a malnourished and pale young male. The abdominal examination was unremarkable. Digital rectal examination revealed bright red blood in the rectum. A c-scope revealed enlarged serpentine vessels in the rectum, sigmoid colon, splenic flexure, and distal ascending colon. A pelvic MRI revealed serpentine vessels in the rectal and rectosigmoid wall and into the mesorectum as well. Based on these test results the hypothesis of a diffuse colorectal hemangioma was made and we decided to do an angiographic study of the rectal vascular supply with subsequent embolization as needed, followed by subtotal proctocolectomy with low colorectal anastomosis and diverting loop ileostomy.

Results/Outcome(s): The arteriography revealed abnormal smalls vessels located at the distal branches of the superior rectal artery, which was embolized. There were no abnormal vessels coming from the internal iliac arteries. No other abnormalities were seen. After the embolization, he underwent an open subtotal proctocolectomy with low colorectal anastomosis and diverting loop ileostomy. During the abdominal cavity initial assessment, we found a diffuse hemangioma affecting the distal right colon, splenic flexure, sigmoid colon, and rectum. In order to have optimal bleeding control, we started the proctocolectomy ligating the IMV, IMA, and trunk of the middle colic artery. After the vascular control, we mobilized the colon and a total mesorectal excision was carried out. There were moderated bleeding during the rectal dissection. The stapled low colorectal anastomosis between the right colon and low rectal stump was performed with the counter-clockwise right colon rotation technique. A loop ileostomy was made on RLQ and a blake drain was placed in the pelvis. The EBL was 600cc and the operation was uneventful. The surgical specimen revealed a diffuse colorectal hemangioma affecting the entire rectum, the rectosigmoid junction, splenic flexure and distal right colon (Figure 1). The postoperative course was unremarkable and he was discharged home on POD 5.

Conclusions/Discussion: Colorectal hemangiomas are rare conditions that can lead to life-threatening hemorrhage before and during surgery. Preoperative vascular embolization and making vessel ligation as the first step of the operation are advisable strategies.

Large and diffuse colorectal hemangioma

COLORECTAL SURGEONS BEWARE, NOT ALL COLON MASSES ARE FROM THE COLON. A CASE SERIES OF YOUNG PATIENTS PRESENTING WITH A LARGE BOWEL OBSTRUCTION SECONDARY TO GYNECOLOGICAL MALIGNANCY.

P1531

E. Olecki, F. Puleo
Hershey, PA

Purpose/Background: This is a case series of 3 young (<35) patients presenting to a colorectal surgery service with symptoms of a large bowel obstruction (LBO) and radiologic imaging indicative of a colon malignancy. After work up by colorectal surgery, all patients in this series were found to have gynecological malignancies causing a LBO. With LBO as rare presenting sign of gynecologic

malignancy and these patients far below the average age of diagnosis for their respective malignancies, the patients in this case series are unique based on both their presentation and age.

Methods/Interventions: We retrospectively reviewed the records of 3 patients from 2017 to 2019 from a single institution. We collected and analyzed patient demographic information, medical history, diagnostic laboratory and radiology tests, endoscopic and surgical procedures, treatments, and survival.

Results/Outcome(s): All patients initially presented to and were managed by colorectal surgeons until a diagnosis of a gynecological malignancy was made. All final diagnoses were made based upon pathology results. The average age was 30 (range 21-35). All patients in this series were presumed to have a sigmoid colon cancer based upon initial CT imaging. Two of the malignancies were ovarian and one was a cervical cancer, all of which were found to be causing extrinsic compression of the sigmoid colon and were metastatic at diagnosis. Two of the malignancies were diagnosed on endoscopic evaluation and one was diagnosed intraoperatively during diversion. All patients required endoscopic intervention for decompression followed by surgical diversion with a transverse loop colostomy. Two of the colostomies were performed as open procedures and the remaining one was performed with laparoscopic assistance. None of the patient's had a family history of gynecological malignancy, and only one had a distant relative with colon cancer.

Conclusions/Discussion: This series illustrates three cases of advanced gynecological malignancy in young female patients presenting as a LBO. These cases are examples of the challenge of accurate diagnosis of malignant processes in the pelvis and illustrates that gynecological processes can be misdiagnosed as colorectal in nature. The implications of misdiagnosis results in colorectal surgeons having to make an accurate diagnosis and coordinate care for patients earlier in presentation. These cases additionally show the short comings of CT imaging, as all thee cases were described as a definitive colon cancer on initial CT when the true diagnosis was only made on final pathological review. These cases exemplify the importance of approaching LBOs secondary to a mass with a wide differential, particularly with abnormal presentation such as young age.

THE BENEFIT OF PROPHYLACTIC URETER CATHETERS DURING ABDOMINOPELVIC OPERATIONS: URETER INJURY PREVENTION OR MERE DETECTION?

P1532

W. Cirocco
Phoenix, AZ

Purpose/Background: PURPOSE/BACKGROUND: Controversy exists regarding the propriety of using prophylactic ureter catheters for abdominopelvic operations. Despite limited published studies, some authors suggest that prophylactic ureter catheters allow detection, but not prevention of ureter injury. A retrospective review of the routine use of ureter catheters in the setting of resection of advanced rectal cancer following neoadjuvant therapy is combined with a review of the literature in an attempt to arrive at a consensus on the benefits (if any) of prophylactic ureter catheters during the performance of abdominopelvic operations.

Methods/Interventions: METHODS/INTERVENTIONS: A retrospective review of a prospectively maintained database (1999-2010) of 109 consecutive patients who underwent resection of advanced rectal cancer following neoadjuvant therapy with routine use of prophylactic bilateral ureter catheters, with the primary outcome of ureter injury. A literature review on the subject further adds a timeline and perspective on the evolution of the practice of employing prophylactic ureter catheters for abdominopelvic operations.

Results/Outcome(s): RESULTS/OUTCOMES: Routine cystoscopy with placement of prophylactic bilateral ureter catheters was accomplished in all 109 subjects. Postoperative morbidity related to catheter placement (e,g, ureter injury, anuria, infection) was not encountered. Literature review (Table 1) revealed limited published studies, with a mix of routine and selective use of prophylactic ureter catheters during colorectal (especially diverticular disease of the colon) and gynecologic (especially hysterectomy) operations. There has been a steadily increasing use of prophylactic ureter catheters in recent decades, from 6.7% in 2000 to 16.3% in 2013, with increased usage documented in laparoscopic versus open operations, spawning the invention of lighted ureter catheters. In fact, 5 of the 7 published studies in the 21st century focused solely on laparoscopic operations. The prevention and easier identification of ureter injury were general themes that inspired this increasing trend. Despite the increased operative time for insertion of ureter stents, literature review suggests a net decrease in total operative time, as an added benefit.

Conclusions/Discussion: CONCLUSIONS: The increasing trend in the utilization of prophylactic ureter catheters for abdominopelvic operations warrants further investigation into the risks and benefits of this strategy. The potential benefits of the use of prophylactic ureter catheters not only include the detection of ureter injury and improved ease of repair if injury occurs, but the prevention of injury during colorectal and gynecologic abdominopelvic operations.

MULTI-CENTER ANALYSIS OF PREDICTORS FOR AND IMPACT OF CUMULATIVE INPATIENT OPIOID USE IN COLORECTAL SURGERY PATIENTS: A CALL FOR LONG TERM ERAS STRATEGIES.

P1534

P. Cavallaro[1], A. Fields[1], R. Bleday[1], H. Kaafarani[1], Y. Yao[1], T. Sequist[1], K. Ahmed[1], M. Rubin[2], R. Ricciardi[1], L. Bordeianou[1]
[1]Boston, MA; [2]Salem, MA

Purpose/Background: The predictors for increased inpatient opioid use for colorectal surgery patients are poorly understood. Even less is known regarding whether high inpatient use alters long term outcomes.

Methods/Interventions: We identified all patients who underwent colorectal resections between 6/2015 and 20/2017 at five institutions (2 academic, 3 private) participating in a colorectal collaborative that works to improve patient care. Patient comorbidities, surgery data, and outcomes were captured in the American College of Surgeons National Surgical Quality Improvement. Preoperative opioid exposure, inpatient opioid use quantified as milligram morphine equivalents (MMEs), and persistent use (defined as one or more opioid prescriptions 90-180 days after surgery) were captured using the electronic medical record pharmacy data. Patient controlled anesthesia (PCA) cumulative dosing was not recorded and therefore PCA was recorded as a categorical variable (used or not used). We then merged data to analyze risk factors for increased inpatient postoperative use and assess impact of high inpatient use on rates of persistent opioid use.

Results/Outcome(s): The final cohort included 1646 patients (diverticulitis: 318 patients (19.3%); colorectal cancer: 644 patients (39.1%)). Patients receiving ≥ 250 MMEs were in the top quartile of inpatient use. On univariate analysis, patients in the top quartile were more likely to be under age 65, have emergency surgery, have an

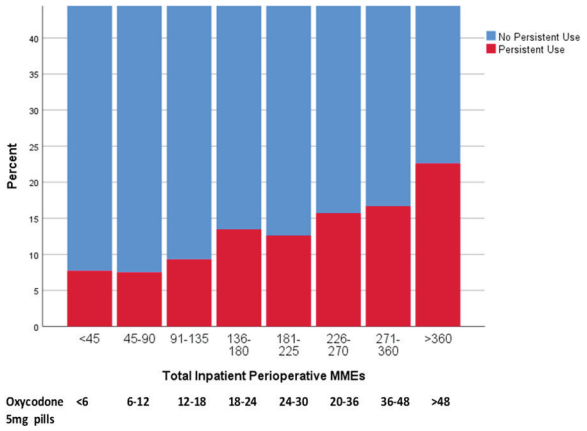
P1532 Literature review of published series of patients who underwent insertion of prophylactic ureter catheters, either on a routine or selective basis

Study (1st Author)	Country	Year	Specialty Area (CRS/GYN/Pelvic)	Operation: CRS/ Hysterectomy Open/Laparoscopic	Ureter Catheter Insertion: Select vs Routine	# patients with ureter catheters	# patients with catheters & ureter injuries (%)
Sampson	USA	1902	GYN/Cervical Cancer	Open Hysterectomy	Select	???	11 (?)
Leff	USA	1982	CRS/Mix	Open CRS	Routine	198	4 (2.0)
Bothwell	USA	1994	CRS/Mix	Open CRS	Select	90	1 (1.1)
Kyzer	Canada	1994	CRS/Mix	Open CRS	Select	120	1 (0.8)
Kuno	USA	1998	GYN/Mix	Laparoscopic/ Open Hysterectomy	Select	147 322	Laparoscopic - 0 (0) Open - 2 (0.6)
Diwevidi	USA	2002	CRS/Diverticular Disease	Laparoscopic Sigmoid Colectomy	Routine	66	1 (1.5)
Tanaka	Japan	2008	GYN/Mix	Laparoscopic Hysterectomy	Routine	60	0 (0)
Redan	USA	2009	Pelvic (CRS/GYN)	Laparoscopic	*Select	151	0 (0)
Beraldo	Germany	2013	CRS/Mix	Laparoscopic CRS	Routine	89	1 (1.1)
Boyan	USA	2017	CRS/Mix	Laparoscopic CRS	*Select	465	0 (0)
Merola	USA	2018	CRS/Mix	Open Colectomy	Select	52	1 (1.9)
Current	USA	2020	CRS/Rectal Cancer	Open Proctectomy	Routine	109	0 (0)
TOTALS						1869	22 (1.2)

* lighted ureter catheters
CRS = Colorectal Operations
GYN = Gynecologic Operations
Pelvic = combination of GYN and CRS operations
Mix = different CRS or GYN operations for both benign and malignant pathology

ASA 3 or greater, have more comorbidities, have an open approach, have any postoperative complication, use a PCA, and have longer median hospital length of stay (3 days IQR 2-5 vs 7 days IQR 4-15, p<0.001). On multivariable analysis, risk factors for high inpatient opioid use were age less than 65, inflammatory bowel disease, emergency surgery, open surgery, surgical site infection, and prolonged length of stay. Prior opioid exposure was not a risk factor for high cumulative inpatient use (OR 0.81, 95%CI 0.6-1.2, p=0.1). Patients in the top quartile of inpatient opioid use had more than twice the risk of becoming persistent opioid users compared to other patients (19.8% vs. 9.7%, p<0.001; OR 1.5, 95% CI 1.1-2.1; p=0.03). Opioid naïve status was protective (OR 0.37, 95%CI 0.26-0.52, p<0.001).

Conclusions/Discussion: High postoperative inpatient opioid used was associated with an increased risk of persistent opioid use. This increased inpatient use was associated with non-modifiable factors such as complications and emergencies. However, the doses of administered opioids following these complications are modifiable. Higher awareness of the long-term impact of in-hospital opioids following treatment of complications is needed for institutions to consider establishing hospital protocols that focus not only on short term ERAS interventions, but also on prolonged opioid sparing strategies.



Rate of persistent use by inpatient perioperative cumulative opioid dose. For reference, one oxycodone 5mg pill is equivalent to 7.5 MMEs.

DOES THE ADDITION OF INTRAOPERATIVE LIDOCAINE AND KETAMINE TO AN ENHANCED RECOVERY AFTER COLORECTAL SURGERY DECREASE OVERALL PERIOPERATIVE OPIOID USE?

P1535

J. Ogilvie, R. Kyriakakis
Grand Rapids, MI

Purpose/Background: In response to the well-recognized opioid epidemic there has been increased awareness to minimize perioperative opioid use. There are only sparse data whether the addition of ketamine and lidocaine to a well-established enhanced recovery would impact opioid use after elective colorectal surgery.

Methods/Interventions: We developed a prospective pilot study to administer lidocaine upon induction and 24 hours postoperatively (1.5mg/kg bolus and 2mg/kg/hr) in conjunction with bolus ketamine (0.5mg/kg) on induction and intraoperatively. A group of historical controls were matched based on patient demographics and surgical approach to compare short term outcomes.

Results/Outcome(s): Comparison of the 22 pilot patients to 36 controls showed no statistical difference in age, sex, ASA, BMI, preoperative opioid use, operative time, blood loss, procedure performed or use of other opioid sparing medications (acetaminophen, gabapentin and preoperative TAP blocks). Intraoperatively, the pilot group received significantly less opioids (25 MMEs [20-31] vs. 16.3 [10-20], p<0.001) and less IV fluids (2.0L [1.5-3.0] vs. 1.6 [1.0-2.0], p=0.028). There was no statistical difference in MMEs during the first (42 MMEs [19-68] vs. 39 [11-49], p=0.24) and second (45 MMEs [22-74] vs 30 [13-58], p=0.24) days postoperatively. There was also no difference in postoperative complications, patient reported pain scores, return to bowel function and length of stay. During the first 24 hours, four patients in the study group (18%) developed minor neurologic symptoms attributed to the lidocaine that resolved upon cessation of the drip.

Conclusions/Discussion: The addition of ketamine and lidocaine to an ERAS protocol resulted in an intraoperative reduction of administered opioids and fluids. This small pilot study however did not identify any additional differences in postoperative opioid use or short-term outcomes.

A REAL WORLD STUDY: THE LONG-TERM SURVIVAL RESULT OF COLORECTAL CANCER - A DATABASE COHORT REPORT FROM SOUTHWESTERN CHINA.

P1556

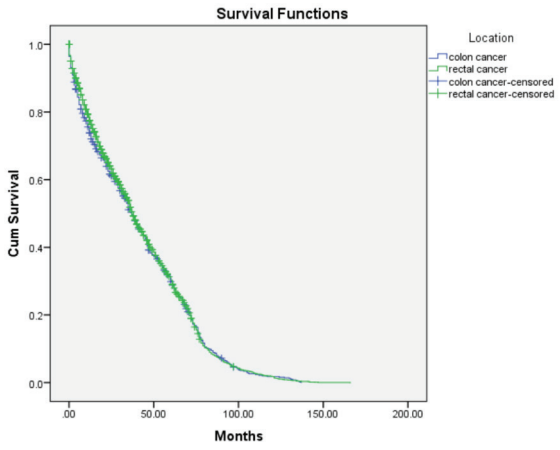
L. An, J. Liu, Y. Zeng, X. Wang, L. Li
Chengdu, China

Purpose/Background: Most of the international clinical databases of colorectal cancer regularly display the long-term survival results of colorectal cancer in their areas. This evaluation is also feasible in China. In our study, we analyzed the real world data of colorectal cancer in Southwestern China and displayed the long-term follow-up result in this area.

Methods/Interventions: The data cohort was from Database from Colorectal Cancer(DACCA) of West China Hospital, Sichuan University. "Endpoint of follow-up", "date of surgery", "state of living", "tumor location", "histological differentiation" and "nature of tumor" were analyzed in this study. Analysis were performed with IBM SPSS Statistics, version 23.0. Kaplan-Meier survival curves with log-rank P-value was used for survival comparison.

Results/Outcome(s): 3206 data was selected. The 5-year overall survival (OS) rate of rectal cancer (n=2479) was 39.3% and the colon cancer (n=641) was 29.8% (P=0.612). In different tumor types, the 5-year OS rate of adenocarcinoma (n=1648) and mucinous adenocarcinoma (n=514) was 33.3% and 34.0%, respectively; As for uncommon tumors, the 5-year OS rate of signet ring cell carcinoma (n=61), neuroendocrine carcinoma (n=23), malignant melanoma (n=14), squamous cell carcinoma (n=11), malignant lymphoma (n=4), leiomyosarcoma (n=2), extramedullary plasmacytoma (n=1) was 24.4%, 39.1%, 0, 47.7%, 50.0%, 0 and 0, respectively. There's no statistical significance in 5-year OS rate of tumors in different types (P=0.584). In different histological differentiations, the 5-year OS rate of high (n=386), moderate (n=2323) and low differentiation (n=297) is 34.9%, 31.6%, 18.2% respectively. The long-term survival of moderate and high differentiation is better than low differentiation (P<0.001). The adenocarcinoma and mucinous adenocarcinoma were analyzed to find out the influence of different stages on survival. The result showed that in adenocarcinoma, the long-term survival of stage I (n=64,5-year OS=40.0%), stage II (n=467,5-year OS=46.0%) and stage III (n=469,5-year OS=35.0%) was better than stage IV (n=154,5-year OS=23.5%) (P<0.001), while in mucinous adenocarcinoma the long-term survival of stage II (n=158,5 year OS=42.9%) and stage III (n=181,5 year OS=35.3%) was better than stage I(n=7,5-year OS=0.00%) and stage IV(n=63,5-year OS=27.4%) (P=0.001).

Conclusions/Discussion: The real world data of colorectal cancer in Southwestern China shows that the long-term survival rate in this area may be lower than the published international data. It probably reflects the therapeutic effect of colorectal cancer in this region. Also for the result shows a worse survival in mucinous adenocarcinoma in stage I than in stage II and III, it requires us to reconsider whether we are accurate enough in important evaluation links such as pathological staging. In the future, further study in prognosis is needed based on the real world data in this area.



TIMP-2 REGULATES 5-FU RESISTANCE VIA THE ERK/MAPK SIGNALING PATHWAY IN COLORECTAL CANCER.

P1557

G. Zhang, Z. Song
Hangzhou, China

Purpose/Background: 5-Fluorouracil (5-Fu) is the first-line chemotherapeutic drug in the treatment of colorectal cancer. The efficiency of 5-Fu is, however, limited by drug resistance in colorectal cancer patients. Cytokine profiles in the tumor microenvironment are correlated with tumor drug resistance. This study was aimed to define the functions of tissue inhibitor metalloproteinases 2 (TIMP-2) in the 5-Fu resistance to colorectal cancer, investigate its potential mechanism and try to find effective therapeutic targets on it.

Methods/Interventions: Cytokine array was designed to scan for differential expression of cytokines in the serum of 5-Fu-resistant and 5-Fu-sensitive colorectal cancer patients. We indicated that TIMP-2 regulated 5-Fu resistance for its high expression detected by ELISA in the clinic and induced to worse Overall survival (OS) and Disease-free survival (DFS). Different techniques were used to monitor the expression of TIMP-2, including ELISA, RT-qPCR, Western blotting and histopathological assays. Using the up-regulation, down-regulation, rescue experiments and drug synergy analysis, we demonstrated the function of TIMP-2 and its downstream signaling pathway. Additionally, we successfully constructed a PDX model of colorectal tumors resistant to 5-Fu to verify the differential expression of TIMP-2.

Results/Outcome(s): Using cytokine array studies, we found that TIMP-2 is highly expressed in 5-Fu resistant colorectal cancer patients. Our clinical data showed that colorectal cancer patients following 5-Fu-based therapy with elevated TIMP-2 are exhibited a poor Overall survival (OS) and Disease-free survival (DFS). Besides, *in vivo*, patient-derived xenograft (PDX) models confirmed that TIMP-2 was highly expressed in the 5-Fu-resistant colorectal cancer. Mechanistically, we demonstrated that elevated TIMP-2 protein levels sustained colorectal cancer cell resistance to 5-Fu by constitutively activating the ERK/MAPK signaling pathway via an autocrine mechanism. Application of anti-TIMP-2 antibody or U0126, the inhibitor of ERK/MAPK, could break up this signaling pathway, which potentially attenuate 5-Fu resistance in colorectal cancer.

Conclusions/Discussion: Our findings identify a novel TIMP-2-ERK/MAPK mediated 5-Fu resistance mechanism in colorectal cancer. Targeting TIMP-2 or ERK/MAPK may provide a new strategy to overcome 5-Fu resistant in colorectal cancer chemotherapy.

TRAVEL TIME TO A HIGH VOLUME CENTER NEGATIVELY IMPACTS TIMING OF INITIATION OF THERAPY FOR PATIENTS WITH RECTAL CANCER.

P1558

J. Abelson, J. Barron, P. Bauer, C. Schad, K. Ohman, S. Hunt, M. Mutch, M. Silviera
St. Louis, MO

Purpose/Background: Rectal cancer care has evolved over time and is increasingly complex. Prior studies demonstrated improved outcomes among rectal cancer patients treated at high volume versus low volume centers. The National Accreditation Program for Rectal Cancer (NAPRC) was established to standardize key process measures to improve survival for these patients. No study has evaluated the relationship between travel distance to a high volume center and adherence to these process measures. The objective of this study was to determine whether longer travel time to a single high volume center impacts adherence to NAPRC measures and disease-free survival (DFS).

Methods/Interventions: We retrospectively reviewed all rectal cancer patients in our institutional database undergoing surgery from 2009 to 2019. Travel time was calculated based on the estimated driving time from patients' home zip codes to our high volume center at a standardized time of day. Short and long travel times were defined as being below or above the 75th percentile for the entire cohort, respectively. The primary outcome was initiation of treatment within 60 days of diagnosis. Secondary outcomes included completeness of preoperative staging, evaluation by a colorectal surgeon prior to initiation of treatment, and DFS. Descriptive statistics and multivariable logistic regression models adjusting for demographic, socioeconomic and tumor-specific variables were performed.

Results/Outcome(s): 654 patients with rectal cancer who underwent surgery during the study period were included for analysis. Patients with short travel (≤120 minutes; n=514) had a median travel time of 40 minutes. Patients with long travel (>120 minutes; n=139) had a median travel time of 150 minutes. A lower proportion of patients with long travel time began definitive treatment within 60 days of diagnosis (74% vs 84%, p=0.007). On multivariable logistic regression, patients with long travel time were significantly less likely to begin definitive treatment within 60 days of diagnosis (OR= 0.55; 95% CI=0.32-0.95) or to be evaluated by a colorectal surgeon prior to initiating treatment (OR=0.47; 95% CI=0.27-0.83). There were no significant differences in likelihood of completing preoperative staging studies nor in DFS based on travel time.

Conclusions/Discussion: Patients with longer travel time did not meet the NAPRC recommended threshold for initiation of cancer therapy. Despite these observations, there was no significant difference in DFS based on travel time. Given the potential benefits of treatment at a high volume center, these data establish that those patients with long travel times may be vulnerable to delays in cancer care. As we consider the implications of regionalization of rectal cancer care, special attention should be placed on the at-risk patient population with longer travel time to reach high volume centers.

THE EFFECT OF RACE, ETHNICITY, AND POPULATION DENSITY ON DISPARITIES IN TIMING TO DEFINITIVE SURGERY IN RECTAL CANCER.

P1559

S. Hill, A. Foiles Sifuentes, D. Meyer, S. Hahn, A. Crawford, P. Sturrock, J. Davids, J. Maykel, K. Alavi
Worcester, MA

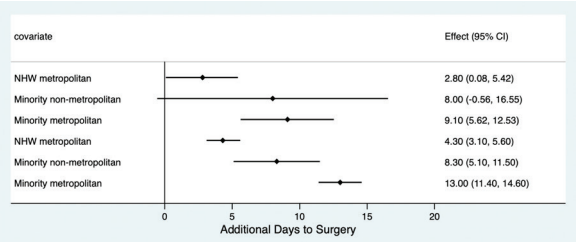
Purpose/Background: Access to care is critical for timely rectal cancer care. Prior studies have found access to care disparities in both minority and rural populations. This observational study examined the intersection of race and population density on timing of care and short-term outcomes.

Methods/Interventions: Patients with clinical stage I-III invasive rectal adenocarcinoma who underwent proctectomy were identified from the 2004-2016 National Cancer Database. Patients were categorized by race/ethnicity and population density (metropolitan vs. non-metropolitan). The primary study outcome was timing (diagnosis to surgery interval) that was adjusted for clinically relevant factors determined by backwards stepwise elimination by multivariable ANCOVA. The secondary outcome was unplanned readmission and short-term mortality evaluated with logistic regression.

Results/Outcome(s): A total of 70,057 patients were identified. Non-metropolitan non-Hispanic whites (NHW) made up 17% (n=13,745), metropolitan NHW 65% (n=51,427), minority non-metropolitan 2% (n=1,271), and minority metropolitans 16% (n=12,614). Clinical stage was 24% (stage I) and 76% (stage II/III). Surgery-only patients had a mean diagnosis-surgery interval of 6 weeks (SD 6). The largest observed difference was between metropolitan minorities (mean interval 7 weeks) and non-metropolitan NHW (mean interval 5 weeks, p<0.001). After adjustment for year of diagnosis, facility volume, and clinical stage, metropolitan minorities had a 9 day longer interval compared to non-metropolitan NHW (p<0.001, Graph). Patients receiving neoadjuvant therapy had a mean diagnosis-surgery interval of 20 weeks (SD 7). Care disparities were identified with the largest difference between metropolitan minorities (mean interval 22 weeks) and metropolitan NHW (mean interval 20 weeks, p<0.001). After adjustment for year of diagnosis, insurance, education, distance from treatment facility, and geographic region, metropolitan minorities had a 13 day longer

interval compared to non-metropolitan NHW (p<0.001). Disparities persisted with unplanned 30-day readmission where non-metropolitan NHW were 11% more likely and non-metropolitan minorities were 44% more likely to be readmitted than metropolitan NHW (p<0.01). No differences were seen in 30-day (1% for all groups) or 90-day mortality rates (approximately 2% for all groups).

Conclusions/Discussion: Race/ethnicity and population density appear to impact timing of surgical care and unplanned readmission rate in patients diagnosed with rectal cancer with no effect on short-term mortality. While the clinical significance of a two-week delay is uncertain, this likely reflects systemic inequalities in access to care that need to be addressed. Resources that facilitate access to timely care may improve outcomes in this vulnerable patient population.



Adjusted Effects of Race/Ethnicity and Population Density in Rectal Cancer Patients on Timing to Definitive Surgery

NEOADJUVANT RADIATION FOR RECTAL CANCER PRIOR TO CURATIVE RESECTION AT AN ACADEMIC CANCER PROGRAM: DOES TREATMENT LOCATION MATTER?

P1560

B. Chapman[1], E. Birnbaum[2], A. Gleisner[2], D. Stanley[1], J. Vogel[2]
[1]*Chattanooga, TN;* [2]*Aurora, CO*

Purpose/Background: In the United States, long-course neoadjuvant chemoradiotherapy (LCRT) is recommended for most patients with stage II and III rectal adenocarcinoma. Patients traveling long distances to high-volume referral centers for surgical resection may have improved perioperative and survival outcomes. However, logistical challenges often precludes receiving LCRT at the referral center. The objective of the present study is to determine the impact of completing LCRT at an outside facility in patients undergoing curative resection at an academic cancer program (ACP).

Methods/Interventions: The National Cancer Database (NCDB) was used, for the period 2004-2015, to identify patients with stage II and III rectal adenocarcinoma, who underwent curative resection at an ACP and received LCRT at the same facility (ACP) or at a non-ACP. Patients in the ACP group were matched to the non-ACP group (1:1) using propensity score matching (pscore/psmatch2) and perioperative outcomes and overall survival (OS) were compared.

Results/Outcome(s): A total of 7,979 patients were identified. Of these, 5684 (71%) received LCRT at an ACP and 2,295 (29%) at a non-ACP. In the propensity-score matched sample of stage II (1,058 matched pairs) and III (1,188 matched pairs), patient demographics and pre-treatment tumor characteristics were similar. In patients with stage II disease, there was no difference in lymphovascular invasion (LVI) (6% vs 6%), circumferential radial margins (CRM) (14% vs 14%), node-positive (17% vs 17%), or 90-day mortality (1.2% vs 1.7%) between the ACP and non-ACP groups, respectively (all p>0.05). Conversely, in patients with stage III disease, the non-ACP group was more likely to have LVI (12% vs. 9%), positive CRM (18% vs 15%), node positive disease (35% vs. 29%), and an increased 90-day (2.4% vs. 0.6%) mortality (all p<0.05). On unadjusted analysis, there was no difference in 5- and 10-year OS among patients with stage II disease in the ACP group (77% and 55%, respectively) compared to the non-ACP group (75% and 49%, respectively) (p=0.184). However, in patients with stage III disease, 5- and 10-year OS was improved in patients treated at an ACP (78% and 55%, respectively) compared to a non-ACP (72% and 50%, respectively)(p=0.001). On multivariable analysis, patients with stage III disease treated at an ACP had a 31% increase in OS compared to non-ACP (HR 1.31, 95% CI 1.10-1.56).

Conclusions/Discussion: In this analysis, patients with stage III, but not stage II, rectal adenocarcinoma receiving neoadjuvant LCRT and curative resection at an ACP had superior survival outcomes compared to propensity matched patients undergoing curative resection at an ACP and neoadjuvant LCRT at an outside facility. These findings suggest that regionalization of LCRT to ACP in patients with stage III rectal cancer may improve survival outcomes.

CIRCUMFERENTIAL RESECTION MARGIN POSITIVITY CAN BE PREDICTED BY INITIAL STAGING MRI IN ADVANCED RECTAL CANCER.

P1561

K. Crowell, I. Sapci, S. Shawki, E. Gorgun, D. Liska, M. Kalady, S. Steele, C. Delaney
Cleveland, OH

Purpose/Background: A positive circumferential resection margin (CRM) is associated with worse oncological outcomes following rectal cancer resection. Multidisciplinary teams (MDT) and preoperative magnetic resonance imaging (MRI) can potentially reduce the rate of positive CRM by helping predict threatened margins. We hypothesized that preoperative MRI could accurately predict positive CRM and help guide extended resections.

Methods/Interventions: A retrospective study was performed utilizing an institutional database of 983 rectal cancer patients at a tertiary hospital from 01/2009-12/2016.

Study patients were ≥ 18 years, underwent a curative intent low anterior or abdominoperineal resection, had a preoperative MRI, and had a positive pathological CRM (defined as resection margin ≤ 1mm). Perforated cancers, palliative resections, and recurrent cancers were excluded. Patient and tumor characteristics and outcomes were reviewed. Pathology and MRI reports, pre- and post-neoadjuvant chemoradiotherapy (nCRT), and operative findings were evaluated to determine if the initial MRI identified the rectal mass as being within 1mm of the radial resection margin. Clinic notes, operative reports and pathologic specimens were reviewed to confirm that MRI findings of potential positive margins were taken into account with wider resection margins where indicated and/or en bloc resection of adjacent structures (e.g., bladder, vagina, Denonvilliers fascia, prostate, coccyx).

P1561 Patient and Tumor Characteristics

Variable	(n = 25)
Age; mean ± SD	63 ± 12
Tumor location in rectum; n (%)	
Upper	11 (44)
Mid	8 (32)
Lower	6 (24)
nCRT; n (%)	21 (84%)
Response to nCRT; n (%)	
Good	3 (14)
Moderate	14 (67)
Poor	4 (19)
Resection type; n (%)	
APR	13 (52)
LAR	12 (48)
Operative approach; n (%)	
Open	18 (72)
Laparoscopic	3 (12)
Robotic	2 (8)
Operative blood loss; mean ± SD (ml)	550 ± 430
T stage; n (%)	
T3	19 (76)
T4a	2 (8)
T4b	4 (16)
N stage; n (%)	
N0	9 (36)
N1	9 (36)
N2	7 (28)
M stage; n (%)	
M0	24 (96)
M1	1 (4)
Mesorectal excision; n (%)	
Intact completely	19 (76)
Near complete	4 (16)
Disrupted	2 (8)

Results/Outcome(s): Twenty-five (2.5%) patients with positive CRM met inclusion criteria as outlined in Table 1. All preoperative MRIs described the relationship of the tumor to the CRM. Twenty-two (88%) MRIs adequately suggested that the CRM would have tumor involved, and 3 (12%) MRIs suggested >1mm distance between the tumor and the radial resection margin. Of the 21 patients who received nCRT, 11 had post-treatment MRI prior to surgery, of which 10 had some radiographic improvement of tumor regression. All operative plans were based upon the pre-nCRT MRI as operative reports verified that the surgeons defined the margins to account for the MRI findings in the initial staging MRI.

Conclusions/Discussion: MRI is an accurate predictor of patients at high risk for positive CRM. Surgeons should continue to plan surgical resection based upon the initial staging MRI in advanced rectal cancers as margins are still positive even with neoadjuvant treatment.

COMPARISON OF FUNCTIONAL AND ONCOLOGICAL OUTCOME OF CONFORMAL SPHINCTER PRESERVATION OPERATION, LOW ANTERIOR RESECTION AND ABDOMINOPERINEAL RESECTION IN ULTRALOW RECTAL CANCER; A RETROSPECTIVE COMPARATIVE COHORT STUDY.

P1562

W. Zhang[1], G. Sun[1], K. Zheng[1], Z. Lou[1], H. Gong[1], E. Furnee[2], P. Broens[2], M. Trzpis[2]
[1]Shanghai, China; [2]Groningen, Netherlands

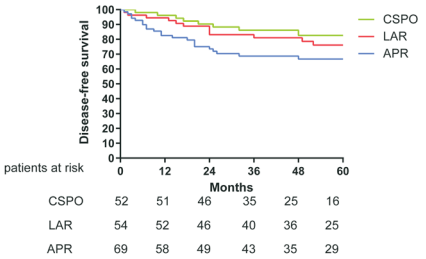
Purpose/Background: Low rectal cancer localized within 5 cm from the anal verge has traditionally been treated by abdominal perineal resection (APR) with acceptable oncological results. However, abdominal perineal resection requires a permanent stoma, which significantly decreases patients' quality of life. With the advancement of surgical techniques, intersphincteric resection (ISR) has gained wide acceptance. However, according to our experience of ISR in our department, patients often have a poor anorectal function after this operation. In order to escape the aforementioned risks, we have established a new surgical procedure, the conformal sphincter preservation operation (CSPO), as described previously. In this procedure, a conformal excision line was designed to preserve more rectal wall and internal sphincter. The aim of this study was to assess the oncological and functional outcome of CSPO, and compare the outcomes with low anterior resection (LAR) and APR.

Methods/Interventions: CSPO avoids the following causes for the poor anorectal function,including: 1. removal of most of the internal anal sphincter and the dentate line, which are important portions of the anal sphincter complex, and removal of the anal continence receptors

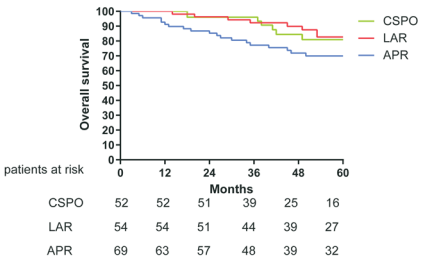
importantly involved in the anal external sphincter continence reflex; 2. Extensive dissection in the intersphincteric space (ISS) destroying the nerves in ISS. In general, CSPO avoids the high risk of accidental damage to the innervation in ISR and CAA. In this study, low rectal cancer patients who received conformal sphincter preservation operation (CSPO, n=52), low anterior resection (LAR, n=54) or abdominoperineal resection (APR, n=69) in a tertiary referral hospital between 2011 and 2016 were included. Postoperative morbidity and oncological and functional outcomes were compared.

Results/Outcome(s): Compared with the LAR-group, CSPO-patients had lower tumor positions [3(3-4) vs. 5(4-5) cm, P<0.001], shorter distal resection margins [0.5(0.3-1) vs. 1.5(1-2) cm, P<0.001], smaller tumor diameters [3(2-3.7) vs. 3.5(2.8- 4.5) cm, P=0.003] and lower T and N stages. No significant differences were identified in daily stool frequency, Wexner incontinence score, patient satisfactory rate, local recurrence, distant metastasis, overall survival and disease-free survival between CSPO and LAR. Compared with APR, CSPO had similar tumor locations, significantly smaller tumors, lower T and N stages, borderline longer disease-free (P=0.051) and overall survival (P=0.08).

Conclusions/Discussion: Fecal continence is preserved in patients operated with CSPO for low rectal cancer. CSPO provides an alternative sphincter preserving procedure to treat (early stage) ultra-low rectal cancer, which is too low to be treated by LAR and required APR previously, without compromising oncological outcome.



A. disease-free survival of three groups



B. overall survival of three groups

A. Kaplan-Meier curve of disease free survival. CSPO vs. LAR (P=0.56), CSPO vs. APR (P=0.051), LAR vs. APR (P=0.19).

B. Kaplan-Meier curve of overall survival. CSPO vs. LAR (P=0.92), CSPO vs. APR (P=0.08), LAR vs. APR (P=0.14).

RISK FACTORS FOR COLON CANCER METACHRONOUS PERITONEAL RECURRENCE AFTER CURATIVE RESECTION.

P1563

V. Le, P. Ituarte, L. Lai, K. Melstrom
Duarte, CA

Purpose/Background: After treatment with curative intent, 30% to 40% of patients with colorectal cancer develop recurrent disease. A subset of metachronous recurrence manifests as peritoneal carcinomatosis (PC). Risk factors for metachronous PC recurrences are not well defined in patients with AJCC Stage 2 or 3 colon cancer after curative resection. The aim of this study was to identify clinical and treatment factors associated with PC in patients with Stage 2 or 3 colon cancer.

Methods/Interventions: Population data from California Cancer Registry for patients with Stage 2 or 3 colon cancer were collected between 2005 and 2012. Metachronous recurrence cohorts were retrospectively reviewed. Independent demographic, clinical, and histopathologic risk factors were identified. Multivariate analysis was used to identify factors associated with metachronous PC. Median follow-up was 5 years. Survival was defined as time from metastases diagnosis to death.

Results/Outcome(s): During this period, 1,730 patients with Stage 2 or 3 colon cancer were found with metachronous recurrence after curative resection. 1,645 patients (95.1%) developed non-PC recurrence in contrast to 85 patients (4.9%) who developed isolated PC. Patients with T4 primary tumor (OR 2.2, p=0.03), mucinous (OR 3.7, p<0.01) or signet ring histology (OR 5.5, p=0.01), undifferentiated grade (OR 6, p=0.04), and right-sided cancer (OR 2.3, p=0.002) were at increased risk of metachronous isolated PC recurrence. AJCC stage, lymph node status, and adjuvant chemotherapy treatment were not significant in isolated PC recurrence. Median survival after diagnosis for patients without PC recurrence was 22 months, compared to 9 months for isolated PC (p<0.01).

Conclusions/Discussion: T4 cancers, right-sided tumor and aggressive histopathologic features are predictive for increased risk of metachronous PC recurrence. Isolated PC group had worst overall survival than patients with recurrent disease in other sites. A better understanding of the tumor biology and molecular characteristics of colon cancers likely to recur as PC is needed to explain behavior and identify potential targeted therapy.

INTRAOPERATIVE NEAR-INFRARED SPECTROSCOPY (NIRS) ASSESSMENT OF COLORECTAL ANASTOMOSIS: INITIAL EXPERIENCE WITH NEW TECHNOLOGY.

P1564

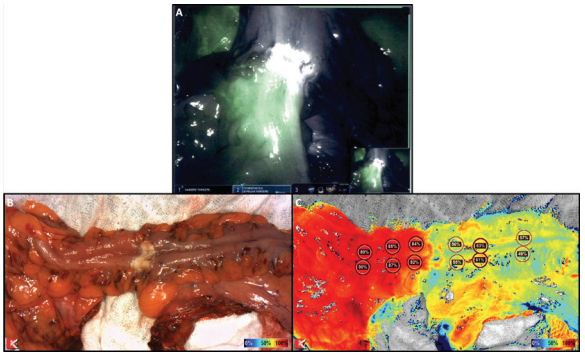
V. Lyuksemburg, J. Abou Hanna, C. Rammos, E. Stroumpi, J. Fischer, S. Tsoraides
Peoria, IL

Purpose/Background: Consensus is lacking on the ideal technique to assess tissue viability for anastomosis involving the colon. Limited by variability and subjectivity, surgeon experience and visual inspection are the most widely used techniques. Use of near-infrared fluorescence (NIF) imaging with indocyanine green (ICG) dye has recently become popularized, but concerns exist regarding cost, potential for reaction to ICG, and limited data to support change in anastomotic leak rates. Near-infrared spectroscopy (NIRS) represents an alternative method to assess tissue appropriateness that is cost-effective, hand-held, non-invasive, and does not require injectable material. It assesses oxygen saturation of hemoglobin rather than perfusion. The primary objective was to determine the feasibility of intraoperative assessment using NIRS.

Methods/Interventions: Individuals undergoing colorectal resection and anastomosis were enrolled from December 2018 to November 2019. Procedures included low anterior resection (LAR), sigmoid colectomy, right colectomy, and total abdominal colectomy (TAC) with the use of robotic, laparoscopic, or open technique. Bowel tissue was assessed extracorporeal by NIRS with the use of Kent Imaging (Calgary, AB, Canada). Patients that had a robotic procedure were compared between NIRS versus robotic NIF imaging device (FireFly^{TM}). The planned transection of the proximal colon was marked by the surgeon prior to NIRS imaging with either electrocautery, marker, or instrument.

Results/Outcome(s): A total of 32 patients underwent colorectal resection with intraoperative NIRS, of which 23 (71.9%) LAR, 6 (18.8%) sigmoid colectomy, 2 (6.2%) right colectomy, and 1 (3.1%) TAC. Rectal cancer (59.4%), diverticulitis (18.8%), and colon cancer (15.6%) were the most common indication for resection. Surgeon assessment was consistent with NIF for all patients at the proximal end marked as the transition point. Thirty-one of the 32 patients showed adequate oxygenation of the proximal bowel with the use of NIRS. The average oxygen saturation for the proximal healthy bowel was 82.4% ± 4.4%, while the distal portion of the bowel was 43% ± 18.4%. The one patient with suboptimal oxygenation on NIRS did develop a postoperative leak that was treated with transrectal drainage of pelvic abscess. The patient had oxygen saturation of 48.8% on the proximal anterior portion of bowel. In robotic cases that utilized NIF with ICG there was 100% correlation when compared with NIRS imaging (**Figure 1**). There were no anastomotic leaks in any patients who had adequate perfusion on NIRS.

Conclusions/Discussion: NIRS offers assessment of colonic transection levels with similar results to NIF while eliminating the need for intravenous injection. There were no leaks in patients that had adequate perfusion with NIRS. This technology may offer advantages over other technologies and warrants further investigation.



A - Robotic Fluorescence Imaging (FireFly^{TM}), B - Kent Spectroscopy Color Imaging, C - Kent Spectroscopy Oxygen Saturation Imaging

NOVEL SURGICAL TECHNIQUE FOR COMPLEX COLONIC POLYP RESECTION ASSOCIATED WITH DECREASED OPERATING TIME.

P1565

A. Jones, J. Broome, M. Zelhart
New Orleans, LA

Purpose/Background: Combined laparoscopic endoscopic surgery (CELS) has decreased the rate of colectomy, and associated morbidity and mortality, for complex polyp resection. However, CELS can be challenging and time consuming given that this procedure often requires 3-dimensional mobilization and intracorporeal knot tying. We aim to address these drawbacks by developing a novel surgical technique, one modifying traditional CELS through robotic approach. We herein describe a robust case series of combined endoscopic robotic surgery (CERS).

Methods/Interventions: A case series was conducted, including all patients scheduled to undergo CERS by a single colorectal surgeon from March 2018 to October 2019. Polyps were found by the referring gastroenterologist and deemed unresectable by traditional methods. In each successful case of this series, the complex polyp was found in the colon endoscopically. The da Vinci Xi robot was docked after trocars were placed. The colon was mobilized and invaginated to aid endoscopic lift and resection of the polyp. The resection site was then over-sewn with absorbable Lembert sutures.

Results/Outcome(s): CERS was attempted in 37 cases, 32 (86.5%) of which saw the CERS technique through to completion. Reasons for conversion include smaller polyp than anticipated, concern for malignancy, involvement

with the inferior vena cava, serrated polyp in the ascending colon, and involvement of appendiceal stump. Among these 32 participants seeing CERS through to completion, average age was 66.1 years (SD=10.0), body mass index 29.8 kg/m^2 (SD=6.3), and history of abdominal surgeries 1.5 (IQR=2). The majority of patients were white (93.8%) and male (62.5%). Median operating room time was 74 minutes (range 31 - 184 minutes). Median polyp size was 35 mm (range 20 - 130mm). Polyps were resected from the following locations: cecum (37.5%), ascending colon (28.1%), transverse colon (21.9%), descending colon (3.1%), sigmoid colon (6.3%), and rectum (3.1%). Polyps were retrieved in 31 (96.9%) cases. Pathology demonstrated 77.4% tubular adenoma, 12.9% sessile serrated adenoma, 6.5% dysplasia, and 3.2% signet cell adenocarcinoma.

Conclusions/Discussion: This serves as the first known case series of CERS, a practical technique to improve upon CELS for the resection of complex colonic polyps. Given the median duration for conventional CELS has been reported to be 152 minutes (range 96 - 322 minutes), the CERS procedure is associated with decreased operating time. Furthermore, the surgeon felt more confident with 3-dimensional visualization and intracorporeal suturing. Capital investments aside, the use of the robot was not cost prohibitive. Additional studies are needed to further define the role of robotics in combined endoscopic surgery.

INITIAL EXPERIENCE WITH ROBOTIC SURGERY FOR RECTAL MALIGNANCIES AT THE PHILIPPINE GENERAL HOSPITAL.

P1566

M. Lopez, B. Viray, M. Tampo, M. Villanueva, H. Monroy
Manila, Philippines

Purpose/Background: Robotic surgery in the Philippines remains in infancy; with, at present, only three centers equipped with a robot. There is agreement that robotic surgery has a particular advantage in areas with limited space, such as the pelvis. This study discussed the clinicopathologic outcomes of the first robotic surgical procedures for rectal cancer at a government hospital in a low-to-middle-income country.

Methods/Interventions: This is a case series of the first 17 robotic surgeries for rectal cancer performed at the Philippine General Hospital from March 2019 to October 2019.

Results/Outcome(s): Seventeen patients with rectal cancer were included in the study. The mean age was 55.71 years (Range: 33 to 76, SD± 9.58 years); 53% (9/17) were male and 47% (8/17) were female. Most of the tumors were in the low rectum (82.36%, 14/15). Most were locally-advanced, with 76.47% (13/17) of patients being Stage IIIB (cT3N1M0). Fourteen patients (82.35%) underwent neoadjuvant treatment. Among those, 71% (12/17) underwent long course chemoradiation and 12% (2/17) underwent short course radiotherapy. No conversion to a laparoscopic, or open, method was reported. The mean operating time was 428.64 (SD ±124.57) mins, with a mean docking time of 13.05 (SD± 5.57) mins, and a mean console time of 233.94 (SD ±93.53) mins. The average blood loss was 320.59 (SD±133.95) cc. An average postoperative length of stay of 6 (range 2 to 16 days; SD ±3) days was observed. The overall morbidity rate was 29% (5/17), but only one patient needed re-operation for an anastomotic dehiscence on the 5th postoperative day. He underwent transanal repair of the dehiscence, and proximal bowel diversion. He was discharged three days later. There was no reported mortality. On pathology review, 88.24% (15/17) had an R0 resection and 11.76% (2/17) had R1 resection. No R2 resections were reported. Circumferential resection margins were negative in 88.24% (15/17) of patients. Proximal and distal margins in all the patients were adequate. With regard to specimen grading, 76.47% (13/17) were considered to be "complete" by the surgical team, and 58.82%(10/17) were considered to be "complete" by the pathologists. Including all other specimen grades (*i.e.* partially complete, and incomplete), a concordance rate between the surgeons' and pathologists' grade of 52.94 percent was noted.

Conclusions/Discussion: We presented the clinicopathologic outcomes of patients with rectal cancer who underwent robotic resection at a single Philippine institution.

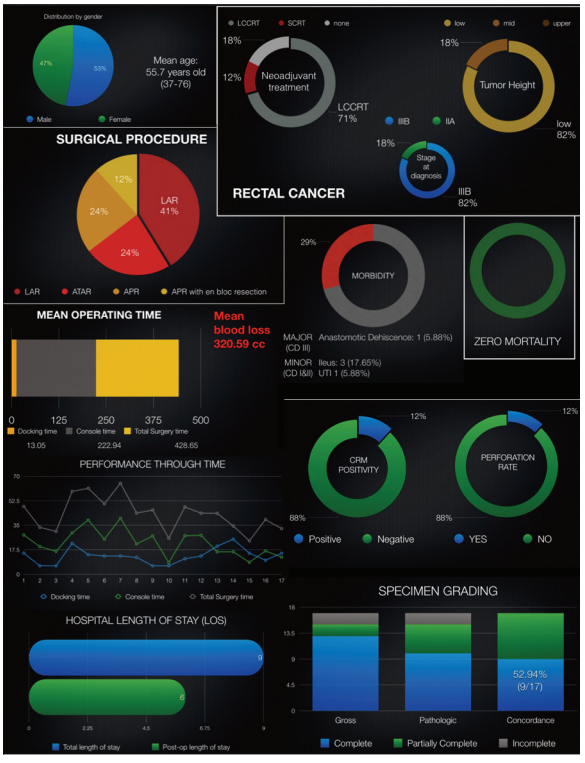


Figure 1. Clinical, perioperative, pathologic, and 30-day outcomes of robotic rectal resections for cancer. PGH, March to October 2019.

TRANS-ANTERIOR OBTURATOR NERVE GATEWAY - A NOVEL APPROACH TO TRANSECT THE DISTAL RECTUM IN LAPAROSCOPIC PARTIAL INTERSPHINCTERIC RESECTION FOR LOW RECTAL CANCERS.

P1567

J. Tang
Beijing, China

Purpose/Background: Laparoscopic intersphincteric resection (ISR) with Double-Stapling Technique (DST) can simplify the coloanal anastomosis procedure for low rectal cancers, but its application is usually limited for the difficulty of the distal rectum transection and multiple firings. A novel method of DST was proposed and its safety and feasibility were evaluated in this study.

Methods/Interventions: Forty consecutive ultralow rectal cancer patients who underwent laparoscopic ISR with DST by the same operator from March 2018 to June 2019 were retrospectively analyzed. Patients were divided as two groups relying on the approach of rectum transection—total mesorectal excision (TME) approach and trans-anterior obturator nerve gateway (TANG) with 20 cases in each group. For the TANG's group, a gateway was built in the right lymph node compartment through which the rectum was transected by a flexible linear stapler. Perioperative characteristics, intraoperative parameters, anal function (Wexner score and Lower Anterior Resection Syndrome/LARS score), and short-term oncological results were compared to evaluate the safety, feasibility and advantage of the novel method.

Results/Outcome(s): There were no significant differences in preoperative characteristics between groups. Intraoperative parameters showed that operation time of the TANG's group was longer than that of traditional group (194±31min vs. 149±37min, $p<0.01$). The average time for building the TANG's gateway was 17.4±4.3min. The TANG's group had a greater angle between the long axis of rectum and the cartridge (113±5° vs. 83±3°, $p<0.01$), less stapler firings (1.8±0.4 vs. 2.6±0.5, $p<0.01$), a shorter length of stapling line (85±19mm vs. 110±17mm, $p<0.01$) and a shorter anastomosis-anal verge distance (1.6±0.3cm vs. 2.3±0.3cm, $p<0.01$). The average extra cutting distances by the TANG's approach was 0.8±0.1cm and 0.5±0.1cm on the right edge and midline of the rectum respectively. For pathological results, a higher specimen positive squamous epithelium rate was observed in the TANG's group (75% vs. 25%, $p<0.05$). Median follow-up was 13.0 months. The postoperative complication, Wexner Score, LARS Score and local recurrence rates were similar in the two groups.

Conclusions/Discussion: The TANG's approach is considered to be safe and feasible for rectal transection in laparoscopic ISR with DST, even for ultralow rectal cancers. The TANG's approach lessens stapler firings and shortens stapling line, theoretically could decrease the incidence of anastomotic leakage.

A PRELIMINARY STUDY OF THE CLINICAL EFFICACY IN RECTAL CANCER AFTER INTENSIVE NEOADJUVANT THERAPY.

P1568

Q. Zhao, H. Wang
Shanghai, China

Purpose/Background: To identify the clinical significance of interphase chemotherapy in rectal cancer after neoadjuvant therapy.

Methods/Interventions: From Jan 2016 to Dec 2018, the clinical data od 35 rectal cancer patients after intensive neoadjuvant therapy in a single attending group of our department were retrospectively analyzed. In this study, the program of intensive neoadjuvant therapy includes conventional fractionation radiotherapy (50Gy over five weeks) with concurrent chemotherapy (Oral capecitabine 825mg/m2 twice daily, five days per week) and interphase chemotherapy (Two cycles of CAPEOX). The interphase chemotherapy conducted between the end of RT and surgery. Then, the clinical efficacy in rectal cancer after intensive neoadjuvant therapy was compared with traditional scheme.

Results/Outcome(s): There were 25 males and 10 females in 35 enrolled patients. The mean age was 62.2±8.63 years. And 31 patients received radical resection, one patient chose local excision while 3 patients reached clinical complete response chose wait and watch. The rate of clinical complete response was 37.1% (13/35), the rate of pathological complete response was29.0% (9/35), and TNM downstaging was found in 76.7% patients. The follow up time ranged 9 to 40 months, and the median follow up period was 25 months. There were three patient suffered metastasis in lung or liver and one patient suffered local recurrence. The 3-year disease free survival (DFS) was 82.0% (95% CI 0.58-0.93). Compared with the data of traditional neoadjuvant therapy in our previous study, intensive neoadjuvant therapy had significant difference in the rate of pCR ($P=0.004$). However, there was no significant difference in the 3-year DFS ($P>0.05$).

Conclusions/Discussion: The clinical efficacy of the intensive neoadjuvant therapy was considerable. It is beneficial to improve the pathological complete response rate of patients with rectal cancer.

ROBOTIC PROCTECTOMY: BEYOND THE INITIAL LEARNING CURVE.

P1694

S. Rosen[1], M. Rupji[2], Y. Liu[2], T. Paul Olson[1]
[1]*Johns Creek, GA;* [2]*Atlanta, GA*

Purpose/Background: Multiple authors have described a learning curve (LC) for robotic proctectomy (RP), typically including the first 25 to 80 procedures. There is scant literature regarding a surgeon's continued technical progression beyond this initial LC. Additionally, although some authors report changes in complication and conversion rates as part of the LC, total operating time (TOT) is the most commonly used measure of technical proficiency. Our goal was to examine a surgeon's RP experience after the initial LC (i.e., after 100 robotic procedures) for evidence of further technical progression. We were also interested in exploring the use of a different metric, percent console time (PCT), as a measure of technical progression, as we believe a surgeon with more expertise will do more of the procedure at the robotic console.

Methods/Interventions: We retrospectively reviewed our robotic surgery database for a single surgeon (SAR) during robotic operations 100 through 550 to identify all RPs performed for polyp or cancer. The following data was abstracted: age, sex, ASA (American Society of Anesthesiologists) score, BMI (body mass index), comorbidities, prior abdominal surgery, tumor location, preoperative stage, preoperative therapy, surgical procedure, extracorporeal or intracorporeal anastomosis (ICA), console time (CT), operative time, conversion, anastomosis location, estimated blood loss, tumor size, distal and radial margin, lymph nodes harvested, pathologic stage, length of stay and complications. PCT was calculated by dividing console time by TOT. A sequence of 83 RPs were divided into 4 equal-sized groups according to the series order, indicating the surgeon's experience level over time. Appropriate statistical tests were performed for univariate and multivariable analyses.

Results/Outcome(s): From March 2014 through March 2019, 450 robotic colorectal operations were performed, 83 of which were RP for polyp or cancer. No significant differences were found among the 4 groups in regard to demographics, tumor location or stage, conversion rate, length of stay or readmission rate. Table 1 summarizes univariate, linear regression and multiple linear regression analysis of the patients' demographic variables and outcomes according to experience group. As experience was gained, there were significant increases in the use of ICA (from 33% to 80%, p<0.001), as well as significant increases in CT, TOT and PCT (from 44% to 59%, p=0.003). Also, complication rate and severity decreased with experience, while number of lymph nodes harvested increased. On multivariable analysis, later experience group, BMI >= 30 and ICA were associated with increased PCT.

Conclusions/Discussion: Incorporation of ICA as a routine part of RP occurred after the initial LC, with consequent increases in CT, TOT and PCT. Number of lymph nodes harvested increased and number and severity of complications decreased with more experience. Increased PCT may be an indicator of increased expertise with RP.

OUTCOMES BY EXPERIENCE GROUP

	Group 1 N=21	Group 2 N=21	Group 3 N=21	Group 4 N=20	p-value (trend)
Mean total operating time (TOT), in minutes (range)	187 (139-276)	207 (141-308)	227 (139-339)	233 (152-330)	0.001**
Mean console time (CT), in minutes (range)	86 (26-267)	101 (39-180)	128 (56-235)	134 (71-223)	<0.001*
Mean percent console time (PCT) (range)	44% (12-97%)	49% (25-90%)	57% (28-90%)	59% (33-77%)	0.003*
Intracorporeal anastomosis (ICA) N (%)	7 (33.3)	7 (35.0)	14 (77.8)	16 (80.0)	<0.001‡
Mean lymph node harvest N (range)	17 (10-30)	14 (3-28)	23 (8-42)	25 (11-57)	0.006**
Complications N (%)	13 (62)	11 (52)	8 (38)	2 (10)	<0.001‡
Clavien-Dindo class 3 or 4 N (%)	9 (69)	3 (27)	0 (0)	2 (22)	0.005‡

ASSOCIATIONS WITH PERCENT CONSOLE TIME

		N	Univariate Beta-coef. (95% CI)	Univariate p-value (trend)	Multivariable Beta-coef. (95% CI)	Multivariable p-value (trend)
Learning curve group	1	21	ref		ref	
	2	21	5% (-5% to 15%)		5% (-5% to 14%)	
	3	21	13% (3% to 23%)	0.003*	13% (3% to 23%)	0.028*
	4	18	14% (4% to 25%)		10% (-0% to 21%)	
BMI	<30	52	ref	0.008*	ref	0.005*
	≥30	29	10% (3 to 23%)		10% (3 to 17%)	
ICA	No	34	ref	<0.001*	ref	0.011*
	Yes	43	14% (7 to 22%)		9% (2 to 17%)	

The trend test p-value is calculated using linear regression, for normally distributed (*) or Jonckheere-Terpstra Test, not normally distributed (**) numerical covariates and Cochran-Armitage Trend Test for categorical covariates (‡). Beta-coef., beta coefficient from regression analysis.

POSTOPERATIVE C-REACTIVE PROTEIN AND INFLAMMATORY PROFILES CAN PREDICT EARLY AND LATE ANASTOMOTIC LEAKAGE IN RECTAL CANCER PATIENTS WHO RECEIVED PREOPERATIVE CHEMORADIOTHERAPY AND UNDERWENT SPHINCTER-SAVING SURGERY WITH A DEFUNCTIONING STOMA.

P1708

H. Kim, G. Choi, S. Song, J. Park, S. Park
Daegu, Korea (the Republic of)

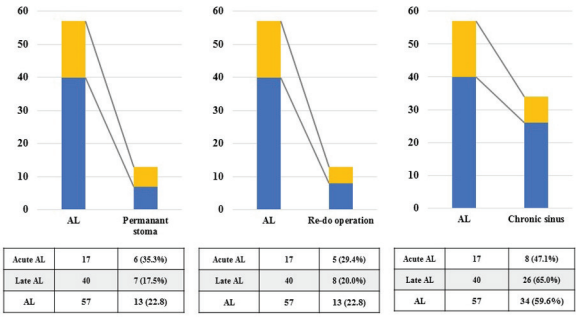
Purpose/Background: In rectal cancer patients who receive preoperative chemoradiotherapy (CRT), surgeons mostly create a defunctioning stoma after sphincter-saving (SS) surgery; however, its effects are unclear. We aimed to evaluate the long-term surgical outcomes following anastomotic leakage (AL) and the prognostic factors associated with AL in these patients based on the variables determined during their first admission.

Methods/Interventions: Data of rectal cancer patients who underwent curative resection for mid or lower rectal cancer between 2011 and 2016 were retrospectively reviewed. AL was defined as contrast extravasation presence on imaging studies or presacral collection requiring

surgical or radiological intervention. Acute AL was a leakage diagnosed within 7 days of surgery or during the first hospital stay.

Results/Outcome(s): Of the 405 rectal cancer patients who received CRT, defunctioning stoma was created in 314 (77.5%) patients following SS surgery. AL occurred in 66 patients (16.3%), including 47 patients (18.2%) in the stoma group and nine patients (9.9%) in the non-stoma group. A late leakage was more frequent in the stoma group (12.7%) than an acute leakage (5.4%), although 3.3% of the non-stoma group patients had a late leakage. A total of 22.8% had a permanent stoma, and chronic presacral sinus remained in 59.6% of patients who had AL. In the multivariate analysis, C-reactive protein (CRP) ≥12g/L on postoperative day 3 (odds ratio 3.813; 95% confidence interval [CI] 1.543-9.421, $P=0.004$), CRP ≥7g/L on postoperative day 5 (odds ratio 7.676; 95% CI 3.121-18.879, $P<0.001$), and neutrophil-lymphocyte ratio (NLR) ≥8 on postoperative day 5 (odds ratio 2.997; 95% CI 1.310-6.853, $P<0.001$) were significantly associated with higher AL in the stoma group. AL could be detected in 50 patients with one or more risk factors (87.8% of sensitivity and 61.6% of specificity).

Conclusions/Discussion: Rectal cancer patients with a defunctioning stoma had a higher frequency of AL, especially late leakage. Postoperative CRP and NLR during the first hospital admission could accurately predict both early and late AL. Careful attention should be paid to patients with elevated CRP and NLR, as they are at a high risk of AL and subsequent development of chronic presacral sinus.



Acute AL	17	6 (35.3%)
Late AL	40	7 (17.5%)
AL	57	13 (22.8)

Acute AL	17	5 (29.4%)
Late AL	40	8 (20.0%)
AL	57	13 (22.8)

Acute AL	17	8 (47.1%)
Late AL	40	26 (65.0%)
AL	57	34 (59.6%)

Long-term clinical outcomes of anastomotic leakage in patients who recieved preoperative chemoradiotherapy for rectal cancer

CURRENT STATUS OF ROBOTIC SURGERY IN COLORECTAL RESIDENCY TRAINING PROGRAMS.

P1695

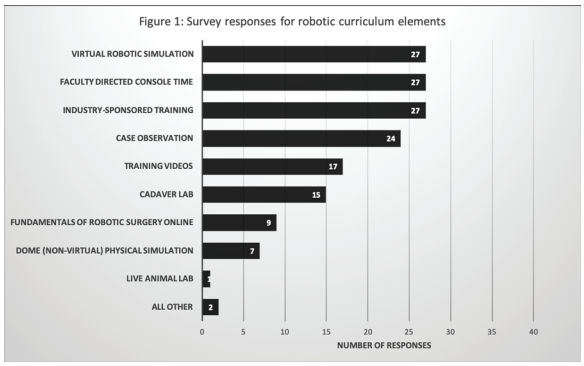
A. Shellito, S. Kapadia, A. Kaji, C. Tom, C. Dauphine, B. Petrie
Torrance, CA

Purpose/Background: Colorectal surgeons were early adopters of robotic-assisted surgery (RAS), and RAS has been increasingly incorporated into colorectal surgery (CRS) training. Despite its widespread use, the degree to which RAS has been integrated into CRS residency curriculum is not standardized nor well described. The aim of our study was to evaluate the extent to which RAS training has been incorporated into CRS residency and describe differences in RAS curricula.

Methods/Interventions: A web-based survey was sent to all 2019 accredited CRS residency programs within the United States and Canada. Program directors were queried on how robotic surgery has been integrated into their program along with specifics on RAS curriculum and distribution of cases. We compared university-based or university-affiliated programs to independent programs as well as survey responses by region (West vs. Midwest vs. East). In addition, a chi-square test was used to evaluate differences in survey responses with respect to RAS curriculum elements.

Results/Outcome(s): Of 66 programs, 64% (n=42) responded to the survey. Of the responding programs, 35 (83%) were university-based or university-affiliated, while 7 (17%) were independent. Most programs were in the Midwest (33%). Forty-one (98%) reported having a surgical robot in use at their institution, with 39 (93%) reporting active participation of CRS residents in RAS. The median operative approach to abdominopelvic (AP) cases was 33% robotic, 40% laparoscopic, and 20% open. Twenty-nine (69%) programs had a formal RAS training curriculum for CRS residents. Of the 10 programs without a formal curriculum, 2 intend to institute a robotic curriculum within two years. Of note, there was considerable variability in the curriculum elements employed by each institution, and the differences in proportions of these elements were significant ($\chi 2$ 99.8, $p<0.001$). However, the majority of programs employed a combination of faculty directed time at the console, virtual simulator training, and industry-sponsored training (Fig. 1). The most common RAS operations CRS residents performed as the primary surgeon included low anterior resection, abdominoperineal resection, and colectomy. There were no significant differences in the survey responses between university/university-affiliated and independent programs ($p>0.05$) or among the different regions ($p>0.05$).

Conclusions/Discussion: This study demonstrated that most CRS residencies have integrated RAS training into their program, and at least a third of AP cases are currently being performed robotically. While nearly seventy percent of colorectal residencies surveyed have instituted a formal robotic curriculum, the individual elements of such curricula vary significantly. Standardization of the curriculum among CRS residency programs should be considered, as robotic surgery is becoming a fundamental part of CRS training across all program types and regions.



COMPARISON OF OUTCOME OF ROBOTIC VERSUS LAPAROSCOPIC HAND ASSISTED COLON RESECTION.

P1697

J. Golzarian[1], C. Schweer[2]
[1]*Huntsville, AL;* [2]*Peachtree Corners, GA*

Purpose/Background: Historically progression from open Colon resection to a lesser invasive laparoscopic hand assisted approach has proven clear advantages for the patients. Recent Progress in Robotic surgery has allowed surgeons to overcome the steep learning curve of straight laparoscopic surgery. In the essence of offering better & less invasive surgical care-obstacles remain like access to new Robot, learning curve, increased OR time & Robot availability. This collection & analysis of data reinforces adoption of minimally invasive robotic-assisted Colon surgery despite the obstacles.

Methods/Interventions: Design: retrospective study Settings: cases were performed by single colon & Rectal surgeon in Two community hospitals using Robotic platform & Gelport, performing Robotic colon surgery since 2013. Patients: data on 154 patients with colon surgery since 2017. 77 robotics & 77 hand assisted surgeries for benign or malignant diseases were compared for specific surgical site: R colon & L/ LAR & in global. Method: All patient received the ERAS protocol. Data was collected on post op pain, hospital length of stay (LOS), Ileus, intracorporeal (ICA) versus extracorporeal Anastomosis (ECA), wound infection, Anastomotic leak, hernia, & readmission & mortality rate. The HALS group consisted of: 18 Right hemi colectomies, all had ECA, 31 LAR, 3 colostomy closures, 6 abdominal colectomies, 15 left segmental/ wedge Resections, 2 APR & 2 Hartman's. the Robotic group consisted of 22 R hemicolectomies, (20 had ICA, two had ECA), 18 LAR, 23 wedge/segmental colectomies, 6 rectopexies, 5 Hartman's, 2 colostomies, & one APR.

Results/Outcome(s): In the Robotic group: average LOS was 3.4 days versus 4.7 days in HALS. 30-Day robotic Readmission was 1/77 = 1.3% versus 6/77= 7.8% ($p<0.1$) in HALS. There was one superficial wound infection in the Robotic group at An ECA site 1.3% versus three in HALS 3.9%. There was one contained leak requiring reanastomosis in the same admission in a R Robotic ICA group. There was one leak in HAL transverse colectomy requiring creation of Ostomy & reversal. In the robot group 95% of patients reported only mild & 5% reported moderate pain on day one & two. In HALS group 30% reported mild, 65% moderate & 5% severe pain ($p<.05$) One patient 1.3% developed Ileus in the Robotic group, a R colon ECA. In the HALS group 12 patients 16.9% developed Ileus ($p<0.01$). The Robot group had no incisional hernia. The HALS group had two requiring primary repair 2.6%. Both modalities 30-day mortality rate was 1.3% after surgery due to unrelated events.

Conclusions/Discussion: Patients who underwent Robotic colon resection had significantly less Ileus, readmission & immediate post op pain. They also had shorter hospital stay, wound infection, and hernia than the hand assist group. This data should encourage hybrid/open surgeons to pursue training in minimally invasive Robotic surgery & creation of intracorporeal Anastomosis.

OUR EXPERIENCE WITH RECTAL BLIND POUCH FOLLOWING END TO ANTERIOR WALL ANASTOMOSIS.

P1698

A. Althoff[1], C. Poulos[1], K. Johnson[2], P. Vignati[2]
[1]*West Hartford, CT;* [2]*Hartford, CT*

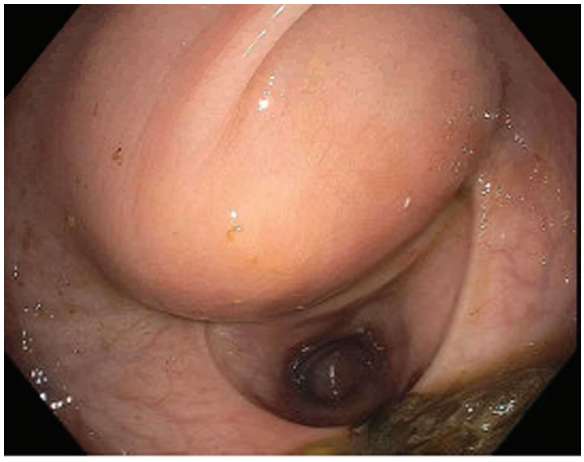
Purpose/Background: There are several methods for reestablishing intestinal continuity after sigmoidectomy or rectal surgery. The decision on what method to employ is dependent on the mobility of the remaining bowel, blood supply, and aim to increase colonic reservoir capacity. When utilizing an end-to-end technique, formation of viable anastomosis may be impaired if the stapler inserted into the anal canal does not reach the distal staple line present at the end of the rectum. A colonic end to anterior rectal wall anastomosis has been described as an alternative to further resection, which has the potential to form a blind pocket. This blind end can lead to delayed complications requiring re-operation. Here we describe a case series of complications resulting from this remnant blind pouch and methods that may be employed to prevent these potential complications.

Methods/Interventions: Patient 1: 61-year-old female who underwent elective laparoscopic sigmoid resection for recurrent diverticulitis with an end-to-side anastomosis that presented 4 years later with lower abdominal pain and discharge from her rectum for five days. On imaging, a 7.0 by 5.0cmfluid collection adjacent to the anastomosis was found requiring resection and re-anastomosis for an obstructing mass at the blind end of the rectum. Patient 2: 63-year-old female who underwent elective laparoscopic sigmoid resection for recurrent diverticulitis with an end-to-side anastomosis that re-presented 4 months post-operatively with complains of abdominal and rectal

pain. Imaging demonstrated a 6.4 by 3.5cm pelvic fluid collection along the previous anastomosis requiring operative revision. Patient 3: 60-year-old female with history of Hartman's procedure and reversal at outside facility that presented 4 years later with loose stools, right lower quadrant pain, and elevated CEA levels. Colonoscopy revealed extrinsic compression at the area of anastomosis requiring resection.

Results/Outcome(s): All three patients were found to have obstruction of their blind rectal pouches which demonstrated inflammatory tissue on final pathology. Following re-operation, all three patients were discharged after an uncomplicated postoperative course.

Conclusions/Discussion: A colonic end to rectal side wall anastomosis can be utilized when the bowel length does not allow an end-to-end anastomosis to be performed. When this technique is employed a blind rectal pouch is formed which can become occluded if the posterior rectal mucosal is brought forward when inserting the circular stapler. As this blind pouch fills with secretions, it can enlarge and produce local mass effect. Patients can present with pain secondary to compression of the anastomosis often necessitating re-operation and resection. We reccomend the utilization of air insufflation or endoscopy to visualize the blind remnant to ensure patency in order to prevent future complications.



Colonoscopy demonstrated extrinsic compression at the area of previous anastomosis secondary to the blind pouch dilatation

COMPLETE MESOCOLIC EXCISION AND CENTRAL VASCULAR LIGATION FOR RIGHT-SIDED COLON CANCER: INITIAL EXPERIENCE IN A COLORECTAL SURGERY TRAINING PROGRAM.

P1700

V. Venida, M. Lopez, M. Tampo, M. Onglao, B. Viray, K. Sotalbo, H. Monroy
Manila, Philippines

Purpose/Background: The objective of complete mesocolic excision (CME) with central vascular ligation (CVL) is to completely remove the affected colonic segment with its lymphatic drainage within an intact envelope of peritoneum, including apical nodes that may potentially be harboring tumor. Several studies show this translated to better oncologic outcomes. This however, may only be achieved with training, exposure, and improvement in surgical technique.

Methods/Interventions: This was a descriptive case series of patients undergoing curative colon resection with CME/CVL for right-sided malignancy. Surgery was performed by colorectal trainees of the Division, with the supervision of a consultant (ML). Data was prospectively collected. Pathologic analysis was done by a single pathologist. Lymph nodes were analyzed in 3 distinct basins (D1- paracolic, D2- intermediate, D3- central). Patients were then followed up for 30 days.

Results/Outcome(s): Nineteen patients satisfied the inclusion criteria. Mean age was 53.63 years (range 34-73 years), with 12 (63.16%) males and 7 (36.84%) females. Majority of the tumors are seen at the proximal transverse colon (52.63%, 10/19), T3 (68.42%, 13/19) N0 (36.84%, 7/19) M0 (73.68%, 14/19). Seven (36.84%) were operated on in an emergency setting (5 gut obstruction, 2 surgical abdomen). Mean lymph node yield was 41.53 nodes (range 18-55 total nodes; D1 - 25.84 nodes (range 10-62); D2 - 9.47 nodes (range 0-26), D3 - 5.79 nodes (range 0-15). Mean lymph node positivity was 1.36 (range 0-5); D1 - 1.21 nodes (range 0-5), D2- 0.21 node (range 0-2), D3- 0.11 node (range 0-2). Eight patients had metastasis to D1 nodes (42.11%), 3 had metastasis to D2 nodes (15.79%), and one had metastasis to D3 nodes (5.26%). One case (5.26%) of skip metastases (negative D1 and D2 but positive D3) was noted. Mean proximal margin was 17.13 cm (range 6-42 cm), mean distal margin was 17.94 cm (range 4-58 cm), mean length of the tumor to the tie on the ileocolic vessels was 12.7 cm (range 3-32 cm). Mean postoperative length of stay was 5.95 days (range 4-10 days). One patient had superficial surgical site infection. Another patient had a ureteral injury that was identified and repaired intra-operatively. The morbidity rate was 10.53%. No mortality was reported.

Conclusions/Discussion: There is evidence that right-sided colonic malignancies have poorer outcomes compared to left-sided disease. CME/CVL is a surgical technique modification that may provide improvements in oncologic

outcome with minimal additional morbidity, especially if standardized to allow for the results of pioneering studies to be duplicated. We have shown the initial attempt of performing CME/CVL by Colorectal Surgery trainees at our institution, and their outcomes.

Table 2: Short term surgical outcomes of patients who underwent CME/CVL. UP-PGH. 2018-2019

	Frequency	Mean	Range	Percentage	Comments
Post op Length of Stay		5.95	(4-10)		
30 day Morbidity	2			10.53%	Urethral Injury, SSSI
30 day Mortality	0			0	

Table 3: Pathologic outcomes of patients who underwent CME/CVL. UP-PGH. 2018-2019

	Frequency	Mean	Range	Percentage	Comments
Lymph Node Harvest		41.53	(18-55)		
(+) Lymph Node Harvest		1.37	(0-5)		
Lymph Node Ratio		0.03	(0-12.5)		
D1 Total		25.84	(10-62)		
D1 (+)		1.21	(0-5)		
D1 (-)		24.63	(10-62)		
D2 Total		9.53	(0-26)		
D2 (+)		0.21	(0-2)		
D2 (-)		9.32	(0-26)		
D3 Total		5.74	(0-15)		
D3 (+)		0.11	(0-2)		
D3 (-)		5.63	(0-15)		
Skip Metastasis	1			5.26%	
Proximal Margin		17.14	(6-42)		
Distal Margin		17.94	(4-58)		
Tumor to Tie Length		12.74	(3-32)		
Tumor Deposit	2			10.53%	D3 specimen
R0	19			100%	
R1	0			0	
R2	0			0	
T1	1			5.26%	
T2	1			5.26%	
T3	13			68.42%	
T4	4			21.05%	
N0	7			36.84%	
N1A	3			15.79%	
N1B	4			21.05%	
N1C	2			10.53%	
N2A	3			15.79%	
N2B	0			0%	
M0	14			73.68%	
M1	5			26.32%	2 Liver 2 Lung 1 Peritoneal

THE IMPACT OF COLON AND RECTAL SURGERY FELLOWSHIP TRAINING ON COLONOSCOPY SKILLS.

P1701

J. Cruz, S. Brown, S. Banerjee, D. Mullins, A. Ayers, A. Raissis, R. Scott, U. Siddiqui, B. Gontarz, R. Lewis
West Hartford, CT

Purpose/Background: The lifetime risk of developing colorectal cancer is approximately 4%. A majority of colorectal cancers arise from adenomatous polyps (AP). The prevalence of AP is about 30% in men and 20 % in women. As AP grow they can change from demonstrating dysplasia to actual carcinoma. Adenoma detection rate (ADR) is the proportion of an endoscopist's screening colonoscopies in which at least one adenoma has been detected. ADR is one of the quality indicators used to identify the adequacy of a colonoscopy and an overall ADR of 25% has been shown to reduce the risk of interval colon cancer. The goals of our study are to evaluate whether trainees in colorectal surgery are achieving an adequate ADR, to evaluate if ADR improves throughout training, and to assess if there is improvement in additional quality metrics such as cecal intubation and withdrawal time.

Methods/Interventions: The electronic medical record system was used to identify all patients ≥ 50 years oldundergoing a screening colonoscopy by the colorectal fellow at a single institution over a 5-year period. To evaluate improvement the colonoscopies were divided into those performed in the first and last 6 months of the year. Multivariate logistic regression, linear regression and t-test were performed using SAS version 9.4.

Results/Outcome(s): A total of 143 screening colonoscopies were performed in the 5-year study period. The mean age of patients was 59. The mean BMI was 30. Females accounted for 57% (n=82) of patients. The majority of patients were ASA class 2 at 64% (n=92). The average Boston Bowel Preparation Scale score was 7. The overall ADR was 40%. ADR did not differ based on preparation or patient characteristics. The ADR in the first half and second half of the year was 39% and 42%, respectively. This was not statistically significant. Significant factors in predicting adenoma detection were trainee and withdrawal time. The mean time to cecum significantly improved from 15.3 to 11.1 minutes in the first and last 6 months of training (p=.005). Withdrawal time was 26.9 and 24.3 minutes in the first and last 6 months of training, respectively (p=.21).

Conclusions/Discussion: The overall fellow ADR was 40% and this was higher than the national benchmark for adequate screening colonoscopy. Mean time to intubate the cecum improved by about 4 minutes between the first 6 months of training and the last. Withdrawal time was longer when an AP was detected and removed. The high ADR we observed may be related to the presence of both the fellow and a teaching attending. This may also explain why no significant change was seen in the ADR between the first and second half of the training year. The 100% cecal intubation rate also likely reflects the presence of a teaching attending. The decreased time to intubate the cecum may more accurately reflect improvement of the fellows' skill level over the course of their training.

ABDOMINAL WALL THICKNESS IS A PREDICTOR FOR MORBIDITY IN COLORECTAL PATIENTS.

P1702

Y. Chang, D. Yackzan, S. Thomas, K. Murphy, D. Kay, D. Davenport, A. Bhakta
Lexington, KY

Purpose/Background: Obesity is a growing epidemic in the United States, with the CDC estimating up to 40% of adults being obese. As this trend continues, surgeons must determine the best way to characterize these patients and

how their outcomes differ from patients who are not obese. We compared three measures for obesity to determine if one is a stronger predictor for postoperative morbidity among colorectal patients.

Methods/Interventions: We queried our ACS-NSQIP database for adult patients (age ≥18 years) undergoing a colectomy (any indication) at the University of Kentucky from 1/1/13 to 12/31/16. We excluded patients if they had an open abdomen or if they did not have a preoperative CT within three months of their operation. We defined intraabdominal fat (IAF) as the distance between the kidney and posterior abdominal wall at the level of the renal vein. We measured abdominal wall thickness (AWT) by the depth of subcutaneous tissue at the level of the ASIS on CT. Postoperative outcomes included the length of stay, readmission, surgical site infection, and transfusion requirement.

Results/Outcome(s): Of 336 patients enrolled, 52% were males with an average age of 56.4 years. Our sample population had a high prevalence of tobacco use (32.4%), diabetes (16.7%), hypertension (49%), and preoperative SIRS (12.2%). The majority of operations did not require an ostomy (55.1%), were elective (60%), and performed via open technique (62%). Our average length of stay was 9.8 days. When looking at operative duration, higher AWT was associated with longer operative time ($p < 0.01$) compared to BMI or IAF. In addition, higher AWT was significantly associated with a higher 30-day readmission rate ($p = 0.05$). There was no significant difference in IAF, AWT, or BMI for mortality rate, postoperative transfusion, SSI, or need for reoperation.

Conclusions/Discussion: Our study demonstrates that AWT has a stronger association with NSQIP outcomes than BMI or IAF in our colorectal patient population. AWT is an easily obtained measure that should be factored in preoperative decision making.

DIFFICULTIES FACED BY GENERAL SURGERY RESIDENTS: A QUALITATIVE SYSTEMATIC REVIEW.

P1703

C. Yaow, H. Mok, C. Ng, M. Kamala, I. Ganpathi, C. Chong
Singapore, Singapore

Purpose/Background: Background General surgery residents face a multitude of challenges within the fast paced working environment. Pressures from stiff competition, expectations from consultations and difficulties in patient care challenge a resident's ability to adapt and cope. Often however, the fear of speaking out allow concerns go unheard and unnoticed, leading to burnouts, lower job satisfaction and quality of care. With renewed interest in ACGME surgical residency guidelines focusing to address the issue of resident wellbeing, we sought to perform a qualitative systematic review on difficulties faced by general surgical residents.

Methods/Interventions: Methods Searches were conducted on 5 databases including Medline, Embase, CINAHL, Web of Science Core Collection and PsycINFO from inception to 8/21/2019, abiding by the PRISMA guidelines. With a set agreed upon inclusion and exclusion criteria, the research team yielded preliminary searches of 4407 articles, 286 full texted and 19 included in the review. Thematic analysis was then proceed in a 3 step methodology. Codes were identified, and similar elements form descriptive themes before the analytical themes were preceded.

Results/Outcome(s): Results 3 overarching analytical themes were identified from thematic analysis of primary literature namely, problems with the residency program, work associated challenges and personal concerns. Problems with the residency program was associated with the training of residents, specially the lack of guidance, delivery of training and feedbacks. Work associated challenges highlighted problems with peer interactions, autocratic relationships and communication with patients. Personal concerns raised by residents included issues regarding the achievement of work life balance, personal wellbeing and gender biases.

Conclusions/Discussion: Conclusion To our knowledge, this is the first qualitative systematic review accounting for the difficulties faced by general surgery residents. The results presented paints a difficult reality faced by general surgery residents. A qualitative methodology was considered, for it allowed for rich incorporation of accounts from first hand of experience, thereby allowing for the mapping of multifactorial elements affecting their wellbeing. As we move towards addressing and focusing on the provision of care for physicians, the data presented in this review would we of key interest for resident directors and educators in developing supportive programmes for residents.

REMOTE ONE-TO-ONE PATIENT COACHING AND A PREHABILITATION APP CAN HELP PREPARE AND IMPROVE THE ENTIRE PERIOPERATIVE JOURNEY AND ERAS COMPLIANCE.

P1704

S. Mehta[1], R. Fearn[1], M. Sampson[2], S. Eisenstein[2]
[1]*Los Angeles, CA;* [2]*San Diego, CA*

Purpose/Background: Patient Coaching provided by experienced patients is well known to be a helpful supportive resource for patients with chronic conditions and undergoing surgery. With improvements in technology, it is now easier to provide remote Patient Coaching both at the convenience of the patient and Coach which makes contacts more straightforward to schedule. At our institution, we have been working with a company that provides Patient Coaching services to ostomy patients and has demonstrated improvements in ostomy care through

coaching. ERAS compliance and focus on prehabilitation in patients are core values in our institution and help in managing expectations, improving post-operative recovery and reducing complications. We wanted to investigate whether Patient Coaching could benefit our elective general surgical population via a combination of a bespoke app and a patient coach.

Methods/Interventions: We partnered with a company who created a bespoke app for our patients that included all the pre-operative and ERAS information we provide in electronic format. All patients over the age of 21 undergoing elective general surgery without routine stoma formation were eligible. Patients were contacted by a Patient Coach by phone or text shortly after enrolling in the scheme. The Patients Coaches helped the patients complete their pre-operative tasks and also set recovery goals with the patient. The Coaches then continued to support the patients remotely for 45-days postoperatively. A survey was sent to patients asking about their overall experience and whether they found it useful. The app included an HRV tracker as a measure of post-operative recovery and Daily Health Check that measured both mental and physical health status.

Results/Outcome(s): A total of 8 patients enrolled in the program in November 2019. One patient subsequently declined to be involved. All remaining patients were successfully contacted by a Patient Coach and underwent a period of goal setting and pre- and post-operative education and support. All patients engaged with the HRV tracker and the Daily Health Check with 2 patients saying that it was a useful tool to monitor their recovery. All patients responded that they felt well-supported by the program and that they would use it again or recommend it to others.

Conclusions/Discussion: This initial pilot has demonstrated that it is possible to provide remote support and Patient Coaching. Patients felt more supported throughout their whole perioperative journey and had an extra level of support to contact in addition to their treating medical team. Next steps are to improve app features and to role the service out to other surgical specialities within the same institution.

CURRENT PRACTICE PATTERNS OF DIFFERENT TREATMENT MODALITIES IN THE ELDERLY POPULATION WITH COLORECTAL CANCER.

P1705

A. Akhtar, I. Bernescu
Elkridge, United States Minor Outlying Islands

Purpose/Background: As the aging population is increasing rapidly, the number of elderly patients diagnosed with colorectal cancers is also rising in the United States. For this reason, a review is conducted on the currently practiced surgical and systemic treatments of colorectal cancers in the elderly population.

Methods/Interventions: The National Cancer Database (NCDB) provided by the Commission on Cancer (CoC) was utilized to study elderly patients age seventy and above with colorectal cancer diagnosed between 2004 and 2015. The administration of standard of care treatment, including chemotherapy administration for appropriate stage, was studied in relationship with demographic, clinical and pathologic characteristics of patients.

Results/Outcome(s): A total of 542513 elderly patients above the age of 70, diagnosed with colorectal cancer between 2004 and 2015 were analysed. Colon cancer was more prevalent 79% than rectal cancer 21%. Eighty-seven percent of patients were Caucasians, while 8.8% were African-Americans; 54% were females. Sixty four percent had a Charlson/Deyo score 0 and 25% had 1. Of 542513 patients, 450556(83%) had surgery of primary site, 135783 (25%) underwent chemotherapy, and 48821 (9%) received radiation treatment. Surgery and chemotherapy was not indicated in 2% and 6% of patients for high risk factors. Adjuvant chemotherapy was administered to 10.3%, 48% and 43% of stage II, III, and IV colon cancer patients respectively. For rectal cancer, 27.4%, 60%, 68%, and 56% of stage I,II,III and IV patients had chemotherapy. Neoadjuvant chemotherapy was administered only in 16%, 29% and 25% of stage I, II and stage III rectal cancer as compared to 19% 34% and 32% neoadjuvant radiation for stage I II and III respectively. Most chemotherapy was administered in comprehensive community cancer program as compared to academic research program. 68% of patients with Charlson/Deyo score of 0 received chemotherapy. Multiagent chemotherapy was administered 81% of patients. Thirty day and 90 day mortality was 5.3% and 7.3% after surgical procedure respectively.

Conclusions/Discussion: In elderly population, the surgical treatment was appropriately provided for early stage colorectal cancer. Adjuvant chemotherapy with multiagents was administered only to half of stage III and IV colon cancer patients while neoadjuvant chemoradiation was given to only one third of locally advanced rectal cancer patients. This undertreatment of elderly patients is multifactorial. Standard of care multidisciplinary approach is being practised more in comprehensive community cancer centers. Mortality after surgical intervention was higher in elderly frail patients as compared to the general population. Decision for multidisciplinary treatment should be taken after assessing the frailty index. The introduction of elderly-standardised guidelines for the management of colorectal cancer would be recommended for maximal survival benefit.

DEVELOPMENT OF STRUCTURED OBJECTIVE METRICS FOR AUTOMATED ASSESSMENT OF DOUBLE LAYERED END-TO-END SMALL BOWEL ANASTOMOSIS.

P1706

G. Sankaranarayanan[1], B. Cetinsaya[2], T. Halic[3], R. Shabbir[1], A. Crawford[4], K. Wells[1], S. De[5], J. Fleshman[1]
[1]Dallas, TX; [2]Little Rock, AR; [3]Conway, AR; [4]Reno, NV; [5]Troy, NY

Purpose/Background: In order to assess the technical skills in colorectal surgery, the Colorectal Objective Structured Assessment of Technical Skills (COSATS) consisting of eight tasks was developed and validated. The tasks require extensive setup and manual assessment, which takes considerable resources and time. As part of the NIH funded project, we are developing a virtual reality-based basic colorectal surgical task trainer for open surgical tasks of the COSATS and for which task-specific objective metrics were developed for automated assessment. In this work, the results from developing metrics for the double-layered hand-sewn end-to-end anastomosis task are presented.

Methods/Interventions: In this IRB approved study, first a detailed hierarchical task analysis was performed by observing the video recording of the procedure done on a pig bowel with mesentery by an expert surgeon. From identified tasks and subtasks, metrics were then developed on a 5-point scale with 5 being completely correct and 0 being completely incorrect. Moreover, majority consensus on preferred suturing technique and materials were developed for proper assessment in the simulator. The developed metrics were then assessed using an online survey for its importance on a 5-point Likert scale by expert colorectal surgeons.

P1706 Expert Agreement of Importance of our Developed Metrics

Number	Metrics	Agreement (Weighted Average of 5-point Likert Scale)
1	Task execution order a. Suturing of outer bowel wall followed by suturing of inner bowel wall b. Suturing of inner bowel wall followed by suturing of outer wall	3.5
2	Suture handling a. Equidistant placement of sutures b. Poor placement of sutures c. Inadequate suture handling	4.5
3	Tool selection Proper selection of surgical tools	4.33
4	Tool handling a. Smoothness and Gentleness in tool handling b. Discrete motions in tool handling c. Aggressive tool handling	4.17
5	Anastomosis quality check Checking for integrity and leakage (air or betadine)	3.33
6	Intestinal tissue damage (due to any reason, instrument use etc.)	4.5
7	Managing bleeding during the procedure a. Immediately b. Delayed	4.17
8	Closure of mesenteric defect a. Completely closed b. Not closed	3.17
9	Placement of stay sutures a. Distal and proximal stay sutures b. No stay sutures placed	3.83
10	Stay sutures tension Placing snaps and having enough tension	3.83

Results/Outcome(s): A total of (n = 9) colorectal surgeons within the Baylor Scott and White system participated in this study. The majority of them (n =8) had more than 5 years of experience. 77.78% (n =7) indicated double-layer closure as their preferred method while the remaining didn't indicate a preference. The majority of the participants (n = 6) indicated that time is an important factor for the task with 10-30 minutes as the most preferred time for completion (71.43%). For the preferred suture material, the responses were for the closure of the inner wall (Vicryl – 16.67%, Chromic – 16.67% and PDS – 66.67%) and the outer wall (Silk-33.33% and Vicryl – 66.7%), respectively. For the preferred suturing method the responses were for outer layer (Lembert – 100%) and for inner layer (baseball stitch -42,86%, Connell stitch – 57.14%). For suturing the inner wall, 85.71% responded that they start in the middle and run on either direction along the posterior wall. For distances to the first bite from the cut end of the bowel, 57.14% preferred less than 5mm and 42.86% at 5 mm. Table 1 shows the weighted average scores of the respondents for the importance of the developed metrics. The weighted average scores ranged from 3.33 (above neutral) to 4.5 (more than important).

Conclusions/Discussion: An expert agreement on the metrics and majority preferences on the double layer end-to-end hand-sewn anastomosis task was obtained within our institute. Our developed metrics were assed to be important or very important. Our next step is to incorporate the measures in our VR simulator and assess its validity.

ATTITUDE TO WATCH AND WAIT STRATEGY AND ORGAN PRESERVATION FOR RECTAL CANCER ACHIEVING CLINICAL COMPLETE RESPONSE (CCR) OR NEAR-CCR AFTER CHEMORADIOTHERAPY: A SURVEY TO CHINESE SURGEONS.

P1707

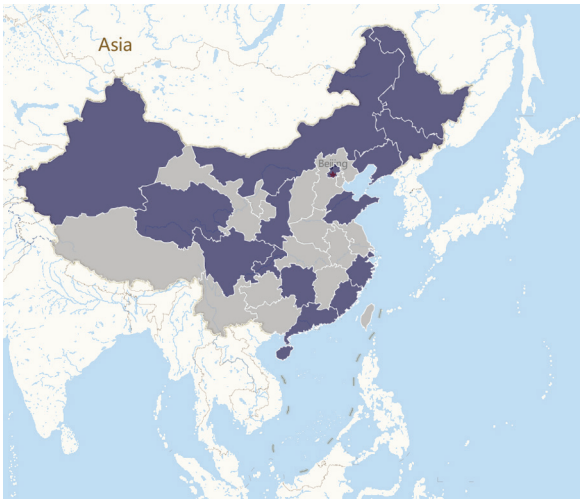
T. Sun, A. Wu, L. Wang
Beijing, China

Purpose/Background: To investigate Chinese surgeons' attitude to watch and wait strategy and organ preservation for rectal cancer achieving cCR/near-cCR after neoadjuvant chemoradiotherapy (nCRT).

Methods/Interventions: A 32-question online survey was sent to senior general or colorectal surgeons across China via WeChat between January 31 and February 19, 2019. All surgeons were from high-volumn centers for rectal cancer treatment.

Results/Outcome(s): A total of 116 surgeons from 48 hospitals were enrolled, with the response rate of 66.4% (77/116). The 67.5% (52/77) of surgeons had been in practice of rectal cancer surgery for more than 8 years and 76.6% (59/77) of them had patients treated by "watch and wait" strategy. The 57.1% (44/77) of surgeons routinely mentioned the possibility of cCR and "watch and wait" strategy in the informed consent before nCRT. Thirteen surgeons (16.9%) would recommend the "watch and wait" strategy as the first choice of treatment after the cCR diagnosis while 52 surgeons (67.5%) demonstrated that this approach would only be recommended to the candidate for abdominoperineal resection. Twenty seven surgeons (33.8%) would recommend excision biopsy to patients with ymrT0-2N0 following nCRT when a margin-negative local excision is possible.

Conclusions/Discussion: The attitudes to watch and wait strategy and organ preservation for rectal cancer after nCRT in Chinese surgeons reflect the status-quo of rectal cancer treatment in China. Important issues in organ preservation like the indication for local excision after nCRT needs more data and evidence from prospective Chinese trials.



ASSESSING THE READABILITY, QUALITY AND SUITABILITY OF ONLINE HEALTH INFORMATION ON SEXUAL DYSFUNCTION AFTER RECTAL CANCER SURGERY.

P1709

V. Brissette, A. Alnaki, R. Garfinkle, M. Lloyd, M. Demian, N. Morin, C. Vasilevsky, M. Boutros
Montreal, QC, Canada

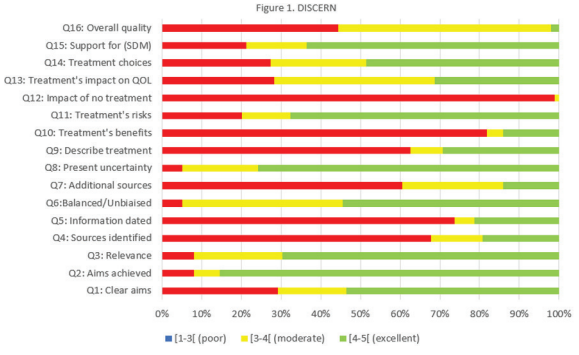
Purpose/Background: Sexual dysfunction is a common sequela of rectal cancer surgery. Patients have reported feeling misinformed about sexual dysfunction following rectal cancer surgery and having difficulty discussing the subject with their physicians. Given that the Internet has become a common resource consulted by patients to find health information, the purpose of this study was to assess online information on sexual dysfunction after rectal cancer surgery.

Methods/Interventions: An online search of Google, Yahoo and Bing was performed using "specific" (e.g., rectal

cancer surgery and vaginal pain) and "general" (e.g., rectal cancer surgery and sex) search terms related to sexual dysfunction after rectal cancer surgery in 07 and 08/2019. These search terms were developed through a collaborative process between physicians and patients. Websites were considered for analysis based on pre-specified inclusion and exclusion criteria, and were assessed in the following domains: (1) readability, using nine standardized tests; (2) quality, using the DISCERN tool; (3) suitability, comprehension, and learning stimulation, using the Suitability Assessment of Materials (SAM) tool; and (4) content. Suitability, quality, and content of included websites were assessed independently by two trained reviewers. Interrater reliability (IRR) was calculated for each assessment with either intracluster correlation (ICC) or Light's Kappa (k) coefficients.

Results/Outcome(s): Of 5040 websites identified, 99 unique websites met the inclusion criteria. Only 3 (3%) websites fulfilled the American Medical Association recommendation of a 6th grade reading level. Using the DISCERN instrument, only 2 (2%) websites were assigned good/excellent quality (ICC=0.62, "fair agreement" Q1-Q3 0.61-0.80), 19 (19%) referenced their sources of information (κ=0.78, "good agreement" 95%CI(0.63,0.86)), and 31 (31%) fully discussed the impact of sexual dysfunction on quality of life (κ=0.60, "fair agreement"95%CI(0.41,0.73)) (Figure-1). Using the SAM instrument, only 3 (3%) websites were classified as highly suitable for rectal cancer patients (ICC = 0.75 "good agreement"Q1-Q3 0.76-0.83), while 65 (66%) were considered adequate, and 31 (31%) were found to be inadequate for the target population. With regards to content, only 9 (9%) websites fully discussed the impact of sexual dysfunction on patients' partners (κ=0.76, "good agreement" 95%CI(0.64,0.84)) and 51 (52%) websites did not offer any prognosis (κ=0.82, "good agreement"95%CI(0.73,0.88)).

Conclusions/Discussion: Online health information available to patients on sexual dysfunction after rectal cancer surgery is suboptimal. Websites are not suitable, lack important content, and are written at too complex a reading level for patients.



KEEP THEM ON THE TABLE: OUTCOMES ARE IMPROVED AFTER MINIMALLY INVASIVE COLECTOMY DESPITE LONGER OPERATIVE TIMES IN HIGH RISK COLON CANCER PATIENTS.

P1710

S. Jochum, Y. Zhang, D. Hayden, T. Saclarides, A. Bhama
Chicago, IL

Purpose/Background: For higher risk patients, traditional surgical dogma advises shorter open operations versus longer minimally invasive (MIS) approaches in order to "get them off the table" faster. The primary objective of this study was to evaluate postoperative outcomes in high risk patients undergoing longer MIS operations compared to shorter open operations in patients with colon cancer.

Methods/Interventions: The National Surgical Quality Improvement Program database was used it identify colon cancer patients with ASA class 3 and 4 undergoing right colectomy and sigmoid colectomy from 2011-2016. The short open right colectomy group was comprised of operations <120 minutes (shortest two quartiles) and >120 minutes (longest two quartiles) for the long MIS right colectomy group. The short open sigmoid colectomy group (<150 minutes) and long MIS sigmoid colectomy (>160 minutes) were defined similarly. Univariate and multivariate analyses were performed to compare outcomes between the groups.

Results/Outcome(s): A total of 2,216 ASA 3 and ASA 4 colon cancer patients were identified as having undergone long MIS and short open right colectomy (33% open, 67% MIS) and 806 colon cancer patients were identified as having undergone long MIS and short open sigmoid colectomy (36% open, 64% MIS). Multivariate analysis demonstrated that patients undergoing longer MIS right colectomy had significantly fewer superficial surgical site infections (SSI), wound disruptions, transfusion requirements and pneumonia ($p<0.05$). They also had lower overall morbidity, discharge to higher level of care, and mortality ($p<0.05$). Similarly, after long MIS sigmoid colectomy, prolonged mechanical ventilation, pneumonia, unplanned intubation, overall morbidity, discharge to higher level of care, and severe adverse events were also lower when compared to the short open group ($p<0.05$). When all MIS and open colectomies were compared with equivalent operative times, the incidence of experiencing at least one complication or a severe adverse event was higher in the open colectomy group.

Conclusions/Discussion: In high risk patients undergoing either right or sigmoid colectomy for cancer, outcomes were worse with shorter open operations. Once comorbidities were adjusted for, MIS approach had better outcomes despite prolonged operative times. Higher ASA class should not be a contraindication for a minimally

P1710 Multivariate Analysis Comparison of Long MIS and Short Open Surgery

	Right Colectomy						Sigmoid Colectomy					
	Long MIS N=1492 (67.33%)		Short Open N = 724 (32.67%)		Odds Ratio for Group (95% CI) (Long MIS vs. Short Open)		Long MIS N=518 (64.27%)		Short Open N=288 (35.73%)		Odds Ratio for Group (95% CI) (Long MIS vs. Short Open)	
Variable	N	%	N	%		Multivariate P-value	N	%	N	%		Multivariate p-value
Superficial Incisional SSI	50	3.35%	40	5.52%	0.617 (0.402, 0.947)	0.027	23	4.44%	22	7.64%	0.562 (0.307, 1.207)	0.061
Wound Disruption	5	0.34%	14	1.93%	0.149 (0.053, 0.417)	<0.001	3	0.58%	2	0.69%		
Urinary Tract Infection	24	1.61%	21	2.90%	0.590 (0.325, 1.071)	0.083	6	1.16%	5	1.74%		
Progressive Renal Insufficiency	7	0.47%	5	0.69%			1	0.19%	4	1.39%	0.137 (0.015, 1.235)	0.076
On Ventilator Greater than 48 Hours	15	1.01%	14	1.93%	0.481 (0.228, 1.013)	0.054	6	1.16%	11	3.82%	0.351 (0.126, 0.978)	0.045
Requiring Blood Transfusion	168	11.26%	118	16.30%	0.721 (0.557, 0.935)	0.014	34	6.56%	32	11.11%	0.665 (0.388, 1.138)	0.137
Pneumonia	26	1.74%	29	4.01%	0.395 (0.230, 0.681)	<0.001	6	1.16%	12	4.17%	0.301 (0.110, 0.823)	0.019
Unplanned Intubation	32	2.14%	25	3.45%	0.723 (0.421, 1.244)	0.241	6	1.16%	14	4.86%	0.229 (0.087, 0.604)	0.003
Any Complication	352	23.66%	235	32.46%	0.701 (0.574, 0.857)	<0.001	94	18.15%	90	31.25%	0.509 (0.362, 0.714)	<0.001
Discharge to Higher Level of Care	177	11.86%	185	25.62%	0.543 (0.421, 0.701)	<0.001	43	8.32%	55	19.16%	0.573 (0.357, 0.920)	0.021
Mortality	17	1.14%	30	4.14%	0.335 (0.181, 0.621)	<0.001	5	0.97%	7	2.43%		
Any Severe Adverse Event	213	14.28%	141	19.48%	0.703 (0.553, 0.893)	0.004	57	11.00%	54	18.75%	0.556 (0.370, 0.836)	0.005
Variable	Mean (SD)	Median (IQR)	Mean (SD)	Median (IQR)	Estimate for Group	p-value	Mean (SD)	Median (IQR)	Mean (SD)	Median (IQR)	Estimate for Group	p-value
Total Hospital Length of Stay	6.52 (5.74)	5 (3-7)	9.74 (7.76)	7 (5-12)	-0.367	<0.001	5.87 (6.39)	4 (3-6)	9.64 (9.54)	7 (5-11)	-0.377	<0.001

invasive approach to colectomy. The known benefits of minimally invasive surgery endure irrespective of longer operative times. Focus should shift from getting patients "off the table" faster to longer, but safer, MIS surgery in high risk patients.

MINIMALLY INVASIVE SURGERY SIGNIFICANTLY LOWERS ALL TYPES OF WOUND INFECTIONS IN A 5 YEAR NSQIP COLECTOMY ANALYSIS OF 90,945 PATIENTS.

P1711

H. Phillips, M. Kapadia, J. Hrabe, J. Cromwell, I. Hassan, I. Gribovskaja-Rupp
Iowa City, IA

Purpose/Background: Surgical site infection (SSI) is a significant cause of morbidity and mortality among colorectal surgery patients. SSI is common, effecting 10-30% of all patients undergoing colorectal procedures. SSI increases the cost of patient hospitalizations, lengthens hospital stay, increases the risk of readmission, and increases mortality in patients. The purpose of this study was to evaluate the effect of surgical approach and year of surgery on the risk of surgical site infection.

Methods/Interventions: The participant use file (PUF) from the 2013-2017 American College of Surgeons-National Surgical Quality Improvement Program (ACS-NSQIP) database was queried. Adult (>18 years) patients who underwent elective colectomy (excluding rectal resections) were included in the analysis. Univariate and multivariate regression was performed.

Results/Outcome(s): A total of 90,945 patients were included for analysis (50.7% female, 86.0% white). An open approach was utilized 60.2% of the time with the remaining 39.8% patients undergoing minimally invasive (MIS) operations (laparoscopic and robotic), which was stable over time. Surgical site infection occurred at significantly lower rates after minimally invasive procedures for all sites: superficial 2.4% vs 4.5% ($p<0.01$), deep 0.3% vs 0.8% ($p<0.01$), and organ space 2.9% vs 4.5% ($p< 0.01$). When evaluated via multivariate analysis, when minimally invasive approach was used compared to open surgery, the odds of developing a surgical site infection was 44% lower for superficial infections, 54% lower for deep infections, and 28% lower for organ space infections ($p<0.01$). The difference in odds of developing SSI between open and laparoscopic approaches was not found to change over time (superficial $p = 0.76$, deep $p=0.04$, and organ space $p = 0.40$).

Conclusions/Discussion: For colorectal patients undergoing elective colectomy (excluding procedures involving rectal resection), odds of experiencing a surgical site infection at any level was more likely if performed using an open approach as compared to an MIS approach. This difference persisted over time. We conclude that MIS approach is should be favored in elective colon resections, whenever possible, and patients should be informed about higher risk of infection with open surgery.

OPIOID PRESCRIBING PATTERNS AFTER COLORECTAL SURGERY AT A LARGE SAFETY-NET HOSPITAL.

P1712

U. Phatak, K. Schultz, J. Favuzza, J. Hall
Boston, MA

Purpose/Background: Colorectal surgery is associated with persistent post-operative opioid use. The purpose of this study is determine prescribing patterns for opioids after colorectal resections at a large safety-net hospital.

P1711

Type	OR	95% CI	P-Value	Year	P-Value
Superficial	0.56	0.51-0.61	<0.01	2013	0.76
				2014	
				2015	
				2016	
				2017	
Deep	0.46	0.37-0.58	<0.01	2013	0.04
				2014	
				2015	
				2016	
				2017	
Organ Space	0.72	0.66-0.78	<0.01	2013	0.40
				2014	
				2015	
				2016	
				2017	

Methods/Interventions: This is a retrospective cohort study of patients who underwent proctectomy or colectomy from January 2018 to August 2019 at a large urban academic safety-net hospital. All patients were aged 18 years or older. Demographics, comorbidities, length of stay, surgical details, readmission rates, and complications were collected. The primary outcome was the rate of new persistent opioid use. This was defined as having an opioid prescription refilled more than 30 days after the index procedure. Secondary outcomes included opioid prescriptions filled more than 60 days, 90 days, and 120 days after the procedure.

Results/Outcome(s): A total of 212 patients underwent 216 colorectal resections at our institution from 2018 to 2019. The median morphine milligram equivalents (MME) in the 24 hours prior to discharge was 5 (IQR 0-23.7). The median pain score at discharge was 3 (IQR 0-5). The most commonly prescribed opioid on discharge was Oxycodone (41.2%) followed by Tramadol (21.3%). There was a significant difference in mean MME depending on the type of opioid prescribed on discharge (Table). In total, 10 (4.7%) patients were persistent opioid users following surgery. Factors associated with requiring persistent opioids were emergent surgery (OR 5.5, 95%CI 1.5-20.4, p=0.01), opioid use in the previous 12 months (OR 11.02, 95% CI 2.7-44.6, p=0.001) and length of stay (OR 1.03, 95%CI 1.0-1.1, p=0.048).

Conclusions/Discussion: There was a low rate of persistent opioid use after colorectal resection at our large urban academic safety-net hospital. Risk factors for persistent opioid use included emergent surgery, opioid use in the preceding 12 months and increased length of stay. This data may help to inform decision-making for refining multimodal analgesia protocols and creating an algorithm to inform discharge prescription writing to minimize new persistent opioid use.

MECHANICAL BOWEL PREPARATION USING ORAL ANTIBIOTICS IN ELECTIVE COLORECTAL CANCER SURGERY: A NATIONWIDE POPULATION-BASED STUDY.

P1714

J. Lee, B. Ahn, J. Ryu, K. Lee
Seoul, Korea (the Republic of)

Purpose/Background: The American Society of Colon and Rectal Surgeons guidelines recommends the use of mechanical bowel preparation (MBP) with oral antibiotics (OA). However, some of the evidence used the same database (American College of Surgeons National Surgical Quality Improvement Program) and this is open to criticism. Thus, we evaluate the effect of MBP with OA in a nationwide population-based study.

Methods/Interventions: A retrospective analysis of the Korean National Health Insurance Service (NHIS) database from 2016 to 2018 was performed. We used a 50% sampling database due to the policy of NHIS. Patients who received elective colorectal cancer surgery were included. Patients who were younger than 18 years old, intestinal obstruction and those who received emergency operations were excluded. A total of 26024 patients were included in this study.

Results/Outcome(s): Among them, 4821 (18.5%) received MBP with OA, 15919 (61.2%) received MBP alone, 336 (1.3%) received OA alone, and 4948 (19.0%) received no preoperative preparation. Baseline characteristics were similar between MBP alone and MBP with OA group. Compared to patients receiving MBP alone, patients who received combined MBP with OA preparation demonstrated a lower surgical site infection rate (5.8% vs 11.2%, P < 0.001), shorter hospital stay (21.6 ± 9.6 days vs 24.5 ± 13.8 days, P < 0.001), and lower medical cost ($8545 ± 4024 vs $9048 ± 5754, P < 0.001). Anastomosis site leakage and 30-day mortality were not significantly different.

Conclusions/Discussion: MBP with OA reduces surgical site infection rate, length of hospital stay and medical cost.

P1712 Last 24 Hours Mean Morphine Milligram Equivalents (MME) by Type of Opioid Prescribed at Discharge

Type of Opioid on Discharge	Mean MME	Standard Deviation	p-value
Dilaudid	56.2	76.2	<0.001
Oxycodone	39.1	82.1	
Tramadol	5.2	6.6	
None	4.5	16.2	

DAY 3 CRP RATE IS A SURICATE OF MORBIDITY AFTER COLORECTAL RESECTION IN AN EARLY RECOVERY PROGRAM.

P1715

G. clarizia, P. Alfonsi, A. Champault, A. Perier, B. Angliviel, S. Li Sun Fui, J. Loriau
Paris, France

Purpose/Background: As length of stay after colorectal resection shortens, the prediction, or at last the very ealy diagnosis, of complication gets more necessary. Our study investigates how a systematic CRP test at Day 1 and day 3 can help on this pupose.

Methods/Interventions: Data from 122 consecutive patients undergoing colorectal cancer resection between may 2018 and June 2019 have been registered and analyzed. Patients presenting intra-operative discover of metastases or needing intra-operative conversion to laparotomy were excluded. Patient's clinical and laboratory post operative data and time of discharge were collected. CRP and WBC were evaluated at 1 st and 3 rd Post-Operative Day (POD). A 30-days follow up was carried out in order to evaluate possible complications. Consecutive data were calculated as mean, median and standard deviations. Patients were then divided into two groups, according to the appearance or not of post-operative complications. Statistical analysis between the two groups were performed using the independant samples t-test, and results were considered statistically significant for $p<0.05$. The CRP and WBC values were also analyzed using the receiver operative curve (ROC), in order to find out a cut-off with appropriate sensibility and specificity.

Results/Outcome(s): The median age was 66 years old and 70% of patients were ASA 1-2. All the patients were managed following our institution Early Recovery Protocol. Among the 122 procedures 80 were colectomies and 42 colorectal resections: 6 APR and 36 colorectal anastomosis (loop ileostomy in 24 cases). Post-operative complications occurred in 18 patients (morbidity rate 15%), out of which 12 (66,6%) were treated conservatively, while 6 patients (33,3%) were re-operated (2 patients for an intra-pelvic collection, 3 patients for leakage of anastomosis, 1 patient for stenosis of anastomosis). Patients free from post-operative complications were on average discharged at day 5, while patients presenting a post operative complication were discharged at day 17 ($p<0,0001$) (Table 3). While POD 1 WBC and CRP didn't show statistical differences between the groups, CRP values at POD 3 between the 2 groups were statistically different. WBC count at POD 3 showed also a statistically significant difference between the two groups. The statistically optimal cut-off for CRP at 3 rd POD was 91,5, with a sensibility of 82,4% and a specificity of 79,6%. At last median time to coomplication diagnosis was POD 6.

Conclusions/Discussion: After Colorectal resection in the setting of an early recovery program a POD 3 CRP level higher than 91,5 is highly predictive of a complication occurence and should question about futher investigations and decision of discharge.

PATIENT, SURGEON, AND HOSPITAL-LEVEL VARIATION IN BOWEL PREPARATION UTILIZATION PRIOR TO ELECTIVE COLECTOMY.

P1716

L. Zhang, M. Cohen, C. Ko, N. Hyman, B. Shogan
Chicago, IL

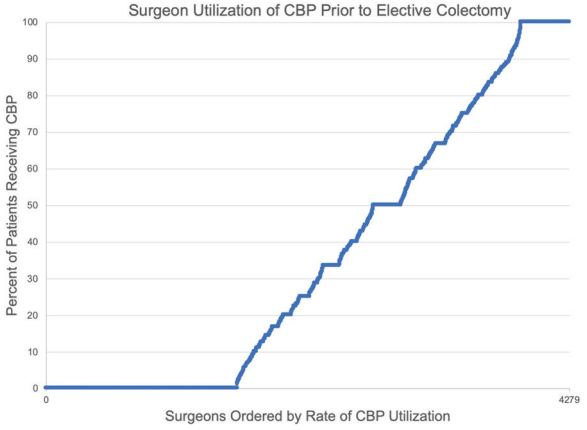
Purpose/Background: Administration of a combined antibiotic and mechanical bowel preparation (CBP) prior to elective colon resection is associated with decreased surgical site infections, anastomotic leak, length of stay, and readmission. CBP is recommended by major American surgical societies including the American Society of Colon and Rectal Surgeons (ASCRS), the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES), and the American College of Surgeons (ACS). It is unknown whether the decision to omit CBP is driven primarily by patient characteristics, surgeon choice, or hospital practice. Therefore, we aimed to assess surgeon- and hospital-level variation in CBP use, and to identify patient factors associated with not receiving a CBP.

Methods/Interventions: We evaluated patients from the ACS NSQIP Targeted Colectomy Dataset who underwent elective colectomy between 2015-2018. Pseudo-identifiers were used to evaluate surgeon- and hospital-level variation in CBP utilization. To further understand factors influencing CBP administration, a multivariable logistic regression model was created to assess associations of not receiving a CBP with patient characteristics including age, race, smoking status, and colectomy indication.

Results/Outcome(s): A total of 94,371 patients were identified for inclusion in this study. Of these patients, 51.6% received a CBP. Between 2015-2018, use of CBP increased from 40.7% to 59.4%, while both the percent of patients receiving no bowel preparation or mechanical only preparation decreased (29.5% to 23% and 25.3% to 11.5% respectively). Of the 332 hospitals included in this analysis, mean CBP rate was 48.6% (Interquartile Range [IQR] 30.2-69.5%). This was similar to the patient-level average, suggesting minimal influence of hospital volume. The surgeon-averaged CBP rate of 35.4% (IQR 0-66.7%) was considerably smaller than the patient-level rate, suggesting that lower volume surgeons were utilizing CBP less often ($r= 0.22$, $p<0.001$). Out of 4,279 surgeons, 36.6% never used a CBP, 9.2% always used a CBP, and the remaining 54.2% used CBP intermittently. Logistic modeling found that patients were significantly less likely to receive a CBP if they were older (≥ 65), minorities (African American/Native Hawaiian/Other vs. White),

co-morbid (e.g. history of congestive heart failure, ascites), active smokers, or undergoing colectomy for inflammatory bowel disease (vs. colon cancer).

Conclusions/Discussion: Despite current recommendations, a minority of surgeons routinely prescribe CBP prior to elective colectomy. Several patient characteristics were shown to be significantly associated with not receiving a CBP. However, given that lower volume surgeons were less likely to utilize CBP and that over one third of surgeons never utilize CBP prior to colectomy, future efforts to increase adoption of this practice should be focused on surgeon outreach and education.



ADDING A SURGICAL SITE INFECTION BUNDLE TO A COLORECTAL ENHANCED RECOVERY PROGRAM RESULTS IN FEWER WOUND COMPLICATIONS.

P1717

T. Cheung[1], B. Baldwin[2], M. Bradway[1]
[1]*Pittsfield, MA;* [2]*Lewiston, ME*

Purpose/Background: Surgical site infections (SSIs) are significant contributors toward unwanted complications for patients and the healthcare system. Not only do SSIs increase surgical morbidity and mortality, but SSIs are also associated with longer postoperative hospital stays, higher rates of hospital readmissions, and an increased financial burden for hospitals. In 2009, as a preliminary protocol to decrease the frequency of SSIs, Berkshire Medical Center (BMC) developed a Colorectal Enhanced Recovery Program with a resultant drop in infectious and other complication rates. In October 2014, BMC instituted a surgical site infection bundle with the primary objective in further mitigating the occurrence of SSIs. The aim of this study is to determine the impact of an SSI bundle on postoperative infectious complications at our institution.

Methods/Interventions: A review of all patients undergoing elective colorectal surgery from 2010 to 2016 from our National Surgical Quality Improvement Program (NSQIP) database was carried out. Patients excluded from the study were those that had underwent an emergent or urgent colorectal surgery. A total of 456 patient data were examined; 211 patients who had surgery prior to instituting the SSI bundle were compared with 245 patients who had surgery with the SSI bundle implemented. The SSI bundle included preoperative chlorhexidine bath at home, the use of wound protectors, weight based antibiotic administration, re-dosing antibiotics, and the use of new drapes, gloves, gowns and instruments for closing of the operative field.

Results/Outcome(s): The overall length of hospital stay was less in those that had the SSI bundle during surgery (4.5 vs 5.5 days) as opposed to those that did not have the SSI bundle. Furthermore, postoperative readmissions were also significantly less; 10.2% vs. 14.2%, of patients pre- and post-SSI bundle. Overall surgical site infections occurred less often in those with the SSI bundle (1.6%) than in patients prior to SSI bundle implementation (15.6%). Of the surgical site infections that did occur, the wound complications were also drastically less with the implementation of the SSI bundle than those without the SSI bundle: superficial infections (1 vs 23 cases), deep infections (2 vs 4 cases), and organ space infections (1 vs 6 cases).

Conclusions/Discussion: The addition of a surgical site infection bundle resulted in fewer wound complications when added to the colorectal enhanced recovery program for elective colorectal surgeries at Berkshire Medical Center. The postoperative length of hospital stay, readmission rate, and overall surgical site infections were improved. Given our initial promising results, we will continue to accrue data to demonstrate statistical significance in implementing the SSI bundle.

OPIOID-FREE ANALGESIA IN ELECTIVE BOWEL RESECTION: CHANGES OVER TIME.

P1718

H. Lee, A. Rojas, M. Gachabayov, R. Bergamaschi
Valhalla, NY

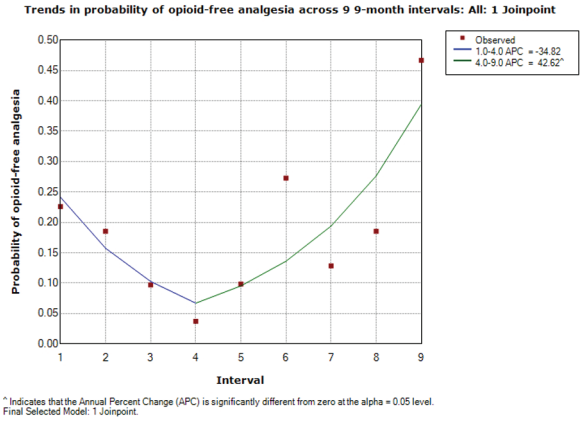
Purpose/Background: The aim of this study was to review the use of different strategies for perioperative analgesia in elective bowel resection.

Methods/Interventions: This was a retrospective cohort study including patients having undergone elective bowel resection between February 2012 and June 2018 at one medical center. Trend analysis was conducted using Joinpoint regression, (National Cancer Institute, Bethesda Maryland) employing 9-month intervals. The primary outcome for each interval was the proportion of patients receiving postoperative opioid-free analgesia (OFA), defined as forgoing all opioid analgesics after the day of surgery. Statistical tests performed on non-overlapping segments of intervals were performed using Student's t-test for continuous variables and Pearson's chi-squared test for categorical variables. These latter tests were performed

using SPSS version 25 (IBM, Inc., Armonk New York). We considered p values <0.05 to be statistically significant.

Results/Outcome(s): 125 patients met selection criteria. Females comprised 52.0% and mean age was 58.0±15.5 years (range 19-86). Mean BMI was 29.1±8.3 kg/m2. The proportion of patients receiving OFA during interval 1 was 20%, falling steadily to 0% at interval 4. The OFA proportion then rose back to 20% at interval 6, declined to 10% at interval 7, then rebounded to 15.4% at interval 8, and rose further to 42.9% at interval 9. (Figure 1) The slope of segment 1 was positive and statistically different from zero, with an average percent change (APC) of 42.6 with a 95% confidence interval of 1.8 to 99.8 and a p value of 0.043. Since interval 4, there has been a positive increasing trend of use of OFA in this patient population at our institution. This change coincides with the arrival of a new anesthesiologist who implemented a new analgesics usage policy favoring non-opioid agents.

Conclusions/Discussion: This study showed a significant increasing trend in opioid-free analgesia in elective bowel resection from 0 to 42.5% over 4.5 years.



PREOPERATIVE PSYCHIATRIC MEDICATION USE DOES NOT CORRELATE WITH POSTOPERATIVE NARCOTIC USE IN ELECTIVE COLORECTAL SURGERY PATIENTS.

P1719

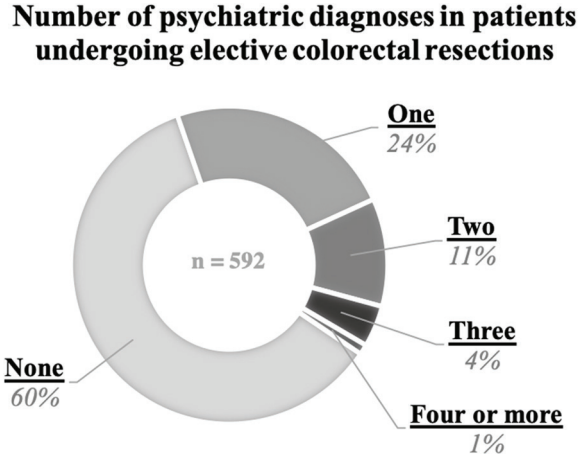
J. Wahba, P. Zhou, S. Mott, J. Hrabe, M. Kapadia, J. Cromwell, I. Gribovskaja-Rupp
Iowa City, IA

Purpose/Background: In the middle of the opioid epidemic, the fear of increasing long-term dependence can make it challenging to adequately treat postoperative pain, which itself is a risk factor for chronic pain. The effect of mental illness on patients' postoperative narcotic use is poorly understood. This study sought to evaluate if there was a correlation between patients' preoperative neuropsychiatric medications and diagnoses with their postoperative narcotic use after elective colorectal resection.

Methods/Interventions: This retrospective review identified all adult patients (age >18) who underwent elective colorectal resection at a single tertiary center between 2015 and 2018 (n=592). The study was approved by the Institutional Review Board. Data were collected including patient demographics, preoperative psychiatric diagnoses and medications, surgical procedure, and intra- and post-operative narcotic requirements including post-operative day 0 through 3 and during total hospital stay. Psychiatric diagnoses were grouped based on Diagnostic and Statistical Manual of Mental Disorders-5 (DSM-5) classification. Narcotic use was recorded using standard conversion to morphine milligram equivalents (MMEs). Univariate and multivariate analyses was performed to determine if psychiatric medications or diagnoses impacted postoperative opioid requirements.

Results/Outcome(s): Five hundred and ninety-two patients were included in this study with 54% female and mean age 57 years. Most common indications for surgery included malignancy, inflammatory bowel disease, and diverticulitis (47%, 19%, and 16%, respectively). Approximately 40% (n=236) of the patients had at least one psychiatric diagnosis, and 34% (n=203) were taking at least one psychiatric medication. Depression (22%), anxiety (19%), and history of substance use (14%) were the most common diagnoses documented. Most patients were prescribed either antidepressants or anxiolytics. Univariate analysis demonstrated an increase in postoperative opioid use in patients with more than two psychiatric diagnoses (p<0.01). However, in multivariate analysis, which controlled for age, sex, smoking status, pre-operative narcotic use, and abdominal pain, DSM-5 diagnoses no longer significantly correlated with postoperative narcotic use (p=0.11).

Conclusions/Discussion: In this survey of patients undergoing elective colorectal resection, the quantity of preoperative psychiatric medications and diagnoses did not increase postoperative narcotic requirements. Due to the prevalence of psychiatric diagnoses in colorectal surgery patients, effects on long-term pain and narcotic use need to be further studied.



A SYSTEMATIC REVIEW TO IDENTIFY BARRIERS AND FACILITATORS TO GUIDELINE ADHERENT STAGING INVESTIGATIONS IN RECTAL CANCER PATIENTS.

P1720

S. Patel[1], S. Candy[1], C. Bankhead[2], C. Heneghan[2]
[1]*Kingston, ON, Canada;* [2]*Oxford, United Kingdom*

Purpose/Background: Patients with a new diagnosis of rectal cancer require a number of investigations prior to initiation of treatment. The purpose of these investigations is to identify the presence or absence of metastatic disease, determine the pre-treatment local-regional stage and to rule out synchronous colon cancers. Appropriate and complete staging is essential in ensuring rectal cancer patients receive the appropriate treatment. Clinical practice guidelines have been developed to encourage the use of appropriate staging investigations. The objective of this review is to identify which factors are acting as barriers or facilitators to receipt of recommended staging investigations in patients with rectal cancer.

Methods/Interventions: A systematic review was completed to address the study objectives. EMBASE and MEDLINE were searched for eligible studies. Studies were included if they assessed the association between potential barriers/facilitators and recommended diagnostic tests (including Magnetic Resonance Imaging, Computed Tomography, Ultrasound, Colonoscopy and Carcinoembryonic Antigen) in patients with rectal cancer. We included studies published between 2000 and 2018. Duplicate review and data abstraction was completed. Study quality was assessed using the Newcastle-Ottawa Scale.

Results/Outcome(s): 5,869 were initially identified, of which 14 studies met our inclusion criteria. All included studies were retrospective cohort studies, and included between 80 and 3,899 patients. A number of potential barriers/facilitators were assessed including: Age, Sex, Social Economic/Education level, Geographic Location, Physician and Hospital Volume, Hospital Type, Physician subspecialty, presence of multidisciplinary care or clinics, and use of multidisciplinary tumor conference discussion. Of the assessed factors, the presence of multidisciplinary care/clinic and use of multidisciplinary tumor conferences facilitated the use of guideline recommended staging investigations. Due to inconsistent reporting and non-uniform definitions, other barriers/facilitators were not identified.

Conclusions/Discussion: We found that the presence of multidisciplinary care and the use of multidisciplinary tumor conferences facilitated the use of guideline adherent staging investigations. Due to the non-conformity of classification and definitions of barriers/facilitators to care, strong recommendations could not be made.

ASSOCIATION BETWEEN LIMITED ENGLISH PROFICIENCY AND COLO-RECTAL CANCER SCREENING.

P1721

T. Kim[1], J. Cataneo-Serrato[1], J. Park[2], S. Marecik[2], K. Kochar[2]
[1]*Chicago, IL;* [2]*Park Ridge, IL*

Purpose/Background: Colorectal cancer is the 2nd leading cause of cancer death in men and women combined with an estimated 140,000 new cases of colorectal cancer expected in 2019. Even with a significant incidence of the disease, the death rates have been declining over the years, likely due to the emphasis on screening and improvements in treatment. Several studies have shown that various ethnic minorities are often diagnosed with advanced stage disease and have higher rates of mortality. Given the increasing diversity in United States with over 20% of the population reporting a language other than English as their primary language, Limited English Proficiency (LEP) may be a barrier to an adequate screening program for colorectal cancer. Here, we seek to explore the disparity between English proficient and LEP patients in relation to colorectal cancer screening.

Methods/Interventions: The 2015 sample of the National Health Interview Survey (NHIS) database was retrospectively reviewed. Only patients over 50 years were included. Univariate analysis was used to compare sociodemographic and colorectal cancer screening variables. Multivariate regression analysis was performed to

P1721

	LEP	English	P-value
Live below poverty line	30.19	11.02	<0.001
No Insurance coverage	13.33	4.23	<0.001
Public insurance coverage	33.33	10.22	<0.001
Private Insurance	29.71	60.09	<0.001
Previous colonoscopy	42.41 (556)	67.16 (9437)	<0.001
Previous flex sig	4.25 (55)	9.58 (1335)	<0.001
Doctor recommendation for scope	63.64 (28)	84.45 (391)	<0.001
FOBT home	16.09 (210)	26.29 (3665)	<0.001
FOBT office	7.51 (97)	11.04 (1532)	<0.001

determine disparities in colorectal cancer screening. Lastly, a propensity score match was utilized.

Results/Outcome(s): A total of 16,475 patients were included in the analysis. The prevalence of LEP was 8.64% (N=1,385). LEP patients had lower rates of screening colonoscopies as compared to English proficient patients (42.41% vs 67.16%; P<0.001). LEP patients also had lower rates of physician recommendation for colorectal cancer screening (63.64% vs 84.45%; P=<0.001) and polyp diagnosis in the past 3 years (10.14 % vs 23.93%; P<0.001). Moreover, LEP patients had higher rates of no insurance (13.33% vs 4.23%; P=<0.001) or public insurance (33.33% vs 10.22%; P=<0.001). After controlling for socioeconomic variables (including living below the poverty line, private vs public vs no insurance, etc.), LEP resulted in a lower probability of obtaining a screening colonoscopy (OR 0.657, 95% CI 0.54 - 0.79; P=<0.001). After propensity score matching, English proficiency was associated with a higher probability of undergoing a screening colonoscopy (OR 1.998, 95% CI 1.46 - 2.74; P=<0.001).

Conclusions/Discussion: As the LEP population of the United States continues to increase, the healthcare community is faced with the challenge of addressing disparities due to the language barrier. Our analysis clearly demonstrates that LEP patients not only have lower rates of screening colonoscopy but are also less likely to be recommended for screening. Further studies analyzing the impact of multi-lingual education and patient navigators for cancer screening may help to bridge this gap.

COMBINED MECHANICAL AND ORAL ANTIBIOTIC BOWEL PREPARATION VERSUS ORAL ANTIBIOTICS ALONE FOR THE REDUCTION OF SURGICAL SITE INFECTION FOLLOWING ELECTIVE COLORECTAL RESECTION: INTERIM ANALYSIS.

P1722

A. Tagliaferri, R. Kucejko, C. Costanzo, B. Phillips
Philadelphia, PA

Purpose/Background: Purpose: The purpose of this study was to compare the efficacy of combined mechanical bowel preparation and oral antibiotics to the use of oral antibiotics alone pre-operatively in patients undergoing elective colorectal surgery. **Background:** Colorectal resections are associated with higher rates of surgical site infections (SSI) than nearly any other gastrointestinal surgery. Many retrospective studies have demonstrated that preoperative polyethylene glycol with oral antibiotics decrease rates of SSI as compared to no prep or mechanical bowel preparation (MBP) alone. Other retrospective data show oral antibiotics alone improve outcomes compared to MBP. There remains no prospective data specifically comparing MBP with antibiotics to oral antibiotics alone.

Methods/Interventions: Methods: All patients over 18 years of age undergoing elective colon resections were included in the study. Patients were stratified using BMI and diabetic status in randomization. Patients took Neomycin and Metronidazole for antibiotic preparation with or without polyethylene glycol. Primary outcomes of superficial and deep SSI, and anastomotic leak as well as secondary outcomes of *Clostridium difficile* infection, ileus, cardiopulmonary complications, urinary tract infection, length of stay and mortality were evaluated. A one-sided p-value of 0.05 was used to determine significance using Fisher's exact tests.

Results/Outcome(s): Results: A total of 105 patients with complete 30-day follow-up were included in the interim report. The mean age of patients was 60.3 years, mean BMI of 29, 46.7% were male and 54% underwent surgery for neoplasm. There were no significant differences between treatment groups after randomization, except for hypertension (25.3% abx alone, 35.4% combined, p = 0.05). There were no significant differences between any primary or secondary endpoints. Occurrence between abx alone group versus combined prep group of UTI (0 vs 4, p = 0.073) and ileus (5 vs 2, p = 0.166) were the only two variables approaching significance. Regardless of treatment group, ileus was significantly more likely in men (7 vs 0, p = 0.007) and in patients with a history of steroid use (7 vs 2, p = 0.047).

Conclusions/Discussion: Conclusion: Our interim data suggests no significant differences in selected outcomes for elective colon resections in patients who receive only preoperative oral antibiotics as compared to those who receive antibiotics and MBP. This is the first prospective blinded randomized trial to directly compare these two groups. This study was limited by power however, the final study is powered to detect a 4% difference in SSI with 200 patients, with an SSI rate of 4-10%. The possibility of safely eliminating cathartic agents prior to surgery would be advantageous to surgeons and patients alike.

PROGRAMME FOR ENHANCED ELDERLY RECOVERY AT SENGKANG (PEERS).

P1723

H. Loh, F. Foo, W. Tan, S. Sivarajah, M. Chew
Singapore, Singapore

Purpose/Background: The **P**rogram for **E**nhanced **E**lderly **R**ecovery **P**rogram at **S**engkang (PEERS) was developed in Singapore to provide a multidisciplinary holistic approach to optimise frail elderly patients in preparation for major surgery with prehabilitation physiotherapy and nutritional therapy.

Methods/Interventions: Patients above the age of 70 having a major general surgical operation were recruited into this program. Patients recruited underwent initial assessment by dieticians and physiotherapists followed by

an individualized nutrition and physiotherapy program over 3 weeks. Physiotherapy outcome measures monitored were grip strength, gait speed, functional reach test, 30 second chair raise and 6 minute walk test. Nutritional parameters monitored were mid-arm muscle circumference, triceps skinfolds, weight and subjective global assessment. These were assessed before, during and after the optimization program. Quality of life (QOL) was assessed using EQ5D. Additionally, patients were also medically optimized via cardiovascular and geriatrician assessments prior surgery. Post-operatively patients are followed up after a month by physiotherapist/ dieticians and up to 6 months for QOL.

Results/Outcome(s): 34 elderly patients have successfully completed the PEERS before undergoing colorectal surgery. The median age of the patients recruited was 77 years old with a gender distribution of 17 female:17 male and 15 (44%) of these patients with stage III and above cancer. All of the patients have showed improvements in their functional assessments with physiotherapy, of which 82% of the patients showed improvements in 3 or more assessments out of 5. There was no 30-day mortality reported and morbidity rate was only 12% (4 of 34 patients). The median length of stay was 10 days. Most of the patients (91%) were discharged home while only 3 (9%) needed rehabilitation at the Community Hospital. 91% of patients professed equal or higher quality of life scores (EQ5D) at 3 months. This was compared against a historical group of 23 elderly patients with a median age of 77 years old and gender distribution of 11 female:12 male. 8 (35%) of these patients had stage III and above cancer. There was no 30-day mortality reported and morbidity rate was 39% (9 of 23 patients). The median length of stay was 19 days with 3 patients (13%) needing rehabilitation at the Community Hospital.

Conclusions/Discussion: Prehabilitation program can feasibly and safely be adopted in the local Singapore population. It benefits elderly patients in terms of physical ability and QOL without compromising surgical outcomes.

HEALTH CARE DISPARITIES AND COLOSTOMY REVERSAL OUTCOMES.

P1725

K. Ota, G. Darby, S. Cassaro
Visalia, CA

Purpose/Background: Complicated diverticulitis requiring operation is increasingly managed with primary resection and anastomosis with or without proximal diversion. A two-stage approach consisting of resection and temporary fecal diversion followed by interval colostomy takedown with anastomosis is still used for patients who require intervention for emergent pathology of the left colon. We compared the American College of Surgeons National Surgical Quality Improvement Program (NSQIP) outcomes of open colostomy takedown to those of Kaweah Medical Center (KMC), a public, disproportionate share hospital serving a large population of uninsured and under-insured patients.

Methods/Interventions: After review and approval of the study by KMC Institutional Research Board, the medical records of all the patients over age 18 who underwent open colostomy reversal between 2010 and 2015 at KMC were reviewed. Demographics, body mass index (BMI), the incidence of diabetes, smoking, chronic obstructive pulmonary disease and hypertension, operating time, hospital length of stay, as well as the incidence of surgical site infections (SSI), pneumonia, sepsis, and return to OR were recorded and compared with those of the cases returned by querying the 2010 through 2015 NSQIP database for Current Procedure Terminology (CPT) codes 44625 and 44626. Continuous variables were analyzed using the independent Student's t-test, and binary variables were analyzed with the chi-squared test.

Results/Outcome(s): Sixty-two patients underwent open colostomy reversals at our institution and 19,062 cases were collected by NSQIP during the study time period. The incidence of comorbidities such as high BMI (29.4 vs. 27.4, $p=0.03$), diabetes (27.4% vs. 11.7%, $p<0.01$), hypertension (53.2% vs. 40.4%, $p=0.04$) was significantly higher in our patients, as were the operating time (209 vs. 141 minutes, $p<0.01$), and the incidence of SSI (29.0% vs. 12.0%, $p<0.01$).

Conclusions/Discussion: Open colostomy takedown with anastomosis is associated with a substantial SSI rate in the NSQIP sample. Our data reinforces well known risk factors for surgical site infections. The uninsured and underinsured patients undergoing the procedure at our institution were significantly more obese, hypertensive and diabetic, and experienced a SSI rate double that of the NSQIP sample.

AUDIT OF COMMUNITY COLORECTAL ENHANCED RECOVERY AFTER SURGERY: ACKNOWLEDGEMENT OF PROTOCOL, ANALYSIS OF COMPLICATIONS, EVALUATION OF SYSTEM COMPLIANCE, UNDERSTANDING NURSING PERCEPTION, AND IMPROVEMENTS.

P1726

K. Curfman, P. Meade, R. Cho, M. Marley
Johnstown, PA

Purpose/Background: Implementation of Colorectal Enhanced Recovery After Surgery (ERAS) guidelines has improved our practice, outcomes, system comprehension, and satisfaction. Though, since application it has become apparent that protocol elements were not considered during development, and guidelines have been updated. In addition, a signifcant lack in understanding and compliance was discovered, possibly causing complications.

By identifying protocol discrepancies, compliance errors, nursing issues, and complications, we implemented several measures for improvement

Methods/Interventions: In acknowledgment of protocol, a comparison was performed between our protocol and current guidelines of the American Society of Colon and Rectal Surgeons and ERAS Society to identify absent components and errors in use. Then, a retrospective review from February 2017 - June 2019 of all colorectal surgeries was performed, which after exclusion criteria, identified 287 ERAS procedures. Two reviews were performed. First, each component of the institution's ERAS protocol (21) was analyzed for compliance from data in the medical record (MR). Those not performed, or not recorded, were noncompliant. Each patient's MR was then reviewed for coded diagnoses considered postoperative complications. These were compiled by code, and compared between complication type and compliance to identify possible causative complication factors. Finally, nursing hestitation was obvious. In effort to understand their reluctance, a 7 question nursing survey was performed to assess familiarity, understanding, comfort, and education; 49% of surveys were completed.

Results/Outcome(s): Comparing the elements of the 2 guidelines to our protocol, we found that our institution was practicing at a 62% concordance rate. On analysis of our compliance to our institution's own protocol components, overall compliance was 69%; preoperative was 70%, intraoperative 79%, and postoperative 62%. Compliance rates were also greatly affected by a lack of documentation. Complications by system and patient were reviewed for which genitourinary complications were most prevalent at 33% of total complications, affecting 50 patients, followed by Cardiac and Gastrointestinal. Per the nursing survey, the most reported qualm was a lack of understanding/proper education, 17%

Conclusions/Discussion: From the data reported, we have made multiple efforts to improve outcomes. Our ERAS protocol has been revised and includes 93% of current guidelines. Nursing has undergone formal in person and online education. Their MR was updated with ERAS checklists to increase familiarity, documentation, and work flow. By updating our protocol, improving nursing education and perception, and encouraging better compliance, we hope to improve both complication rates and employee and patient satisfaction.

QUALITY OF COLORECTAL CANCER CARE IN PATIENTS UNDERGOING EMERGENCY SURGERY.

P1727

K. Guidolin[1], F. Shariff[1], R. Withers[2], A. Nadler[1], S. Ashamalla[1]
[1]*Toronto, ON, Canada;* [2]*Hamilton, ON, Canada*

Purpose/Background: Colon cancer (CC) is the third most commonly diagnosed malignancy worldwide, and 30% of these diagnoses occur following emergency presentations, often as a large bowel obstruction or perforation requiring urgent surgical intervention. Prior studies have demonstrated greater disease burden and lower 5-year overall survival in CC patients presenting emergently, when compared to those in the elective setting. This study aims to compare cancer care quality outcomes between patients receiving surgery in emergent versus elective contexts to attempt to elucidate potential factors behind this discrepancy.

Methods/Interventions: We conducted a matched case control study on patients who underwent a colon cancer operation from January 1, 2017 to February 28, 2019 at a tertiary care centre. Two patients undergoing elective surgery (EL) were matched to each patient undergoing emergency surgery (EM) with respect to age (within 10 years), sex, and overall cancer stage. Data was collected through the National Surgical Quality Improvement Program and supplemented with additional information obtained from chart review. Exclusion criteria applied to the initial cohort of 170 patients were: non-resection/diversion procedures, rectal cancer, recurrent cancers, known stage IV disease, and non-adenocarcinoma disease. 46 EL cases were matched to 23 EM cases (n=69) and quality markers in both groups were compared across a number of clinically relevant outcomes. Univariate analysis was conducted using Pearson chi-square (nominal variables), and Mann Whitney U (continuous variables) testing in SPSS.

Results/Outcome(s): There were no significant differences found between EL and EM groups with respect to sex, stage, age, tumour location, 30-day readmission, or nodal yield. There were also no differences between the groups in terms of receipt of appropriate medical oncology referral, time from surgery to medical oncology referral, and time from surgery to pathology result. Patients who underwent EM were less likely than EL to have a CEA and complete CT staging (chest, abdomen, and pelvis) completed within 30 days of surgery (70% vs 97% of patients, $p=0.02$; and 87% vs 100%, $p=0.012$). Patients who underwent EM were less likely than EL to undergo a laparoscopic approach (39% vs 85% patients, $p=0.001$), and had a greater length of stay (9 vs 2.5 days, $p<0.001$).

Conclusions/Discussion: Patients in the EM group received high quality oncologic resections based on the nodal yield obtained. Perioperative workup was inferior in EM patients based on 30 day CEA and CT staging. Despite increased length of stay, these patients still received appropriate and timely post-operative referral to medical oncology. Our study demonstrates how surgeons treating patients with colorectal cancer emergently can improve the quality of their cancer care by ensuring that appropriate and timely staging is completed.

HYALURONATE CARBOXYMETHYLCELLULOSE BARRIER FOR THE PREVENTION OF ADHESIVE COMPLICATIONS AFTER COLORECTAL CANCER SURGERY: A COST-UTILITY ANALYSIS.

P1728

D. Zhang, C. Sue-Chue-Lam, N. Baxter, Z. Michael, C. De Mestral
Toronto, ON, Canada

Purpose/Background: Hyaluronate carboxymethylcellulose barriers (HA/CMC, trade name 'Seprafilm') may prevent complications related to the development of adhesions after intra-abdominal surgery, such as adhesive small bowel obstructions (ASBOs). However, its widespread use is potentially deterred by its high upfront cost. Given this trade-off and uncertain net benefit, we examined the

P1727 Comparison of outcomes between patients who underwent emergency versus elective colorectal cancer operations

Variable	Emergency cases, n=23 (%)	Elective cases, n=46 (%)	p-value
Type of operation (CPT code)			0.046
Open right hemicolectomy (44160)	7 (30)	4 (9)	
	9 (39)	23 (50)	
Segmental colectomy (44140)	2 (9)	0 (0)	
Laparoscopic segmental colectomy (44204)	3 (13)	9 (20)	
Laparoscopic low anterior resection (44207)	1 (4)	8 (17)	
Open low anterior resection (44145)	0 (0)	1 (2)	
Laparoscopic low anterior resection + diversion (44208)	1 (4)	0 (0)	
Laparoscopic Hartmann	0 (0)	1 (2)	
Approach			0.001
Open	9 (39)	3 (7)	
Laparoscopic	9 (39)	39 (85)	
Converted	2 (9)	2 (4)	
Laparoscopic-assisted	3 (13)	2 (4)	
Tumour location			0.115
Cecum	11 (48)	8 (17)	
Ascending colon	4 (17)	18 (39)	
Hepatic flexure	0 (0)	1 (2)	
Transverse colon	3 (13)	4 (9)	
Splenic flexure	1 (4)	1 (2)	
Descending colon	1 (4)	1 (2)	
Sigmoid colon	3 (13)	13 (28)	
Nodes resected (median)	28	27	0.819
Length of stay (days)	9	2.5	<0.001
30-day readmission	6 (26)	2 (4)	0.053
CT staging within 30 days	20 (87)	46 (100)	0.012
CEA within 30 days	16 (70)	44 (96)	0.02
Medical oncology referral*	16 (70)	39 (85)	0.599
Time from OR to medical oncology referral (days)	30	26.5	0.058

*High risk stage II or stage IIIv

cost-effectiveness of a HA/CMC barrier for preventing adhesions after open colorectal cancer surgery.

Methods/Interventions: We conducted a cost-utility analysis using a Markov Monte Carlo microsimulation model with a lifetime horizon to compare costs and quality-adjusted life years (QALYs) associated with the use of a HA/CMC barrier at the time of open colorectal cancer resection versus a no-barrier strategy. Two scenarios were analyzed: application at index colorectal resection only and application at all operations. Outcomes considered included clinical events (admission for ASBO, operations for ASBO and operations for other reasons), cost in Canadian dollars, and quality-adjusted life years (QALYs). Outcome probabilities and QALY values were derived from the published literature, and costs, from the perspective of the Ontario Ministry of Health, were derived from the Ontario Case Costing Initiative. Parameter uncertainty was evaluated through probabilistic sensitivity analysis.

Results/Outcome(s): Using a HA/CMC barrier at the index operation only was associated with an average gain of 0.03 QALY compared to no barrier use, with an incremental cost-effectiveness ratio (ICER) of 11,961$/QALY. Using a HA/CMC barrier at all operations was associated with an average gain of 0.03 QALY compared to no barrier use, with an ICER of 23,614$/QALY. In probabilistic sensitivity analysis with a cost-effectiveness threshold of $20,000/QALY, HA/CMC barrier use at index operation only was more cost-effective than the no barrier strategy in 98.6% of iterations. HA/CMC barrier use at all operations was more cost-effective than the no-barrier strategy in 89.8% of iterations.

Conclusions/Discussion: The use of a HA/CMC barrier at the time of open colorectal cancer surgery appears to be cost-effective in preventing complications related to adhesions.

COMMUNICATING WITH HIGH RISK PATIENTS ABOUT COLORECTAL SURGERY.

P1729

A. De Roo, C. Vitous, S. Rivard, M. Bamdad, S. Jafri, M. Byrnes, P. Suwanabol
Ann Arbor, MI

Purpose/Background: The Institute of Medicine recommends aligning care with patients' values and preferences. While this emphasis is clear in the literature and guidelines, less is known about how surgeons achieve these goals in the real world, particularly in cases where patients are at high risk for poor outcomes: complications, prolonged hospitalizations, and functional limitations after surgery. Therefore, we sought to explore how colorectal surgeons approach decision making conversations with patients at high risk for poor outcomes, to inform future efforts to improve patient involvement in their care.

Methods/Interventions: As part of a larger study of 46 surgeons and their approaches to decision making and palliative care involvement for high risk patients, we interviewed 14 colorectal surgeons in Michigan. Surgeons participated in semi-structured, in-depth 30-60 minute interviews that included specific questions and probes regarding the decision making process. Interviews were coded first for broad content domains given the breadth of the interview guide. For this study, we then tailored our analysis to the domains "high risk decision making" and "factors influencing decision making" to create themes and derive understanding of decision making for these high risk situations. We applied interpretive analysis in iterative theme identification, with involvement from the entire research team. Transcribed interviews were coded in MaxQDA qualitative data analysis software.

Results/Outcome(s): Three major themes of high risk decision making were identified: 1) risk assessment and risk communication; 2) goals and expectations; and 3) external and internal motivating factors. In all interviews, surgeons reported a mechanism of risk assessment. Some explicitly referenced risk calculators, while others took a gestalt approach of accounting for patient comorbidities, and sometimes function and cognition, to assess risk. Risk assessment was also useful in communicating clinical expectations with the patient. The majority, but not all interviewed surgeons, discussed eliciting patient and/or family goals and expectations. While these two themes were frequently encountered across participant interviews, a variety of other external and internal motivating factors were introduced, including patient social support, ability of patients/families to comprehend the severity of disease and implications of surgery, case severity and acuity, limited time, and societal or institutional pressure.

Conclusions/Discussion: Surgeons rely on risk assessment, both through formal and informal means, to make decisions about high risk surgery. Most surgeons also elicit patients' goals and set expectations with family. However, much of surgical decision making is influenced by external and internal motivating factors, which diverges in accordance with surgeons' experiences, values, environment, and other individual modulations.

PERIOPERATIVE MANAGEMENT OF ANTITHROMBOTIC MEDICATIONS FOR MINOR COLORECTAL PROCEDURES: DOES IT IMPACT THE INCIDENCE OF BLEEDING COMPLICATIONS AFTER HEMORRHOIDECTOMY AND POLYPECTOMY?

P1730

K. Dean[1], H. Pavuluri[1], S. Fox[2], G. Blestel[1], A. Ewing[1], M. Mullins[1], E. Jones[1], B. Knoedler[1]
[1]*Greenville, SC;* [2]*Wilmington, NC*

Purpose/Background: Bleeding is a well-known risk associated with common minor colorectal procedures such as hemorrhoidectomy and endoscopic polypectomy. With the prevalence of anticoagulant and antiplatelet therapies in the aging patient population and the advent of the novel oral anticoagulants (NOACs), more information is needed to guide perioperative management of these medications. There is currently a paucity of data regarding the incidence of bleeding complications involved with minor colorectal procedures performed on patients receiving anticoagulation or antiplatelet therapy, especially on NOACs. The purpose of this study is to determine the incidence of bleeding after hemorrhoidectomy and polypectomy in patients on oral anticoagulants to guide perioperative management of antithrombotic medications.

Methods/Interventions: A retrospective chart review of 3510 patients who underwent hemorrhoidectomy (N=1160) or colonoscopy with polypectomy (N=2350) in the year 2016 was performed. Among other data points, we examined whether patients were on chronic anticoagulation or antiplatelet therapy, how the medication was managed perioperatively, the rate of bleeding complications and how bleeding complications were managed.

Results/Outcome(s): Of the 1160 patients who underwent hemorrhoidectomy, 15.49% of those on antithrombotic therapy reported postoperative bleeding versus 13.85% of those not on antithrombotic therapy (p=0.538). Over 70% of all reported post-hemorrhoidectomy bleeding events were minor and managed without readmission. Of

P1729

Theme	Exemplary Quotes
1. Risk assessment and risk communication	"I kind of use that as a tool to let them know that, you know, that it's a major surgery, and functionally there could be some changes moving forward, and they need to be aware of that. I kind of use that as a tool to kind of open that discussion agent." (Participant 2) "What is the right choice for the patient, being very explicit about those short- and long-term outcomes that are reasonable and expectable, to have potentially some things like the ACS ... risk of complications in the short-term for surgery." (Participant 9)
2. Goals and expectations	"I think you really want to try to get a sense from the patient as to what they're interested in and what they're not. And if you don't ask, you know, you won't find out until it's like much further along than you should have stopped." (Participant 25) "But I think just asking them, what is the, knowing that you can't have everything, and likely we can't reverse you. We can't do everything you want to do with the outcome that you're hoping for. What is it that, what is one thing we could do to make you better?" (Participant 11)
3. External and internal motivating factors	"I feel, for me, it's more of a pressure, you know, knowing that if you say, no, the family either will find someone else, or they'll get angry, potentially file a complaint, things like that. Or at least that's the fear. I mean, you don't know that that's going to happen, but that's kind of the fear. I mean, we, that's just kind of the climate in which we practice today." (Participant 29) "I think most physicians want to do the right thing and go into medicine for all the right reasons. You know, they want to help people. You know, like in the case that I described to you, I wanted to help that patient and his family. You know, I, and my decision to operate was really out of a desire to help. That being said, and I think most physicians make their decisions because they want to help, and they think they can." (Participant 21)

the 2350 patients who underwent colonoscopy with polypectomy, postoperative bleeding was reported in 4.24% of patients on antithrombotic therapy versus 3.36% of those not on antithrombotic therapy (p=0.347). There was no significant difference in the incidence of postoperative bleeding complications between patients on chronic antithrombotic therapy compared to those not prescribed antithrombotic therapy.

Conclusions/Discussion: Results of this study seem to indicate that the risk of bleeding complications after minor colorectal procedures is low even in patients prescribed antithrombotic therapy, and that standard perioperative management of these medications is adequate. The retrospective nature of this study presented challenges in data collection such as the frequent absence of documentation regarding the perioperative management of antithrombotic medications. Future prospective studies could focus more on specific perioperative management practices and whether or not bleeding risk is impacted by surgeons' awareness of antithrombotic medications.

LIPOSOMAL BUPIVACAINE REGIONAL BLOCKS ARE ASSOCIATED WITH DECREASED OPIOID USE FOLLOWING MAJOR INPATIENT COLORECTAL SURGERY.

P1731

E. Staudt, T. Aiken, P. Skelton, D. Livingston-Rosanoff, C. Hartwig, D. Lemaster, B. Hanlon, E. Lawson
Madison, WI

Purpose/Background: Regional blocks, such as the transversus abdominis plane (TAP) block, are associated with improved pain management and reduced opioid use following surgery. Liposomal bupivacaine was recently approved for use in TAP blocks and has a longer half-life than traditional bupivacaine hydrochloride. Our objective was to compare postoperative opioid use and pain management between patients who received a liposomal bupivacaine TAP block versus a traditional bupivacaine TAP block prior to undergoing major inpatient colorectal surgery.

Methods/Interventions: We conducted a retrospective analysis of a prospectively collected database of patients who underwent major inpatient colorectal procedures from January 2018 to September 2019 at an academic medical center. Patients that received traditional TAP blocks were compared to patients who received liposomal TAP blocks with respect to postoperative opioid usage (milligram morphine equivalents, MME), discharge opioid prescriptions, uncontrolled pain (pain score 9-10), and length of stay (LOS). Results were analyzed with Student's T-test and Pearson chi-squared tests. Multivariable regressions were performed for opioid usage, LOS, and uncontrolled pain adjusting for differences found on bivariate analysis.

Results/Outcome(s): A total of 381 patients were included in the analysis. Nearly half received a traditional TAP block (n=191, 50.1%) versus a liposomal TAP block (n=190, 49.9%). Patients who received liposomal TAP blocks were more likely to be male (52.1% vs 41.9%, p=0.05) and had lower BMI (27.1±6.2 vs 28.5±7.3, p=0.04) than patients who received traditional TAP blocks. A higher proportion of patients who received liposomal TAP blocks underwent laparoscopic procedures (45.8% vs 29.3% p<0.01). Patients who received liposomal TAP blocks had lower opioid usage during the 24-48 hours following surgery (32.0±64.3 vs 46.6±69.8 MME, p=0.04) and were prescribed less opioids at discharge (139.6±88.9 vs 171.6±104.1 MME, p=0.02). Despite less opioid use, patients who received liposomal TAP blocks reported less uncontrolled pain during their hospitalization (15.5% vs 24.5%, p=0.03). LOS was also shorter for patients who received liposomal TAP blocks (4.7±3.2 vs 6.0±5.4 days, p<0.01). These differences persisted on multivariable regression, with liposomal TAP blocks being associated with fewer opioids at discharge (-34.4 MME, p=0.01), shorter LOS (-1.2 days, p=0.01), and lower odds of uncontrolled pain (OR 0.53, 0.31-0.91, p=0.02).

Conclusions/Discussion: Liposomal TAP blocks were associated with reduced postoperative opioid usage, shorter LOS, and less uncontrolled pain in patients undergoing major inpatient colorectal surgery compared to patients who received a traditional TAP block. Liposomal TAP blocks represent a promising addition to current multimodality pain management strategies aimed at reducing postoperative opioid usage.

Table 1: Multivariable regression comparing patients who received a traditional bupivacaine TAP block versus a liposomal bupivacaine TAP block prior to major inpatient colorectal surgery

	Traditional Bupivacaine TAP Block	Liposomal Bupivacaine TAP Block	p-value
Inpatient opioid usage (MME)			
. **0-24 hours after surgery**	Ref	-13.1	0.14[i]
. **24-48 hours after surgery**	Ref	-13.5	0.06[i]
Opioid prescription at discharge (MME)	Ref	-34.4	**0.01**[i]
Length of stay	Ref	-1.2 days	**0.01**[i]
Uncontrolled Pain, * OR (95% CI)			
. **0-24 hours after surgery**	Ref	0.70 (0.19-2.64)	0.60[g]
. **24-48 hours after surgery**	Ref	1.91 (0.41-8.65)	0.40[g]
. **Total Admission**	Ref	0.53 (0.31-0.91)	**0.02**[g]

TAP, transversus abdominus plane; MME, morphine milligram equivalent; Ref, reference category; OR, odds ratio; CI, confidence interval.
Each regression analysis controls for sex, BMI, and laparoscopic status.
i = multivariable linear regression g = multivariable logistic regression
*Uncontrolled pain defined as a pain score of 9 or 10.

COST-DRIVERS OF ELECTIVE COLON AND RECTAL SURGERY.

P1732

S. Ranney, C. Dayman, A. Atherly, P. Cataldo
Burlington, VT

Purpose/Background: Elective Colon and Rectal Surgery (eCRS) is expensive. In 2015, the average cost of a colectomy in the USA was approaching $30,000. As a whole, US healthcare expenditure was $3.5 trillion, or approximately 18% of the GDP. Surgical costs alone are expected to account for 7.3% of US GDP by 2025. Finding

ways to reduce cost is critical to providing sustainable, high-quality surgical care. While some studies advocate the use of minimally invasive surgery (MIS) techniques to cut cost, other researchers have investigated the use of enhanced recovery protocols after surgery (ERAS) to reduce complications. However, few investigators have examined complications as economic drivers of cost. Furthermore, few studies directly compare multiple cost-drivers of eCRS to determine the most effective means of reducing total cost. The aim of this study is to examine the effects of MIS vs. open techniques, the use of ERAS protocols, and presence or absence of complications on total cost of eCRS. We hypothesize that decreasing complications (regardless of open vs. MIS or use of ERAS) is the most cost-effective method of decreasing eCRS costs.

Methods/Interventions: We utilized a retrospective, cohort methodology utilizing data abstracted from a single, academic institution from the last fiscal quarter of 2011 through 2018. eCRS procedures were included if they met both CPT code criteria and if they were performed by a board certified CRS surgeon. All CRS surgeons, except one, began participating in ERAS as of June 1, 2012. Significant complications were tracked using ICD 9 and ICD 10 diagnosis codes for surgical infection, hemorrhage, and return to the OR. Mean costs of procedures were used for all monetary calculations. Mean cost was the combined expenditure of both institutional and professional fees. A combination of univariate and multivariate regression analyses were used to compare the impact of surgical technique (MIS vs open), presence of complications, and use of ERAS on total cost of eCRS. All dollars were converted to 2019 US dollars.

Results/Outcome(s): In total, 1,039 surgeries were included and were performed by 5 different surgeons. In univariate analysis, the mean cost for all eCRS was $18,830. A regression analysis was used to account for patient and pathologic variability. Regardless of age, race, smoking status, BMI, anatomic location of surgery, and time course (yearly trends), we found that compared to the average cost for eCRS, MIS reduced cost by $4,009 ($p<0.001$), ERAS reduced cost by $5,759 ($p=0.007$), and complications increased cost by $18,010 ($p=0.001$) (Figure).

Conclusions/Discussion: Minimally invasive surgical techniques and use of ERAS protocols do decrease total cost, however minimizing complications is the most effective method for decreasing eCRS cost. While surgeons should appropriately employ minimally invasive techniques and ERAS protocols, continued efforts to minimize complications will have the most significant impact on overall costs.

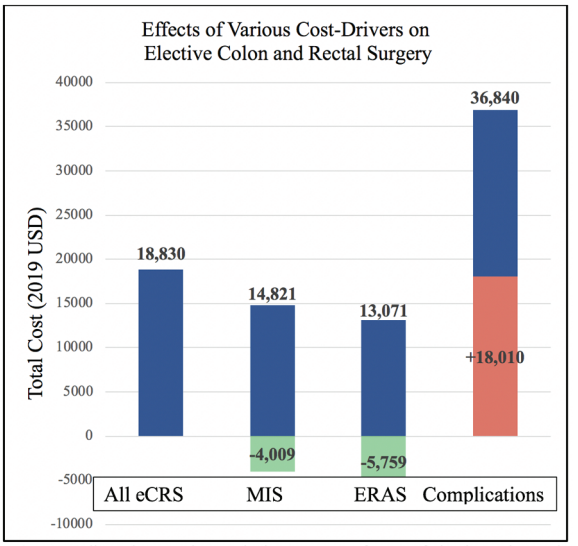


Figure: Adjusted regression analysis outcomes of costs of elective colon and rectal surgery (eCRS) between 2011 through 2018. All eCRS is the mean cost of all surgeries. Minimally Invasive Surgery (MIS) reduced cost by $4,009. ERAS reduced cost by $5,759. Complications increased cost by $18,010. All values are in 2019 USD and were statically significant ($p<0.05$).

POSTOPERATIVE RESULTS FOR PALLIATIVE STOMA CREATION TO RESOLVE BOWEL OBSTRUCTION DUE TO CANCER PROGRESSION.

P1734

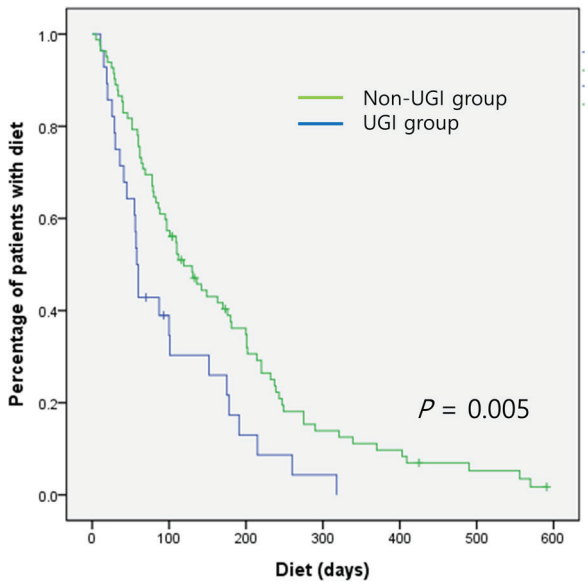
E. Han, S. Kim, J. Kim
Busan, Korea (the Republic of)

Purpose/Background: Obstruction of the small bowel or colon can occur due to various types of cancer and is particularly common in cases of peritoneal seeding. Stoma surgery is necessary for bowel decompression for patients with multiple lesions or extensive peritoneal metastasis. However, there are very few clinical studies on the post-operative progress of stoma surgery. Therefore, this study aimed to evaluate the surgical outcomes, such as duration of food intake and symptom improvement after palliative stoma creation in patients with bowel obstruction.

Methods/Interventions: This study included 110 stage IV patients who underwent palliative stoma creation for bowel obstruction secondary to peritoneal seeding(2010 - 2019) at our institute. The patients were stratified into the upper gastrointestinal cancer (UGI) and non-UGI groups according to the primary tumor site. The UGI group included 28 patients with stomach cancer, hepatobiliary and pancreas cancer, and the non-UGI group included the remaining 82 patients(52 patients had primary colorectal cancer; 17 patients, primary gynecologic cancer; 7 patients, primary genitourinary cancer; and 6 patients, primary lung cancer). Age and sex were investigated. Pre-operative pain was measured on the numerical pain scale (NPS; no pain was graded as 0, and the most severe pain was graded as 10). The duration of food intake was defined as the time from palliative stoma surgery to 3 days of fasting or death and was measured and confirmed using Kaplan-Meier analysis.

Results/Outcome(s): In this study, there were 65 (59.1%) male patients and 45 (40.9%) female patients. Regarding the stoma-related post-operative complications, 25 (22.7%) patients developed prolapse after surgery. Prolapse occurred in 17 of 55 patients (30.9%) who underwent palliative ileostomy and 8 of 55 patients(14.5%) who underwent palliative colostomy, and this difference was statistically significant (p = 0.041). The incidence of NPS was higher in the UGI group both preoperatively (6.8 ± 1.2 vs. 5.4 ± 1.1, p<0.001) and post-operatively (3.7 ± 1.8 vs. 1.8 ± 0.9, p<0.001). The duration of food intake was 91.3 ± 80.0 days in the UGI group, which was significantly shorter than that in the non-UGI group (157.8 ± 134.3 days, p=0.002). The time at which 50% patients in each group were fasting was 57 and 119 days in the UGI and non-UGI groups, respectively, which was statistically significant (p = 0.005). In multivariate analyses, the UGI group was identified as a significant factor[A2], with a hazard ratio of 1.86 (95% confidence interval: 1.16–2.97, p = 0.010).

Conclusions/Discussion: The results of this study suggest that patients with UGI cancer tend to feel acute pain before the occurrence of bowel obstruction and show shorter duration of food intake after palliative stoma surgery. Therefore, palliative stoma creation, should be actively considered before complete bowel obstruction in UGI cancer patients.



Kaplan–Meier plots comparing percentage for patients with diet between UGI and non-UGI group

POSTOPERATIVE PAIN AFTER ENHANCED RECOVERY PATHWAY ROBOTIC COLON AND RECTAL SURGERY: DOES SPECIMEN EXTRACTION SITE MATTER?

P1735

R. Brown, D. Rajkumar, M. Battaglia, R. Cleary
Ann Arbor, MI

Purpose/Background: Enhanced recovery pathways include minimally invasive surgery and opioid-sparing pain management strategies. The current opioid crisis has motivated surgeons to critically evaluate ways to balance postoperative pain while decreasing opioid use and opioids available for community diversion. The longest incision for robotic colorectal surgery is the specimen extraction site incision. Intracorporeal techniques allow the specimen extraction site to be at any location. This study was designed to determine if the Pfannenstiel location is associated with less pain and opioid use than other extraction sites.

Methods/Interventions: This is a retrospective cohort study of numeric pain scores and opioid use following elective enhanced recovery robotic colorectal resections comparing Pfannenstiel and other extraction site incisions at a single institution (7/2018 to 11/2019). All fentanyl was administered with epidurals or in the recovery room. Propensity score weighting was used to derive adjusted rates for numeric pain scores, inpatient opioid use, opioids prescribed at discharge, opioid refills after discharge, and other related outcomes. For comparing outcomes between groups, p-values were calculated using weighted regressions including several variables that differed after propensity weighting.

Results/Outcome(s): There were 137 (70.9%) cases with Pfannenstiel extraction site incisions and 56 (29.0%) at other locations (7 midline, 49 off-midline). There was no significant difference in transversus abdominis plane blocks and epidural analgesia between groups. Numeric pain scores, Overall Benefit of Analgesia Scores, inpatient postoperative opioid use, opioids prescribed at discharge and taken after discharge, and opioid refills were not significantly different between groups. Non-opioid pain medication (acetaminophen, non-steroidal-anti-inflammatory drugs, gabapentin) use was significantly less in the Pfannenstiel group (90.19% vs. 98.45%, p=0.006). Postoperative complications and readmissions were not different between groups.

Conclusions/Discussion: The Pfannenstiel incision as the extraction site choice in minimally invasive surgery is not associated with less postoperative pain or opioid use in patients having robotic colorectal resections. Institutional quality improvement should include ensuring the use of non-opioid pain medications and attention to comprehensive enhanced recovery multimodal opioid-sparing pain strategies.

COLECTOMY ACROSS THE BMI SPECTRUM: WORSE OUTCOMES AT THE EXTREMES OF WEIGHT.

P1736

J. Underhill, S. Jochum, E. Ritz, A. Gazal, J. Chin, D. Hayden, T. Saclarides, A. Bhama
Chicago, IL

Purpose/Background: Obesity is a well-known risk factor for poor postoperative outcomes following colorectal surgery. Obese patients frequently have more comorbidities, longer operations, and more postoperative complications compared to those with normal body mass index (BMI). Most studies have focused on patients with a BMI greater than 30 kg/m^2, without stratifying patients into morbidly obese or super-obese categories. Furthermore, the literature is sparse on the underweight population, with a BMI below 18.5. The aim of this study is to analyze the outcomes of underweight, morbidly obese, and super-obese patients undergoing open and minimally invasive colectomy.

Methods/Interventions: The National Surgical Quality Improvement Program Database from 2012-2016 was queried for minimally invasive and open colectomy. BMI categories were defined as: underweight (BMI < 18.5), normal (BMI 18.5-29.9), obese (BMI 30-39.9), morbidly obese (BMI 40-49.9), and super-obese (BMI >50). Multivariable logistic regression analysis was performed amongst the five groups to adjust for comorbidities, using "normal" as the reference range. Clinicopathologic data and 30-day outcomes were analyzed among the five BMI groups to examine postoperative outcomes.

Results/Outcome(s): 164,318 patients were included in the study: 5,036 (3.06%) underweight, 102,699 (62.5%) normal weight, 46,938 (28.6%) obese, 8,061 (4.91%) morbidly obese, and 1,584 (0.96%) super-obese. On univariate analysis, BMI significantly interacted with all measured outcomes, most notably: death, reoperation, cardiac arrest, pulmonary embolism, septic shock, and length of stay ($p<0.001$ for each). Multivariable regression analysis demonstrated that super-obese patients were more likely to experience death (OR 1.80, $p<0.0001$), reoperation (OR 1.42, $p=0.0004$), and septic shock (OR 2.29, $p<0.0001$). Underweight patients also experienced worse outcomes with higher mortality (OR 1.59, $p<0.0001$) and reoperation (OR 1.38, $p<0.0001$). Of note, when compared to those with normal BMI, obese patients did not have higher risk of death (OR 0.96, $p=0.3746$) nor

P1735 Weighted Outcomes Comparison of Specimen Extraction Site Incisions

Variable	Other (n=56)	Pfannenstiel (n=137)	p value
Numeric Pain Score Day 0	2.21 (2.83)	2.56 (2.42)	0.517
Numeric Pain Score Day 1	2.86 (1.92)	2.54 (1.77)	0.303
Numeric Pain Score Day 2	2.1 (2.11)	1.9 (1.86)	0.617
Numeric Pain Score Day 3	2.5 (2.05)	2.15 (1.96)	0.468
OBAS Day 1	2.89 (2.8)	3.78 (2.72)	0.279
OBAS Day 2	3.31 (3.11)	2.45 (2.78)	0.378
OBAS Day 3	2.95 (2.95)	3.06 (3.65)	0.938
Non-opioid Medication Usage	98.45%	90.19%	0.006
Inpatient Logged Opioids MME	5.71 (0.94)	5.73 (0.81)	0.893
Inpatient Logged Opioids MME - Excluding Fentanyl IVP and Epidural	3.22 (1.85)	3.54 (1.83)	0.494
Inpatient Logged Opioids MME - Excluding Fentanyl IVP	3.97 (2.48)	4.31 (2.13)	0.569
Opioid Prescribed at Discharge	50.97%	47.06%	0.717
Discharge Opioids (# 5mg oxycodone tablet equivalents)	5.3 (5.74)	6.34 (8.42)	0.414
Opioid Pills Taken After Discharge	2.41 (4.47)	2.93 (5.28)	0.592
Opioid Refills	0.17 (0.43)	0.42 (0.84)	0.148
Logged Length of Stay	1.31 (0.47)	1.47 (0.56)	0.118
Discharge Destination Not Home	7.46%	2.81%	0.148
Ileus	0%	2.93%	0.322
Surgical Site Infection	2.4%	0.72%	0.31
Urinary Tract Infection	2.51%	0.56%	0.193
Readmission	14.85%	6.95%	0.199

OBAS = Overall Benefit of Analgesia Score; MME = morphine milligram equivalents; IVP = intravenous push; mg = milligram

reoperation (OR 0.99, p=0.74), but did have more pulmonary embolism (OR 1.345, p=0.0298). Interestingly, these findings remained significant despite operative approach (minimally invasive versus open).

Conclusions/Discussion: This is the first study to evaluate colectomy in underweight and super-obese populations on a national level. Both underweight and super-obese patients had more reoperations and higher mortality than obese and normal-weight patients, demonstrating that any extreme weight has higher morbidity and mortality after colectomy, regardless of the operative approach. These findings should guide preoperative discussions regarding risks of surgery for any patients at the extremes of the BMI spectrum as well as plan for a prehabilitation intervention if surgery can be delayed.

THE ROLE OF NEGATIVE PRESSURE WOUND THERAPY WHEN PERFORMING ELECTIVE OPEN COLECTOMY.

P1738

S. Nguyen[2], S. Gillern[2], E. Lin[1], C. Yheulon[2], P. Sullivan[1]
[1]Atlanta, GA; [2]Honolulu, HI

Purpose/Background: The impact of Negative Pressure Wound Therapy (NPWT) as an adjunct to colorectal surgery is largely unknown. The purpose of this study is to determine if NPWT impacts wound complications during elective open colectomy.

Methods/Interventions: The ACS-NSQIP and colectomy targeted procedure databases were queried from 2014-2017 for patients undergoing non-emergent planned open colectomies. Groups were Propensity Score Matched for anastomosis type (ileo-colic, colo-colic, colo-rectal), age, BMI, diabetes, smoking, steroid use, wound classification, ASA Class, operative time, and wound layers closed. Wound complications were defined as superficial surgical site infection (SSI), deep incisional SSI, and dehiscence.

Results/Outcome(s): 14060 patients were identified, 87 who underwent simultaneous NPWT (0.62%). Non-NPWT patients were matched at a 5:1 ratio, producing 435 comparisons. There was no difference in wound complications between the groups (9.2% vs. 10.8%, p = 0.85). In addition, there were no differences when only including patients who had NPWT placed over closed skin (11.1% vs. 12.1%, p=1). On multivariate analysis, NPWT was not significantly associated with wound complications (OR 0.83, 95% CI 0.20-1.34).

Conclusions/Discussion: NPWT does not significantly reduce wound complications in open elective colectomies. Large randomized studies and more granular data are needed to ascertain if there is any benefit in select patient populations.

CREATION AND VALIDATION OF A GENERALIZABLE RISK MODEL FOR MORBIDITY AND MORTALITY AFTER PROCTECTOMY.

P1739

D. Keller, S. Nemeth, H. Simon, R. Kiran
New York, NY

Purpose/Background: There is increasing emphasis on stratifying frail and high-risk patients to improve surgical quality. Tools to date, such as the risk calculator and frailty index, fail to accurately predict risk at the individual institutional level. There is currently no tool available to predict the risk of postoperative complications for common, high-risk cases in colorectal surgery, such as proctectomy, using variables available at administrative and institutional levels. Our goal was to assess the ability and strength of a generalizable risk model created for combined overall morbidity/mortality after proctectomy.

Methods/Interventions: The 2016 NSQIP general and proctectomy-targeted participant user files (PUF) were evaluated for patients that underwent proctectomy. Variable selection was performed through logistic regression with backward stepwise selection on a training dataset to identify predictors for a combined morbidity/mortality outcome. Receiver operator characteristic (ROC) curves assessed the strength of model's sensitivity/specificity in predicting outcomes on the test set. Brier scores measured the accuracy of the predictions. For a simplified integer-valued risk model, scalar multiples were applied to the model coefficients, then rounded to the nearest integer. Those integers were then placed into a model to create predicted risks at each score value before replotting the ROC.

Results/Outcome(s): 3,654 patients were analyzed. The median age was 57 and 55.6% were male. 15.8% were on steroids, and 29.7% had neoadjuvant chemoradiotherapy. The main diagnosis was rectal cancer (41.2%) and most common procedure performed an open low anterior resection (29.2%). 91.1% were elective and 8.9% emergent cases. There was 29.8% overall morbidity, <1% mortality, 5.6% superficial site infection (SSI), 8.6% deep/organ space infection, 5.9% that required reoperation, and 16.9% readmitted within 30 days of surgery. The AUC for the logistic regression model was 0.66 CI[0.62-0.69] and the simplified, integer-valued risk model was 0.64 CI[0.61-0.68]. The Brier's Score was 0.19 for the regression model and 0.20 for the simplified model, showing the simplified model performs extremely well to the full model to predict outcomes.

Conclusions/Discussion: Proctectomy surgery is associated with a substantial risk of morbidity. A simplified predictive model performed extremely well against the full model, and the common variables used may make it generalizable. Next steps are to validate the model at the institutional level for preoperative counseling and risk-stratification in proctectomy patients.

UTILIZATION OF PALLIATIVE CARE TREATMENTS IN COLON CANCER PATIENTS AT THE END OF LIFE: THE EFFECT OF SURGICAL RESECTION.

P1740

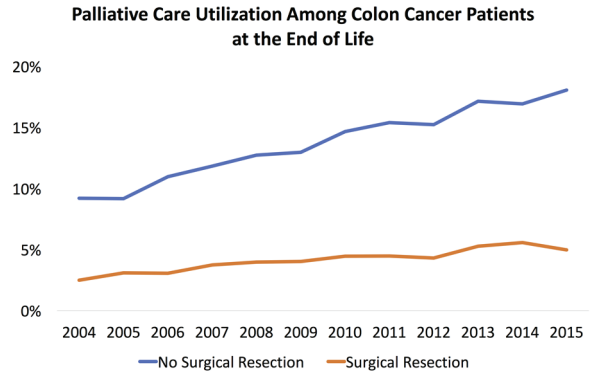
G. Lee[1], R. Goldstone[2], H. Kunitake[1], J. Cusack[1], D. Berger[1], L. Bordeianou[1], R. Ricciardi[1], C. Cauley[1]
[1]*Boston, MA;* [2]*Newton, MA*

Purpose/Background: Palliative care is associated with improved quality of life in patients with life-limiting illness. The aim of this study is to assess utilization of palliative care treatments in colon cancer patients at the end of life and determine the effect of non-palliative surgical resection on utilization. We hypothesize that palliative care utilization is increasing overall in this patient population, but with decreased utilization in patients who undergo surgical resection with non-palliative intent.

Methods/Interventions: This is a retrospective, multi-institution cohort study using the National Cancer Database (1/2004-12/2015). Patients were included if they had colon adenocarcinoma and died within 1 year of their cancer diagnosis. Demographic, clinical, treatment, and survival information were abstracted. The primary outcome measure was palliative care utilization. Utilization among patients who underwent surgical resection was compared to those who did not. Palliative care treatment was defined as treatment provided to alleviate symptoms. Surgical resection was defined as operations performed with the intent of removing the primary tumor (without the purpose of alleviating symptoms). Multivariable logistic regression was used to adjust for potential confounders. Sensitivity analysis to account for 30-day and 90-day post-operative mortality was performed.

Results/Outcome(s): 124,448 patients died within 1 year of their colon cancer diagnosis (13.7%). Of these, 9,230 (7.4%) underwent palliative treatments. The types of palliative treatment provided included surgical (1.6%), radiation (0.7%), chemotherapy (2.3%), pain management alone (1.2%), or a combination/other palliative treatments (1.6%). Utilization of palliative care increased over the study period from 4.3% to 10.6%. 80,791 patients (65.8%) who died within 1 year of their colon cancer diagnosis underwent a surgical resection. Use of palliative care treatments was significantly lower in patients who underwent surgical resection compared to those who did not (4.0% vs. 14.1%, $p<0.001$). Utilization of palliative care treatments did increase for both groups over the study period. On multivariable logistic regression (controlling for patient age, sex, race, comorbid disease burden, insurance status, hospital characteristics, year of diagnosis, clinical stage), surgical resection was associated with a lower odds of receiving palliative treatments (OR 0.49, 95% CI 0.46-0.52; $p<0.001$). Sensitivity analysis revealed similar findings.

Conclusions/Discussion: The use of palliative treatments is low among all colon cancer patients at the end of life. Overall utilization has been slowly increasing over time. However, use of palliative care treatments in patients undergoing non-palliative surgical resection remains low. Targeted interventions to improve palliation of surgical patients at the end of life are needed to improve utilization in this group.



CIRCULAR POLYETHYLENE DRAPE IN PREVENTION OF SURGICAL SITE INFECTION (COVER TRIAL): INTERIM ANALYSIS (NCT 03170843).

P1741

R. Yoo[1], H. Kim[2], H. Cho[1], B. Kye[1], W. Kang[2]
[1]*Suwon, Korea (the Republic of);* [2]*Seoul, Korea (the Republic of)*

Purpose/Background: Surgical site infection (SSI) after abdominal surgery is significantly associated with an increased socioeconomic burden and reduced quality of life. The prevalence of SSI is reported as high as 40% in cases of fecal contamination. However, the current guideline to reduce SSI is limited to elective abdominal surgery. It is necessary to evaluate a preventive intervention to reduce SSI in an emergency setting of bowel perforation or a state of a dirty, infected wound. The COVER trial investigates the effectiveness of a dual-ring circular plastic wound protector to reduce the rate of SSI in patients undergoing open gastrointestinal (GI) surgery.

Methods/Interventions: It is a multi-centered, randomized controlled trial with two parallel arms, one using a wound protector and the other using conventional surgical dressing gauze. Inclusion criteria are the age of 18 to 75; Open laparotomy; surgery for the stomach, small intestine, or colon and rectum. Patients with any of the following will be excluded: presence of concurrent infection in the abdominal wall; open conversion from laparoscopic surgery; presence of poor nutritional status indicated by nutrition risk screening (NRS) 2002 score greater than 3; patients undergoing combined hepatobiliary surgery; pregnant or breast-feeding women; moderate to severe immunosuppression state, defined as previous organ or bone marrow

transplantation, concurrent steroid administration, concurrent administration of other immunosuppressive agent or chemotherapeutic agent within the last 2 weeks prior to trial intervention. The randomization was stratified by the wound classification – clean, clean-contaminated versus contaminated, dirty/infected. The primary outcome will measure the rate of SSI in two groups. Statistical analysis of the primary endpoint is the intention-to-treat population. The sample size is determined to achieve a study power of 80% at 95% 2-sided confidence limits. This analysis reports the interim result of the trial.

Results/Outcome(s): From June 15th, 2017 to May 1st, 2019, 207 patients, 80 of the wound protector group and 79 of the control group, were enrolled. Eighteen patients in the wound protector group were diagnosed with SSI, presenting the SSI rate as 22.5%. The rate of SSI was 36.7% for the control group, 29 out of 79 patients. The rate of SSI was significantly lower in the wound protector group than in the control group, $p = 0.037$.

Conclusions/Discussion: The wound protector seems to reduce the rate of SSI compared to the conventional surgical dressing gauze, used in GI tract surgery even in the presence of dirty, infected wounds.

IMPACT OF PRE-OPERATIVE ANEMIA ON ANASTOMOTIC LEAK AND POST-OPERATIVE MORBIDITY AFTER COLECTOMY.

P1743

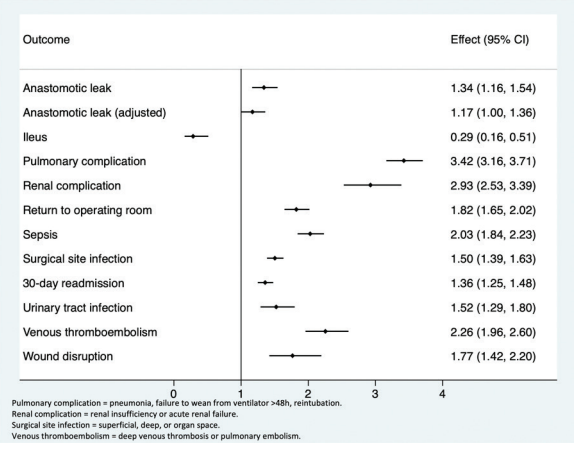
S. Hahn, C. Beauharnais, S. Hill, J. Davids, P. Sturrock, J. Maykel, K. Alavi
Worcester, MA

Purpose/Background: Anastomotic leak (AL) is a dreaded complication after colectomy. Pre-operative anemia is often encountered in patients undergoing colon surgery; however, large studies analyzing the effect of anemia on anastomotic leaks and other post-operative morbidity are sparse. This study aims to evaluate the potential role of pre-operative anemia on patient outcomes.

Methods/Interventions: Data from the 2015-2017 targeted colectomy NSQIP database were extracted. Pre-operative anemia was defined as hematocrit<27. Descriptive statistics and a forward stepwise multivariable logistic regression model were used to determine the association of pre-operative anemia with anastomotic leak. Univariable logistic regression was used to determine the association of pre-operative anemia with other post-operative complications, such as pulmonary complications, sepsis, etc.

Results/Outcome(s): A total of 100,465 colectomies were analyzed, of which 5% of had pre-operative anemia (n=5,009). Anemic patients were more likely to be younger, female, African-American, ASA 3/4, underweight (BMI<18), diabetic, functionally dependent, and have functional dyspnea, COPD, HTN, CHF, ESRD, a bleeding disorder, and >10% weight loss pre-operatively. There was a total of 3,321 AL (3%), of which 216 (7%) were anemic. On univariable logistic regression, anemia was associated with higher odds of post-operative complications, except anemia had a protective effect on ileus ($p<0.001$, Graph). In particular, patients with pre-operative anemia had 34% higher odds of AL ($p<0.001$). On multivariable analysis, anemia was associated with AL (OR 1.17, $p=0.04$, 95% CI 1.0-1.4), after adjustment for statistically significant covariates of pre-operative antibiotics, operative time, pre-operative sepsis, smoking, ASA3/4, steroid use and race.

Conclusions/Discussion: An association was observed between pre-operative anemia and increased post-operative morbidity. This relationship may reflect that anemia is a marker of overall increasing patient disease burden and likelihood of post-operative complications. Further prospective data is needed to examine if pre-operative optimization such as transfusion to mitigate anemia may help to improve overall patient outcomes.



The Effects of Pre-operative Anemia on Post-operative Morbidities

SAFETY AND OUTCOMES OF ISOLATED DIVERTING ILEOSTOMY VERSUS COLOSTOMY: A NSQIP ANALYSIS OF 3,564 PATIENTS.

P1744

P. McClelland, O. Bolaji, M. Zenilman, G. Ozuner
Brooklyn, NY

Purpose/Background: Previous studies have analyzed defunctioning stomata in association with distal colorectal procedures, but the overall outcomes of the two different types of stomas when used for pure diversion are not well-established. This study seeks to compare outcomes in patients undergoing isolated colostomy versus ileostomy without any associated colorectal procedure.

Methods/Interventions: This is a retrospective cohort study using NSQIP data from 2015 to 2017. All adult patients (aged 18-89 years) who had a colostomy or ileostomy without any other associated colorectal

P1744 Preoperative and intraoperative characteristics of patients undergoing ileostomy vs. colostomy, open vs. laparoscopic approach

	COLOSTOMY (*n* = 2732)			ILEOSTOMY (*n* = 832)			TOTAL (*n* = 3564)
	Open (*n* = 1092)	Laparoscopic (*n* = 1640)	*p*-value	Open (*n* = 317)	Laparoscopic (*n* = 515)	*p*-value	
Sex (F)	603 (55.2%)	803 (49.0%)	0.001	167 (52.7%)	279 (54.2%)	0.675	1852 (52.0%)
Age, years (mean ± SD)	62.9 ± 14.3	59.8 ± 15.6	< 0.001	55.4 ± 15.7	54.1 ± 16.7	0.284	59.5 ± 15.7
BMI, kg/m^2 (mean ± SD)	26.3 ± 7.0	26.7 ± 7.0	0.170	25.1 ± 6.5	26.0 ± 6.8	0.071	26.3 ± 7.0
Diabetes			0.623			0.977	
No	905 (82.9%)	1349 (82.3%)		283 (89.3%)	459 (89.1%)		2996 (84.1%)
Non-Insulin Dependent	97 (8.9%)	147 (9.0%)		16 (5.0%)	27 (5.2%)		287 (8.1%)
Insulin Dependent	90 (8.2%)	144 (8.8%)		18 (5.7%)	29 (5.6%)		281 (7.9%)
Prior functional status (Independent)	872 (81.0%)	1283 (78.9%)	0.076	287 (91.1%)	479 (93.2%)	0.391	2921 (82.7%)
Hypertension (Yes)	518 (47.4%)	686 (41.8%)	0.004	89 (28.1%)	151 (29.3%)	0.700	1444 (40.5%)
Preoperative renal failure (Yes)	11 (1.0%)	7 (0.4%)	0.066	2 (0.6%)	0 (0.0%)	0.071	20 (0.6%)
Undergoing steroid therapy (Yes)	71 (6.5%)	118 (7.2%)	0.484	40 (12.6%)	85 (16.5%)	0.128	314 (8.8%)
ASA Classification			< 0.001			0.120	
ASA I (Healthy)	4 (0.4%)	13 (0.8%)		5 (1.6%)	2 (0.4%)		24 (0.7%)
ASA II (Mild Systemic Disease)	175 (16.1%)	326 (19.9%)		98 (30.9%)	182 (35.5%)		781 (22.0%)
ASA III (Severe Systemic Disease)	705 (64.7%)	1051 (64.2%)		169 (53.3%)	282 (55.0%)		2207 (62.0%)
ASA IV (Life-Threatening Disease)	203 (18.6%)	248 (15.1%)		45 (14.2%)	47 (9.2%)		543 (15.3%)
ASA V (Moribund)	2 (0.2%)	0 (0.0%)		0 (0.0%)	0 (0.0%)		2 (0.1%)
Wound Classification			< 0.001			0.003	
Clean	14 (1.3%)	20 (1.2%)		8 (2.5%)	15 (2.9%)		57 (1.6%)
Clean/ Contaminated	847 (77.6%)	1354 (82.6%)		245 (77.3%)	434 (84.3%)		2880 (80.8%)
Contaminated	141 (12.9%)	188 (11.5%)		36 (11.4%)	44 (8.5%)		409 (11.5%)
Dirty/Infected	90 (8.2%)	78 (4.8%)		28 (8.8%)	22 (4.3%)		218 (6.1%)
Operative duration, min (mean ± SD)	76.0 ± 55.0	79.5 ± 39.1	0.051	102.2 ± 79.8	75.0 ± 54.1	< 0.001	79.8 ± 51.7

procedure were analyzed. Individuals whose index CPT code corresponded with ileostomy or colostomy creation were included in the analysis. Patients who had any concurrent procedures or emergency ostomy creation were excluded. Demographic data and comorbidities were used for covariate analysis. Primary outcomes of interest were superficial, deep, and organ-space wound infections. Secondary outcomes included 30-day morbidity and length of hospital stay.

Results/Outcome(s): The demographics, comorbid conditions, and operative details of the 3,564 patients evaluated are shown in the accompanying table. In both colostomy and ileostomy groups, approximately 60% of stomas were created laparoscopically. Colostomy patients were older (61.0 ± 15.1 vs. 54.6 ± 16.3 years, $p < 0.001$) and had higher BMI (26.5 ± 7.0 vs. 25.7 ± 16.3 kg/m^2, $p = 0.003$). Ileostomy patients were more functionally independent (92.4% vs. 79.8%, $p < 0.001$) and had lower ASA class (ASA < 3: 34.7% vs. 19.1%, $p < 0.001$). Despite this, ileostomy patients had longer operative durations (mean 85.4 ± 66.3 min vs. 78.1 ± 46.1 min, $p < 0.001$), increased risk of renal insufficiency [OR 6.80, 95%CI 3.20-14.4, $p < 0.001$], increased risk of septic shock [OR 2.23, 95%CI 1.19-4.16, $p = 0.012$], and prolonged hospital stay compared to colostomy patients (5.0 [IQR 3.0-9.0] vs. 4.0 [IQR 3.0-7.0] days, $p = 0.013$). In the colostomy cohort, laparoscopic approach was associated with a decreased risk of superficial surgical site infection [OR 0.48, 95%CI 0.30-0.76, $p = 0.002$] and decreased time from operation to discharge (4.0 [IQR 3.0-7.0] vs. 5.0 [IQR 3.0-8.0] days, $p < 0.001$). Within the ileostomy cohort, laparoscopic approach was associated with decreased risk of organ space infection, pneumonia, bleeding, and sepsis, although none of these associations were significant in the multivariate analysis.

Conclusions/Discussion: Ileostomy and colostomy are safe procedures. Postoperative renal insufficiency is more commonly seen in patients undergoing ileostomy. Patients having an ileostomy should be carefully evaluated prior to surgery and postoperatively monitored for renal function. For colostomy creation, a laparascopic approach is preferable to minimize superficial wound infection and to decrease length of hospital stay.

SURGICAL CORRECTION (MODIFIED DUHAMEL PROCEDURE) AMONG ADULTS WITH HIRSCHSPRUNG'S DISEASE IN THE PHILIPPINES.

P1745

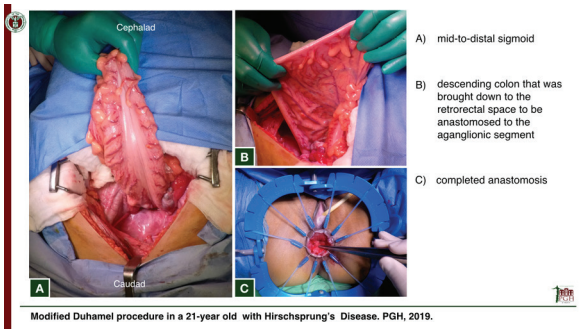
R. Estrada, M. Lopez, M. Tampo, M. Villanueva, A. Crisostomo, H. Monroy
Manila, Philippines

Purpose/Background: Hirschsprung's disease (HD) is rare in adults as majority of cases are corrected in infancy or childhood. We aimed to describe the profile of patients with HD who reached adulthood without having undergone corrective surgery. We also aimed to determine the outcomes of performing a modified Duhamel procedure in these patients in terms of morbidity and mortality.

Methods/Interventions: This retrospective study included adult patients diagnosed with HD who reached adulthood without having undergone definitive repair and managed surgically by the Division of Colorectal Surgery, Philippine General Hospital from January 1, 2004 to December 31, 2019. Data from our electronic database and hospital records were used to fill out a Data Collection Form. Frequencies and percentages were computed. A modified Duhamel procedure was performed through a midline laparotomy incision, with left colonic mobilization. Care was taken in mobilizing the rectum with an attempt to limit the dissection posteriorly to avoid nerve injury. The rectum was divided above the anterior peritoneal reflection, and resection of the aganglionic segment was performed proximal to the level of aganglionosis or proximal to an identified pale, toneless, rubbery segment of bowel. During the perineal portion of the surgery, the proximal colon was directed to the posterior rectum and a retrorectal anastomosis was performed. A side-to-side anastomosis between the common wall of the aganglionic rectum and the ganglionic colon was then created using a linear stapler. A proximal diversion was created, if none was yet in place.

Results/Outcome(s): Twenty patients were included. Most were male (M:F ratio 3:1), aged 18 to 41 years (mean 28.8 years). Most were from Luzon (95.0%, 19/20), with 6 (30.0%) from the National Capital Region. The most common presenting symptom was constipation (70.0%, 14/20), followed by abdominal pain (30%, 6/20), abdominal distension (40.0%, 6/20). There were 6 diagnosed before one year of age (30.0%), 6 in childhood (30.0%) and 8 in adulthood (40.0%). Almost all (95.0%, 19/20) patients had a proximal bowel diversion prior to definitive surgery, with a transverse loop colostomy (55.0%, 11/20) being the most common. The mean time from diagnosis to definitive surgery was 11.1 years (0.2-22.0 years). Eleven (55.0%) have since undergone stoma reversal. All reported to be subjectively satisfied with their anorectal function. There was only one (5.0%) morbidity, a superficial surgical site infection. No mortalities were reported.

Conclusions/Discussion: We reported a series of adult patients with HD who underwent definitive surgery using the modified Duhamel procedure in our institution. Outcomes after 30 days showed good results with minimal morbidity and no mortalities. An attempt to track the patients and document outcomes related to function with an objective measure, particularly those who have undergone stoma reversal, would be ideal.



Modified Duhamel procedure in a 21-year old with Hirschsprung's Disease. PGH, 2019.

TWO CASES OF MALROTATION IN THE ADULT PRESENTING AS PARTIAL GUT OBSTRUCTION.

P1747

M. Cabanilla-Manuntag, M. Lopez
Manila, Philippines

Purpose/Background: In the adult, intestinal malrotation is an often-overlooked etiology for partial gut obstruction because of its rarity. We present two cases of intestinal malrotation in adults that were seen and managed at the Philippine General Hospital.

Methods/Interventions: We performed a review of the patients' hospital and operative records.

Results/Outcome(s): Case 1. A 59-year old male presented with sudden onset epigastric pain, post-prandial vomiting, and abdominal distention. Physical examination showed a distended and tympanitic abdomen, with hypoactive bowel sounds. There was no palpable mass. CT scan and upper GI series showed dilatation of the stomach and the duodenum with an abrupt cut-off at the duodeno-jejunal junction. The small bowels were mostly at the right hemiabdomen. A Ladd's procedure was performed. The patient was sent home well. Case 2. A 37-year old male sought consult for recurrent vomiting. Four months prior to consult, patient had had an abdominal CT scan done that showed dilatation of the stomach and duodenum prior to an abrupt cut-off at the duodenojejunal area, with minimal passage of contrast beyond this point. On consult with us, he was seen with a scaphoid, non-tender abdomen with normoactive bowel sounds. A Ladd's procedure was performed as well.

Conclusions/Discussion: Intestinal obstruction from a midgut volvulus is a rare pathology in the adult. The mainstay of management is still surgery, regardless of age, to avoid the complications of an untreated disease. Ladd's procedure is the surgical management of choice. It was first described by William Ladd for pediatric patients in 1936 and consists of four steps: 1) division of Ladd's bands overlying the duodenum, 2) widening of the narrowed root of the small bowel mesentery by mobilization of the duodenum and release of the adhesions around the SMA, 3) counterclockwise detorsion of the midgut volvulus, and 4) an appendectomy. The judicious use of imaging modalities allows for reliable identification of this pathology and limiting delay in management.

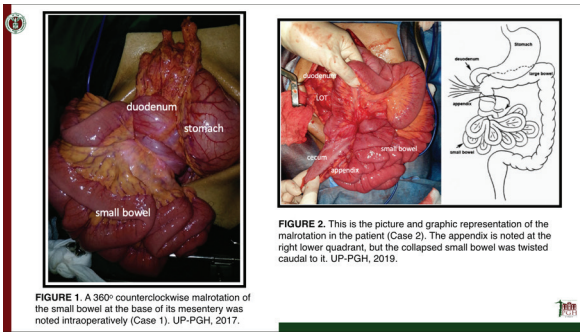


FIGURE 1. A 360° counterclockwise malrotation of the small bowel at the base of its mesentery was noted intraoperatively (Case 1). UP-PGH, 2017.

FIGURE 2. This is the picture and graphic representation of the malrotation in the patient (Case 2). The appendix is noted at the right lower quadrant, but the collapsed small bowel was twisted caudal to it. UP-PGH, 2019.

A CASE REPORT OF STONES AND CROHN'S.

P1748

D. Kuehler, M. Rakhmanine, D. Latta, J. Park
Allentown, PA

Purpose/Background: Gallstone ileus (GI) is a rare cause of mechanical small bowel obstruction accounting for 1-4% of obstructions in patients under 65. GI occurs from passage of one or multiple gallstones through a biliary-enteric fistula into the intestinal lumen, resulting in a mechanical bowel obstruction from stone impaction. Patients with Crohn's disease (CD) may present with purely inflammatory pathology, however at the time of presentation, 11% are found to have strictures and 16% have fistulae. Strictures, fistulae, and abscesses are the most common indication for operative management, requiring surgery in 40-71% of patients within 10 years of diagnosis. Strictures can occur anywhere in the gastrointestinal tract, most commonly in the ileum and ileocolonic region. These strictures may present with clinical symptoms of intestinal obstruction. Very few cases of gallstone ileus associated with CD have been reported. Here we present a case of gallstone ileus secondary to CD with associated stricture. A 67-year-old male with history of CD and subtotal colectomy presented with 24 hours of obstructive symptoms. Computed tomography was notable for a gallstone within the terminal ileum resulting in a GI.

Methods/Interventions: The patient was trialed on a course of solumedrol to decrease inflammation of an acute Crohn's flare and allow for possible passage of the gallstone. After 3 days of non-operative management and nasogastric decompression, repeat computed tomography showed no advancement of the gallstone. Having failed medical management, an exploratory laparotomy, small bowel resection, and partial cholecystectomy was performed. Intraoperatively, the patient was noted to have evidence of CD with stricture, creeping fat and thickened bowel wall proximal to the ileorectal anastomosis. Small bowel resection with end ileostomy was performed as the patient had recently received an integrin receptor agonist and was malnourished.

Results/Outcome(s): Post-operative course was complicated only by a prolonged ileus. He recovered well and his diet was slowly advanced with discharge on post-operative day 13. Five months later, the patient underwent ileostomy reversal with ileorectal anastomosis. He recovered well and was discharged on post-operative day 2.

Conclusions/Discussion: Traditional treatment of GI is enterolithotomy with delayed or primary cholecystectomy. Conversely, CD is preferentially treated medically with strictures being treated via endoscopic balloon dilation, strictureplasty, and lastly bowel resection. Strictures secondary to CD may cause obstruction of gallstones in patients who have developed a biliary-enteric fistula. Therefore, stricturing Crohn's may be more susceptible to gallstone ileus than an otherwise healthy patient. In a case of these two concurrent disease processes, it would be prudent to avoid enterolithotomy so as to prevent further stricturing in the setting of CD. Instead, attempted medical management followed by surgical resection if failed would be preferred.

SYNERGISTIC EFFECT OF DOXYCYCLINE-COATED STAPLES IN ENTERIC ANASTOMOSIS: AN IN-VITRO STUDY.

P1749

Y. Yurko[1], A. Vertegel[2], M. Bredikhin[2]
[1]*Greenville, SC;* [2]*Clemson, SC*

Purpose/Background: Failure of healing surgical wound with conventional therapy can lead to significant morbidity. Anastomotic leak is a dangerous complication following colorectal surgery, with mortality ranging from 0.5-29%. Numerous potential causes including technique, significant co-morbidities, immunosuppression etc., and switch of E. Coli to the pathogenic phenotype. It is suggested that these leaks can either originate or progress from the elevated activity of matrix metalloproteinases (MMPs). MMPs activation is a response to a variety of signals, and it was shown that the disturbance in local microflora can trigger host immune system to overproduce MMPs. Doxycycline is the only FDA-approved synthetic MMP inhibitor with bacteriostatic properties. Therefore, it acts synergistically by inhibiting MMPs directly and through antimicrobial effect. In our experiment, we coated the titanium staples normally used in intestinal anastomosis with hydrophobic form doxycycline. We hypothesize that this targeted delivery of doxycycline will reduce anastomotic disruption.

Methods/Interventions: The disposable DST SeriesTM titanium staples (3.8 mm) were coated in the ethanol solution of doxycycline monohydrate (Alfa Aesar) and then were air-dried under sterile conditions. For all experiments, the control staples followed the same procedure but with pure ethanol. The antimicrobial efficacy of the coated staples was investigated in vitro on E. Coli (ATCC, 51739). Additionally, MMP-inhibitory characteristics were explored in vitro using mouse macrophages (ATCC, Raw 264.7) culture and with commercially available MMP activity kit (AnaSpec).

Results/Outcome(s): The maximum binding yield per one staple was 5 ug at coating concentration 15 mg/ml. As expected, the coated staples showed bacteriostatic activity. One such staple was able to prevent bacteria from reproducing at 5*10^4 CFU/ml, whereas bacteria proliferated readily in the presence of a control staple. Furthermore, cell cultures incubated with coated staples contained significantly lower levels of active MMPs compared to control cultures after induction with lipopolysaccharide. We have also incubated recombinant human MMP-12 together with the coated staples and measured its activity using a fluorometric kit; activity was significantly reduced compared to the control staples

Conclusions/Discussion: We were able to show that the coated staples exhibited bacteriostatic and MMP-inhibitory properties in vitro. In the future we plan to conduct the study with intestinal macrophages to resemble intestinal environment more closely. We are also currently working on modifying the surface of staple to increase the binding yield of the drug. We are taking advantage of the recent advances in the creation of nanoporous titanium which can be coupled with the application of polymeric matrices.

LAPAROSCOPIC HARTMANN'S REVERSAL: LESSONS LEARNED.

P1750

J. Koury, S. Atkinson
Hummelstown, PA

Purpose/Background: Multiple studies have documented that laparoscopic Hartmann's reversal is safe and feasible. In addition, it may be associated with better outcomes including a shorter length of stay, reduced complication rate and reduced morbidity. We present our experience with laparoscopic Hartmann's reversal in a large teaching hospital and share important technical tips for success.

Methods/Interventions: We retrospectively analyzed the records of 15 patients (8 males, 7 females) who underwent straight laparoscopic Hartmann's reversal by a single surgeon in a large community teaching hospital over a period of three years. We offered the laparoscopic approach to colostomy reversal to all patients with a descending colon colostomy regardless of the indication for the colostomy, age, body mass index (BMI), or any other prior abdominal surgeries. We reviewed the following patient data including: age at reversal, American Society of Anesthesia score (ASA), BMI, Charlson Comorbidity Index score, initial indication for colostomy, and time before reversal. We report our outcomes including operative time, need for conversion to laparotomy, complications, length of stay, mortality, and if a loop ileostomy was performed.

Results/Outcome(s): Diverticular disease was the most common reason for the colostomy. The mean age at reversal was 55 years old (28-79), mean ASA score was 2.4 (2-3), mean BMI was 29.81 (20.8-48.7), mean Charlson Index score was 2.1 (0-6), and the mean time before reversal was 374.5 days (42-1809). The average length of stay was 5.5 days (2-12). Four patients required conversion to an open procedure for the following reasons: dense adhesions (2), pelvic bleeding (1), and staple line leak (1). Operative time ranged from 210 to 510 minutes with a mean of 321 minutes. Fourteen patients (93%) had their colostomies successfully reversed and eleven of the fourteen reversals (78%) were successfully completed laparoscopically. All patients required resection of the rectal stump to facilitate easy passage of the circular stapler for a double stapled end-to-end circular anastomosis. Rectal mobilization and division to facilitate passage of the stapler was more challenging in females. Four patients required loop ileostomies. There were no mortalities or anastomotic leaks and all patients with ileostomies had successful reversals (Table 1).

P1750 Postoperative Complications

Mortality (30 day)	0
Reoperation within 30 days (unplanned)	0
Anastomotic leak	0
Cardiac complications	0
Respiratory complications	0
Renal Failure	0
Enterocutaneous Fistula	0
Surgical Site Infection	3
Ileus	0
Bowel Obstruction	0
Intra-abdominal abscess	1
Readmission (30 day)	1
Reoperation within 30 days (planned)	1
Sepsis	0

Conclusions/Discussion: The laparoscopic Hartmann's reversal is challenging but is safe and feasible. Our results for laparoscopic Hartmann's reversal are comparable to those of other published series. In our series, all patients required rectal mobilization and resection of the prior staple line. The need for this is often not reported in published series. We believe mobilization and division of the rectum is critical to a successful anastomosis and found it to be more difficult in female patients. This likely contributed to our low anastomotic leak rate and we believe it should be part of every Hartmann's reversal both open and laparoscopic.

INTESTINAL OBSTRUCTION CAUSED BY A PERSIMMON BEZOAR: A CASE REPORT.

P1751

B. Hu
Hefei, China

Purpose/Background: The intestinal obstruction caused by persimmon bezoars is rare, making the persimmon bezoar, a least likely trigger of intestinal obstruction, being often overlooked.

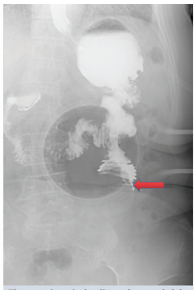
Methods/Interventions: We herein report an intestinal obstruction in a 63-year-old Chinese female who ate a mass of persimmons in fall. The patient was hospitalized after 3 weeks' upper abdominal pain and emesis. Three weeks ago, the patient-with no reported fever and icterus-was suffered from dull pain in the upper abdomen and emesis without any obvious triggers, with the vomituses being gastric contents along with bile. Based on the patient's history of distal gastrectomy due to gastric ulcer 11 years ago, we initially diagnosed her with intestinal obstruction. After being hospitalized, the abdominal CT scan reported a 5*5cm^2 low-density circular shadow in the enteric cavity of small intestine; the gastrointestinal radiography revealed the filling defeat of output loop in small intestine; the gastroscope showed that, in output loop of small intestine, a big persimmon bezoar measured around 5cm was stuck in the enteric cavity. We hereby confirmed it is a intestinal obstruction evoked by the persimmon bezoar after distal gastrectomy. Above all, we recommended the patient to drink cola and sodium bicarbonate to soften the

persimmon bezoar. Then, by repeatedly using the endoloop to smash the persimmon bezoar can we take out small parts of persimmon beoar during gastroscope. Several patients with the gastrolithiasis admitted to our hospital in fall were cured in the above-mentioned method and fully recovered. However, after 3 times of using gastroscope to smash and extract the persimmon bezoar in 8 days, the persimmon bezoar, stuck in the jejunum, was too big to to be successfully taken out. Considering the symptoms have lasted a month, we immediately performed the jejunotomy to take out the persimmon bezoar, during which process we saw a 7*5*5cm^3 persimmon bezoar lying on the output loop.

Results/Outcome(s): The persimmon bezoar was successfully taken out. Three days after the surgery, the patient vented and defecated; seven days after the surgery, the patient fully recovered and left the hospital.

Conclusions/Discussion: In this case, the clear diagnosis is made by consulting the patient's dietary history-a pivotal part-along with the radiography, the endoscope and the surgery. The treatments involve using cola and sodium bicarbonate to soften the persimmon bezoar, smashing and extracting it by the endoscope and last, the surgical operation.

The abdominal CT scan reported a 5*5cm^2 low-density circular shadow in the enteric cavity of small intestine.



The gastrointestinal radiography revealed the filling defeat of output loop in small intestine.

During the jejunotomy, we saw a 7*5*5cm^3 persimmon bezoar lying on the output loop.

A PROSPECTIVE STUDY OF DISCREPANCY BETWEEN CLINICAL AND PATHOLOGICAL DIAGNOSIS OF APPENDICEAL MUCINOUS NEOPLASM.

P1752

H. Kwak, J. Chung, J. Ju
Gwangju, Korea (the Republic of)

Purpose/Background: Appendiceal tumoral lesions can occur as benign, malignant, or borderline disease. Determination of the extent of surgery through accurate diagnosis is important in these tumoral lesions. In this study, we assessed the accuracy of preoperative computed tomography (CT) and identified the factors affecting diagnosis.

Methods/Interventions: Patients diagnosed or strongly suspected from July 2016 to June 2019 with appendiceal mucocele or mucinous neoplasm using abdominal CT were included in the study. All the patients underwent single-incision laparoscopic cecectomy with the margin of cecum secured at least 2 cm from the appendiceal base. To compare blood test results and CT findings, the patients were divided into a mucinous and a non-mucinous group according to pathology.

Results/Outcome(s): The total number of patients included in this study was 54 and biopsy confirmed appendiceal mucinous neoplasms in 39 of them. With CT, the accuracy of diagnosis was 89.7%. The mean age of the mucinous group was greater than that of the non-mucinous group ($p=0.035$). CT showed that the maximum diameter of appendiceal tumor in the mucinous group was greater than that in the non-mucinous group ($p<0.001$). Calcification was found only in the appendix of patients in the mucinous group ($p=0.012$). Multivariate analysis revealed that lager tumor diameter was a factor of diagnosis for appendiceal mucinous neoplasm.

Conclusions/Discussion: The accuracy of preoperative diagnosis of appendiceal mucinous neoplasms in this study was 89.7%. Blood test results did not provide differential diagnosis, and the larger the diameter of appendiceal tumor on CT, the more accurate the diagnosis.

TURNBULL COLOSTOMY: TWO SUCCESSFUL UTILIZATIONS OF THE PROCEDURE.

P1742

S. Jochum, A. Bhama
Chicago, IL

Purpose/Background: The Turnbull "blowhole" colostomy has been utilized less frequently since the improvement of medical treatment and endoscopic techniques to prevent and treat megacolon and large bowel obstructions (LBO). However, this quick procedure still can be utilized in select patients. Two patients recently underwent this operation for LBO.

Methods/Interventions: The first patient is a 54 year old male with a history of widely metastatic recurrent gastric cancer treated with radiation, chemotherapy (CT), and gastrectomy. He presented with LBO due to recurrent

P1752 Discrepancy between perioperative diagnosis

	Pathologic positive, n	Pathologic negative, n
Radiologically positive, n	35	14
Radiologically equivocal, n	4	1

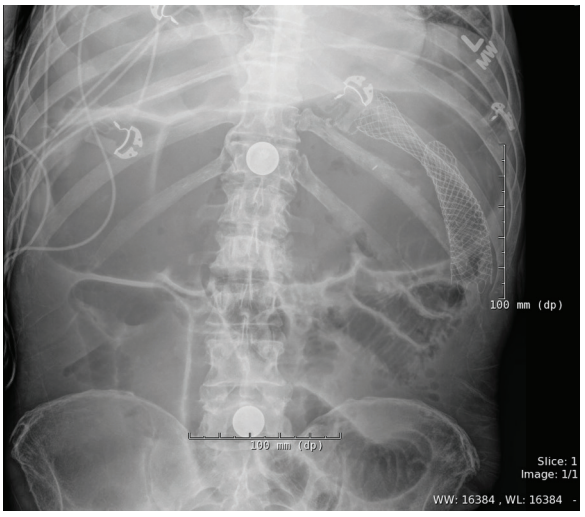
Accuracy 89.7%, Sensitivity: 89.7%, Specificity: 6.7%

PPV (positive predictive value): 71.4%, NPV (negative predictive value): 20%

tumor externally invading into the splenic flexure. He underwent endoscopic colon stenting and balloon dilations but returned with recurrent obstruction due to tumor invasion after receiving CT two weeks prior to presentation. Due to the hostile environment of his abdomen and terminal nature of his Stage IV gastric cancer, the decision was made to create a Turnbull colostomy. To determine the ideal location of the ostomy, a radiopaque marker and surgical skin marking were placed at the xyphoid and umbilicus for a supine abdominal x-ray (**Figure 1**). The patient was taken to the operating room and, correlating the measurements from the radiograph to the patient's abdomen, the Turnbull colostomy was placed right of midline, inferior lateral to the xyphoid at a location determined to be safe based upon the radiograph and previously placed skin markings. There was limited mobility of the medial and left aspect of the colon likely due to the ingrowth of tumor. The second patient is a 71 year old female with a history of a diverticular stricture, colovesical fistula, and acute myeloid leukemia actively treated with CT who presented with a LBO due to the diverticular stricture. On the morning of surgery her platelet count with 28 K/uL and she was transfused one pack of platelets with an improvement to 43K/uL. The same method described above was employed to identify the appropriate location of the ostomy. Because of this patient's thrombocytopenia, the decision was made to place the ostomy midline to avoid dissection through the abdominal musculature with potential for severe bleeding.

Results/Outcome(s): Both patients tolerated the procedures well. The obstructions were relieved, the patients both tolerated low fiber diets, and received appropriate stoma teaching. The first patient was discharged 4 days after surgery and the second patient was discharged 7 days postoperatively.

Conclusions/Discussion: While advances in medical and endoscopic treatment have limited the use of the Turnbull colostomy, it remains a valuable procedure to utilize in patients with LBOs who cannot tolerate more invasive surgery. In both of these cases, the patients were high risk surgical candidates with terminal cancer who required palliation for a large bowel obstruction. The procedures described here provided a safe and effective method to divert from the obstruction and avoid iatrogenic injury in complicated surgical patients.



Supine abdominal x-ray with radiopaque markers (corresponding to skin markings placed with surgical marker) used for intraoperative ostomy positioning.

DELAYED SPHINCTEROPLASTY AFTER COMPLETE SPHINCTER SECTION BY BULL HORN.

P1746

G. Marin
Sevilla, Spain

Purpose/Background: *Penetrating anal trauma due to bull goring is an uncommon but severe condition due to the complexity of the definitive surgical treatment and the frequent long-term sequelae. Primary sphincter repair performed by a colon and rectal surgeon is the optimal technique recommended in case of traumatic sphincter injury. Emergency cases treated in a community hospital pose a therapeutic challenge. The benefit of an immediate primary sphincter repair performed by a general surgeon versus delayed sphincteroplasty in a referral center is controversial. We present the management and treatment results of a patient with a complex perineal bull horn injury initially attended by a general surgeon in a community hospital. Definitive treatment was deferred and sphincteroplasty was performed in a reference center by an experienced colon and rectal surgeon.*

Methods/Interventions: *A 22-year-old male was attended in the emergency department with a perineal bull horn wound, with an entry hole in the left margin of the anal canal. Anal examination showed dissolution of both anal sphincters and large perforation of the pelvic floor muscle plane with intact rectal mucosa. An exploratory laparotomy was performed appreciating hemoperitoneum, wide dissection of the rectovesical space, intact rectum, left seminal vesicle avulsion and triple perforation of the urinary bladder. Hemostasis, primary bladder suture and bladder catheterization were performed. It was decided to defer the definitive repair of the perineal wound and thorough lavage, drainage and derivative colostomy were performed. EAUS and pelvic MRI were achieved in an elective fashion. Dilaceration of the anal sphincter complex*

along the entire length of the anal canal with 180 ° separation of sphincter ends, and wide tear of the left branch of the puborectal muscle were observed. The neurophysiological study showed no response after stimulation of the left pudendal nerve. Sphincteroplasty with en-block apposition of anal sphincters was performed in an elective fashion.

Results/Outcome(s): *A functional study was carried out after complete recovery form the sphincteroplasty. Anorectal manometry showed normal resting and contraction sphincter pressures. A colostomy perfusion test was performed and demonstrated correct continence to fluids. Colostomy closure was performed as a next step. Three months after colostomy closure the patient presented a score of 3 on the Wexner scale and maximum scores in terms of lifestyle, behavior, self-perception and shame (FI-QL). A maximum level of health status and a value 95 on the analog visual scale were also demonstrated on EQ-5D questionnaire.*

Conclusions/Discussion: *The management of the patient with anal sphincter bull horn lesion is complex. Initial drainage of the perineal wound associated with a derivative colostomy, followed by a deferred sphincteroplasty performed by an expert surgeon, can offer good results in terms of continence and quality of life.*

ABDOMINAL CRYSTALLOID FLUID INSTILLATION DECREASES ADHESIVE SMALL BOWEL OBSTRUCTION.

P1753

Z. Nemeth, H. Sanchez-Trejo, K. Kong, P. Stopper, R. Rolandelli
Morristown, NJ

Purpose/Background: Peritoneal adhesion formation is one of the most common causes of small bowel obstructions (SBO) in the United States. This surgical complication accounts for about 15% of all surgery related hospital admissions. Based on previous publications, we hypothesized that hydroperitoneum achieved by abdominal crystalloid fluid instillation (ACFI) could decrease the rate of postoperative recurrence of peritoneal adhesions.

Methods/Interventions: In this study we included 21 adult patients who had SBO caused by peritoneal adhesions or partial obstructive symptoms. Patients were divided into two groups: in the ACFI cohort 11 patients underwent laparoscopic lysis of adhesions and abdominal crystalloid fluid instillation (n=11), and in the control group (CO) 10 patients received laparoscopic lysis of adhesions without fluid instillation (n=10). Hydroperitoneum was achieved by the abdominal instillation of 1,864 ± 97.5 ml of crystalloid fluid, either lactated Ringer's (LR) or normal saline (NS) solution immediately following the lysis of adhesions.

Results/Outcome(s): The primary outcome we analyzed was the recurrence of peritoneal adhesions resulting in SBO within 20 months after laparoscopic lysis of adhesions. We found that the ACFI group had significantly lower SBO recurrence rates with 9.1% on average compared to the CO group's 60.0% rate (p=0.0237, Fisher's exact test). We also documented that ACFI did not have any side effects and did not cause any complications.

Conclusions/Discussion: Taken together, our results show that ACFI could decrease the recurrence of SBO secondary to adhesion formation compared to lysis of adhesions alone as seen in the CO group. Moreover, the use of these crystalloid solutions is medically and surgically safe, and they are readily available at a low cost. Therefore, we believe that this single institution observation warrants additional studies with higher patient numbers and longer post-operative follow up period.

CLINICAL OUTCOMES OF MANAGEMENT FOR PATIENTS WITH COLONIC DIVERTICULITIS.

P1754

D. Lim, E. Shin
Bucheon, Korea (the Republic of)

Purpose/Background: The aim of this study is to analyze clinical outcome after surgical and/or conservative management for patients with colonic diverticulitis patients in Korea.

Methods/Interventions: In Kora, between January 2001 and November 2018, 1175 patients who underwent conservative (n=987) and surgical management (n=188) for colonic diverticulitis retrieved from a prospective database.

Results/Outcome(s): The mean age of all diverticulitis patients was 43.2 ± 17. Mean age was significantly higher in left sided (57.0±15.7 yrs) compared to right sided diverticulitis (41.4±13.4 yrs, p=0.001). The distribution of age of patients with Lt. sided diverticulitis who underwent surgery was higher than that with Rt. sided diverticulitis (60-70th: 46.7%, n=29 vs. 30-40th:46.0%, n=58, p<0.005). Distribution of lesions in the Rt. sided was 71.7% (n=843) in cecum, 7.7% (n=90) in ascending colon, and 8.6% (n=104) in hepatic flexure. Distribution of lesions in the Lt. sided was 8.3% (n=97) in sigmoid colon, 3.4% (n=40) in descending colon and 0.1% (n=1) in splenic flexure. In the number of attacks, the first time was most common (91.0%, n=1069). In surgical management, mean age, distribution of age, BMI, open surgery rate, stoma formation rate, Hinchey stage III, IV was significantly higher compared to Rt. sided diverticulitis (p<0.005). Older age, higher BMI (≥25), Hinchey III & IV were significantly associated with risk factor of surgery of colonic diverticulitis (p<0.005).

Conclusions/Discussion: The medical management plays the first role in the vast majority of cases. In colonic diverticulitis requires surgical management, left sided colonic diverticulitis is older and more severe than that of right sided and various surgical options exist.

TIMING AND OUTCOME OF RIGHT- VS LEFT-SIDED COLONIC ANASTOMOTIC LEAKS: IS THERE A DIFFERENCE?

P1755

L. Hung, A. Lightner, S. Holubar, S. Steele, M. Valente
Cleveland Heights, OH

Purpose/Background: Anastomotic leaks (AL) contribute to postoperative mortality rates, prolonged hospitalization, and increased health care costs. While left sided AL (LAL) have been well described in the literature, there is a paucity of studies on outcomes and management of right-sided AL (RAL). This study aimed to compare the timing of LAL versus RAL, and the variable diagnosis, management and outcomes of LAL versus RAL. We hypothesized that the timing of RAL may be later compared to LAL and may result in worse outcomes in RAL.

Methods/Interventions: Patients who underwent curative intent surgery for neoplastic disease from January 2006 to December 2015 were included in our rate calculation of AL. Patients that underwent an anastomosis below the peritoneal reflection, received neoadjuvant treatment, fecal diversion, previous colectomy/anastomoses or multiple anastomoses, and patients with inflammatory bowel disease or hereditary colorectal cancer syndromes were excluded (of 2,383 charts reviewed, 1,063 [44.6%] patients were included). Given the low number of leaks, patients with AL from January 1995 to December 2015 were included in the comparative analysis to increase the number of events for analysis. Data collected included patient demographics, neoplastic data, operative data, time to AL, and management of AL. The primary endpoint was timing of AL, and secondary endpoints were management and outcome based on right versus left sided AL. LAL and RAL were compared; categorical variables were expressed as number (percentage) and continuous variables expressed as median (interquartile range).

Results/Outcome(s): A total of 1,063 patients underwent oncologic resection for neoplastic colonic disease (663 right sided and 400 left sided anastomoses); there were 29 AL events (2.7%): 12 LAL (3.0%) and 17 RAL (2.6%). Then, a total of 48 patients were included in the comparative analysis; 26 (54%) had a right colectomy with AL and 22 (45.8%) had a left colectomy with AL. 67% were male and the median age was 69 years (range 34-91). RAL had significantly decreased operative time ($p=0.016$), decreased intraoperative blood loss ($p=0.002$), and increased diagnosis by CT or radiograph ($p=0.04$). There was no difference in leak rates, time to diagnosis, or management of RAL vs. LAL. All patients that underwent surgery had some type of fecal diversion performed. Morbidity and mortality were comparable between the groups ($p=0.70$, $p=1.0$). (Table 1).

Conclusions/Discussion: This study found comparable timing of LAL and RAL, and no difference in management or outcome of LAL vs. RAL. These findings are informative for patient and surgeon expectations after surgery and when AL is suspected.

P1755 Table 1. Comparison between Left and Right Anastomotic Leaks

Variable	Variable Right (median[IQR]) N= 26 (54%)	Left (median[IQR]) N= 22 (45.8%)	P value
Gender	17M (53%)	15M (46.8%)	0.84
Age (years)	70 (59-78)	67.5 (60-78)	0.59
Surgery time (sec)	6270 (5685-8745)	9480 (7080-13290)	0.016
Estimated Blood Loss (mL)	100 (50-125)	225 (150-300)	0.002
Method of Diagnosis			
CT or radiograph	19 (73%)	9 (41%)	
Contrast enema	3 (11.5%)	9 (41%)	0.04
Clinical	4 (15.4%)	4 (18%)	
Time to Anastomotic Leak (days)	7.5 (5-10.25)	8.0 (5.75-11.25)	0.54
Intervention			
Surgery	20 (76.9%)	18 (82%)	
IR drainage	4 (15.4%)	1 (4.6%)	0.41
Conservative	2 (7.7%)	3 (13.6%)	
Morbidity due to Leak			
Postoperative complications	15 (57.7%)	14 (64%)	
Other	6 (23%)	3 (13.6%)	0.70
None	5 (19%)	5 (22.7%)	
Mortality	2 (7.7%)	1 (4.6%)	1.0

EARLY VERSUS DELAYED ANASTOMOTIC LEAKAGE FOLLOWING ANTERIOR RESECTION FOR RECTAL CANCER: A SINGLE CENTER REVIEW.

P1756

M. Ménassa, C. Marcoux, S. Drolet
Québec, QC, Canada

Purpose/Background: Anastomotic leakage (AL) is a significant complication after anterior resection of the rectum. It can lead to increased mortality, considerable morbidity and higher risk of permanent stoma. Patients experiencing anastomotic leaks usually present themselves early after surgery (EL) but delayed leaks (DL) can also be found in a significant proportion. Literature has indicated differences in predisposing factors of EL and DL, and thus, raised the question whether they should be considered as two separate entities. There is still no consensus on the matter. The aim of this study was to compare the characteristics and the rates of intestinal continuity restoration in early (EL; ≤ 30 postoperative days) and delayed (DL; > 30 postoperative days) anastomotic leakages following anterior resection for rectal cancer.

Methods/Interventions: All patients who underwent anterior resection for rectal cancer in our center between January 2003 and December 2014 were included. We proceeded with a standardized retrospective chart review. The definition of AL included both clinical and radiological presentations. Patients were divided in three groups: Early leak (EL), delayed leak (DL) and no leak (NL).

Results/Outcome(s): Of the 476 identified patients, 379 (79.6%) had no leak, 56 (11.8%) presented an EL and 41 (8.6%) a DL. Male gender (81.4% vs 67.3%, p=0.0087), diabetes (25.8% vs 12.7%, p=0.002), a Charlson Comorbidity Index (CCI) ≥3 (51.5 vs 35.6%, p=0.0041), cigarette smoking (61.9% vs 50.4%, p=0.0437) and perioperative blood loss ≥250mL (40.2% vs 29.1%, p=0.0355) were more frequently observed in patients with anastomotic leaks. EL were more frequently associated with diabetes (33.9% vs 14.6%, p=0.0367), a CCI ≥3 (60.7% vs 39.0%, p=0.0347), a tumor >6cm from anal verge (60.0% vs 39.0%, p=0.042) and an open surgical approach (21.4% vs 4.9%, p=0.0377) than DL. When compared with DL, patients with EL showed a significantly lower rate of intestinal continuity restoration after 1 year (60.7% vs 80.5%, p=0.0374) and overall (66.1% vs 95.1%, p=0.0006). Treatment of EL required higher rates of abdominal surgery (58.9% vs 34.1%, p=0.0252) than DL.

Conclusions/Discussion: Early anastomotic leaks are associated with different patient characteristics than delayed ones. They require more invasive management and present a less favorable outcome than their counterpart in terms of intestinal continuity restoration. Thus, this study reinforces the hypothesis that these two complications represent different clinical entities.

SURGICAL RESECTION IN PATIENTS WITH LOWER GASTROINTESTINAL TUBERCULOSIS.

P1757

M. Cabanilla-Manuntag[1], J. Gonzalez[2], E. Razon-Gonzalez[2], M. Tampo[1], M. Lopez[1]
[1]*Manila, Philippines;* [2]*Iloilo, Philippines*

Purpose/Background: The Philippines, at present, is ranked 4th globally in terms of burden of tuberculosis (TB). Aside from pulmonary TB (PTB), gastrointestinal tuberculosis (GITB) remains an important cause of morbidity and even mortality, especially in endemic areas. This study, over a 10-year period, described the clinicopathologic profile of patients with lower GITB—defined as tuberculous disease at a segment of bowel from the ligament of Treitz to the anus--at the Philippine General Hospital (PGH). Our experience in performing surgical resection on these patients was also documented and discussed.

Methods/Interventions: This is a retrospective descriptive study that included patients seen and managed from January 1, 2009 to December 31, 2018.

Results/Outcome(s): A total of 297 cases of lower GITB were seen and managed by our Division, of these 138 were newly-diagnosed. Half (51.4%, 71/138) of these new cases underwent emergent surgery, while the rest received anti-Koch's treatment as initial therapy. The patients' ages ranged from 21 to 72 years (mean 26 years), with a 1.5:1 male:female ratio. The most common presenting symptoms were colicky abdominal pain (34.06%, 47/138), and a palpable right lower quadrant mass (29.71%, 41/138). The most common site for the pathology was the ileocecal area and a right hemicolectomy was the most common surgical procedure (66.20%, 47/71) performed. The operative morbidity (1 case of small bowel anastomotic leak) and mortality (2 cases of anastomotic leak and 1 case of septic shock) rates were 0.72% and 2.17%, respectively.

Conclusions/Discussion: The recommended initial therapy for all forms of extrapulmonary TB remains to be a six- to nine-month regimen (two months of isoniazid, rifampin, pyrazinamide, and ethambutol, followed by four to seven months of isoniazid and rifampin), unless the organisms are known or strongly suspected to be resistant to the first-line drugs. Surgery is often reserved for complications, *i.e.* obstruction, perforation, severe bleeding. In our Division, we recommend resection of the involved segment of bowel to reduce the bacillary load and improve treatment response to an anti-Koch's regimen. Furthermore, we have, in our experience, seen a good number patients obstructing from stricture formation from tuberculous lesions even after successful treatment. Finally, it may be more prudent to rid the patient of a mass that may potentially obstruct, bleed, or even lead to perforation, during the course of medical treatment and, hence, delay completion of treatment significantly. This study showed that surgery is a safe alternative, with good clinical outcomes.

Table 1. Presenting Symptoms (n=138)

Symptoms	Number of Patients	Percentage
Abdominal pain	47	34.06%
Right lower quadrant mass	41	29.71%
Gut obstruction	18	13.04%
Constipation	5	3.62%
Anorectal discharge	5	3.62%
Perforation	4	2.90%
Enterocutaneous fistula	4	2.90%
Lower GI bleeding	4	2.90%
Intraabdominal abscess	2	1.45%
Stomal Prolapse	2	1.45%
Others	6	4.35%

Table 2. Surgical management (n=71)

Surgical Management	Number of Patients	Percentage
Right hemicolectomy	47	66.20%
Small bowel resection +/- diversion	12	16.90%
Biopsy of peritoneal lesions	10	14.08%
Peritoneal lavage and drain	2	2.82%

OPERATIVE TIME DOES NOT EFFECT SHORT TERM OUTCOMES IN COLON AND RECTAL RESECTIONS.

P1608

L. Gerson[1], E. Hagen[1], J. Griffin[1], A. Hayman[2], J. Scanlan[3], L. Rashidi[3]
[1]*Seattle, WA;* [2]*Portland, OR;* [3]*Tacoma, WA*

Purpose/Background: Longer operating times in surgery have been associated with worse clinical outcomes. However, robotic surgeries often take more operative (OR) time than open and laparoscopic surgeries, yet robotic outcomes do not appear to be worse. Here, we investigated the relationships between different surgical approaches (open, laparoscopic and robotic), various colorectal surgeries with differing difficulty levels, and the relationship between OR time and patient outcomes, in particular, hospital length of stay (LOS). We hypothesized that despite longer OR times for robotic surgeries length of stay will still be improved.

Methods/Interventions: This is a single institution retrospective review of colorectal surgical patients over a 4 month period, using 18 surgeons, different surgical procedures (right, left and total colectomies, colostomy reversal, total proctocolectomy with IPAA, low anterior resection (LAR) and abdominal perineal resection (APR)) and three different surgical approaches (open, laparoscopic and robotic). Operating time and patient demographics (age, gender, BMI, ASA, etc.) were collected. Swedish IRB approval was obtained. ANOVA, t-tests and multiple regression were used to analyze group differences and test predictors of patient outcomes, such as LOS, 30 day readmission, and reoperation.

Results/Outcome(s): Initial analyses showed one specific surgical procedure (APR) had much longer OR times (5:32 vs 3:11 hrs., P<.0001) and LOS (7.8 vs 3.3 days, P<.0001) than all other surgeries, and was unequally distributed across the three surgical approaches. Because we wanted an "even playing field" to evaluate these different approaches we excluded these patients from subsequent analyses. After doing so, we found robotic surgery to take the most OR time (4:01 hrs. N=13) followed by laparoscopic (3:05, N=51) and open (2:35, N=10; F=4.1, P=.021). In contrast, LOS showed the opposite pattern, robotic having the shortest LOS (2.22 days) followed by laparoscopic (3.17 days) and open (5.42 days; F=9.7, P<.001). When correlating OR time with LOS within procedures, open and laparoscopic showed similar positive relationships (r's=.33 and .31, respectively), while that correlation within robotics was much weaker (r=.04).

Conclusions/Discussion: The disassociation of OR time and patient LOS within robotic surgery is striking and deserves further research. Our study shows that despite longer robotic surgery OR times, short term patient outcomes (LOS) are improved. This is encouraging and provides data to support completing more complex colorectal procedures robotically can benifit patients.

COMPARISON OF THE EFFECTS OF A MULTIMODAL ANALGESIC APPROACH IN SINGLE INSTITUTIONAL ERAS PROTOCOLS ON POSTOPERATIVE OUTCOMES FOR COLORECTAL CANCER MINIMAL INVASIVE SURGERY.

P1609

C. Lee, I. Lee, Y. Lee
Seoul, Korea (the Republic of)

Purpose/Background: The objective of this study was to compare perioperative outcomes between multimodal analgesic approaches with ERAS management and conventional ERAS management for colorectal cancer minimal invasive surgery (MIS).

Methods/Interventions: Of 534 colorectal surgery cases for colorectal cancer from March 2017 to October 2019, 504 patients treated with ERAS management without multimodal analgesic approach (group E) and 30 patients received multimodal analgesic approaches with ERAS management (group EM) (Table 1). We compared single institution's ERAS approach with and without multimodal analgesia. To adjust for baseline differences and selection bias, operative outcomes and complications were compared after propensity score matching (PSM).

Results/Outcome(s): After 1:1 PSM, well-matched 30 patients in each group were evaluated. As a result, significant differences were observed between two groups in postoperative hospital stay(day) (group E:4.74±5.40 vs.

group EM:3.81±11.63 days, p⟨0.001) and opioid consumption. The median visual analogue scores for pain observed from patients on postoperative day (POD) 1 (group E:5.55±2.50 vs. group EM:4.23±1.83, p=0.021) and POD 2 (group E:5.26±2.76 vs. group EM:3.32±1.66, p=0.002) were significantly less than those from patients in group EM, as well. There were no significant differences between groups about mean operative time, estimated blood loss, major complications.

Conclusions/Discussion: Multimodal analgesic approaches with ERAS management resulted in less postoperative pain and the shortening length of hospitalization without increase in complications or readmission rates. Especially our multimodal analgesic approaches with ERAS protocol contain structured pain rounding and effective rescue program. Thus, our multimodal analgesic approaches with ERAS protocol may serve the feasible alternative approach for Asian colorectal cancer MIS.

A NATIONAL EVALUATION OF THE USE AND SURVIVAL IMPACT OF ADJUVANT CHEMOTHERAPY IN STAGE II COLON CANCER FROM THE NATIONAL CANCER DATABASE (NCBD).

P1759

T. Reif de Paula, R. Kiran, H. Simon, M. Profeta, P. Gorroochurn, D. Keller
New York, NY

Purpose/Background: Stage II colon cancer is a heterogeneous category, and there is controversy over use of adjuvant chemotherapy (AC). Patient with high-risk features may benefit from AC to improve overall survival (OS). However, current United States guidelines do not routinely recommend AC for Stage II colon cancers without high-risk features. The actual use and benefit of AC on OS in this low and average-risk cohort has not been fully examined on a national scale. We aimed to evaluate the use of AC and impact of AC on survival in average and low-risk Stage II colon cancer in United States.

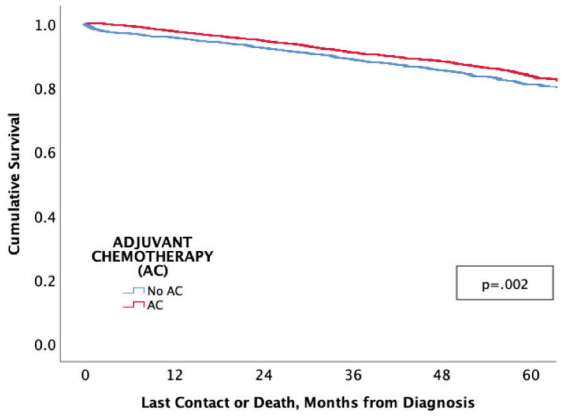
Methods/Interventions: The NCBD was reviewed from 2010-2015 for Stage II colon cancers undergoing curative surgical resection. We excluded cases where patients received preoperative radiotherapy or chemotherapy or had high-risk features (T4 tumors, < 12 lymph nodes examined, positive margins, high-grade, perineural and lymphovascular invasion), then stratified the group into AC and no AC cohorts. Propensity score matching was performed to balance the cohorts. Kaplan-Meier and Cox regression were used to analyze OS. The main outcome measures were the incidence of AC and impact of AC on OS in average and low-risk Stage II colon cancer.

Results/Outcome(s): 39,926 patients were evaluated-8.2% received AC, while 91.8% received no AC. After matching, there were 3,275 cases in each cohort. Patient, provider, and disease characteristics were well balanced. The median follow-up time was 40.2 months (IQR, 21.6-60). AC significantly improved 1-, 3- and 5-year OS compared to no AC (97.4%, 90.9%, 83.3% and 95.5%, 88.7%, 81%, respectively; p=.002), with 5-year absolute risk reduction of 2.3%, relative risk reduction of 12%, and a number needed to treat of 44. In the Cox model, AC remained significantly associated with increased OS (HR .816; 95%CI .713-.934; p<.003). Factors associated with significantly worse OS were advanced age (HR 1.049; 95%CI 1.040-1.058, p<.001), Medicare (HR 1.882; 95%CI 1.417-2.500; p<.001) or Medicaid (HR 1.654; 95%CI 1.356-2.017; p<.001) payors, and left-sided tumors (HR 1.170; 95%CI 1.021-1.340; p=.024). Factors associated with improved OS were female gender (HR 0.795; 95%CI .693-.911; p=.001) and treatment at an Integrated/ Commission on Cancer Network Program (HR.692; 95%CI .675-1.069; p=.009).

Conclusions/Discussion: Adjuvant chemotherapy was associated with improved OS in average and low-risk Stage II colon cancers. Both modifiable and non-modifiable demographic characteristics impacted OS, emphasizing the need to address disparities in the delivery of care. This finding from a matched nationally-representative sample questions the current guidelines. Prospective, controlled study is warranted to determine the best treatment recommendations for AC in all Stage II colon cancers.

P1609 Multimodal Analgesic Approaches for Enhanced Recovery After Surgery Protocols

Preoperative	Intraoperative	Postoperative
Gabapentin 300mg PO 2hr before surgery	Surgical TAP block (Ropivacaine 0.75% 150mg)	IV PCA(bolus only)
Acetaminophen 900mg PO 2hr before surgery	Acetaminophen 1g IV at end of case	Acetaminophen 900mg PO Q6hr until POD 1
Celecoxib 200mg PO 2hr before surgery	Ketorolac 30mg IV at end of case	Celecoxib 200mg PO Q12hr



Number at risk						
AC	3275	2827	2417	1877	1381	840
No AC.	3275	2723	2279	1748	1258	815

Kaplan-Meier curve for overall survival for the matched cohorts of patients diagnosed with low-risk stage II colon cancer between 2010 and 2015, stratifed by receiving adjuvant chemotherapy versus no adjuvant chemotherapy.

CAN COLON AND RECTAL CANCER BE PREVENTED BY LIFESTYLE MODIFICATIONS?

P1760

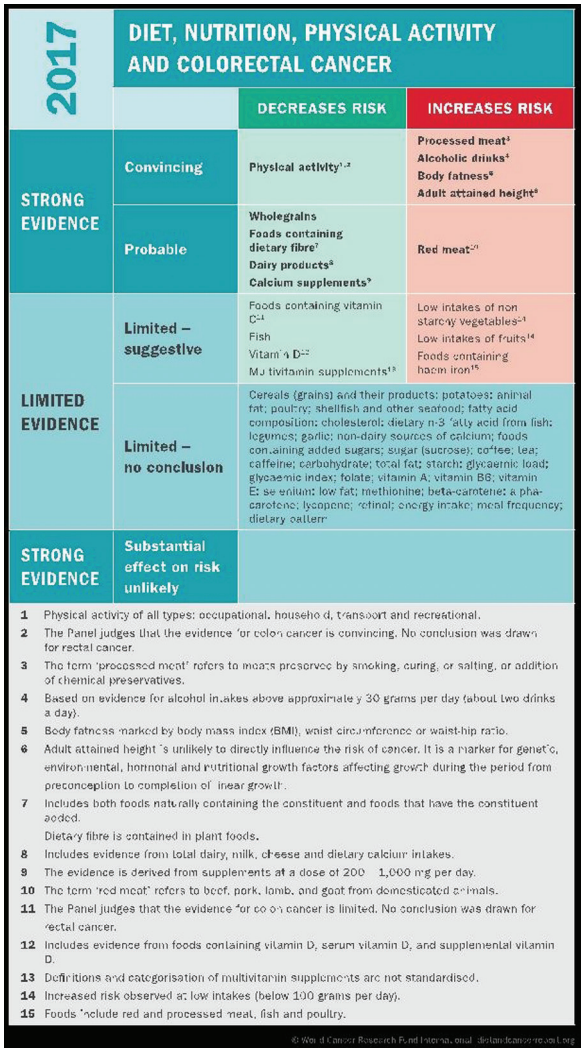
J. Griffin[1], L. Gerson[1], N. Brockton[2]
[1]*Seattle, WA;* [2]*Arlington, VA*

Purpose/Background: Chronic disease in America is pervasive. It is estimated that 80% of these diseases are a direct result of lifestyle and potentially preventable with lifestyle modifications. The molecular basis of CRC and its inherited syndromes have been well studied and our understanding is evolving. Prevention is encouraged with screening modalities and these have decreased its incidence. In the ASCRS Textbook of CRS "modifiable risks factors include low-fiber, high-fat diet, obesity, smoking, and heavy alcohol consumption" but no references are cited. Can lifestyle changes impact the incidence of CRC?

Methods/Interventions: The American College of Lifestyle Medicine's purpose is to use evidence-based approaches to prevent (and reverse) chronic diseases by addressing their root-causes. It does this by pursuing non-drug modalities such as healthful eating, physical activity, management of stress, relationships, sleep, and avoidance of risky substances. The American Institute for Cancer Research's purpose is to use the latest and most authoritative scientific research on cancer prevention and survival through diet, weight, and physical activity to make informed choices to reduce cancer risk. It does this through the Continuous Update Project that conducts systemic literature reviews, meta-analyses and an independent expert panel assess the strength of evidence for each factor according to a priori critera.

Results/Outcome(s): WHOLEGRAINS AND FIBER- Higher intakes of fiber probably reduce CRC risk (RR: 0.91; 95% CI 0.88-0.94 per 10g/day). Analysis stratified by gender showed significant decreased risks. Wholegrain consumption probably reduces CRC risks. **RED AND PROCESSED MEAT**- There is strong evidence that higher red meat consumption increases CRC risk overall (RR: 1.12; 95% CI 1.00-1.25 per 100g/day) in the dose-response meta-analysis. The evidence is also strong for processed meat increasing risk of CRC risk at only 50g/day (RR: 1.16; 95% CI 1.08-1.26). **ADULT BODY FATNESS**-There is strong evidence and a clear dose-response relationship between BMI and CRC risk (RR: 1.05;95% CI 1.03-1.07 per 5 units of BMI). Significant positive associations were also observed for CRC in the dose-response for waist circumference and waist-hip ratio. **ALCOHOL**-There was is strong evidence that alcohol consumption increases CRC; linear dose response meta-analysis shows RR: 1.05; 95%CI 1.03-1.07 per 10g ethanol/day. Non-linear dose response meta-analysis reveals significant risks of above 30g per day and above (~2 drinks per day).

Conclusions/Discussion: Consumption of foods containing dietary fiber **probably** protects against CRC. Consumption of wholegrains **probably** reduces CRC risk. Consumption of red meat is a **probable** a cause of CRC. Consumption of processed meat is a **convincing** cause of CRC. Greater body fatness is a **convincing** cause of CRC. Consumption of alcoholic drinks is a **convincing** cause of CRC. Physical activity **probably** reduces risk of CRC.



2017

DIET, NUTRITION, PHYSICAL ACTIVITY AND COLORECTAL CANCER

		DECREASES RISK	INCREASES RISK
STRONG EVIDENCE	Convincing	Physical activity[1,2]	Processed meat[3] Alcoholic drinks[4] Body fatness[5] Adult attained height[6]
	Probable	Wholegrains Foods containing dietary fibre[7] Dairy products[8] Calcium supplements[9]	Red meat[10,11]
LIMITED EVIDENCE	Limited – suggestive	Foods containing vitamin C[12] Fish Vitamin D[12] Multivitamin supplements[13]	Low intakes of non starchy vegetables[14] Low intakes of fruits[14] Foods containing haem iron[15]
	Limited – no conclusion	Cereals (grains) and their products; potatoes; animal fat; poultry; shellfish and other seafood; fatty acid composition; cholesterol; dietary n-3 fatty acid from fish; legumes; garlic; non-dairy sources of calcium; foods containing added sugars; sugar (sucrose); coffee; tea; caffeine; carbohydrate; total fat; starch; glycaemic load; glycaemic index; folate; vitamin A; vitamin B6; vitamin E; selenium; low fat; methionine; beta-carotene; alpha-carotene; lycopene; retinol; energy intake; meal frequency; dietary pattern	
STRONG EVIDENCE	Substantial effect on risk unlikely		

1 Physical activity of all types: occupational, household, transport and recreational.
2 The Panel judges that the evidence for colon cancer is convincing. No conclusion was drawn for rectal cancer.
3 The term 'processed meat' refers to meats preserved by smoking, curing, or salting, or addition of chemical preservatives.
4 Based on evidence for alcohol intakes above approximately 30 grams per day (about two drinks a day).
5 Body fatness marked by body mass index (BMI), waist circumference or waist-hip ratio.
6 Adult attained height is unlikely to directly influence the risk of cancer. It is a marker for genetic, environmental, hormonal and nutritional growth factors affecting growth during the period from preconception to completion of linear growth.
7 Includes both foods naturally containing the constituent and foods that have the constituent added.
Dietary fibre is contained in plant foods.
8 Includes evidence from total dairy, milk, cheese and dietary calcium intakes.
9 The evidence is derived from supplements at a dose of 200 – 1,000 mg per day.
10 The term 'red meat' refers to beef, pork, lamb, and goat from domesticated animals.
11 The Panel judges that the evidence for colon cancer is limited. No conclusion was drawn for rectal cancer.
12 Includes evidence from foods containing vitamin D, serum vitamin D, and supplemental vitamin D.
13 Definitions and categorisation of multivitamin supplements are not standardised.
14 Increased risk observed at low intakes (below 100 grams per day).
15 Foods include red and processed meat, fish and poultry.

SHORT TERM RESULTS AND POTENTIAL ADVANTAGES OF SINGLE SURGEON taTME.

P1761

T. Tonooka
Chiba, Japan

Purpose/Background: AIM: Dissection and transection of the rectum deeply located in the narrow pelvis is technically challenging. Transanal total mesorectal excision (taTME) may play role to overcome some of these difficulties. Here we report our initial series of single surgeon taTME.

Methods/Interventions: METHOD: From October 2018 to November 2019, ten patients underwent taTME by one team method. Abdominal approach in all cases were performed laparoscopically with no conversion. All ten patients underwent lymph node dissection followed by anastomosis. Data were collected retrospectively.

Results/Outcome(s): RESULTS: There were 8 male in this series, and the location of the tumor was at lower third in 8 cases and middle third in 2 cases. Operation procedure were low anterior resection (LAR) (one case), very LAR (6 cases), and intersphincteric resection (ISR) (3cases). All ten patients underwent lymph node dissection followed by anastomosis, either by stapler (6 cases) or handsewn (4 cases). The mean operation time and blood loss was 421 min and 39.5 ml. There was one postoperative complication (outlet obstruction of the ileostomy), but no anastomotic leakage. The median length of stay was 10 days. The TME surface was intact and circumferential resection margin was negative in all cases. The mean number of harvested lymph nodes was 21.4.

Conclusions/Discussion: CONCLUSION: Single surgeon taTME of our institute was safely introduced with favorable results. This procedure was technically demanding, but very reliable tool to achieve proper distal and circumferencial margin. Patients with difficulty factors such as male patient with a narrow pelvis and a bulky tumor in the lower third of the rectum, would be the good candidate of this procedure.

LOCAL RECURRENCE AFTER NEOADJUVANT CHEMORADIOTHERAPY AND TME IN RECTAL CANCER PATIENTS WHEN THE DISTAL RESECTION MARGIN IS COMPROMISED.

P1762

S. Song, J. Park, G. Choi, S. Park, H. Kim
Daegu, Korea (the Republic of)

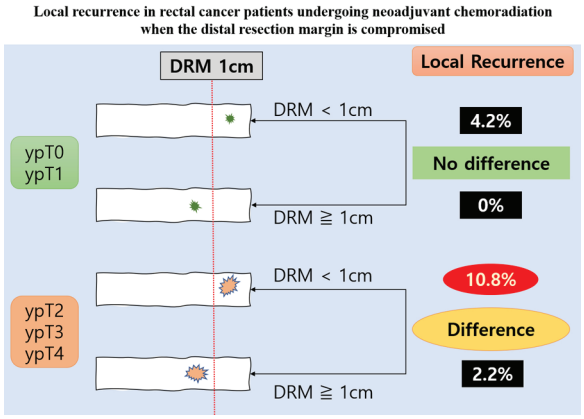
Purpose/Background: We investigated the minimum, safe distal resection margin (DRM) for patients with advanced mid-low rectal cancer.

Methods/Interventions: Patients with rectal cancer within 10 cm of the anal verge who underwent preoperative chemoradiation following surgery were included. Patients with distant metastasis were excluded. Patients were divided into two groups based on the DRM (<1 cm and ≧1 cm groups) and their oncological outcomes were compared. We performed a subgroup analysis based on the ypT stage. We divided them into ypT0 and ypT1 into one subgroup and ypT2, ypT3 and ypT4 into another subgroup.

Results/Outcome(s): A total of 507 patients were enrolled in this study. The median follow-up duration was 48.9 months. The local recurrence rate was 9.0% and 1.9% in the DRM < 1 cm (n = 89) and DRM ≧ 1 cm (n = 418) groups, respectively (p = 0.002). On multivariable analysis, DRM < 1 cm was the only independent risk factor for local recurrence (odds ratio 1.07, 95% confidence interval 1.02-1.11, p = 0.002). The 5-year local-relapse free survival rates were 89.9% and 98.0% in the DRM < 1 cm and DRM ≧ 1 cm groups, respectively (p = 0.003). The 5-year disease-free survival rates were 70.3% and 74.5% in the DRM < 1 cm and DRM ≧ 1 cm groups, respectively (p = 0.715). The patients with ypT0 and ypT1, local recurrence rates were similar between the DRM < 1cm and DRM ≧ 1cm groups (4.2% vs 0%, p = 0.654). However,

the patients with ypT2, ypT3, and ypT4, local recurrence rate was higher in the DRM < 1cm group than in the DRM ≧ 1cm group (10.8% vs 2.2%, p = 0.002).

Conclusions/Discussion: A DRM of < 1 cm could influence local recurrence rates. Especially, adjuvant therapy should be considered in patients with ypT2-T4 and the DRM of < 1 cm to achieve local control.



LONG-TERM D3 LYMPHADENECTOMY IN THE PATIENTS OVER THE AGE OF 80 WITH STAGE II AND III COLON CANCER.

P1763

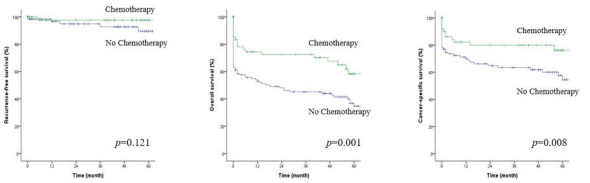
H. Kwak, J. Chung, J. Ju
Gwangju, Korea (the Republic of)

Purpose/Background: Radical lymph node dissection and adjuvant chemotherapy in elderly patients have been difficult to determine because of underrepresented clinical trials. However, the median age at diagnosis of colon cancer is 71, and the number of elderly patients presenting for care of colon cancer is expected to rise. The aim of this study was to analyze the short- and long-term outcomes in older patients treated adjuvant chemotherapy following colonic resection.

Methods/Interventions: Between May 2004 and December 2014, all patients were treated for stage II and III colon cancer. The operation were performed open or laparoscopic resection, and D3 lymph node dissection. D3 dissection was defined as excision of paracolic, intermediate, and principal lymph nodes. This is a retrospective study of prospectively collected data in a tertiary teaching hospital.

Results/Outcome(s): A total of 176 patients were included. Mean age was 83 years old, of whom sigmoid colon cancer took 25.5%, and ascending colon was 31%. Laparoscopic resection had 135(76.7%) cases. Mean retrieved lymph node was 31.2. The overall morbidity rate was 4% (7/176), and there was no postoperative mortality. Forty-one (23.3%) patients had chemotherapy. With a mean 30.7 months of follow-up, recurrence free, overall, and cancer-specific survival at 5-years between chemotherapy and no-chemotherapy group were not different statistically.

Conclusions/Discussion: In the elderly patients who are over the age of 80, our results suggest that stage II and III colon cancer has no survival benefit from chemotherapy. Well-designed clinical trials will be required for the management for elderly colon cancer patients.



Kaplan–Meier curves of disease-free survival, overall survival, and cancer-specific survival.

THIRTY-DAY READMISSION AFTER ELECTIVE COLORECTAL SURGERY FOR COLON CANCER: A SINGLE-CENTER COHORT STUDY.

P1764

J. Ju, J. Chung, H. Kwak
Gwangju, Korea (the Republic of)

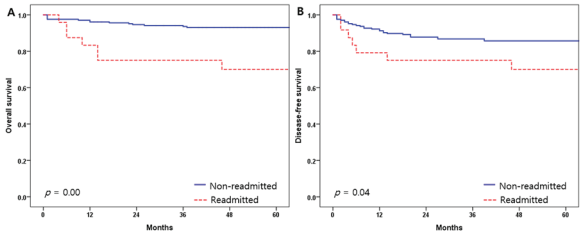
Purpose/Background: There has been a concern that the concept of enhanced recovery after surgery could affect other proposed quality measures, including the rate of readmission due to early discharge. We aimed to examine the 30-day readmission rate, risk factors associated with readmission after elective colorectal surgery for colon cancer, causes of readmission, disease-free survival, and overall survival in a single institution.

Methods/Interventions: We retrospectively investigated 292 patients who underwent elective colorectal surgery for colon cancer between 2010 and 2015. Their baseline data were obtained: age, sex, body mass index, ASA score, preoperative comorbidities, previous operation history, tumor-node-metastasis stage, surgical approach type, operation time, gas passage time, length of stay, and CRP, albumin, and creatinine levels. Univariate and multivariate logistic regression analyses were used to identify risk factors associated with 30-day readmission.

Results/Outcome(s): A total of 229 patients who underwent elective colorectal surgery were enrolled. Twenty-four patients were readmitted 30 days after discharge. The most common readmission diagnoses were wound bleeding or surgical-site infection, ileus or intestinal obstruction, watery diarrhea, and hepatobiliary disease. Multivariate

analysis indicated that patients who had preoperative hepatic disease were at the highest risk of readmission (OR, 8.98; 95% CI, 7.35–10.61). The survival outcomes showed no significant differences between the readmitted and non-readmitted groups.

Conclusions/Discussion: This study identified that preoperative comorbidities including hepatic and pulmonary diseases were associated with higher readmission rates after elective colorectal surgery. Moreover, the most common cause of readmission in patients who underwent elective colorectal surgery was wound bleeding or surgical-site infection.



Kaplan–Meier analyses of Overall survival (A) and Disease-free survival (B) in elective colorectal surgery patients.

A DIAGNOSTIC MODEL FOR EARLY DETECTION OF COLORECTAL CANCER BASED ON PLASMA EXTRACELLULAR VESICLE LONG RNAs.

P1765

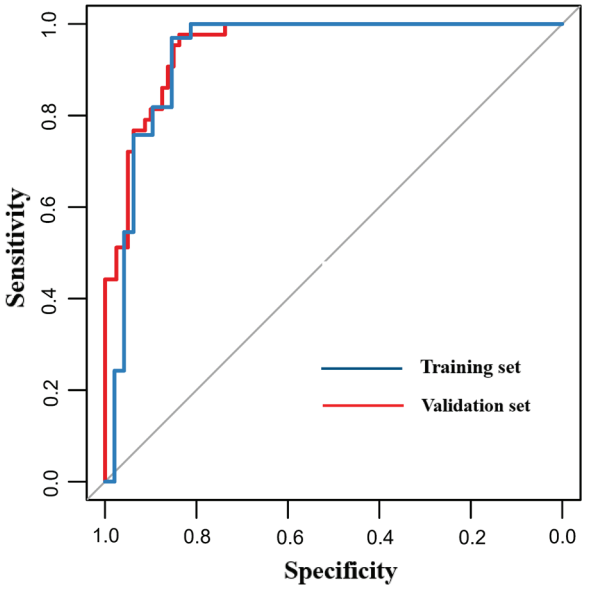
T. Guo, S. Huang, Y. Xu
Shanghai, China

Purpose/Background: This study aimed to establish a diagnostic model for screening colorectal cancer based on high-throughput sequencing of extracellular vesicle long RNAs from plasma samples of colorectal cancer (CRC) patients, colorectal adenoma (CRA) patients and healthy people. We expected to develop an effective noninvasive screening method for colorectal cancer.

Methods/Interventions: Peripheral blood samples were collected from 80 CRC patients, 43 CRA patients and 81 healthy people. RNA-seq libraries were prepared using the SMART cDNA synthesis technology. Gene dosage and expression differences were analyzed. We used SVM algorithm to construct the CRC diagnosis model and evaluate its diagnostic efficiency in different groups. The samples were divided into CRC group and non-CRC group (including CRA and healthy people), and the training set and validation set were further formed at a ratio of 3:2. 11 markers were determined by LASSO and random forest method to construct the diagnostic model.

Results/Outcome(s): Sequencing analysis showed that 3010 genes were different between the CRC group and the non-CRC group, and pathway analysis showed that these differentially expressed gene was enriched in some tumor-related pathways. In the training set, the diagnostic accuracy, sensitivity and specificity of this model were 88.62%, 97.67%, 83.75%, AUC 0.9515, and 95% CI 0.9184-0.9845. In the validation set, the diagnostic accuracy, sensitivity and specificity were 90.12%, 96.97% and 85.42%, respectively, and the AUC was 0.9350 and 95%CI was 0.8778-0.9921. To distinguish CRC from healthy people, the accuracy, sensitivity and specificity of this diagnostic model were 99.36%, 100.00%, 98.77%, respectively, AUC 0.9998, 95% CI 0.9994-1.0000. To distinguish CRA from healthy people, the accuracy, sensitivity and specificity of this diagnostic model were 90.00%, 97.06%, 84.78%, respectively, AUC 0.9578, 95%CI 0.9079-1.0000. To distinguish CRC from CRA, the accuracy, sensitivity and specificity were 78.05%, 73.68%, 85.11%, respectively, AUC 0.8410, 95% CI 0.767-0.915. To distinguish the healthy group and the non-healthy group (CRC and CRA), the accuracy, sensitivity and specificity were 95.06%, 91.30%, 100.00%, respectively, AUC 0.9851, 95% CI 0.9590-1.0000. The accuracy, sensitivity and specificity of determining distant metastasis of CRC were 75.64%, 73.68%, 76.27%, respectively, AUC 0.7672, 95% CI 0.6386-0.8958.

Conclusions/Discussion: The CRC diagnostic model based on high-throughput sequencing of EVs long RNAs can distinguish CRC, CRA and healthy groups. This model has potential application value in early detection of CRC, CRA and distant metastasis.



ROC curve of the CRC diagnosis model in the training set and validation set

SURVIVAL AND PROGNOSIS OF PRIMARY R0 RESECTED PATIENTS WITH LUNG METASTASIS FROM COLORECTAL CANCER.

P1767

C. Yang
Fuzhou, China

Purpose/Background: To explore the related factors affecting survival and prognosis of patients with lung metastasis from colorectal cancer.

Methods/Interventions: The clinicopathological features and survival follow-up data of 100 patients with lung metastasis from colorectal cancer who underwent R0 resection were retrospectively analyzed From January 2013 to November 2017 in the Department of Gastrointestinal Oncology, affiliated in Cancer Hospital of Fujian Medical University. Kaplan-Meire method was used to draw the survival curve. Univariate analysis (Log-rank test) and multivariate COX regression analysis were used to determine risk factors affecting survival and prognosis. Chi-square test was used to compare the differences among different groups.

Results/Outcome(s): The median follow-up time was 51.6months (11.3-120) and median survival time was 25.4 months (2.1-85.1). Univariate analysis showed that synchronic and metachronous metastasis, mutation of KRAS gene, extrapulmonary metastasis, and molecular targeted therapy after operation were all factors influencing the overall survival of patients with lung metastasis from colorectal cancer ($P < 0.05$). Multivariate analysis showed that synchronic and metachronous metastasis ($P = 0.006$), KRAS gene mutation status ($P = 0.043$), extrapulmonary metastasis ($P = 0.050$), molecular targeted therapy after operation ($P = 0.021$), Primary foci (colon / rectum, $P = 0.021$) were independent risk factors of survival and prognosis. In addition, the subgroup analysis: in patients with simple lung metastasis, the patients treated with lung metastasis (compared with those without treatment of lung metastasis) had a longer survival time.

Conclusions/Discussion: Synchronic lung metastasis, KRAS gene mutation and extrapulmonary metastasis are negative prognostic factors of patients with lung metastasis from CRC. Compared with the patients who had not receive molecular targeted therapy after operation, the patients who received targeted therapy more than 4 cycles had a longer survival time. The prognosis of patients who treated with lung metastasis was better than those without treatment amomg simple lung metastasis patients.

TOTAL ROBOTIC TRANSANAL TOTAL MESORECTAL EXCISION – A VIDEO VIGNETTE.

P1769

T. Suhardja[1], P. Smart[2], A. Heriot[2], S. Warrier[2]
[1]*Dandenong, VIC, Australia;* [2]*Melbourne, VIC, Australia*

Purpose/Background: Total Mesorectal Excision (TME) is recognised as the standard of care for the surgical management of rectal cancer. A complete TME has been shown to reduce the rate of local recurrence. Risk factors that adversely affect the rate of R0 resections includes a narrow pelvis, male patient, locally advanced mid and distal rectal cancer, and anteriorly placed rectal cancer. Transanal TME (TaTME) provides an ideal approach for this particular patient population, especially for optimum identification of distal resection margin. Data in the literature has supported the use of TaTME, as an alternative to laparoscopic or open TME, achieving either similar or better oncological outcome. Robotic-assisted surgery (da Vinci Si Surgical System; Intuitive Surgery, Sunnyvale, CA) has gained a lot of traction in colorectal surgery due to the ease of the wrist articulating instruments in overcoming ergonomic challenges accessing the narrow pelvis, as seen with open or laparoscopic TME.

Methods/Interventions: We present a unique case of a 67-year-old male with a mid rectal cancer, 8cm from the anal verge, with standard preoperative pelvic MRI and staging CT scan, which showed a T3aN0M0 disease. He underwent neoadjuvant chemoradiotherapy prior to a low anterior resection with curative intent. Patient positioned in a Lloyd-Davies position and procedure commenced with the transanal approach first. A GelPOINT path transanal access platform was used along with Lone Star retractor. Routine purse string suture applied with adequate distal resection margin. GelSeal cap prepared with a diamond orientation of ports inclusive of three 8mm robotic ports, with the camera arm placed anteriorly and a posteriorly placed 8mm AirSeal port.

Results/Outcome(s): Procedure commenced with rectal mucosa circumferential marking of dissection plane. Full thickness rectotomy performed before establishing the TaTME plane posteriorly first, before proceeding lateral then anteriorly. Dissection continued superiorly towards the peritoneal reflection, while maintaining a complete mesorectal envelope and positively identifying important landmarks anteriorly, including paraprostatic tissue and the endopelvic fascia. Once the peritoneal cavity is breeched circumferentially, then the procedure can be continued transabdominally. Conventional robotic anterior resection and transabdominal TME performed, with specimen extraction through a Pfannenstiel incision. A conventional TaTME end-to-end colorectal anastomosis performed with a Covidien DST haemorrhoidal stapler, with a covering loop ileostomy through a RIF port site.

Conclusions/Discussion: We presented a novel modification of the Da Vinci Xi robotic platform, to perform

a single surgeon total robotic transabdominal TME and transanal TME. We demonstrated the feasibility of this novel approach and expansion of the use of the Da Vinci Xi platform.

NAVIGATION FOR LAPAROSCOPIC TOTAL MESORECTAL EXCISION: FIRST EXPERIENCE IN MEXICO.

P1770

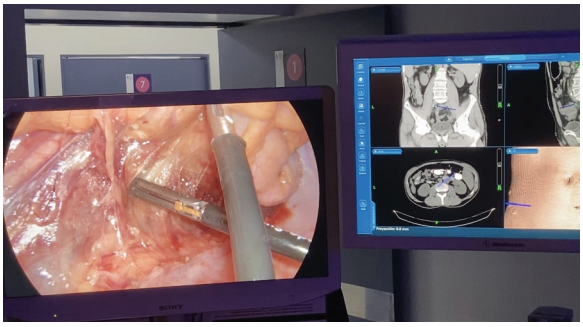
A. Iberri, B. Jimenez, A. Guemes, J. De Leon, J. Villanueva, R. Alcantara
Mexico City, Mexico

Purpose/Background: Surgical navigation has been mainly used in neurosurgery, increasing precision and offering improved outcomes for patients, becoming a fundamental tool in their procedures by making them less invasive and safer. This technology allows to match a tracked instrument with multiplanar reconstructed images (MRI and CT), enhancing anatomic identification, therefore, having less morbidity, an accurate oncologic resection and surgical confidence among others advantages still being studied. There have been few reports in current literature about the use of navigation in rectal cancer surgeries, and its standardization is still not well known. Surgical navigation is considered to be feasible in rectal cancer, it has been tried most commonly for TAMIS-TME, but it is considered to be relevant also for a laparoscopic approach.

Methods/Interventions: A male of 48 years old with rectal cancer (T3,N2b,M0), 12 weeks post neoadjuvant therapy, tumor localization at 7 cm from anal verge was selected for this procedure. Two weeks preoperative, a CT and MRI (with 2mm slices) were performed. He was admitted for surgical resection, and one day before surgery a simple CT with fiducials on place along the anterior pelvis was taken for later registration, these images were registered in a navigation software. The patient had already a stoma, so he did not undergo mechanical bowel preparation, in the operating room a single dose of metronidazole was administered. The patient was placed in Lloyd Davies position. A tracker was fixed in an arm beside patient in line with a receiver. Registration in each fiducial with a pointer was made and a number was assigned to each one, therefore, correlating any structure on the registered portion of the patient with CT in real time. A tracking device was attached to the tissue sealer device allowing the tip after calibration to correlate in real time with the images reconstructed on the screen and keeping a direct line with the receiver. The TME laparoscopic procedure was performed using navigation.

Results/Outcome(s): Laparoscopic TME guided by navigation was performed. The specimen had the mesorectal tissue intact. The patient was discharged four days after surgery with no post-operative complications

Conclusions/Discussion: Surgery guided by navigation for rectal cancer is a helpful tool, especially for complex tumors improving surgical outcomes and oncological results. It is also supportive for younger and unexperienced colorectal surgeons for better recognition of pelvic structures decreasing surgery mistakes dissection's and morbidity.



THE RISK FACTORS OF LOCAL RECURRENCE AND DISTANT METASTASIS ON PT1/T2 MID-LOW RECTAL CANCER AFTER TOTAL MESORECTAL EXCISION.

P1771

I. Lai
Taoyuan City, Taiwan

Purpose/Background: Curative total mesorectal excision for early-stge mid-low rectal cancer bring ideally oncological outcome. On the other hand, local recurrence and distant metastasis after total mesorectal excision are lethal and frustrate both patients and surgeons. This study tried to separately identify the risk factors of local recurrence and distant metastasis in pT1/T2 rectal cancer after total mesorectal excision, and to offer the hints on treatment modality.

Methods/Interventions: Tracing back the database of Chang Gung Memorial Hospital, 990 patients were identified as rectal cancer in pT1/pT2 stage. By careful patient selection, this study finally collected 352 patients with solitary, localized, rectal adenocarcinoma in pT1/pT2 stage, distance from anal verge ≤ 8cm. This study excluded (1) Patients who received long course neoadjuvant chemoradiotherapy, or (2) Patients received surgery delayed more than 30 days after neoadjuvant radiotherapy. COX regression model was adopted, and the results revealed in hazard ratio (95% CI for Exp(B)).

Results/Outcome(s): 352 patients were included in this study with 10 local recurrences and 22 distant metastasis events. The median time for follow up was 80.4 months. Median time to event in local recurrence and distant metastasis were 32.8 and 26.5 months. The independent risk factor for local recurrence was "Distance from anal verge ≤ 5cm" (HR = 5.2 (1.05 - 26.08), p = 0.043). The independent risk factors for distant metastasis were

"CEA ≥ 5 (ng/mL)" (HR = 5.8 [2.04 – 16.36], p = 0.001), "Lymph nodes yield < 12" (HR = 4.9 [1.79–13.67], p = 0.002), "N stage (+)" (HR = 3.4 [1.28 – 8.81], p = 0.014), "Resection margin < 1.5 cm" (HR = 2.9 [1.13 – 7.32], p = 0.021), and "Age < 55 years old" (HR = 2.9 [1.14–7.29], p = 0.026).

Conclusions/Discussion: "Distance from anal verge ≤ 5cm" was independent risk factor for local recurrence. "CEA ≥ 5 (ng/mL)", "Lymph nodes yield < 12", "N stage (+)", "Resection margin < 1.5 cm", and "Age < 55 years old" were independent risk factors for distant metastasis. By the findings, we suggest cautious follow-up plan in those with high-risk factors. Adequate lymph nodes yield and resection margin suggested the lower risk of distant metastasis in early stage rectal cancer. Further prospective study is needed.

Table Hazard Ratio for cancer recurrence

Variable	Hazard Ratio (95% CI for Exp(B))**	*p* value
Local recurrence		
DAV ≤ 5 (cm)	5.2 (1.05 – 26.08)	0.043*
Resection margin ≥ 1.5 (cm)	2.0 (0.50– 8.14)	0.320
Distant metastasis		
CEA ≥ 5 (ng/mL)	5.8 (2.04 – 16.36)	0.001*
LNY < 12	4.9 (1.79 – 13.67)	0.002*
N stage (+)	3.4 (1.28 – 8.81)	0.014*
Age < 55 (y/o)	2.9 (1.14 – 7.29)	0.026*
Resection margin < 1.5 (cm)	2.9 (1.13 – 7.32)	0.027 *
Post-op morbidity (early)	2.0 (0.78 – 5.07)	0.150

DAV: Distance from anal verge; *CEA*: Carcinoembryonic Antigen; *LNY*: Lymph node yield.

* *p* value < 0.05

** Adjusted parameters for local recurrence: DAV, resection margin, T stage. Adjusted parameters for distant metastasis: age, CEA, post-operative morbidity (early), resection margin, LNY, N stage.

ROBOTIC BEYOND-TME MULTIVISCERAL RESECTION IN PRIMARY LOCALLY ADVANCED RECTAL CANCER.

P1772

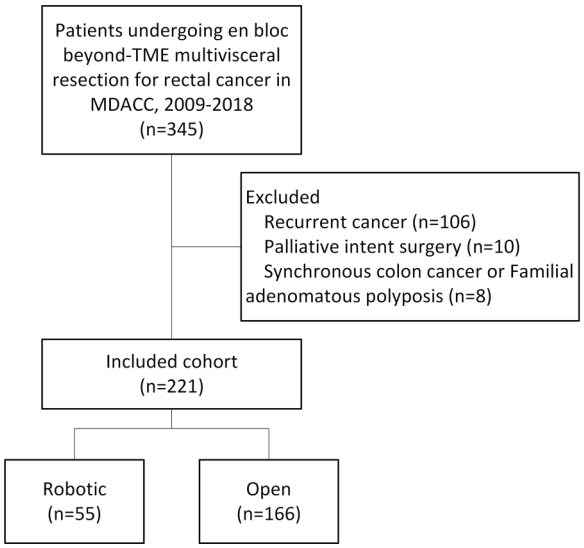
Y. Yang[2], T. Limvorapitak[1], S. Zafar[1], B. Bednarski[1], J. Skibber[1], M. Rodriguez-Bigas[1], Y. You[1], G. Chang[1]
[1]*Houston, TX;* [2]*Beijing, China*

Purpose/Background: Surgery for locally advanced rectal cancer should include complete multivisceral resection beyond the total mesorectal excision (TME) plane. Given the extent and complexity of surgery, patients with such tumors have been excluded from randomized trials of minimally invasive rectal cancer. The aim of this study was to assess the short-term outcomes of robotic beyond-TME multivisceral surgery for rectal cancer.

Methods/Interventions: All patients with locally advanced primary rectal cancer who underwent radical en bloc multivisceral resection with curative intent between January 2009 and December 2018 were identified from a prospective institutional database. Patient and treatment characteristics, perioperative outcomes, and short-term oncological results were compared for both robotic (ROBOTIC) and open (OPEN) approaches using bivariate analysis.

Results/Outcome(s): A total of 221 patients were identified, 55 (24.9%) operations were by robotic approach and 166 (75.1%) by open approach. The median age, median body mass index, tumor distance from anal verge, and clinical stage of the patients did not differ between the two groups. Patients in OPEN were more likely to be female (p=.029), had higher ASA (p=.004), and a higher proportion of cT4 tumors (68.1% vs 45.5%, p=.004). Neoadjuvant chemoradiation therapy was administered in 46 (83.6%) patients in ROBOT, and 158 (95.2%) in OPEN. The beyond-TME resections most commonly included anterior structures (36, 65% ROBOT vs. 119, 72% OPEN; p=.33) and intraoperative radiotherapy was used in 14.5% (ROBOT) and 23.5% (OPEN), p=.19). Median operative time was slightly shorter with ROBOT (7.1 hrs, IQR 5.8-10.1 hrs) than OPEN (8.4 hrs, IQR 6.5-10.5 hours), p=.071;blood was lower with ROBOT vs OPEN (200ml vs 800 ml, <.001); and median length of hospital stay was shorter with ROBOT vs OPEN (4 vs 7 days, p<.001). R0 resections were achieved in 94.5% (ROBOT) vs 89.2% (OPEN), p=.44. Rates of major post-operative complications, 30 days re-operation or re-admission did not differ (all P>0.05).

Conclusions/Discussion: Among patients with rectal cancer requiring a beyond-TME multivisceral resection, a high rate of R0 resection could be achieved with either a robotic or open approach. One in 4 patients could undergo a robotic approach and in these carefully selected patients, robotic surgery was associated with less blood loss and shorter hospital length of stay, although had a lesser tumor burden than patients undergoing open surgery.



LATERAL RECURRENCE OF RECTAL CANCER, AN OFTEN BELATED DIAGNOSTIC ISSUE THAT COMPROMISES THE OPPORTUNITY FOR SALVAGE TREATMENT.

P1773

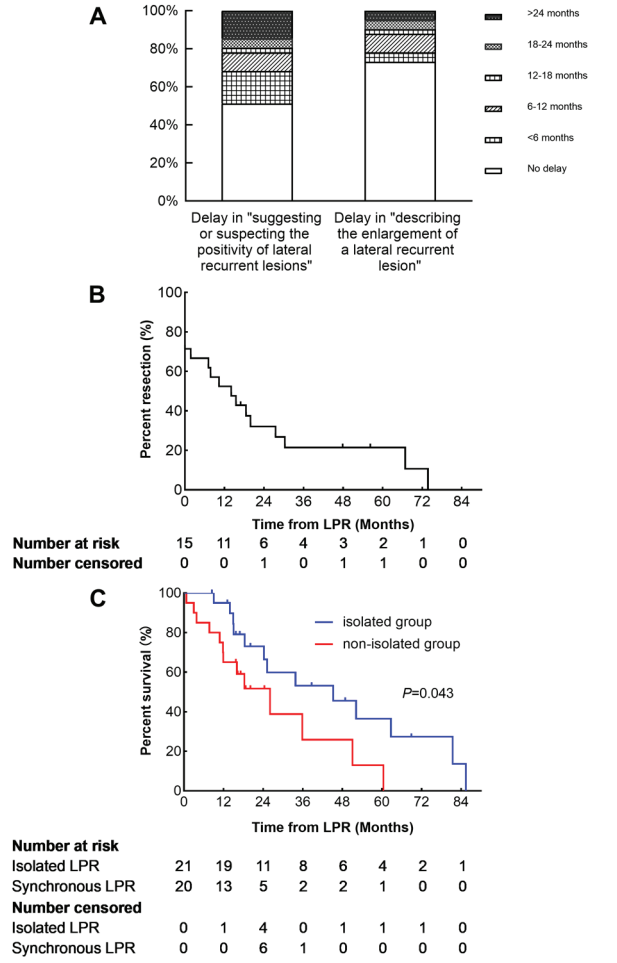
Z. Wang, S. Yang
Chengdu, China

Purpose/Background: To identify the extent of delay in diagnosis of LPR and investigate the process of lateral pelvis recurrence (LPR) development.

Methods/Interventions: 41 patients with LPR and annually imaging studies were enrolled for this study. CT scans of the abdominopelvic at each visits were retrospectively reviewed and all visible lateral lymph nodes (LLNs) were inspected.

Results/Outcome(s): According to different criteria, delay in diagnosis was found in up to 26.8% and 48.7% of all patients, and lasted a median of 10.4 and 12.3 months respectively (Fig. 1 A). 51.2% of patients with LPR can be classified as isolated LPR. In 21 patients with isolated lateral recurrence, 15 patients were considered to be resectable at the supposed time of diagnosis. For radiologically diagnosable lymph nodes, the median time of progressing into unresectable lesions was 14.1 months in patient with isolated LPR (Fig. 1 B). The overall survival time after the supposed time of diagnosis, for patients with isolated LPR, was significantly longer than those with synchronous LPR (median survival time was 45.3 months versus 26.1 months respectively; P = 0.043) (Fig. 1 C). In 30 out of 32 (94%) patients, and 74 out of 93 (80%) recurrent lesions, the lateral recurrence could be contributed to smaller lymph nodes at presentation and their steady progress after surgery. Among 30 patients with undiagnosable LLNs, small LLNs of <5mm in SAD accounts for 52.7% percent of all lateral recurrent lesions and 30% lateral recurrent cases.

Conclusions/Discussion: The LPR is prone to a delayed diagnosis. More attention should be paid to patients with undiagnosable enlargement of LLNs at presentation for the purpose of early diagnosis and timely treatment.



ROBOTIC ABDOMINOPERINEAL RESECTION: SINGLE INSTITUTION EXPERIENCE AT A NEW ROBOTICS PROGRAM.

P1569

K. Luberice, H. Browning, J. Dolce, K. Jacob, T. Bourdeau, H. Massarotti, A. Chudzinski
Tampa, FL

Purpose/Background: Robotic approaches have gained great momentum in surgery. This study was undertaken to examine our results with robotic abdominoperineal resection (APR) and to compare our results with those predicted by NSQIP and to the national benchmark reported through NSQIP.

Methods/Interventions: With Institutional Review Board approval, all patients who underwent a robotic APR from 2017-2019 at our institution were prospectively followed and reviewed. Outcomes were compared with predicted outcomes calculated using the ACS NSQIP

Surgical Risk Calculator and with outcomes documented in NSQIP. Data were analyzed using Chi-Square analysis and Student's t-test. For illustrative purposes, data are presented as median (mean ± SD) where appropriate.

Results/Outcome(s): 15 patients underwent robotic APR: 10 adenocarcinoma, 3 squamous cell carcinoma, 1 GIST and 1 chronic ulcerative proctocolitis with dysplasia. 14 patients underwent resection for anorectal neoplasm. Of those median age was 57 (59±16) years, BMI was 24 (26±9) kg/m^2, and 64% were men. Operative duration was 392 (402±94) minutes and estimated blood loss was 175 (167±126) mL. No operations were converted to 'open'. Length of stay (LOS) was 4 (6±4) days. 21% of patients had complications: myocardial infarction (1), sepsis (1), SSI (1) (Table). Two patients died within 30 days [1 myocardial infarct, 1 sepsis secondary gram-negative bacteremia]. Two patients were readmitted within 30 days [abdominal pain (1), abdominal abscess (1)]. Predicted outcomes were like outcomes reported in NSQIP (Table). Actual outcomes were similar to predicted outcomes (e.g., rates of SSI and patients returned to the O.R.) and national benchmark outcomes reported in NSQIP (e.g., rates of any complication, serious complications, cardiac complication, and SSI) (Table). Compared to the predicted outcomes, actual LOS was notably shorter than predicted LOS (4 (6±4) vs. 8 (8±1), p = 0.07).

Conclusions/Discussion: Our patients were not a select group; their predicted outcomes were the same as national outcomes. Our actual outcomes after robotic APR's were similar to those reported by or predicted by NSQIP. Our complications for robotic APR's are limited. While we believe our results will continue to improve with more experience, the robotic approach is the future of abdominoperineal resections. Our short experience shows that the application of the robotic platform is safe, feasible, and can secure a role in abdominoperineal resections for rectal cancer, and that this role will grow.

Variable	ACS NSQIP - Outcome	ACS NSQIP- Predicted Outcome	Actual Outcome
Patients (number)	-	14	14
Serious Complication, %	28	26	21 (3 Patients)
Any Complication, %	31	29	21 (3 Patients)
Pneumonia, %	2	2	0
Cardiac Complication, %	1	1	7 (1 Patient)
Surgical Site Infection, %	13	15	0
Urinary Tract Infection, %	7	5	0
Venous Thromboembolism, %	4	4	0
Renal Failure, %	2	2	0
Sepsis, %	11	11	7 (1 Patient)
Return to Operating Room, %	5	6	7 (1 Patient)
Length of Stay (days)	N/A	8 (8±1)	4 (6±4)
In-Hospital / 30-Day Death, %	1	1	14 (2 Patients)
Discharge to Nursing / Rehab Facility, %	16	14	14 (2 Patients)
Readmission, %	20	17	14 (2 Patients)

PERSISTENT HIGH POSITIVE CIRCUMFERENTIAL RESECTION MARGINS AFTER NEOADJUVANT TREATMENT IN CLINICALLY STAGED T4 RECTAL CANCER.

P1570

L. de Nes[1], L. Drager[2], P. Burger[3], H. de Wilt[2], P. Tanis[1]
[1]*Amsterdam, Netherlands;* [2]*Nijmegen, Netherlands;* [3]*Eindhoven, Netherlands*

Purpose/Background: The purpose of this study was to assess differences in circumferential margin (CRM) involvement after total mesorectal excision (TME) and multivisceral resection (MVR) in patients with locally advanced clinical T4 (cT4) rectal cancer and to evaluate the potential higher morbidity and mortality after MVRs.

Methods/Interventions: This population-based study involved 2242 patients diagnosed with locally advanced cT4 rectal cancer recorded between 2009 and December 2017. We compared CRM positivity and short-term outcomes after TME and MVR. MVR was divided in two subgroup depending on the extend of resection; limited and extended. Univariate and multivariable logistic regression analyses were performed to identify predictive factors for perioperative adverse events.

Results/Outcome(s): A TME was performed in 1306 patients and in 629 of the 736 patients who underwent a MVR an extended resection was conducted. A positive CRM was more often demonstrated after MVR than after TME 21.2% vs 13.9% (p<.001). More postoperative complications appeared in the limited and extended MVRs compared to TME (44.1% and 53.8% vs. 37.6%, p<0.001). The incidence of 30-day mortality was similarly low in TME and MVR (1.5% vs 2.2%, p = 0.196). Independent predictors of postoperative complications were age ≥70 years (OR = 1.26, 95% CI [1.03 to 1.54], p = 0.028), male gender (OR = 1.67, 95% CI [1.37 to 2.04], p<.001), mucinous tumours (OR = 1.54, 95% CI [1.05 to 2.25], p = 0.028) extended MVR (OR = 1.99, 95% CI [1.59 to 2.50], p<.001), LAR (OR = 1.472, 95% Cl [1.10 to 1.97], p = 0.009) and APR (OR 1.64, 95% Cl [1.30 to 2.06], p<.001).

Conclusions/Discussion: This population-based study revealed higher CRM positivity and more complications after MVR than after TME. Mortality rate is comparable low in both groups. Improvement in both TME and MVR should be strived for and reorganisation of perioperative care in cT4 rectal cancer could be helpful.

OMISSION OF NEOADJUVANT RADIOTHERAPY FOR CLINICALLY T2/N1 AND T3N0/1 MIDDLE AND LOW RECTAL CANCER WITH NEGATIVE RESECTION MARGIN.

P1571

K. Lee[1], Y. Sul[2], J. Kim[1], J. Kim[1]
[1]*Daejeon, Korea (the Republic of)*; [2]*Cheongju, Korea (the Republic of)*

Purpose/Background: Neoadjuvant concurrent chemoradiotherapy is currently the part of the standard treatment for locally advanced rectal cancer based on it superiority for local control. For the far advanced rectal cancers threatening the circumferential margin or massive lymph node metastasis, there is no doubt about neoadjuvant radiotherapy is mandatory. However, for the intermediately advanced cancers with the safe circumferentical margin as clinically T2N1 or T3N0/1, the oncologic benefit of neoadjuvant radiotherapy may need to be reconsidered. It can be overtreatment for pathologically T2 or node negative rectal cancer, increase the chance of anastomotic failure, induce postoperatively defecatory, urinary, or sexual function, or delay radical resection and/or systemic chemotherapy. We performed the present study to evaluate the safety of omission of neoadjuvant radiotherapy in c T2N1 and T3N0/1 rectal cancers.

Methods/Interventions: Between 2008 and 2014, medical records of the patients who underwent radical resection for middle & low rectal cancer were evaluated retrospectively. Distant metastasis, clinically T4, clinically N2 or positive lateral pelvic lymph node, positive circumferential resection margin, clinically T1/2 and N0, hitologically signet ring cell carcinoma and adjuvant radiotherapy were excluded. Clinical and pathological characteristics

P1571 Clinical and pathological characteristics of no radiotherapy group and radiotherapy group

	No radiotherapy group (N=34)	Radiotherapy group (N=32)	P value
Sex			
Male	19	26	0.027
Female	15	6	
Age			
<75	10	18	0.027
≥75	24	14	
Tumor location			
<4 cm	12	18	0.087
4-8 cm	22	14	
cT			
2	8	3	0.112
3	26	29	
cN			
0	21	18	0.649
1	13	14	
Operation type			
Sphincter saving surgery	34	30	0.231
Abdominoperineal resection	0	2	
pT			
0	0	8	
1	0	1	<0.000
2	12	13	
3	22	10	
pN			
0	25	29	
1	7	2	0.121
2	2	1	
Anastomotic leakage	3	2	0.121
Adjuvant chemotherapy			
No	30	22	0.050
Yes	4	10	

and 5-year oncologic outcomes between no radiotherapy group (n=34) and radiotherapy group (n=32) were analyzed by chi square test and Kaplan Meier analysis.

Results/Outcome(s): There was no statistically significant difference of tumor location, clinical stage, operation type, and anastomotic leakage between both groups. Male patients and adjuvnat chemotherapy were significantly more in radiotherapy group and elderly patients were significantly more in no radiotherapy group. Pathological T stage was significantly low in radiotherapy group. There was no statistically significant difference of 5-year disease free survival (89.4% vs. 85.4%, p=0.787), 5-year overall survival (96.6% vs. 89.0%, p=0.381), 5-year local recurrence rate (6.9% vs. 0%, p=0.427), and 5-year distant metastasis rate (7.2% vs. 14.6%, p=0.655). Although 5-year local recurrence rate of radiotherapy gourp was 0%, a delayed local recurrence after 63 months was found in radiotherapy group.

Conclusions/Discussion: Oncologic benefit of neoadjuvant radiotherapy for clinically T2/N1 and T3N0/1 middle and low rectal cancer with negative resection margin might be unclear, and the possibility of its omission needs to be reconsidered and prospective studies are required.

COMPARISON OF THE EARLY IMPLEMENTATION PHASE OF taTME VS. ROBOTIC SURGERY WITHIN A RECTAL CANCER PROGRAM IN A SINGLE PAYER, UNIVERSAL HEALTH CARE SYSTEM.

P1572

L. Zhang[1], P. MacDonald[1], A. Caycedo[2], S. Merchant[1], S. Patel[1]
[1]*Kingston, ON, Canada;* [2]*Sudbury, ON, Canada*

Purpose/Background: Transanal Total Mesorectal Excision (TaTME) and robotic surgery have been increasingly adopted in the management of rectal cancer. There are significant challenges in implementing new techniques in a single payer universal health care system; operating room availability is limited, hospital bed shortages are common and increased disposable costs often prohibit early adoption of novel techniques. The objective of this study was to compare the early implementation phases of taTME and robotic surgery in the management of rectal cancer, with a focus on delivery of MIS surgery, costs, procedure time and length of stay.

Methods/Interventions: This is a retrospective cohort study, comparing the early implementation phase of taTME ("Phase I") and robotic surgery ("Phase II") in a single payer, universal health care system (Ontario, Canada). "Phase" of treatment was used (instead of comparing taTME to robotics directly) to capture the overall impact of implementing these techniques on an existing rectal cancer program. Due to changes in available resources, taTME was only available during Phase I, while robotics was only available during Phase II. Implementation of both techniques followed a similar protocol (including training, case observation and proctoring). During Phase I, "high" (i.e. proximal and rectosigmoid) cancers were approached laparoscopically or open, while "low" (i.e. mid-distal rectal) cancers were eligible for taTME. During Phase II, all cancers ("high" and "low") were eligible for robotics. Surgical approach, conversion, length of stay, operating room time and estimated total costs were assessed. Total costs were estimated from disposable operative costs, fixed operative costs and cost of hospital stay.

Results/Outcome(s): A total of 82 patients (45 in Phase I and 37 in Phase II) were included. There were a similar numbers of low rectal cancers (62% vs. 57%, P=0.67), use of neoadjuvant therapy (49% vs. 43%, P=0.64), and use of ostomy (62% vs. 55%, P=0.50) between phases. Conversion was 17% during Phase I vs. 6% during Phase II (P=0.13). Successful completion of an MIS technique (i.e. attempted MIS, without conversion) was lower in Phase I vs. Phase II (64% vs. 91%, P=0.07). Median length of stay was longer in Phase I for high (5 vs. 2.5 days, P=0.04) and similar between groups for low (5.5 vs. 5 days, P = 0.58) Operative time was similar between phases for both high (P=0.17) and low (P=0.22) rectal cancers. Overall costs were also similar for high (P=0.22) and low (P=0.60) cancers, with higher disposable costs during Phase II, and higher length of stay costs during Phase I.

Conclusions/Discussion: This study compared early implementation of taTME and robotic surgery within a pre-existing rectal cancer program. Perceived barriers to implementation, including costs and operating times were similar, while length of stay favoured robotics implementation.

100 ROBOTIC LOWER ANTERIOR RESECTIONS: OUR EXPERIENCE WITH AN INNOVATIVE APPROACH TO A GOLD STANDARD PROCEDURE.

P1573

A. Bhatt, T. Lippert, K. Jacob, J. Dolce, H. Browning, H. Massarotti, A. Chudzinski
Tampa, FL

Purpose/Background: Though there continues to be an increase in utilization of 'the robot' for colon and rectal surgery, there remains disproportionate data with regards to perioperative outcomes supporting its continued application. This study was undertaken to examine a single institution's experience with 100 consecutive robotic lower anterior resections (LAR), and to compare our hospital outcomes to the national and predicted outcomes defined by the ACS National Surgery Quality Improvement Program Surgical Risk Calculator (NSQIP).

Methods/Interventions: We prospectively followed 100 consecutive patients undergoing robotic LAR. Demographics and perioperative outcomes were analyzed.

Data was examined in 25 consecutive patient cohorts. Outcomes were compared with predicted outcomes calculated using NSQIP and with outcomes documented in NSQIP for open and laparoscopic LAR. Data was analyzed using student t-test, ANOVA and Chi-squared analysis. Data are presented as median (mean ±SD).

Results/Outcome(s): 100 consecutive patients underwent robotic LAR; 46% for diverticulitis, 31% for colonic neoplasm, 22% for adenocarcinoma, 1% for colitis. 50% of patients were women, median age 63 years and BMI of 28 kg/m^2. Operative duration was 278 minutes and estimated blood loss (EBL) was 50 mL. 6 operations were converted to 'open', but only one in the last 25 patients. Length of stay (LOS) was 4 (5±2.1) days. 13% of patients had complications: ileus (3), surgical site infection (2), urinary retention (2), abdominal pain (1), duodenal perforation (1), atelectasis (1), bladder injury (1), acute kidney injury (1), and colonic stricture (1) (Table). 11 patients were readmitted within 30 days. 0 patients died within 30 days. 3 of these patients returned to the OR for duodenal perforation (1), bladder injury (1), and colonic stricture (1). When comparing consecutive cohorts, over time, there was an increase in the number of patients with previous abdominal operation (p=0.05). There was a reduction in EBL and LOS (p=0.05 and p=0.042, respectively). Our outcomes were significantly superior to the predicted outcomes in regard to serious complications 16.1% vs 2% (p=0.001), surgical site infections 10.8% vs 2% (p=0.002), colonic ileus 19.8% vs 3% (p=0.001), and length of stay 6.5 vs 4.0 (p=0.001) (Table). Similar results were seen when comparing our outcomes with average national results (Table).

Conclusions/Discussion: Our patients were not a select group; their predicted outcomes were similar to national averages. Over time, we were able to take on more challenging cases, decrease EBL, and discharge patients sooner without increasing operative time. Our outcomes after robotic LAR were like or significantly superior regarding serious complications to those reported and predicted by NSQIP. We believe that our results will continually improve, and the application of the robotic platform allows us to outperform national averages based upon NSQIP data.

THE IMPACT OF SURGICAL DAY OF THE WEEK ON THE LENGTH OF STAY IN COLORECTAL PATIENTS UNDER ERAS PATHWAYS.

P1574

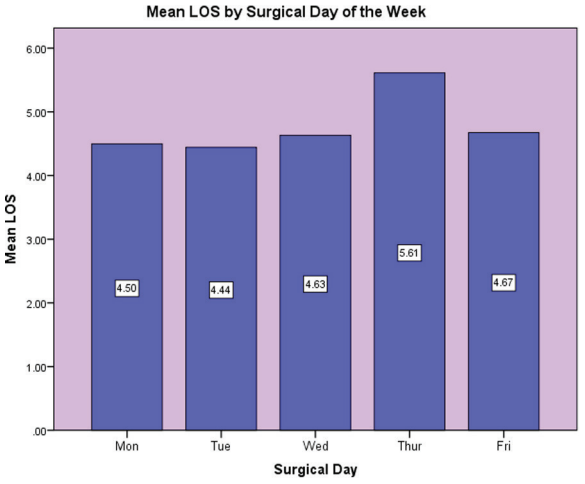
R. Hilli, H. Wasvary, M. Habra
West bloomfield, MI

Purpose/Background: The Enhanced Recovery after Surgery (ERAS) protocol seeks to improve the patient recovery process and facilitate early discharge from the hospital. Weekends in the hospitals are characterized by decreased staffing of ancillary services to coordinate patient discharges, which can lead to prolonged hospital stay. The primary aim of this study was to analyze how surgical day of the week impacts length of stay (LOS) in colorectal ERAS patients.

Methods/Interventions: A total of 940 patients who underwent colorectal surgery with ERAS pathways at Beaumont Health (Royal Oak, MI) were identified between August 2015 and December 2018 and retrospectively analyzed. The exclusion criteria were LOS > 20 days, BMI > 45, procedure conversion from laparoscopic/robotic to open, age > 85, and weekend surgeries. Patients were divided into 5 groups based on the surgical day of the week. The LOS for each operative day of the week was measured. Statistical analysis was performed using SPSS software (version 21.0).

Results/Outcome(s): A total of 827 patients met the inclusion criteria. Robotic procedures were performed in 392 patients (47.4%), laparoscopic in 258 patients (31.2%) and open in 177 patients (21.2%). Robotic and laparoscopic surgeries had a significant reduction in mean LOS, 1.03 and 1.14 days, respectively, when compared to open when analyzed via a univariate and ANCOVA methodology (p=0.00). Pelvic area resections (proctectomy/APR, low anterior resections) had longer mean LOS than non-pelvic resections (segmental left/right, sigmoid resections), but this was not statistically significant when controlling for the other variables (p=.896). Mean LOS was longer for males (p=0.016). Patients with increased comorbidities, higher BMI's, smokers and users of ETOH did not impact LOS, but patients with increased ASA scores did increase mean LOS (p=0.01). The average LOS for the entire cohort was (4.72 days). Tuesdays' procedures had the shortest LOS (4.51 days) and Thursdays' were the longest (5.61 days). Average LOS for Monday, Wednesday and Friday were 4.56, 4.67 and 4.82 days respectively. Univariate analysis found a statistically significant difference with regards to the LOS and the surgical day of the week (p=0.016). Multiple comparisons demonstrated that the mean difference between Thursday and Monday was (1.045 days); p = 0.011). The mean difference between Thursday and Tuesday was (1.1 days); p = 0.015). General linear model tests were performed and found that LOS was statistically affected by the surgical day of the week after controlling for other variables (Procedure, Procedure type, Sex, age, ASA score, number of comorbidities).

Conclusions/Discussion: The length of hospital stay was impacted by the day that the surgical procedure was performed. Further investigation is required to determine if short-staffed services such as social work and rehabilitation on weekends influence LOS in colorectal ERAS patients.



ASSOCIATION BETWEEN SOCIODEMOGRAPHIC VARIABLES AND RATE OF ADHERENCE TO FECAL OCCULT BLOOD TESTS IN A COLORECTAL CANCER SCREENING CAMPAIGN CONDUCTED IN BRAZIL.

P1575

S. Aguiar, B. Kupper, P. Stevanato, T. Bezerra, R. Takahashi, W. Nakagawa
Sao Paulo, Brazil

Purpose/Background: In Brazil, it remains challenging to encourage adherence to colorectal cancer (CRC) screenings, and the reasons for this are poorly understood. Therefore, the aim of this study was to evaluate the association between demographic, socioeconomic, and clinical measures and adherence to CRC screening with fecal immunochemical test (FIT) among average-risk individuals for colorectal cancer.

Methods/Interventions: In this prospective cross-sectional study, 1,254 asymptomatic individuals aged 50–75 years were selected between March 2015 and April 2016, during screening campaigns conducted at a tertiary hospital in Brazil. All of the participants were invited to undergo FIT and to complete a questionnaire that provides demographic, socioeconomic, and clinical variables. Data were analyzed in 2016.

Results/Outcome(s): The adherence rate to FIT was 55.6% (697/1254). In the multivariate logistic regression analysis, patients aged 60–75 years (odds ratio (OR) = 1.30; 95% confidence interval (CI): 1.02–1.66; p = 0.03), religious belief (OR = 2.04; 95% CI: 1.34–3.11; p < 0.01), previous fecal occult blood test (OR = 2.07; 95% CI: 1.55–2.76; p < 0.01), and full/part-time work status (OR = 0.66; 95% CI: 0.49–0.89; p < 0.01) were independently associated with adherence to CRC screening.

Conclusions/Discussion: In this population, young age, absence of religious beliefs, no previous history of FOBT, and full/part-time working status were associated with an increased risk of not adhering to CRC screening with FIT.

PARADIGM SHIFT UNDER THE INSTITUTIONAL MULTIDISCIPLINARY TUMOR BOARD SUPERVISION FOR THE CURATIVE MANAGEMENT OF STAGE IV COLORECTAL CANCER WITH LIVER METASTASES.

P1576

I. Cakcak[2], E. Aytac[1], B. Uzunoglu[1], O. Sariyildiz[1], V. Ozben[1], L. Ozer[1], I. Yildiz[1], M. Gonenc[1], G. Ceyhan[1], B. Baca[1], T. Karahasanoglu[1], I. Hamzaoglu[1], A. Acibadem Multidisciplinary Gastrointestinal Oncology Tumor Board[1]
[1]*Istanbul, Turkey;* [2]*Edirne, Turkey*

Purpose/Background: While the international guidelines provide basic principles for the management of stage IV colorectal cancer, multidisciplinary coordination of care is a requirement for selection of proper treatment strategy on an individual basis. Monitorization of clinical practices under the supervision of multidisciplinary tumor boards (MDTBs) are poorly studied. This study aims to evaluate impact of institutional gastrointestinal MDTB on curative management strategy for stage IV colorectal cancer with liver metastases.

Methods/Interventions: Between May 2014 and February 2019, medical records of patients who were diagnosed with stage IV colorectal cancer with liver metastases were reviewed. Patients who were managed under supervision of an institutional MDTB with a curative intent were included. All patients had hepatic metastases at the time of diagnosis. Treatment strategies and outcomes were compared between the first (the early period, 2014-16) and the last half (the recent period, 2017-19) of the study period.

Results/Outcome(s): There were 51 patients (13 patients in the early period). Basic patient characteristics, including gender (males 69% vs 63%, p=0.750), age (60±10 vs 56±14 years, p=0.324), having rectal cancer (54% vs 40%, p=0.518) and T stages (T4 vs others; 46% vs 39%, p=0.750) were comparable between the study periods. The number of patients with additional resectable metastatic lesions were ***(54% vs 21%, p=0.025)*** significantly higher and the number of patients having induction chemotherapy ***(31% vs 66%, p=0.049)*** were lower in the early period compared to the recent period. Simultaneous resections of primary and metastatic lesions were performed similarly in both study periods (46 vs 34, p=0.515). The number of patients undergoing major liver resections (23% vs 5%, p=0.098), simultaneous use of radiofrequency ablation (15% vs3%, p=0.156) and application of neoadjuvant radiotherapy among the rectal cancer patients were comparable (57% vs 73%, p=0.630) between the study periods. R1 resection rate was higher during early period ***(23% vs 3%, p=0.046).***

Conclusions/Discussion: Our institutional MDTB controlled care has provided a standardized approach for stage IV colorectal cancer with liver metastases with superb adherence to the main guidelines. Our curative

approach for these patients has recently prioritized induction chemotherapy prior to curative surgery. Use of primary chemotherapy may allow identification of the tumor biology and accelerate success of surgical treatment.

RENDEZVOUS COLONOSCOPY FOR RETRACTED COLO-ANAL ANASTOMOSIS FOLLOWING ROBOTIC INTER-SPHINCTERIC RESECTION WITH LOOP ILEOSTOMY FOR LOW RECTAL CANCER.

P1577

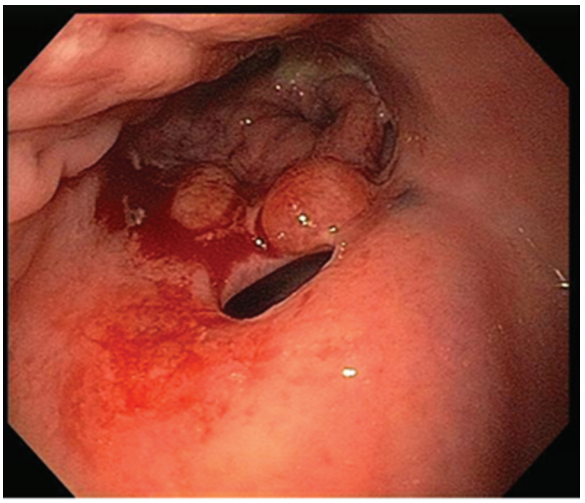
B. Rothschild, M. Gachabayov, L. Quintero, A. Rojas, R. Bergamaschi
White Plains, NY

Purpose/Background: Patients with low rectal adenocarcinoma located just proximal to dentate line albeit with no involvement of the external anal sphincter may be candidate for robotic sphincter- sparing proctectomy with loop ileostomy after neo-adjuvant chemo-radiation. Such patients should be counseled pre-operatively regarding suboptimal continence following ileostomy reversal. The surgical technique may entail an inter-sphincteric resection (ISR) with primary handsewn colo-anal anastomosis. The level of inter-sphincteric dissection may be at the inter- sphincteric groove or just distal to the dentate line depending on tumor location. Proximal retraction of the anastomosis with subsequent complete stricture may occur in 15%-26% of cases despite optimal surgical technique. In such patients with loop ostomy in place, rendezvous colonoscopy may be considered.

Methods/Interventions: We herein describe a case description Rendezvous colonoscopy with a balloon dilation of stricturing colo-anal anastomosis following Inter-Sphincteric Resection With Loop Ileostomy For Low Rectal Cancer

Results/Outcome(s): Case Presentation: A 55-year old male with a 47 BMI, ASA 3, with history of pulmonary embolus underwent robotic ISR with primary handsewn colo-anal anastomosis and loop ileostomy for T3N0 circumferential tumor located at 1 cm proximal to dentate line 8 weeks after neo-adjuvant chemo-radiation. Histopathology confirmed uninvolved radial margin and complete quality of TME. Retraction of the anastomosis with complete stricture (Figure 1) was diagnosed at completion of adjuvant chemotherapy. One colonoscope was advanced anterograde through the efferent limb of the ileostomy. Once the stricture was reached a biliary dilation balloon was used to inject contrast. A second colonoscope was inserted trans-anally for visualization. A 0.035-inch wire was advanced through the occlusive web of the stricture, which was then dilated with a through the scope CRETM (Boston Scientific, Marlborough, MA) dilation balloon. The procedure was repeated as needed and the ileostomy reversed. Figure 1. Colonoscopic view.

Conclusions/Discussion: Although rendezvous colonoscopy may offer a solution for patients with retracted colo-anal anastomosis following robotic inter-sphincteric resection with loop ileostomy for low rectal cancer, Turnbull-Cutait pull-through with delayed handsewn colo-anal anastomosis might be considered in an effort to decrease anastomotic retraction rates.



DIFFERENCES IN CECAL INCUBATION RATE AND COLONOSCOPY SCOPE POSITIONS? A META-ANALYSIS.

P1578

S. Lin, C. Yaow, C. Ng, C. Chong
Singapore, Singapore

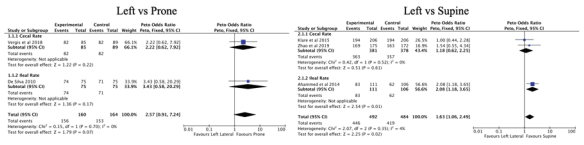
Purpose/Background: Background Cecal incubation rate is an important indicator for quality assessment of colonoscopy. Conventionally, left lateral position is the starting position. A favourable position, if of any difference, will improve cecal intubation rate and, more importantly, it being a surrogate for relative ease for colonoscopy, might indicate a higher polyp detection chance especially for right sided lesions which tends to be sessile and missed during colonoscopy. Hence, we sought to identify if there is any significant difference between the conventional position when compared to the rest.

Methods/Interventions: Methods Searches were ran on 3 databases including Medline, Embase, Cochrane with adherence to the PRISMA guidelines on 11/20/2019. The primary outcome in the study was cecal incubation rate, and secondary outcomes were cecal incubation time and adenoma detection rate. Studies comparing left lateral to other scope positions were included with reference to study designs including randomised controlled trials and cohort studies. For binary and continuous outcomes, pooled odds ratio and means were used respectively with

95% confidence interval and p<0.05 for statistical significance. RevMan 5.3 software was used in the meta-analysis. Cochrane risk of bias tool 2.0 was used in the assessment of bias, and funnel plot was used in the assessment of publication bias.

Results/Outcome(s): Results A total of 644 abstracts were retrieved and 41 relevant full texts were reviewed. 5 RCT studies included for the analysis. The number of patients who underwent left lateral, prone and supine positions were 648, 160 and 492 respectively. Compared to left lateral position, procedures conducted in the supine position showed significantly higher cecal intubation rates (Peto Odds Ratio: 1.63, 95% CI 1.06 to 2.49, p = 0.02). Compared to left lateral position, procedures conducted in the prone position however, were comparable and showed no significant difference in cecal intubation rates (Peto Odds Ratio: 2.57, 95% CI 0.91 to 7.24, p = 0.07).

Conclusions/Discussion: Discussion Amidst the available literature, the use of other positions can be taken into consideration when performing colonoscopy. This highlights that the existential practice is based predominantly on familiarity instead of evidence based benefits. In addition, some studies highlighted that using a supine position improved adenoma detection rates, decreased pain perception by patients and analgesia use and reduced difficulty in conducting the colonoscopy.



IMPROVING RECTAL CANCER OUTCOMES THROUGH REGIONALIZATION OF SURGICAL CARE.

P1579

F. Rutigliano, R. Heslin, P. Rider, J. Hunter, L. Grimm
Mobile, AL

Purpose/Background: Resection of rectal neoplasm remains a complex surgical endeavor due to technical difficulty and high rates of morbidity, thus is frequently performed at high-volume regional centers. Multiple articles have demonstrated favorable outcomes associated with high volume but few have evaluated the growth of a single institution and how its volume relates to changes in surgical outcomes. This longitudinal study analyzes clinical outcomes at a single institution over six years as it transitions from a low to high volume regional center, while implementing a Multidisciplinary Tumor Board and expanding it's referral region.

Methods/Interventions: Using ICD-9 and ICD-10 codes we identified all patients with rectal cancer seen by the USA Health Division of Colon & Rectal Surgery from 2013-2018. Through chart reviews, we acquired the patient's zip codes and used it to determine each patient's home county. Chart reviews were additionally used to acquire operative data; we excluded any patients who had a secondary tumor, a tumor originating above the peritoneal reflection, and emergent operations.

Results/Outcome(s): We identified 112 total patients who were treated surgically for rectal cancer from 2013-2018. The number of patients per year increased at an average rate of 7.74 patients per year (P = .00089, R^2= 85%). In 2013-14 there were 21 cases, 2015-16 there were 37 cases and in 2017-18 there were 48 patients who underwent surgical resection of rectal cancer. We saw significant improvements in 90-day morbidity, anastomotic leak rate and sphincter preservation in each consecutive two year span.

Conclusions/Discussion: Resection of rectal cancer remains a technically challenging procedure associated with high morbidity but has improved outcomes with greater volumes. Low volume institutions aiming to increase surgical caseload in an effort to provide regional care may be deterred from a high rate of surgical complications. However our early findings suggest that institutions transitioning into a high volume center should observe improvements in 90-day morbidity, anastomotic leak rate, and sphincter preservation. The establishment of a fellowship-trained colorectal group as well as a Multidisciplinary Tumor Board in 2013 has resulted in increased annual volume and referral region. The increased regionalization of rectal cancer care at USA Health Division of Colon & Rectal Surgery and the linear fashion of volume expansion correlate to better perioperative surgical outcomes, as demonstrated by our results.

P1579 Rectal Cancer Bi-Annual Outcomes

	2013-14	2015-16	2018-19
Total Cases	21	37	54
90-Day Morbidity	33%	14%	15%
Anastomotic Leak	21%	14%	15%
Sphincter Preservation	52%	67%	72%

SARCOPENIA IS ASSOCIATED WITH A MORE AGGRESSIVE TUMOR BIOLOGY WITH INCREASED NEURAL INVASION IN PATIENTS WITH LOCALLY ADVANCED RECTAL CANCER.

P1580

E. Yilmaz[2], E. Aytac[1], K. Uzun[3], M. Bas[1], E. Esen[3], V. Ozben[1], B. Bozkirli[1], G. Ceyhan[1], I. Bilgin[1], A. Aghayeva[1], L. Celik[1], E. Karaaslan[1], B. Baca[1], I. Hamzaoglu[1], T. Karahasanoglu[1]
[1]Istanbul, Turkey; [2]Bolu, Turkey; [3]NewYork, NY

Purpose/Background: The role of sarcopenia is recently being investigated in terms of its relationship with operative and oncologic outcomes in rectal cancer surgery. While its negative impact on postoperative recovery and prognosis was documented in the setting of rectal cancer, data regarding sarcopenia-associated pathophysiological mechanisms are scarce. This study aims to investigate perioperative and histopathologic outcomes in sarcopenic patients undergoing radical surgery after neoadjuvant treatment for locally advanced rectal cancer.

Methods/Interventions: Between February 2014 and June 2019, patients undergoing neoadjuvant treatment and mesorectal excision for locally advanced rectal cancer with curative intent were queried. Patients with available preoperative computerized tomography (CT) images were included. Lumbar skeletal muscle index, visceral adipose tissue surface area and mean muscle attenuation were calculated by analysis of CT images at the level of the third lumbar vertebra. Outcomes were analyzed based on presence of sarcopenia and visceral obesity.

Results/Outcome(s): 96 patients fulfilled the study criteria. Frequency of sarcopenia and visceral obesity were 41% and 58%, respectively. While visceral obesity was similar in both genders (p=0.833), males were more prone to sarcopenia than females (male, 49% vs female, 26%, p=0.031). An abdominoperineal resection was required more frequently in sarcopenic patients compared to their non-sarcopenic counterparts (sarcopenic: 30% vs non-sarcopenic: 5%, p=0.005). Overall complications were comparable in patients with sarcopenia (sarcopenic: 33% vs non-sarcopenic: 26%, p=0.498) and visceral obesity (visceral obesity: 34% vs no visceral obesity: 23%, p=0.261). Visceral obesity was associated with lymphatic involvement (visceral obesity: 48% vs no visceral obesity: 28 %, p=0.048). Incidence of neural invasion was higher in sarcopenic patients (sarcopenic: 38% vs non-sarcopenic: 15%, p=0.012). Visceral obesity and sarcopenia had no impact on tumor regression after neoadjuvant treatment (p>0.05).

Conclusions/Discussion: This is the first study reporting the association between sarcopenia and neural invasion in patients undergoing surgery following neoadjuvant treatment for locally advanced rectal cancer. Sarcopenia may be one the predisposing factors causing aggressive tumor biology via neuronal invasion.

ROBOTIC LATERAL PELVIC LYMPH NODE DISSECTION AFTER CHEMORADIATION FOR RECTAL CANCER: A WESTERN PERSPECTIVE.

P1581

O. Peacock, T. Limvorapitak, B. Bednarski, H. Kaur, E. Holliday, E. Dean, M. Taggart, G. Chang
Houston, TX

Purpose/Background: Lateral pelvic lymph node recurrence is an important issue in rectal cancer, despite the use of neoadjuvant chemoradiation therapy (CRT) and total mesorectal excision. There is limited outcomes data for lateral pelvic lymph node dissection (LPLND) following neoadjuvant CRT, particularly in the West. The aim of this study was to evaluate the short-term peri-operative and oncologic outcomes of robotic LPLND at a single NCI designated cancer center.

Methods/Interventions: A retrospective analysis of a prospective database of consecutive patients undergoing robotic LPLND for rectal cancer between November 2012 and October 2019 was performed. Main outcomes were short-term peri-operative and oncologic outcomes. Major morbidity was defined as Clavien-Dindo≥3.

Results/Outcome(s): A total of 34 patients underwent robotic LPLND during the study period. The mean age was 51 (SD+/-14) years and 10 (29.4%) were female. The median BMI was 29.6 kg/m^2 (IQR 26.0-32.7). All patients were identified to have clinical evidence of lateral pelvic lymph node metastasis on pre-treatment MRI. Neoadjuvant CRT was performed in 32 (94.1%) patients. Resection of the primary rectal cancer and concurrent LPLND occurred in 30 (88.2%) patients, whilst the remaining 4 (11.8%) patients had subsequent LPLND after prior rectal resection. The types of primary procedures performed, including 7 multi-visceral resections, were: 13 low or ultra-low anterior resections, 8 handsewn colo-anal anastomoses, 7 abdominoperineal resections, 1 total proctocolectomy and 1 total pelvic exenteration. Seven (20.6%) patients required bilateral LPLND and 2 patients had en-bloc resections of the internal iliac vessels. The median operating time was 390 minutes (IQR 300-532), estimated blood loss was 135ml (IQR 50-200) and the length of hospital stay was 4 days (IQR 3-6). The major morbidity rate was 14.7% (n=5), including 2 anastomotic leaks, 1 pelvic collection and 2 perineal wound infections. In addition, 5 (14.7%) patients failed a trial of void and required subsequent recatheterisation, but all were transient and symptoms had resolved by 2 weeks after discharge. The median lymph node harvest from the LPLND was 6 (IQR 3-9) and 13 (38.2%) patients had one or more positive lateral pelvic lymph nodes. The median follow-up was 22 months (IQR 6-41), with 1 (2.9%) local recurrence and 7 (20.6%) patients developing distant disease, resulting in 3 (8.8%) deaths.

Conclusions/Discussion: Robotic LPLND for rectal cancer can be performed in Western patients to completely resect extra-mesorectal lateral pelvic lymph nodes and is associated with acceptable peri-operative morbidity.

DOES MUCINOUS RECTAL ADENOCARCINOMA BENEFIT FROM NEO-ADJUVANT CHEMO-RADIATION?

P1582

H. Kessler, K. Cunningham, L. Duraes, T. Hassan
Cleveland, OH

Purpose/Background: The purpose of this study was to compare clinical results of mucinous and non-mucinous rectal adenocarcinoma, and to assess the effectiveness of neo-adjuvant chemo-radiotherapy (CRT) on mucinous rectal adenocarcinoma for clinical stage III patients.

Methods/Interventions: An institutional database was queried to identify patients with clinical stage III rectal adenocarcinoma confirmed by pelvic imaging, operated with curative intent between 2000 and 2012. Exclusion criteria were emergent operations, inflammatory bowel disease, and hereditary colorectal neoplasia. Patients were divided into two groups according to their neo-adjuvant treatment. Mucinous (M) and non-mucinous (NM) adenocarcinomas were compared to each-other. Uni-variate, and Kaplan-Meier survival statistical analyses were performed.

Results/Outcome(s): Out of 354 patients, 256 patients received CRT (34 M vs. 222 NM), and 98 patients did not receive CRT (14 M vs. 84 NM) due to comorbidities and patients' preference. Compared to M, NM patients had greater down-staging after CRT, and presented with lower post CRT pathological staging (yp stage I – 8.8% vs. 32.9%, ypstage II – 29.4% vs. 26.6%, and ypstage III – 61.8% vs. 40.5% for M and NM respectively). Among patients who received CRT, M had worse overall survival and cancer specific survival than NM. On the other hand, no difference in oncologic outcomes was found between NM and M in patients who did not receive CRT.

Conclusions/Discussion: In mucinous rectal adenocarcinoma, the indication for neo-adjuvant therapy has to be balanced carefully with potential side effects, as less favorable oncologic outcomes may be observed.

ANTHROPOMETRIC ANALYSIS OF THE PELVIS IN PATIENTS UNDERGOING ROBOTIC TOTAL MESORECTAL EXCISION FOR RECTAL CANCER.

P1583

K. Uzun[1], M. Bas[1], E. Aytac[1], E. Yilmaz[2], E. Esen[3], V. Ozben[1], I. Bilgin[1], L. Celik[1], E. Karaaslan[1], B. Baca[1], I. Hamzaoglu[1], T. Karahasanoglu[1]
[1]Istanbul, Turkey; [2]Bolu, Turkey; [3]NewYork, NY

Purpose/Background: The anatomy of pelvis varies individually and may complicate the course of surgery. There are limited data about the impact of pelvic architecture on the outcomes of minimally invasive surgery for rectal cancer. This study aims to evaluate the relationship between the anthropometric measurements of pelvis and short-term outcomes in patients undergoing a totally robotic total mesorectal excision (TME) for rectal cancer.

Methods/Interventions: Patients who had a totally robotic TME using the da Vinci Xi robotic system (Intuitive Surgical Inc., Sunnyvale, CA, USA) for rectal cancer in 12/2014–2/2019 were reviewed. Patients with available preoperative computerized tomography (CT) or magnetic resonance imaging (MRI) images were included. Pelvic anthropometric measurements, perioperative, short-term postoperative and histopathological outcomes were evaluated.

Results/Outcome(s): 113 patients [n=50 (44% males)] with a mean age of 59.4±10 years fulfilled the study criteria. The mean operating time was 300.5±102.9 minutes, estimated blood loss was 70.5±12.7 ml, length of hospital stay was 6.0±2.9 days and number of harvested lymph nodes was 25.2 ±10.9. Incomplete mesorectal excision rate was 6.2% (n=7) and overall short-term morbidity was 27% (n=30). Patients with an adroid pelvis who had a long pelvic depth (10.7 ±1.1 vs 11.3±0.9cm, p=0.010), sort pelvic inlet length (12±0.8 vs 11.6±1 cm p=0.010) and sort intertuberous distance (11±1.3 vs 10.4±1.3 cm p=0.032) were under the increased risk of operative morbidity. Fistula formation was more frequent in patients with an anthropoid pelvis who had a long pelvic inlet length (11.9±0.8 vs 13.2±0.2 cm, p=0.039). Operating time was shorter in patients with a platypelloid pelvis who had a short pelvic inlet length (12.1 ± 0.8 vs 11.7 ± 0.8 cm, p=0.023). While incomplete mesorectal excision was associated with sort pelvic inlet length (12 ± 0.9 vs 11.2 ± 0.8 cm, p=0.019), circumferential resection margin involvement was associated with wider surface of the sacrum coccyx concavity 33.6±6 vs 39.2±8.6 cm^2, p=0.007.

Conclusions/Discussion: This is the first study evaluating the short-term outcomes in patients undergoing robotic TME based on the anthropometic measurements of the pelvis. Adroid pelvis, narrow pelvic brim and increased sacrum coccyx concavity seem to be the factors associated with poor surgical outcomes. The traditional anatomical limitations of the pelvis has not been surpassed by using the most advanced multiport robotic platform for rectal cancer surgery.

POINTS TO KEEP IN EFFECTIVE CHEMOTHERAPY FOR ELDERLY PATIENTS AND PATIENTS WITH POOR GENERAL CONDITION WITH METASTATIC COLORECTAL CANCER.

P1584

G. Tsurita, T. Kurokawa, Y. Kanemoto, Y. Azuma, K. Yazawa
Tokyo, Japan

Purpose/Background: In our institute, chemotherapy for metastatic colorectal cancer (mCRC), have been aggressively performed for the elderly patients or the

patients with poor general condition, as same as not. The purpose of this study was to investigate these therapeutic outcome and to suggest more effective and safer chemotherapy for mCRC. In particular, we focused on elderly patients over 80 years old and patients with poor general condition over 2 of ECOG performance status (PS) score.

Methods/Interventions: Retrospectively analysis were performed for the patients who underwent chemotherapy for mCRC in our institute from 2008 to 2018. These patients (n=93) divided into two groups. The group of the elderly, 80 years or older patients (n = 25, E group) and others (n = 68, NE group) were compared, and Patients with poor general condition as ECOG PS score of 2 or higher (n = 10, P-PS group), and other (G-PS group n = 81,) were compared. Between these groups, clinicopathological factors, treatment-related adverse events and survival rate were estimated.

Results/Outcome(s): (Age) In the background factors, the dose of the first drug administration in E group was significantly lower than in NE group, but there were no significant difference in other factors. There were no differences in treatment-related adverse events between the two groups. The overall survival rate tended to be shorter in E group, but there were no significant difference. (PS) In background factors, Age and the dose of the first drug administration in P-PS group were significantly lower than in G-PS group, but there were no significant difference in other factors. There were no differences in treatment-related adverse events. Median survival time (MST) was significantly shorter in P-PS group than in G-PS group. There were short-term death cases in P-PS group, however, were not a few long-term survival cases in P-PS group.

Conclusions/Discussion: Chemotherapy for the elderly patients with mCRC can be safely administered by reducing the dose, and is effective. Patients with poor performance status can be expected to improve if chemotherapy is effective for poor performance status due to progression of cancer, and long-term survival can be expected. Chemotherapy should be aggressively, paying close attention to treatment-related adverse event, performed for the elderly patients or the patients with poor performance status with mCRC.

A COMPARISON OF LAPAROSCOPIC AND ROBOTIC COLECTOMIES FOR MALIGNANCY AT A HYBRID COMMUNITY CANCER CENTER.

P1585

B. Gough[1], E. McCarthy[1], M. Johns[1], S. Vaid[2], N. Petrelli[2]
[1]Wilmington, DE; [2]Newark, DE

Purpose/Background: The present study compares clinical outcomes on minimally invasive operative approach for colectomy amongst patients with malignant diagnoses. We hypothesized that patients who have undergone robotic colon surgery will demonstrate improved clinical outcomes relative to laparoscopic techniques.

Methods/Interventions: A retrospective review was performed via medical record review of all patients undergoing colectomies performed by a fellowship-trained colon and rectal surgeon at a single institution from 2015-2019. Patients demonstrating a benign diagnosis on final pathology and open cases were excluded. Based on laparoscopic versus robotic operative approach, two cohorts were developed, and 30-day outcomes were evaluated.

P1585 Colectomy for Malignancy Demographics and 30-Day Outcomes

	Laparoscopic	Robotic	Total	p-value
Number of Operations	18	26	44	
Demographics				
Female (%)	66.7%	46.2%	54.5%	0.143
Age (years, median)	74	65	67	0.056
BMI (median)	26.5	28.2	28.1	1.000
ASA (median)	3	2	3	0.347
Outcomes				
Operative Time (minutes, mean)	182.8	162.1	170.4	0.303
Lymph Nodes Harvested (median)	31.5	20.5	21.5	0.025
Length of Stay (days, mean)	5.5	3.4	4.3	0.002
Estimated Blood Loss (milliliters, mean)	137.1	63.7	93.0	0.332
Reoperation (n[%])	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Acute Kidney Injury (n[%])	3 (16.7%)	1 (3.8%)	4 (9.0%)	0.158
Anastomotic Leak (n[%])	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Readmission (n[%])	5 (27.8%)	3 (11.5%)	8 (18.2%)	0.190

BMI = body mass index

ASA = American Society of Anesthesiologists physical status classification

All outcomes are for 30 days post-operatively

Statistical analysis was performed utilizing Mann-Whitney U test for continuous variables and chi squared for categorical variables.

Results/Outcome(s): 116 patients who underwent a colectomy were evaluated. After implementing exclusion criteria, 44 colectomies were analyzed, of which 41% (n=18) were laparoscopic and 59% (n=26) were robotic. The median age was 67 years, and 55% (n=24) were female. Neither age nor gender demonstrated statistically significant differences between the two groups. The median American Society of Anesthesiologists physical classification was 3, and the majority of the patients were overweight with a median body mass index of 28.11. When comparing the laparoscopic and robotic cohorts, there were no statistically significant differences in operative time, estimated blood loss, tumor size, acute kidney injury, or 30-day readmission. No surgical site infections, anastomotic leaks, 30-day reoperations, or deaths were reported. Median T-stage in both cohorts was T3, with a median tumor size of 4.5 cm for laparoscopic cases and 4.1 cm for robotic cases. All of the cases in both cohorts demonstrated negative margins on final pathology. A single case in each of the cohorts demonstrated a lymph node yield of less than twelve. Patients undergoing laparoscopic colectomies demonstrated a statistically significant increase in number of lymph nodes harvested (p=0.025), while those undergoing robotic colectomies demonstrated a statistically significant shorter length of stay (p=0.002).

Conclusions/Discussion: Our results for a single colorectal surgeon suggest that amongst laparoscopic and robotic colectomies for malignant diagnoses there is no statistically significant difference in 30-day morbidity or mortality, but there are statistically significant differences in length of stay and lymph node harvest.

THE PATHOLOGICAL AND FUNCTIONAL RESULTS AFTER TRANSANAL TOTAL MESORECTUM EXCISION FOR LOWER RECTAL CANCER.

P1586

W. Tong, M. Li, J. Zhang, L. He, L. Zhang, Q. Wang
Changchun, China

Purpose/Background: Total mesorectal excision (TME) is known to improve oncologic outcomes in rectal cancer, and TME quality is one of the main prognostic factors associated with local recurrence in rectal cancer. Transanal TME (taTME) is an approach that may have the benefit of allowing for better definition of the distal margin and better visualization of hard-to-access anatomical areas. In this study, we analyzed the pathology and quality of the TME specimens and the quality of life functional test result after TaTME for the lower rectal cancer patients in our center-the First Hospital of Jilin University.

Methods/Interventions: Patients who underwent TaTME for lower rectal cancer (6 cm from anal verge) from January 2016 to December 2019 were included. Patient characteristics, staging, treatment, operative variables, and pathology data were collected. The TaTME procedure was performed by one team, the anastomosis was mostly performed by two-purse-suture staple method and a few cases were hand sutured. A diverting ileostomy were performed. The stomas were returned in 3-6 months after TaTME. The pelvic excises or biofeedback therapy were conducted to improve the defecation function, the LARS (lower anterior resection syndrome) score and the other quality of life function tests were recorded by follow up procedure. The local recurrence and metastatic status were followed up.

Results/Outcome(s): There were 105 TaTME patients during the study period. The baseline patient characteristics, perioperative characteristics and the pathological results after surgery were analyzed. The average distance of tumor from anal verge was 53.4 mm, the average distance of anastomosis from anal verge was 25 mm. The average circumferential margin was 12 mm. An average of 18 lymph node were harvested. The median follow-up time is 20 months. There was 1 case died of local recurrence and refused radio-chemotherapy, the rate of local recurrence is 0.95%, the ileostomy reversal rate is 89.1% six months after surgery, the incidence of LARS after 3 months and 6 months after surgery are 67.5% and 54.6%. There are 3 cases with anastomosis leak, the anastomosis leak rate was 2.85%, one case was transferred to permanent colostomy. The pelvic excises and biofeedback could help patients recover from LARS.

Conclusions/Discussion: Based on our single-center analysis of TaTME for the lower rectal cancer patients in 3 years period, the TaTME approach had a good CRM(circumference resection margin) and a lower rate of local recurrence. TaTME could preserve anal sphincter and improved the postoperative quality of life in patients with low rectal cancer

COLORECTAL LINITIS PLASTICA: A RARE NEOPLASTIC CONDITION WITH COMMON HISTOLOGICAL FEATURES.

P1587

J. Zakhaleva[1], B. Rothschild[2], D. Koo[2], M. Gachbayov[2], R. Bergamaschi[2]
[1]*Brooklyn, NY;* [2]*Westchester, NY*

Purpose/Background: Colorectal linitis plastica (CRLP) is an extremely rare (accounting for 1/1000 cases of colon cancer) but aggressive malignancy. CRLP can be either primary or secondary to metastatic spread originating from the stomach or breast. The aim of this systematic review was to evaluate the clinical presentation, diagnosis, treatment, and outcomes in patients with CRLP.

Methods/Interventions: PubMed, Medline, and EMBASE databases were systematically searched by two independent researchers for reports published between 1980 and 2019. Linitis plastica was defined as an infiltrating diffuse carcinoma of the colon or rectum that causes a desmoplastic response leading to a rigid and noncompliant colonic wall without any changes to the mucosa.

Results/Outcome(s): Sixty-nine published cases met the inclusion criteria. CRLP was primary in 55 and secondary in 14 patients. Mean age was 50 ± 18 years. Male to female percent ratio was 57:43. Most common presenting symptom was abdominal pain (43%), followed by diarrhea (29%), hematochezia (19%), and constipation (17%). Time from the onset of symptoms to diagnosis varied from 3 days to 6 years. The diagnosis was made at surgery in 50%, colonoscopy with biopsy in 33%, and autopsy in 27%. CRLP is defined as stage 4 disease and the histology showed signet cell carcinoma in most patients. The location of CRLP was colon in 55% (left-sided in 2/3 and right-sided in 1/3), rectum in 19%, and anus in 3%. For some patients, the disease was diffuse involving both the colon and the rectum. Breast cancer was the primary tumor in 7 of 14 patients with secondary CRLP, gastric cancer in 6, and ovarian cancer in 1 patient. One-year overall survival was 23%, despite surgery and chemoradiation in all patients.

Conclusions/Discussion: CRLP is infrequently diagnosed at colonoscopy, and despite R0 resection followed by a chemoradiation, is currently associated with a 77% mortality at 1 year.

EFFECTS OF A POSTOPERATIVE INFECTION ON PROGNOSIS AFTER CRS AND HIPEC.

P1588

K. Jonsdottir, M. Enblad, W. Graf
Uppsala, Sweden

Purpose/Background: CRS and HIPEC is an effective option for treatment of peritoneal metastasis originating from colorectal or appendiceal tumors. However, severe morbidity and rapid tumor recurrence may outweigh the benefit of the procedure. A well-defined complication is a bacterial infection with possible impact on the immune system but long-term effect of this influence on the prognosis is unknown. In this study the effect of infectious complications on survival will be addressed.

Methods/Interventions: Patients accepted for CRS and HIPEC operation in our clinic, between 2012-2017, were analysed using baseline characteristics with known importance for prognosis. Patients with cancer originating in the colon, rectum and appendix were included. Patients that had been operated before with CRS and HIPEC or who did not receive HIPEC were excluded. Patients who developed an infection postoperatively defined as a positive culture were compared to those who did not.

Results/Outcome(s): In all 171 fulfilled the inclusion criteria. There were 71 men and 100 women with average age of 63 years. 113 were diagnosed with colorectal cancer and 58 were diagnosed with pseudomyxoma peritonei (PMP). The median and projected 5-year survival, of the colorectal cancer group, was 2.1 years and 14% with an infection (n=40) compared with 3.5 years and 41% in 73 without infection (n=73) (Figure, p=0.03, log rank test). Intraoperative bleeding tended to be higher in the group with infection, but other prognostic factors were well balanced between the groups. In those with PMP projected 5-year survival was 89% irrespective of infection.

Conclusions/Discussion: Postoperative infection seems to impair the prognosis in patients treated with CRS and HIPEC for colorectal cancer. Further studies are needed to analyze the underlaying mechanisms.

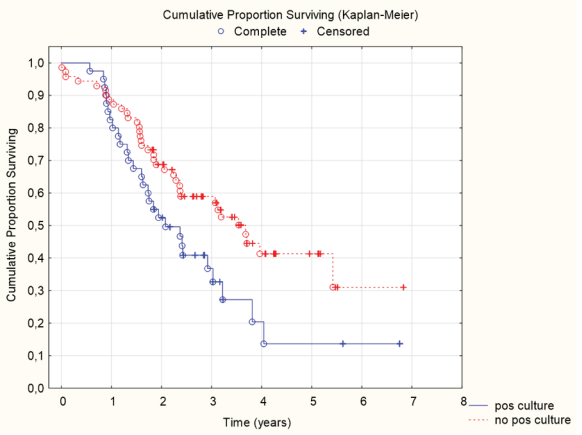


Fig 1 Cumulative proportion survival

DELAY TO ADJUVANT TREATMENT AND BODY COMPOSITION IN RESECTABLE COLON CANCER.

P1589

J. Hopkins, R. Reif, D. Eurich, D. Bigam, V. Baracos, M. Sawyer
Edmonton, AB, Canada

Purpose/Background: Delay to adjuvant treatment in colon cancer is associated with poor survival. Sarcopenia and myosteatosis are poor prognostic factors for survival outcomes. We hypothesized sarcopenia and/or myosteatosis at time of diagnosis would predict increased risk of delay to and reduced likelihood of completing adjuvant treatment. We also hypothesized combined risks of sarcopenia/myosteatosis and delay to treatment would predict poor survival.

Methods/Interventions: This was a retrospective cohort study of adult patients (pts) with stage II-III colon cancer undergoing resection from 2007 to 2009 to assess associations between body composition and survival outcomes. All were seen in a Northern Alberta cancer

center. We excluded patients with rectal cancer, recurrent disease, or no preoperative CT scan. Sarcopenia and myosteatosis were defined by cohort specific cutoff values. Multivariate and multinominal logistic regression were used to assess relationships between body composition and delay to/completion of adjuvant treatment. Multivariate cox proportional hazards models were used to determine effects of body composition and delay/completion of adjuvant treatment with overall (OS), disease free (DFS) and recurrence free survival (RFS) outcomes.

Results/Outcome(s): Of 529 pts, 152 had sarcopenia, 318 had myosteatosis and 112 had both. Adjuvant treatment was given to 384 pts. A total of 87 pts were not given adjuvant treatment because of post-operative complications or comorbidities. Of those, more were myosteatotic (75.9 vs 57.0%, p=0.001) and sarcopenic (33.3 vs 28.5%, p=0.289). Sarcopenia prevalence was similar regardless between groups (20.0 vs 29.48%, p=0.731). Pts receiving oxaliplatin based chemotherapy without delay were less than 70 years (62.8 vs 37.2%, p<0.001). Neither sarcopenia (OR 0.60, p=0.519), nor myosteatosis (OR 2.70, p=0.212) predicted delay to treatment in univariate or multivariate analysis (OR 0.43, p=0.308; OR 2.26, p-0.338). Myosteatosis was predictive of no adjuvant in univariate (RRR 2.68, p<0.001), but not multivariate analysis (RRR 1.35, p=0.342). Sarcopenia trended towards significance in predicting treatment completion(RRR 1.66, p=0.086). Both sarcopenia (RRR 2.36, p=0.018) and myosteatosis (RRR 3.50, p=0.007) predicted delay for comorbid status. Myosteatosis predicted pts-declining adjuvant treatment (RRR 2.06, p=0.016). Presence of sarcopenia, myosteatosis and treatment delay predicted significantly worse OS (HR 4.97, p<0.001), DFS (HR 4.77, p=0.002) and RFS (HR 5.37, p=.001).

Conclusions/Discussion: We demonstrated an association between body composition and treatment delay with survival outcomes. In this cohort, body composition parameters did not predict delay to or completion of adjuvant treatment. This may be a result of a small sample size. Or, related to a significantly larger portion of pts with sarcopenia/myosteatosis who were older than 70, and not offered oxaliplatin.

THE TREND OF SPHINCTER PRESERVATION IN LOW RECTAL CANCERS - 10 YEARS AUDIT FROM AN INDIAN TERTIARY CANCER CENTRE.

P1590

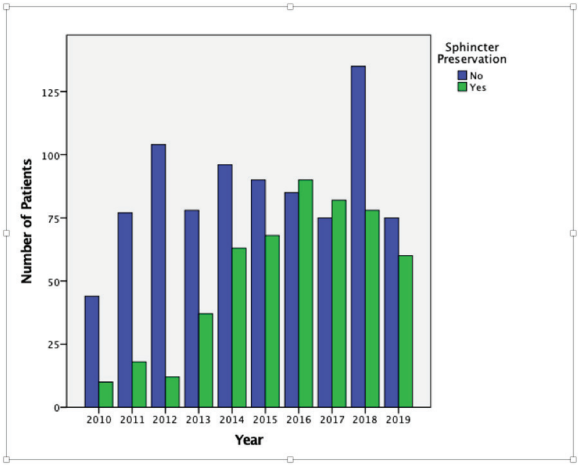
D. Pandey, S. Bankar, J. Rohila, S. Raghavan, P. Shetty, S. MR, M. Varma, A. Desouza, A. Saklani
Mumbai, India

Purpose/Background: Colorectal cancer is 3rd most common cancer worldwide, accounting for almost 10% deaths due to all cancers. For more than a century, the gold standard treatment for rectal cancer was Abdominoperineal resection (APR) but since the introduction of Total mesorectal excision(TME) and Neoadjuvant Chemoradiation, it has witnessed a paradigm shift. Heald also concluded that short distal margin was oncologically safe with TME. Later on, Schiessel and Watanabe revolutionised sphincter preservation with the introduction of intersphincteric resection(ISR). Transanal minimally invasive surgery(TAMIS) and Transanal TME came later. This audit aims to evaluate 10 years trend of sphincter preservation for low rectal cancers from a tertiary care centre in India.

Methods/Interventions: This is a retrospective analysis of a prospectively maintained database from a Tertiary care centre in South Asia. All curative intent Low rectal cancer resections performed between January 2010 till October 2019 were included. Low rectal cancers were defined as all tumours within 5cm from anal verge either measured by Sigmoidoscopy/Colonoscopy or an MRI pelvis. All patients went through a Multidisciplinary tumour board before treatment planning. Data were analysed by calculating the proportion of patients undergoing Sphincter preservation each year. Similarly, short term outcomes of ISR were analysed.

Results/Outcome(s): A total of 1377 patients were included in the study with 63% males and 37% females. Sphincter preservation could not be achieved in 859 (APR n=787, Pelvic Exenteration n=72) patients and rest 518 underwent Sphincter Preservation Procedures (ISR n=236, Low Anterior resection n=157, Ultra LAR n=74, Transanal excisions n=35, TEMS with TEO platform n=11, Supralevator Pelvic exenteration n=5). Yearly sphincter preservation rates were 18.5%,18.9%,10.3%,32.17%,39.62%,43%,51.4%,52.2%,36.6%,44.4% in year 2010 ,2011,2012,2013,2014,2015,2016,2017,2018, till October 2019 respectively. Sphincter preservation in the majority of our patients was achieved with ISR. Out of 236 patients undergoing ISR,213(90.2%) received neoadjuvant chemoradiation.33% patients underwent Open resection, 40.1% Laparoscopic resection and 26.9% underwent Robotic resection. The Median Blood loss was 350ml(range of 30-3500ml). Postoperatively mean nodal harvest was 12.14 (+/-6.4). Mean distal margin was 1.6cm with a distal margin positive rate of 1.4% whereas CRM positive rates were 3.6 %. Anastomotic dehiscence occurred in 15(6.3%) patients and grade III or more Clavien Dindo morbidity occurred in 7.2%.

Conclusions/Discussion: The present audit shows an improving trend in the adaptation of Sphincter preservation over the years in our institute. It can also be attributed to the formation of a dedicated colorectal oncology division at our institute in year 2012. Sphincter preservation surgeries are often feasible in low rectal cancers and a shared decision with the patient is essential.



THE EFFECT OF NEOADJUVANT THERAPY ON PERIOPERATIVE OUTCOMES IN RECTAL CANCER PATIENTS FOLLOWING STOMA REVERSAL.

P1591

M. Hamidi, K. Hanna, T. Jerome, M. McIntosh, R. Turk, V. Nfonsam
Tucson, AZ

Purpose/Background: Anastomotic leak after reversal of an ostomy is a significant complication in rectal cancer patients. The effect of neoadjuvant chemoradiotherapy (NCRT) on outcomes following stoma reversal are not well established. The aim of our study was to evaluate the effect of NNCRT on outcomes in rectal cancer patients following stoma reversal.

Methods/Interventions: We performed a (2005-2012) retrospective cohort analysis of the National Surgical Quality Improvement Program including adult (≥18y) rectal cancer patients who had an elective stoma reversal. Patients were stratified into those who received NCRT and those who did not (no NCRT). Primary outcomes were anastomotic leak, and major complications. Secondary outcomes were mortality, and length of stay (LOS). Regression analysis was performed.

Results/Outcome(s): We identified a total of 461 patients of which 259 received NCRT while 202 did not receive NCRT. The mean age was 52±10y, and 28% had an ASA class III-IV. Overall, the rate of anastomotic leak was 6.8%. Major complications were seen in 5.6% of patients with the most common complication being organ space infection (3.2%). There was no difference between the two groups in terms of anastomotic leak (6.2% vs. 7.9%; p=0.22), major complications (5.1% vs. 6.4%; p=0.17), or mortality (1.9% vs. 2.4%; p=0.26), LOS (4[4-5] vs. 5[3-5]; p=0.12). On regression analysis, after adjusting for confounding variables, NCRT was not associated with anastomotic leaks (OR 1.03[0.86-1.07]), major complications (OR 1.97[0.79-1.99]), or mortality (OR 1.04[0.59-1.12])

Conclusions/Discussion: NCRT for rectal cancer does not result in higher morbidity following stoma closure despite its well-known side effect profile. Stoma closure is as safe and should not be withheld based on NCRT.

EMERGENT COLECTOMY FOR COLORECTAL CANCER: A COMPARATIVE ANALYSIS OF OPEN VS. MINIMALLY INVASIVE APPROACH.

P1592

H. Jecius, E. Krall, D. Tso, K. Hanna, M. Hamidi, V. Nfonsam
Tucson, AZ

Purpose/Background: Colorectal cancer (CRC) remains a significant contributor to health care utilization in industrialized nations, especially in the surgically emergent setting. Minimally invasive surgery (MIS) for CRC gained popularity in the past few decades. Surgery for colon cancer in the emergent setting resulting from bleeding, obstruction and other complications is frequently associated with higher rates of morbidity and mortality due to the inability to adequately optimize the patients. However, outcomes following different surgical approach is not well understood. The aim of our study was to compare short-term surgical outcomes of colon resection using the open vs minimally invasive approach.

Methods/Interventions: We performed a four-year review (2012-2015) of the ACS-NSQIP Colectomy dataset and included all adult patients with CRC who underwent emergent surgical intervention. Emergent cases were selected according to the Emergency Surgery variable in NSQIP. Patients were stratified into two groups based on surgical approach: Open and MIS (laparoscopic vs robotic). Outcome measures were anastomotic leaks, operative time, 30-d complications, 30-day readmission, and 30-d mortality. Multivariate Regression analysis was performed.

P1592 Table 1. Multivariate Logistic Regression Analysis of Outcomes: Effect of Open

Outcome	Odds Ratio	95% Confidence Interval	P-Value
30-Day Mortality	1.45	1.10-2.47	0.01
30-Day Complications	1.38	1.02-1.45	0.01
Anastomotic Leak	0.39	0.29-0.53	0.01
30-Day Readmission	1.06	1.03-1.19	0.11

Results/Outcome(s): A total of 7,136 patients were included in our analysis of which 1855 (MIS: 279, Open: 1576) patients underwent emergent surgery. Mean age was 67 ± 13 years, 45% were male, and 74% of the patients had ASA class of 3 and above. Overall mortality rate was 7.4%. Patients in the open group were more likely to be older (70y vs. 61y, p<0.01), have higher ASA class, and of Black race compared to those in the MIS group. On univariate analysis of outcomes, patients in the MIS group had higher rates of post-operative leak (8.1% vs. 3.3%, p<0.01), longer operative time (189±41 min vs. 161±69 min, p<0.01). Conversely, patients in the open group had higher rates of mortality (6.7% vs. 3.8%, p<0.01) and 30-day complications (28.1% vs. 16.7%, p<0.01) compared to the MIS group. However, there was no difference between the two groups in terms of 30-day readmission. On regression analysis, the open approach was independently associated with higher odds of 30-day mortality and 30-day complications and lower odds of anastomotic leaks compared to the MIS approach. No association was found in terms of 30-day readmissions.

Conclusions/Discussion: Despite a longer operative time and a higher rate of anastomotic leak, an MIS colectomy approach for CRC patients is associated with lower overall mortality and complications likely because they were younger with a lower ASA class. Future studies should further verify whether an MIS approach is a viable alternative for open colectomy in properly selected patients.

VARIABILITY IN COMMUNICATION AND REPORTING PRACTICES BETWEEN GASTROENTEROLOGISTS AND SURGEONS CONTRIBUTES TO REPEAT PREOPERATIVE ENDOSCOPY FOR COLORECTAL NEOPLASMS: A QUALITATIVE ANALYSIS.

P1593

O. Hershorn, J. Park, H. Singh, G. Restall, K. Clouston, A. Vergis, R. Helewa
Winnipeg, MB, Canada

Purpose/Background: There is a trend towards increased rates of repeat preoperative endoscopy by the operating surgeon prior to planned colorectal resection. However, the reasons for this are not entirely clear and repeat endoscopy may lead to delays in curative resection, increased costs, and patient discomfort. Our aim was to determine practice patterns, localization techniques, and processes of communication undertaken by endoscopy specialists at a high volume Canadian institution.

Methods/Interventions: A qualitative study design was used. Gastroenterologists and Surgeons who perform lower endoscopy were contacted. Audio-recorded interviews using a semi-structured script were conducted from October 2018 to February 2019. Approach to lesions requiring surgical resection, localization techniques, communication amongst endoscopy specialists, and decision-making strategies related to repeat preoperative endoscopy were discussed. Data were analyzed using a thematic approach.

Results/Outcome(s): Ten Surgeons and 10 Gastroenterologists practicing in both community and tertiary centres were interviewed. The majority were male (70% GI, 60% Surgeons). Physician experience varied from less than 1 year to greater than 25 years. Three key themes emerged and included 1) patterns of communication, 2) feedback, and 3) trust. Thematic analysis revealed that poor communication and ambiguous documentation increased the likelihood of performing a repeat preoperative endoscopy. Factors such as clearly defined anatomical landmarks, thorough characterization of the lesion, and a comprehensive description of the tattooed location were important descriptors for Surgeons. Left-sided and rectal lesions, as well as, incongruent findings on endoscopy and imaging were more likely to undergo repeat preoperative endoscopy. Importantly, inconsistencies in tattooing practices was found. Fifty percent of Gastroenterologists tattooed distally while the other half tattooed both proximal and distal. However, the majority of Surgeons reported tattooing only distal (90%). Lastly, issues related to trust emerged as a contributor to repeat preoperative endoscopy.

Conclusions/Discussion: Incongruent endoscopic reporting contributes to gaps in communication amongst endoscopists and increases the likelihood of performing a repeat preoperative endoscopy. Ambiguous documentation and inconsistent tattooing practices amongst physicians pose significant concerns for accurate intraoperative lesion localization. Closed-loop communication with consistent feedback, and joint educational initiatives were proposed to enhance knowledge translation. These results support the need for standardized guidelines and endoscopic reporting in the management of colorectal lesions.

DETERMINATION OF OPTIMAL DISTAL RESECTION MARGIN AFTER NEOADJUVANT RADIOTHERAPY FOR RECTAL CANCER USING THE NAKED EYE.

P1594

W. Zhang[1], G. Sun[1], X. Ye[1], C. Bai[1], E. Furnee[2], P. Broens[2], M. Trzpis[2], H. Zhang[1]
[1]Shanghai, China; [2]Groningen, Netherlands

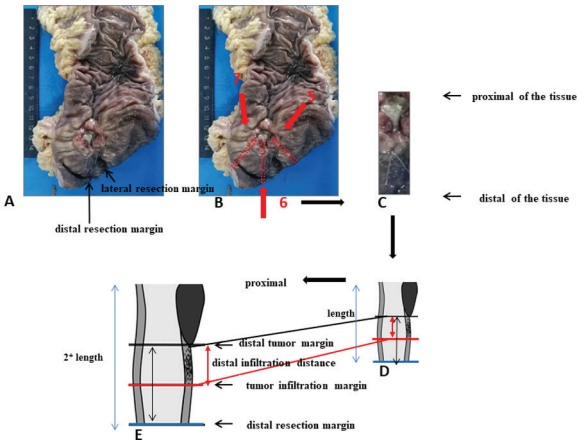
Purpose/Background: How to intra-operatively determine the safe distal resection margin after chemoradiotherapy in rectal cancer surgery always remains a matter of controversy in both the length of distal resection and the definition of the tumor margin. The aim of this study was to detect a universal, safe length of both lateral and distal resection margins of rectal cancer after

radiotherapy by measuring the intramural infiltration distance. Additionally, we aimed to investigate whether the tumor margin, determined by using naked eyes during operation is optimal and trustable. The possible influencing factors of distal infiltration will also be analyzed.

Methods/Interventions: It is a prospective, observational study, performed in the First Affiliated Hospital of Naval Military Medical University, Changhai Hospital. Twenty surgical specimens from consecutive patients, who underwent abdominal perineal resection (APR) or low anterior resection (LAR) after preoperative radiotherapy from June 2018 to December 2018, were prospectively collected. From each rectal specimen, three samples (at 5, 6, 7 o'clock position) were collected. We determined the tumor infiltration distance firstly ex vivo, after formalin fixation, using histopathological outcomes. Secondly, we calculate the infiltration distance in vivo by multiplying value in vitro by two, according to the already published literature. Distance between the nanocarbon indicating tumor margin and most distal tumor cells was measured ex vivo for each slide, and then the max value of the distance was calculated. Firstly, the nanocarbon was used as a zero point (step 1). Secondly, based on the morphological view, the tumor cells located distally were found, and this way the distal tumor margin was determined (step 2). Thirdly, a black and red line was drawn across nanocarbon and distal tumor margin, respectively, perpendicular to the rectum (step 3). Lastly, the distance between the two lines was measured (step 4).

Results/Outcome(s): The maximal distance of the tumor infiltration was 6, 4 and 4mm at 5, 6 and 7 o'clock, respectively, based on histopathological analysis. The relative maximal tumor infiltration distance in vivo was 12, 8 and 8mm, respectively. Out of five patients, whose distal tumor infiltration at 6 o'clock was confirmed histopathologically, four had positive lymph nodes (80%), while out of 15 patients without distal tumor infiltration, only two had positive lymph nodes (13.3%). Patients with positive lymph nodes had the longest distal infiltration distance.

Conclusions/Discussion: The resection margin after radiation can be optimally determined in vivo, using naked eyes basing the determination on the visually recognized scar and fibrotic tissue, which surrounds the tumor after radiotherapy. Patients with pathologically positive lymph nodes have a higher risk of distal tumor infiltration.



TOTAL NEOADJUVANT THERAPY: A COMPARATIVE ANALYSIS OF PERI-OPERATIVE OUTCOMES AND COMPLICATIONS IN LOCALLY ADVANCED RECTAL CANCER.

P1595

K. Cunningham, A. Jarrar, M. Kalady, D. Liska, M. Valente, S. Shawki, H. Kessler, S. Steele
Cleveland, OH

Purpose/Background: Total neoadjuvant therapy (TNT) utilizing long-course chemoradiation (CRT) and consolidation chemotherapy prior to surgical resection is an increasingly utilized treatment strategy for locally advanced rectal cancer due to increased rates of pathologic complete response and improved facilitation of chemotherapy delivery. However, there is limited data regarding the impact of TNT on short and long-term post-operative morbidity. Due to concern that TNT may increase peri-operative complications, we sought to investigate post-operative morbidity in the setting of TNT as compared to standard neoadjuvant long-course CRT followed by definitive oncologic resection.

Methods/Interventions: A case-matched retrospective review of adult patients with locally advanced rectal adenocarcinoma treated with TNT (long-course CRT followed by four months of consolidation chemotherapy with FOLFOX) was performed. Study patients were matched by age, gender, and surgical approach to a control cohort of adult patients who received standard neoadjuvant long-course CRT. All patients underwent subsequent curative intent resection. Data collected included patient demographics, tumor characteristics, surgical details, pathologic features, and post-operative outcomes. The primary endpoint was the rate of Clavien-Dindo Grade III and IV post-operative complications.

Results/Outcome(s): 42 patients were included in each cohort. There were no differences with regard to tumor height, differentiation grade, presence of tumor deposits, microsatellite instability, tumor regression grade, mesorectal excision quality, perineural and lymphovascular

invasion, estimated blood loss, negative surgical margin, and pathologic stage between the two groups (Table 1). The rate of Clavien-Dindo Grade III and IV complications was similar between both groups: 14.3% (p=NS). In the TNT cohort, there were three organ space infections, one pulmonary embolus (PE), one acute renal failure (ARF), and one wound dehiscence. In the control cohort, there were two organ space infections, one PE, one ARF, one cerebrovascular accident, and one wound dehiscence.

Conclusions/Discussion: In our practice, TNT utilizing long-course chemoradiation and consolidation chemotherapy prior to surgical resection is a feasible approach that does not appear to increase post-operative morbidity. Larger patient cohorts and long-term follow-up are needed to determine which treatment strategy is oncologically optimal.

Total Number	**n=42 (%)**	**n=42 (%)**	
Age at surgery (years) SD	62.8 ± 13.5	58.2 ± 9.5	NS
Males	23 (54.7)	23 (54.7)	
BMI SD	29.3 ± 2	27.5 ± 3	
Tumor Height (From Anal Verge (cm) SD	5.3 ± 4.7	8.4 ± 5.6	NS
Surgical Approach			
Open Low Anterior Resection	5 (11.9)	5 (11.9)	
Laparoscopic Low Anterior Resection	7 (16.7)	7 (16.7)	
Transanal Total Mesorectal Excision	8 (19.0)	8 (19.0)	
Open Abdominoperineal Resection	7 (16.7)	7 (16.7)	
Laparoscopic Abdominoperineal Resection	15 (35.7)	15 (35.7)	
Estimated Blood Loss SD	300 ± 20	280 ± 20	NS
Differentiation Grade			NS
Well	6 (14.3)	5 (11.9)	
Moderate	32 76.2)	34 (81.0)	
Poor	4 (9.5)	3 (7.1)	
Tumor Deposits Present	8 (19.0)	9 (21.4)	NS
Tumor Regression Grade			NS
0	7 (16.7)	2 (4.8)	
1	11 (26.2)	12 (28.6)	
2	12 (28.6)	14 (33.3)	
3	12 (28.6)	14 (33.3)	
Mesorectal Excision Quality			NS
Complete	38 (90.5)	39 (92.9)	
Near complete	2 (4.8)	1 (2.4)	
Incomplete	2 (4.8)	2 (4.8)	
Lymph Nodes Examined	13	17 (40.5)	NS
Microsatellite Instability (MSI-H)			NS
MSS	40 (95.2)	39 (92.9)	
MSI-H	2 (4.8)	3 (7.1)	
Perineural Invasion Present	15 (35.7)	13	NS
Lymphovascular Invasion Present	17 (40.5)	15 (35.7)	NS
Surgical Margin Negative	39 (92.9)	40 (95.2)	NS
Pathological Stage			NS
II	8 (19.0)	6 (14.3)	
III	32 (76.2)	34 (81.0)	
IV	2 (4.8)	2 (4.8)	
Major Post-operative Complications	6 (14.3)	6 (14.3)	NS
Organ Space Infections	3 (7.1)	2 (4.8)	
Wound Dehiscence	1 (2.4)	1 (2.4)	
Pulmonary Embolus	1 (2.4)	1 (2.4)	
Acute Renal Failure	1 (2.4)	1 (2.4)	
Cerebrovascular Accident	N/A	1 (2.4)	

Table 1: Patient demographics, pathologic features, surgical details, and post-operative complications in TNT and control cohorts.

A NOVEL STAPLE-FREE DEVICE WITH UNIQUE INTRA-OPERATIVE VALIDATION AND POST-OPERATIVE MONITORING BENEFITS - A FIRST-IN-PATIENT COLONIC END-TO-END ANASTOMOTIC STUDY.

P1596

J. You[2], S. Zhang[1], N. Chen[2], J. Peng[3], C. Lu[2], G. Su[2], L. Luo[2], A. Grönberg[1]
[1]Halmstad, Sweden; [2]Xiamen, China; [3]Shanghai, China

Purpose/Background: Stapling and suturing are routine methods for intestinal anastomoses in colorectal surgery. Despite decades of efforts, anastomotic leakage, stenosis and risk for permanent stoma remain significant post-operative challenges. Recently, a novel staple-free tool, C-REX LapAid™, has been developed to address these challenges. Preclinical porcine studies showed that C-REX LapAid™ could provide an improved contact surface between the intestinal ends and eliminate the root cause of (stitch- or stapler-) bleedings and postoperative stenosis. C-REX LapAid™ consists of anastomotic collars and helping tools facilitating the placement of a collar into the intestinal ends. Four catheters are connected to the collar, that allow intra- and post-operative evaluation of the anastomosis. The purpose of this study was to prospectively assess the effectiveness and safety of C-REX LapAid™ in patients who underwent colonic resection.

Methods/Interventions: 33 patients with left colon malignancies without history of radiotherapy treatment, eligible for colonic resection, were included in the two-centre study. Two patients were withdrawn from the study before surgery. Anastomotic integrity pressure, time for evacuation of the short-term implant, and adverse events were assessed in 31 patients (20 males and 11 females, mean age 55.0 ± 9.8).

Results/Outcome(s): Anastomotic integrity pressure, measured through catheters in the first 5 patients, was 66.0 ± 11.4 (range 50 – 80 mmHg). Remaining 26 patients were not measured, thus failing to comply with all benefits. The aftercare was in concordance with site's standard clinical care protocol for patients undergoing surgery with circular staples. The short-term implant evacuated by the natural route in 29 out of 31 patients after 13.8 ± 4.7 days. None of the patients experienced anastomotic leakage. Adverse events (4/31 patients) included abdominal wound infection and postoperative abdominal abscess, and reoperations (2/31 patients).

Conclusions/Discussion: The novel anastomotic device C-REX LapAid™ is a safe and effective method for performing and monitoring the outcomes of colonic anastomoses in patients undergoing colonic resection. In average the surgeons felt confident using the device after surgery on 3-5 patients. However, it is crucial to have an accreditation program for surgeons before clinical study starts to ensure compliance with the customized frequency of monitoring, adjustment of connection between the

collars at the intestinal ends, healing tissue secretion sampling and remote monitoring via Bluetooth. Further studies in a diverse population of patients with colon and rectal malignancies are warranted.

EFFICACY OF COLLATAMP ON SURGICAL SITE INFECTION IN LAPAROSCOPIC COLORECTAL CANCER SURGERY.

P1597

K. Lee[1], J. Lee[1], Y. Park[1], H. Kim[2], S. Oh[1]
[1]Uijeongbu-si, Korea (the Republic of); [2]Seoul, Korea (the Republic of)

Purpose/Background: Laparoscopic colorectal surgery has been reported to reduce surgical site infection (SSI) compared to open surgery. Nevertheless, the frequency of SSI after laparoscopic colorectal cancer has been reported up to 26%. Several studies have attempted to reduce SSI using various types of gentamicin-collagen sponge. Among them, most studies using Collatamp have been conducted in orthopedics and cardiovascular surgery, but few have been applied to laparoscopic colorectal cancer surgery. Therefore, purpose of this study is to hypothesize that the incidence of SSI can be reduced by using Collatamp in the surgical site in patients who underwent laparoscopic colorectal cancer surgery.

Methods/Interventions: This study enrolled patients who underwent laparoscopic colorectal cancer surgery from December 2018 to November 15th, 2019. A prospectively collected database was analyzed retrospectively. Patients were separated into a Collatamp group and a control group. A 5x5 cm-sized Collatamp (gentamicin sulfate 50mg) was applied to the surgical site in a Collatamp group. The Collatamp was inserted between rectus sheath and Scarpa's fascia. The primary endpoint was SSI within 30 days postoperatively. Logistic regression test was performed to determine whether applying Collatamp was an independent risk for SSI.

Results/Outcome(s): A total of 155 consecutive patients were included. Among them, Collatamp was used in 56 patients. There was no statistical significance in age (p=0.360), sex (p=0.413), BMI (p=0.836), ASA classification (p=0.766), operation name (p=0.522) and pathologic stage (p=0.481) between two groups. SSI was diagnosed in 1.8% in the Collatamp group and 6.1% in the control group. (p = 0.423) In logistic regression test, Collatamp was not a risk factor for SSI. (Hazard ratio : 0.22, 95% confidence interval 0.026 – 1.914, p=0.171)

Conclusions/Discussion: The use of Collatamp showed a low frequency of SSI although there was no statistical significance. It is thought to be a negative result originating from a small sample size. Therefore, further study with larger sample sizes is needed to confirm the efficacy of Collatamp.

OMENTAL FLAP DURING ABDOMINOPERINEAL RESECTION FOR RECTAL CANCER DOES NOT INFLUENCE THE RATE OF DEEP AND ORGAN SPACE SURGICAL SITE INFECTION.

P1598

M. Fuglestad, R. Batra, H. Hernandez, J. Leinicke, S. Langenfeld
Omaha, NE

Purpose/Background: Wound-related complications negatively impact quality of life, time to recovery, and ability to pursue adjuvant therapy after abdominoperineal resection (APR) for rectal cancer. Omental flaps (OF) are often employed to fill the dead space left in the deep pelvis after APR, and may reduce the risk of deep and organ space surgical site infection (D-SSI and OS-SSI, respectively). The purpose of our study was to evaluate the impact of OF on 30-day D-SSI and OS-SSI. We hypothesized that the addition of omental flaps to APR reduces the rate of wound-related complications.

Methods/Interventions: We performed a retrospective review of the American College of Surgeon's National Surgical Quality Improvement Program Proctectomy Procedure Targeted Database (NSQIP P-PTD) from 2016 – 2018. All patients with diagnosis code of malignant neoplasm of the rectum who underwent APR were selected (ICD-10: C20; CPTs 45110 & 45395). Exclusion criteria included emergent cases, non-elective cases, and ASA classification of 5. Cases with omental flaps were identified by CPT codes 49905, 449904, 49329, & 49999. Patient demographics, operative measures, and 30-day outcome variables recorded. Cases with omental flap were case-matched based on year of operation, operative approach, presence of diabetes, obesity, and use of preoperative chemoradiotherapy. No data on preoperative bowel preparation was available. A case-matched analysis was then performed. Categorical variables were compared with Chi-Squared tests. Continuous variables were analyzed with independent samples t-tests. P<0.05 was considered statistically significant. P-values were Bonferroni corrected for multiple comparisons as appropriate. All analyses were performed using SPSS software version 26.0 (Armonk, NY: IBM Corp.).

Results/Outcome(s): A total of 1621 patients underwent APR for rectal cancer from 2016 – 2018. Of those, 107 (6.7%) utilized an omental flap. 96 (89.7%) of cases with an omental flap were case matched. There were no significant differences in baseline demographics, medical comorbidities, preoperative clinical staging, or use of neoadjuvant therapies between the two cohorts. Overall wound complications were similar between the cases with and without an OF (10.4% and 13.5% respectively, P=0.51). There were no significant differences in the occurrence of superficial, deep, or organ space surgical site infection between the two cohorts (P=1.0 for all). Mean

operative time was significantly longer in the omental flap cohort (341 *vs.* 301 minutes respectively, P=0.05) while mean total length of stay was similar (7 days for both, P=0.79).

Conclusions/Discussion: In a case-matched analysis using the NSQIP P-PTD, the addition of omental flap to APR for rectal cancer did not significantly reduce the rate of wound-related complications, but it was associated with a small but significant increase in operative time.

DIFFERENCES IN THE IMMUNE MICROENVIRONMENT BETWEEN EARLY AND LATE ONSET RECTAL CANCER.

P1599

I. Gardner, R. Siddharthan, K. Watson, R. Ruhl, S. Anand, V. Tsikitis
Portland, OR

Purpose/Background: Over the past 40 years, the incidence of rectal cancer in patients 20-39 years old has quadrupled. The immune microenvironment in colorectal cancer is a key player in disease progression, therapy response, and overall survival. However, the role of the immune microenvironment in early onset rectal cancer (< 50 years old) has not been elucidated. This study aims to characterize the immune microenvironment of early onset and late onset (>65 years old) rectal cancer.

Methods/Interventions: We used Nanostring immune profiling to analyze FFPE surgical specimens and biopsies from patients with early and late onset colorectal cancer.

P1598

	Omental Flap (N=96)	No Omental Flap (N=96)	P-Value
Year of Operation			1.00
2016 N (%)	19 (19.8 %)	19 (19.8 %)	
2017 N (%)	24 (25.0 %)	24 (25.0 %)	
2018 N (%)	53 (55.2 %)	53 (55.2 %)	
Demographics			
Age, Yrs ± std	61 ± 12	63 ± 13	0.27
Sex N (% Male)	63 (65.6 %)	55 (57.3 %)	0.24
BMI, Kg/M2 ± std	28.5 ± 6.1	27.9 ± 7.1	0.23
Diabetes N (%)	21 (21.9 %)	21 (21.9 %)	1.00
Active Smoking N (%)	21 (21.9 %)	15 (15.6 %)	0.27
Hypertension N (%)	41 (42.7 %)	40 (41.7 %)	0.88
Perioperative Steroids N (%)	3 (3.1 %)	3 (3.1 %)	1.00
Neoadjuvant Therapy			1.00
None N (%)	30 (31.3%)	30 (31.3%)	
Chemotherapy N (%)	6 (6.3%)	6 (6.3%)	
Radiation N (%)	1 (1.0%)	1 (1.0%)	
Chemoradiation N (%)	59 (61.5%)	59 (61.5%)	
Outcomes Data			
Operative Time, Mins ± std	341 ± 160	301 ± 130	0.05*
Total Length of Stay, Days ± std	7 ± 5	7 ± 5	0.79
Overall Wound Complications N (%)	10 (10.4 %)	13 (13.5 %)	0.51
Superficial Wound Infection N (%)	6 (6.3 %)	6 (6.3 %)	1.00
Deep Surgical Site Infection N (%)	1 (1.0 %)	1 (1.0 %)	1.00
Organ Space Infection N (%)	3 (3.1 %)	6 (6.3 %)	1.00
Wound Dehiscence N (%)	1 (1.0%)	1 (1.0%)	1.00
Operative Approach			1.00
Open N (%)	48 (50.0 %)	48 (50.0 %)	
Laparoscopic N (%)	24 (25.0 %)	24 (25.0 %)	
Robotic N (%)	24 (25.0 %)	24 (25.0 %)	

* P<0.05 Considered Statistically Significant

Our results were compared to our analysis of a publically available database (GSE8721) of gene expression profiles for 203 rectal cancer and 160 matched normal mucosa samples. We identified genes that were differentially expressed between early and late onset rectal cancer groups and validate our results with qPCR. Cell proliferation and cell death assays were performed on human and mouse colorectal cancer lines treated with FLT3 inhibitors, crenolanib and gilteritinib. In vivo experiments with crenolanib were performed using a subcutaneous MC-38 xenograft in C57BL/6 mice.

Results/Outcome(s): Using Nanostring, we identified several genes that were differentially expressed between early and late onset rectal cancer. Two genes, FLT3 and SAA1, were found to have increased expression in both our patient samples and the GSE8721 rectal cancer database. FLT3 codes for fms-like tyrosine kinase receptor and activating mutations of this gene are present in 30% of acute myeloid leukemia cases and is associated with a worse prognosis. SAA1 codes serum amyloid A1 which is an acute phase protein that is highly expressed in response to inflammation. Using qPCR, FLT3 and SAA1 expression is significantly increased in early onset rectal cancer specimens compare to late onset rectal cancer, early onset colon cancer, and early liver metastases. FLT3 inhibitors, crenolanib and gilteritinib, do not affect cell proliferation and cell death in culture at therapeutic levels, but crenolanib does decrease tumor growth in a xenograft mouse model.

Conclusions/Discussion: There are distinct differences in the immune microenvironment between early and late onset rectal cancer. FLT3 expression in the immune microenvironment appears to contribute to tumor growth. FLT3 inhibitors may hold therapeutic promise for the treatment of early onset rectal cancer.

CLINICAL OUTCOME AND PATHOLOGICAL RESULTS OF TRANSANAL TOTAL MESORECTAL EXCISION FOR MIDDLE AND LOW RECTAL CANCER - A SINGLE INSTITUTE EXPERIENCE.

P1600

H. Lin, S. Yang, C. Lin, S. Chang, W. Chen, J. Jiang
Taipei, Taiwan

Purpose/Background: Transanal total mesorectal excision (TaTME) is a new treatment in which the rectum is dissected transanally according to TME principles. The aim of our study was to assess the short-term results and oncological results following TaTME for rectal cancer.

Methods/Interventions: We collected a retrospective analysis of a prospectively maintained database of consecutive patients who underwent TaTME for rectal cancer in Taipei Veterans General Hospital. The study period was from January 2016 to December 2018. All transanal mobilization was performed with the aid of GelPOINT path and endoscopic instruments according to TME criteria.

Results/Outcome(s): A total of 115 patients were available for inclusion in a period of 3 years. The study included 87 males (75.7%) and 28 females with mean age 62.0 ± 12.2 years (range 33-93). The average BMI was 24.8 ± 3.6 kg/m2. The mean tumor distance from anal verge was 5.8 ± 1.8 cm. Sixty-nine (60%) patients underwent preoperative chemoradiation. The mean operative time was 282 ± 54.0 min (range 95-680). Two patients converted to open surgery due to severe adhesion and iatrogenic internal iliac vein injury, respectively. Proximal protective enterotomy was done in 99 patients (86%). Postoperative morbidity was 23.5%. Intraoperative complications were recorded in 4, while early post-operative complications (<30 days) were observed in 23 patients. The mean hospital stay was 10.2 ± 4.7 days (range 5-33). A positive circumferential resection margin (<1 mm) was observed in four patients (3.5%). The mean distal margin distance was 2.2 ± 1.1 cm (range 0.8-7.0). The mean number of harvested lymph nodes was 14.8 ± 6.6 (range 5-32). During the two years study period, there were five patients (4.5%) with local recurrence, three patients (2.9%) with peritoneal carcinomatosis, and sixteen patients (16.5%) with distant metastases.

Conclusions/Discussion: TaTME is a safe alternative to standard laparoscopic TME in selected patients with middle and low rectal cancer when treated by an experienced colorectal team. In the future, randomized trials are necessary to prove its functional and lon-term oncological safety.

A COMPARISON OF RE-ADMISSION AND ED VISITS IN A COLORECTAL SURGICAL HOME VERSUS TRADITIONAL ENHANCED RECOVERY PROTOCOL.

P1601

C. Couch, H. Guend, K. Coleman, A. Fellner
Cincinnati, OH

Purpose/Background: Enhanced recovery protocols (ERPs) are an established part of caring for post-operative colorectal patients. They have shown better outcomes such as LOS and complications for colorectal patients. Perioperative surgical homes add additional pre-operative optimization protocols to reduce the effect of comorbidities. Surgical homes have been studied in other surgical fields and portions have been studied in colorectal surgery but effects have not been studied as a whole in colorectal patients.

Methods/Interventions: This is a retrospective review of data from the electronic medical record from multiple hospitals and surgeons within medium-sized health care system. Subjects were over 18 years old and had an

elective colorectal surgery after the implementation of a colorectal surgical home (2016-2018). This included pre-operative optimization of anemia, nutrition, frailty and other comorbidities as well as operative and post-operative ERP. These patients were then case matched to patients who were managed only with a previously established ERP (2014-2016) by age, sex, and BMI. The primary endpoints were hospital readmissions and ED visits within 30 days. Secondary endpoints included length of stay, mortality, and post-operative complications such as UTI, MI, ileus, new onset atrial fibrillation, need for transfusions, pneumonia, leak, wound infections and return to the OR.

Results/Outcome(s): A total of 167 colorectal surgical home patients were matched to colorectal ERP only patients. The types of surgeries were similar between the two groups. Of note despite case match, the surgical home patients were younger than the ERP patients (61.6 years vs 65.4 years, p<0.001). However ERP patients had better ASA scores (p<0.001). Pre-operative malnutrition, anemia, poorly controlled DM and smoking rates were similar between the groups. The 30- day readmissions and ED visits were not statistically significant between the matched groups (p = 0.515 & p = 0.409 respectively). Although secondary outcomes were not different between the two groups such as rate of ileus, leaks or return to the OR, length of stay trended towards better length of stay in the surgical home group.

Conclusions/Discussion: In our study population there was no statistical significance between the 30 day readmissions or ED visits of colorectal patients cared for in a surgical home versus those in an ERP. While it is possible this is a result of insufficiently powered data, it is also possible that in this population the benefit of surgical home is primarily imparted by the ERP components.

IMPACT OF ILEOCOLIC ANASTOMOTIC TECHNIQUE ON THE RATE OF POSTOPERATIVE ANASTOMOTIC HEMORRHAGE.

P1602

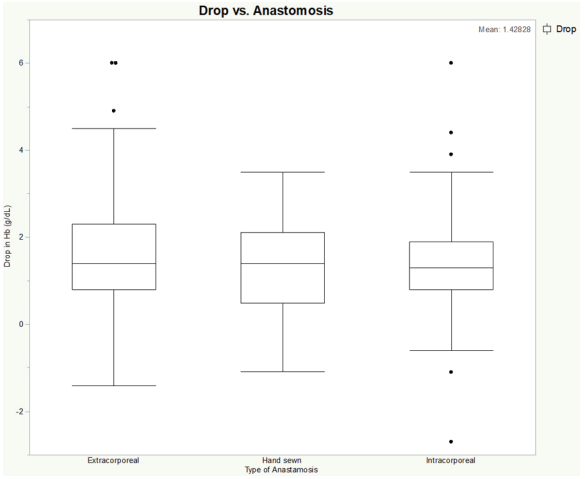
T. Law, M. Snyder, H. Bailey, M. Pidala
Houston, TX

Purpose/Background: The use of robotics has become increasingly prevalent in the realm of colon and rectal surgery, not only in pelvic cases but in right colectomies as well. This study seeks to examine its application in intracorporeal ileocolic anastomosis and whether there is a demonstrable increase in the rate of anastomotic bleeding compared to that of traditional techniques.

Methods/Interventions: A single group multi-institutional retrospective review was conducted of all ileocolic anastomoses performed over a two-year time period from January 1, 2018 to November 28, 2019. Patients were identified using CPT codes for right colectomies, ileocecectomies, and end ileostomy reversals. The primary endpoint was decrease in hemoglobin (Hgb) from pre-op to post-op. A secondary endpoint was clinical identification of an anastomotic bleed. A Kruskal-Wallis test was used to evaluate for any significant differences. Patients were excluded if there was not an anastomosis created or if they received intraoperative blood transfusions.

Results/Outcome(s): A total of 297 patients were identified in this cohort with 129 robotic intracorporeal anastomoses (ICA), 150 extracorporeal stapled anastomoses (ECA) and 18 extracorporeal hand-sewn anastomoses (EHA). All intracorporeal anastomoses were stapled with the common enterotomy closed in two layers. The mean decrease in Hgb across the entire study population was 1.43 g/dL with a range of -6.0 to +2.7 g/dL. The mean decrease and 95% confidence intervals were 1.33 (1.15, 1.51), 1.52 (1.32, 1.75), and 1.27 (0.65, 1.88) for the ICA, ESA, and EHA groups, respectively. There was no statistically significant difference between the three groups ($p = 0.427$). A total of 12 (4.0%) clinically positive bleeds were identified. 7 (5.4%) were in the ICA group and 5 (3.3%) in the ESA group without a statistically significant difference.

Conclusions/Discussion: For all eligible patients, there was no difference in the mean decrease in Hgb when analyzed by anastomotic technique. While this is an imperfect surrogate since it is affected by factors such as intravascular volume status and intraoperative blood loss, it is the only reliable quantitative metric available at this time. The results suggest that robotic ICA is a valid and safe alternative with regard to risk of anastomotic bleeding when compared to traditional stapled or hand-sewn anastomoses.



EFFICACY OF THE ADDITION OF ULTRASOUND-GUIDED QUADRADUS LUMBORUM REGIONAL NERVE BLOCKS TO AN EXISTING MULTIMODAL ENHANCED RECOVERY PATHWAY IN COLORECTAL SURGERY.

P1603

D. Yoon, G. Low, J. Chen, M. Eloustaz, M. Kim, S. Lee, K. Cologne
Los Angeles, CA

Purpose/Background: Regional analgesia has been shown to improve postoperative outcomes. Quadratus lumborum (QL) block is a new type of regional analgesic technique aimed at truncal blockade for abdominal procedures. Its efficacy is reported in a wide range of surgical specialties, but the evidence of its efficacy in colorectal surgery has been conflicting. The goal of this study was to evaluate the impact of QL blocks in the immediate postoperative period following elective colorectal surgeries.

Methods/Interventions: From a prospectively maintained database, all adult patients undergoing elective colorectal surgeries in a tertiary academic center from October 2018 to October 2019 were identified. Patients who received QL blocks were compared with consecutive patients who did not receive QL blocks in a 1:2 ratios, respectively. Demographic and perioperative data were collected. Opioid amounts were reported as morphine milligram equivalent (MME). Pain scores were measured by the Numeric Rating Scale, from 0 (no pain) to 10 (worst pain) and reported as mean ± standard deviation. A $P<0.05$ was considered statistically significant.

Results/Outcome(s): A total of 261 patients were enrolled. 87 patients who received QL blocks were compared to 174 who did not. There was no significant difference in the two cohorts' demographic, percentages of open and minimally invasive surgery (MIS) approaches, and intra-operative factors. The QL cohort had lower reported pain at 1 hour after surgery (3.82 ± 3.24 vs 4.70 ± 3.02, $P=0.035$), but the difference disappeared in the subsequent hours during postoperative day zero. The QL cohort used less opioid in the post-anesthesia care unit (PACU) (16.58 vs 20.35, $P=0.137$). When comparing the MIS subset of each cohort, the QL MIS group used less opioid in the PACU (11.39 vs 16.51, $P=0.049$) and also had lower pain scores at 1 hours (3.16 ± 2.94 vs 4.21 ± 2.96, $P=0.033$). Overall there was no difference in total MME use in postoperative day 0, rate of nausea and vomiting within the first 24 hours, time to return of bowel function, ambulation, incidence of deep vein thrombosis, and length of inpatient stay.

Conclusions/Discussion: QL blocks decrease pain levels immediately after colorectal abdominal surgery and decrease opioid use in the PACU, especially for patients who receive MIS procedures. However, its efficacy appears to be limited to the immediate postoperative period, and it does not affect time to return of bowel and ambulatory function or length of stay.

OPTIMIZING APPROPRIATE DISPOSAL OF UNUSED POSTOPERATIVE OPIOID: WHAT HAPPENS TO UNUSED MEDICATION?

P1604

D. Yoon, C. Wickham, K. Mirza, S. Lee, K. Cologne, G. Ault
Los Angeles, CA

Purpose/Background: Unused postoperative opioid medications are vulnerable for diversion and misuse. Providing convenient strategies for patients to properly dispose of remaining opioids has been shown to increase compliance with appropriate opioid disposal. Our study aim was to evaluate the impact of patient education and provision of home disposal bags on opioid disposal.

Methods/Interventions: Patients undergoing elective outpatient anorectal procedures at an academic, county safety-net hospital were enrolled from August 2018 to November 2019. Written and verbal patient education on appropriate opioid disposal methods was provided starting July 2019. Home disposal bags containing medication deactivating charcoal (Deterra® Drug Deactivation System) were provided starting September 2019. A telephone survey was conducted one week postoperatively. Data regarding opioid storage and plans for disposal was collected. A $P<0.05$ was considered statistically significant.

Results/Outcome(s): A total of 236 patients were enrolled, with a telephone response rate of 72% (n=170). Out of 170 patients, 163 (95.9%) received opioids. Of those, 66.3% (n=108) did not receive either opioid disposal education or disposal bags, 23.9% (n=39) received education only, and 9.8% (n=16) received both education and bags. Among patients who did not receive education or disposal bags, 76% reported unsecure opioid storage, with predominant disposal plan being long term storage (42%), followed by unaltered trash disposal (22%). Notably, 2% reported planned diversion to friends or family. Following educational intervention, fewer patients planned on long term storage (8% vs 42%, $P<0.001$), and patients predominantly preferred disposing opioids in the toilet (36% vs 15%, $P=0.005$). Only 10% planned to follow the prescribed method of mixture disposal. Among patients receiving both education and disposal bags, 94% reported plans for using the bags. Following implementation of disposal bags, more patients felt that disposal instructions were clear (100% vs 77%, $P=0.046$) and more followed disposal instructions (94% vs 10%, $P<0.001$).

Conclusions/Discussion: Patient education increases appropriate disposal of unused postoperative opioids. Utilizing home disposal bags, such as the Deterra® Drug Deactivation System, may further increase compliance with appropriate opioid disposal methods.

THE FINANCIAL BURDEN OF HIGH ILEOSTOMY OUTPUT ON A COLORECTAL SURGERY SERVICE IN A TERTIARY CARE CENTRE.

P1605

M. Lipson[2], W. Buie[1], T. Maclean[1]
[1]*Calgary, AB, Canada;* [2]*Selkirk, MB, Canada*

Purpose/Background: Healthcare providers are under increasing pressure to deliver a high volume and quality of care within a limited budget. This task is complicated because the cost of healthcare in Canada is largely hidden. Understanding healthcare costs on a granular and episodic level is challenging. Ileostomy creation is associated with readmission to hospital, however, the cost of managing high ileostomy output during index admission has not been well described. This study seeks to describe the financial burden of extended length of stay (LOS) due to high ileostomy output for patients undergoing elective surgery.

Methods/Interventions: Elective patients receiving an ileostomy between January 1, 2016 and December 31, 2017 were identified. The electronic medical record of each patient was reviewed and relevant data was extracted. Comprehensive cost estimates for the average cost of a day admitted to hospital on the relevant surgical units were used to estimate the cost of potentially avoidable days in hospital due to high ileostomy output.

Results/Outcome(s): During the study period 76 patients received an ileostomy. Ileostomates were mostly male (n=45, 59%) with an average age of 51.8 years (median 52, range 24-85). Mean post-surgical LOS was 10 days (median 8, standard deviation 8.7). Eleven patients had ileostomy output >1,200 mL on days leading up to their discharge with no other reason for extending their length of stay identified. A total of 29 hospital days were attributable to high ileostomy output, representing 3.8% of hospital days for this cohort of ileostomates. The total cost of these potentially avoidable hospital days is estimated to be $38,879 CAD in 2018 dollars.

Conclusions/Discussion: Prolonged index admission for high ileostomy output represents potentially avoidable healthcare system costs. There may be more cost-effective avenues to manage this condition such as outpatient infusion appointments or output tracking apps. Exploration of alternative ways to provide this care is needed.

COLORECTAL SURGICAL PROCEDURES FOR ADULT PATIENTS WITH CYSTIC FIBROSIS ARE INCREASING AND ASSOCIATED WITH SIGNIFICANT MORBIDITY.

P1606

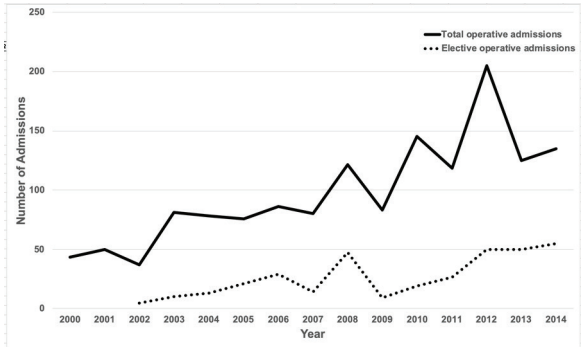
M. Hite, V. George, P. Maxwell, T. Curran
Charleston, SC

Purpose/Background: Background: With advances in medical care, patients with cystic fibrosis (CF) are more commonly living into adulthood with unique and complex care needs across multiple organ systems. Yet, while an increased gastrointestinal cancer risk has been reported in CF patients, there are limited data describing the need for colorectal surgery and its outcomes in adult CF patients. We aim to use a national administrative database to evaluate trends in abdominal colorectal procedures and their associated outcomes among adult CF patients.

Methods/Interventions: Methods: International Classification of Diseases, Ninth Revision (ICD-9) diagnosis and procedure codes were used to identify all adult (age≥18) patients with cystic fibrosis receiving abdominal colorectal surgery in the Nationwide Inpatient Sample from 2000 to 2014. Surgical procedures included any ostomy creation, reversal or revision or any small bowel or colorectal resection. Trends in the performance of colorectal procedures were evaluated stratified by patient age and indication. Outcomes of the index hospitalization including mortality, morbidity and length of stay were evaluated by age and indication.

Results/Outcome(s): Results: We identified 1,465 admissions for abdominal colorectal surgery of which 350 (24%) of these were elective. The number of total and elective procedures increased over the study period (Figure). Mean age at the time of surgery was 33 years (SE 0.81) with 27% of patients 40 or older. Charlson comorbidity index was 2 or greater in 28%. The most common procedure performed was appendectomy (N=504; 34%) followed by segmental colectomy (N=412; 28%). A stoma was created in 13% of cases. Laparoscopy was utilized in 36% of cases. More than one colorectal procedure was performed in 20% of admissions. The most common operative indication was obstruction (N = 517; 35%). Among non-elective admissions for conditions other than appendicitis, in-hospital mortality was 4.0%, morbidity 19% and mean length of stay 13.2 days (SE 0.92). On the index admission, elective admissions for segmental colectomy were associated with a 2.3% mortality, 19% morbidity and mean length of stay of 10 days (SE 1.66).

Conclusions/Discussion: Conclusions: Colorectal surgical admissions for adult patients with cystic fibrosis are increasing with the majority of surgical admissions being non-elective. Admissions for conditions other than appendicitis are associated with significant risk of morbidity, mortality and prolonged length of stay. These risks should inform surgeons in their decision making for adult patients with cystic fibrosis.



CHOOSING WISELY: APPLICATION OF PROTOCOLS TO PREVENT MODERN BLOODLETTING.

P1607

A. Perez-Tamayo, G. Gantt, J. Harrison, M. Abdulhai, J. Martinolich, V. Chaudhry
Chicago, IL

Purpose/Background: Unnecessary laboratory testing is a pervasive problem, particularly in teaching institutions where often the least experienced physicians are responsible for ordering the tests. The extra tests often do not add much information, put a strain on hospital staff, are invasive to the patient, and can lead to further nonessential imaging or interventions. In the era of enhanced recover pathways, we aim to assess whether this standardized protocol could decrease the number of labs ordered and moreover, whether this decrease in ordering would affect important patient outcomes, such as length of stay, morbidity, or mortality.

Methods/Interventions: This multi-institution quality improvement project required the use of both retrospective and prospective data on elective abdominal operations performed by the Colon and Rectal Surgery departments from May 2019-November 2019. The lab protocol included a hemogram with a differential and a basic metabolic profile on the first post-operative day and a C reactive protein on post-operative day three. The protocol allowed repeated labs for vital sign abnormalities, evidence of metabolic abnormalities, or in the case of clinical suspicion of an ileus. No further labs would be obtained with the resolution of the aforementioned complications. The attending of record could opt out of the protocol. Emergency cases or patients with end stage renal disease on hemodialysis, decompensated heart failure, liver cirrhosis, or on total parenteral nutrition were excluded from the study. Data was then collected on patient demographics, procedure performed, presence of an ileostomy, acute kidney injury, superficial wound infections, deep space infections, ICU stays, readmission, and mortality.

Results/Outcome(s): The new lab protocol was instituted on August 15, 2019. Prospective data was collected on patients from August 15, 2019 to November 15, 2019. Retrospective data was collected on eligible patients from May 1, 2019 until August 15, 2019. A total of 123 patients met the inclusion criteria, 63 patients in the pre-protocol arm and 60 in the post-protocol arm. There were no significant differences in the patient demographics between the arms. Length of stay was similar in both groups, 5.3 days before and 5.5 days after the protocol was instituted. There was no statistical difference in morbidities, ICU, readmission, or mortality between the groups. Protocol compliance was approximately 60%, resulting in labs obtained 3.07 days compared to 4.5 days prior to the intervention. This translates into over $13,000 in savings with 60% compliance in 3 months, extrapolated to over $50,000 annually, simply in costs of laboratory studies.

Conclusions/Discussion: Standardizing lab orders after elective abdominal surgeries reduced the number of days labs were ordered without negatively impacting patient outcomes. Future efforts should be geared toward increasing compliance with the protocol.

URETERAL ICG STAINING INSTEAD OF STENT PLACEMENT FOR ROBOTIC ASSISTED COLON RESECTIONS.

P1611

C. Fong, A. Kim
New york, NY

Purpose/Background: Ureteral stent placement for elective colon resection has become standard for complicated colon resection. While utilization of ureteral stents does not decrease rates of inadvertent ureteral injuries, in select patients this practice has been shown to improve recognition of injuries. Especially when the injury is identified intraoperatively, early repair can result in fewer long term sequelae. However, ureteral stents, even when done for elective colon or pelvic surgeries, carries its own complications, such as flank pain, urinary tract infection or acute kidney injury. These are usually self-limiting but can be concerning for both the clinician and patient when blood is seen in the Foley catheter. In this technical report, we are presenting 5 complicated colon resections performed using Robotic technique and ICG staining of ureters instead of stent placement.

Methods/Interventions: Five patients seen between September 2019 and January 2020 who underwent elective colorectal / pelvic operations were selected prospectively for this technical feasibility study. Selected patients qualified as complicated surgical candidates if they would normally benefit from intra-operative ureteral stenting just prior to beginning colorectal surgery. They underwent

a routine cystoscopy with intubation of ureteral os for introduction of Indocyanin Green agent (3 cc, with 10 cc flush of normal saline) immediately before commencing colorectal operation. Visualization of stained ureter was done using ICG technology within Davinci Xi. Patients were also followed for the study period to assess for any complications.

Results/Outcome(s): All five patients did well from their surgeries. The patients were diverse in terms of demographics and pathology. For example, Patient 1 had a history of perforated diverticulitis status post wash out, while patient 4 had a rectosigmoid cancer. In all instances, ureteral staining provided adequate intraoperative visualization of the ureters during the duration of the operation, which spanned 3-4 hours.

Conclusions/Discussion: This novel technique of ureteral staining has many advantages over the traditional ureteral stenting method. Firstly, there is no indwelling ureteral stent that may cause patient complications or discomfort. Secondly, it aides in intraoperative identification of the ureters. Firefly mode can be turned on and off at any point to check the location of the ureters without interruption of the operation, saving operating time and anesthesia time. Lastly, since there is no indwelling stent, this procedure could potentially be done by the surgeon, especially when urologists are not available. None of the patients in our feasibility study had any complications from this procedure. The long-term follow-up and whether outcomes are improved remains to be addressed in a larger randomized controlled trial.

WE MIND ABOUT OCCUPATIONAL RADIATION EXPOSURE BUT WHO MINDS ABOUT PATIENTS EXPOSURE? WE SHOULD KEEP IT AS LOW AS POSSIBLE.

P1612

P. Moctezuma Velázquez, J. Sainz Hernández, N. Salgado Nesme, C. Moctezuma Velázquez, O. Vergara-Fernandez[1]
Mexico City, Mexico

Purpose/Background: Imaging technologies are essential for the diagnosis and management of colorectal diseases, although ionizing radiation has been related to increased cancer risk. The aim of this work was to quantify the radiation exposure (RE) by imaging studies to which colorectal surgery patients are submitted. A secondary aim was to recognize the cost of these studies.

Methods/Interventions: The radiological archives from a cohort of patients submitted to colorectal surgery from 2017-2018 was retrospectively examined. The radiological studies considered for the RE quantification were the computed tomography scans, and X-rays that were necessary for surgical planning and follow-up. Preoperative and postoperative periods were assessed. RE was classified in: very low; ≤3mSv, low; >3-20mSv, high;>20-50mSv and very high; >50mSv. Imaging examination costs are presented in US dollars. Demographic data was collected from clinical files. Continuous variables were presented as mean ± standard deviations(SD). Categorical variables were presented as numbers(n) and percentages.

Results/Outcome(s): A total of 117 patients were included, 43 (37.06%) were male, the mean age was 57.40 ±12.22 years, 25 (21.55%) of patients developed an abdominal collection. Preoperative and postoperative RE was 24.75±15.45mSv and 12.02 ± 22.90mSv respectively. Preoperative and postoperative cost for imaging studies was 504.53±159.02dollars and 226.27±294.58dollars respectively. The cost/patient was 730.75±359.29 dollars. High RE was received by each patient (36.75 ±29-.3mSv). During preoperative assessment, 0.85%,41.88%, 51.28% and 5.98% and postoperativeley 60.68%, 12.82%, 22.22%, 4.27% of patients received very low, low, high and very high doses of RE respectively. Patients who had abdominal collections after surgery RE was 25.75mSv whilst patients without this complication had a RE of 8.25mSv with statistical significance ($p<0.05$).

Conclusions/Discussion: Patients received high doses of RE, while the normal background radiation exposure a person receives/ year is 3mSv. Our patients are receiving the radiation dose they would receive in 12 years from

P1612 Rates of Radiation Expossure

Period	Very Low <3mSv	Low <3-20 mSv	High <20-50mSv	Very high <50 mSv
Preoperative	1 (0.85)	49 (41.88)	60 (51.28)	7 (5.98)
Postoperative	71 (60.68%)	15 (12.82%)	26 (22.22%)	5 (4.27%)

Data are presented as n(%)

radiation of natural sources, moreover, we should consider that some countries had an occupational limit of 50mSv in one year. In addition, 730.75±359.29 US dollars are spent just on imaging studies. Patients who developed an abdominal collection after surgery received more radiation during their postoperative course than their counter parts. We are not trying to avoid the use of imaging studies, we just wanted to raise awareness among colorectal surgeons about the amounts of ionizing radiation our patients are exposed to, and the costs. Wenshould try to consider the use of alternative non radiation ionizing emitting imaging modalities if possible and we should always avoid non indicated imaging studies in order to try to keep our patients radiation exposure as low as possible.

A CHANGE IN PARADIGM? INTRACORPOREAL ANASTOMOSIS FOR LAPAROSCOPIC RIGHT COLECTOMIES.

P1613

J. Rodriguez[1], Y. Robles[1], O. Cardona Gonzalez[1], G. Aviles[1], J. Montero[1], G. Bolanos[1], M. Torres[2], N. Lopez[2]
[1]*Ponce, PR;* [2]*San Juan, PR*

Purpose/Background: Minimally invasive colectomies are the standard of care for the management of most colonic pathologies. Laparoscopic-assisted colectomies have proven to be superior to open surgery with regards to postoperative pain and length of stay. For right colectomies, the creation of an extracorporeal ileocolonic anastomosis remains the preferred approach in most centers. This study aimed to assess the safety and feasibility of intracorporeal (IA) versus extracorporeal anastomosis (EA) for laparoscopic right colectomies. Secondary aims include the description of the baseline characteristics of our local population and the comparison of surgeons' additional training with patient's outcomes at two high-volume centers.

Methods/Interventions: All patients from July 1st, 2016 to July 1st, 2019 who underwent laparoscopic right colectomies were included for evaluation. A total of 95 patients who underwent laparoscopic right colectomy with three different surgeons, one general surgeon, and two colorectal surgeons. Patients were excluded if less than 21 years of age, pregnant women, and if they underwent emergent colectomies. The outcomes of interest were short- and long-term complications, length of stay, the return of bowel movement, estimated blood loss during surgery, and conversion to open surgery.

Results/Outcome(s): The most common diagnosis that led to an elective colectomy was colorectal cancer. Most procedures were performed on female and overweight patients. There was a significant difference in age between patients and type of procedure (IA vs EA). Comparing extracorporeal versus intracorporeal anastomosis, the operative time was significantly less in the extracorporeal group (113.5 min vs 172.9 min, p<0.001). No differences were comparing the return of bowel function, length of stay, number of harvested nodes or anastomotic leaks. Further analysis comparing colorectal versus general surgeons revealed statistically significant less OR time performing IA (216.7 min vs 115 min, p<0.001). Wound infection and paralytic ileus in the colorectal group were significantly less compared with the general surgeon (12% vs 0, p 0.016; 16% vs 1.4%, p 0.016). See Table 1 for additional results.

Conclusions/Discussion: Although IA had a longer operative time, we concluded that IA and EA techniques have similar outcomes. Our study also suggests that surgeons with additional training can perform IA during laparoscopic colectomies faster, with fewer wound infections and post-op ileus. These differences might be explained by additional training, but also by a dedicated colorectal multidisciplinary team, availability of equipment and trained staff. Further studies may be warranted to assess the impact of advanced training, and variables like standardized OR protocol in our results. Finally, this study revealed that laparoscopic right colectomy with intracorporeal anastomosis is a safe procedure.

Data Point	Intracorporeal	Extracoporeal	P-Value
Anastomotic Leak	2(4.4%)	2(4.0%)	0.914
Wound infection	3(6.7%)	0	0.064
Paralytic Ileus	4(8.9%)	1(2.0%)	0.133
Estimated Blood Loss (mL)	89.5	75.5	0.491
OR time (min)	172.9	113.5	<0.001
Return of Bowel Function (POD)	3.3	3.2	0.970
Length of Stay (POD)	5.3	4.5	0.314
Conversion to open surgery	1(2.2%)	1(2.1%)	
	General (IA)	**Colorectal (IA)**	
Anastomotic Leak	2(8%)	2(2.8%)	0.277
Anastomotic Bleeding	0	1(1.4%)	1
Duodenal Injury	0	1(1.4%)	1
Wound infection	3(12%)	0	0.016
Paralytic Ileus	4(16%)	1(1.4%)	0.016
OR time (min)	216.7	115	<0.001

Table 1: Study Results

MALE GENDER, SMOKING, YOUNGER AGE, AND PREOPERATIVE PAIN FOUND TO INCREASE POSTOPERATIVE NARCOTIC REQUIREMENTS IN 592 ELECTIVE COLORECTAL RESECTIONS.

P1614

P. Zhou, J. Wahba, P. Goffredo, S. Mott, J. Hrabe, M. Kapadia, I. Hassan, J. Cromwell, I. Gribovskaja-Rupp
Iowa City, IA

Purpose/Background: With increased awareness of the opioid epidemic and movement to decrease unnecessary opioid use, understanding contributing factors is increasingly important. In this study, factors including minimally invasive approach (MIS) were studied to examine effect on immediate postoperative narcotic use in colorectal resections.

Methods/Interventions: All patients who underwent an elective colorectal resection at a single tertiary institution between 2015 to 2018 were included. Standardized enhanced recovery protocol was used. Approach was MIS (laparoscopic or robotic) or open (midline and Pfannenstiel); conversions and laparoscopic-assist cases were considered open. Data were collected including patient demographics, preoperative abdominal pain, surgical procedure, pain medication use, and outcomes. Postoperative narcotic use in standard conversion morphine milligram equivalents (MMEs) was recorded for postoperative days 0 to 3 and total hospital stay. Univariate and multivariate analyses stratified over postoperative days 0 to 3 were performed to determine risk factors for increased perioperative opioid use and long-term dependency.

Results/Outcome(s): Five hundred and ninety-two patients were identified: 46% male and median age 58 years. Indications for surgery included cancer, inflammatory bowel disease, and diverticulitis (47%, 19%, and 16%, respectively). More patients underwent open approach (64%) compared to MIS (36%) and there was no significant difference in postoperative narcotic use between these groups (overall mean day 0 to 3 total 283±167 MMEs). Narcotic use was decreased in females (mean MME decrease -42), patients who received intraoperative lidocaine (-30), and for increased age per year (-4, all $p<0.03$). Preoperative narcotic use (29%), preoperative abdominal pain (61%), and smoking (22%) all independently increased postoperative requirements for narcotics (mean MME increase 52, 45, and 44, respectively); epidural use also increased narcotic requirements (94, all $p<0.01$). Inclusion of adjunct medications, such as NSAIDs, had minimal effect on narcotic use. In patients who were opioid naive prior to surgery, 23% of patients were still using opioids 6 months after their procedure.

Conclusions/Discussion: In this study of patients undergoing elective colorectal resection, open approach had no bearing on postoperative opioid needs. However, factors that increased perioperative narcotic use included male gender, smoking, younger age, preoperative narcotic use and preoperative abdominal pain. Epidural use resulted in increased narcotics likely due to its selective use in patients with known pain issues (n=33). Perioperative administration of lidocaine decreased narcotic requirements. Understanding these risk factors and stratifying postoperative pain regimens may aid in improved pain control and decrease long-term dependency.

IMPACT OF MEDICAID EXPANSION ON TOTAL COLECTOMY FOR PATIENTS WITH CLOSTRIDIUM DIFFICILE (C. DIFF) COLITIS.

P1615

M. Lin[1], J. Hsieh[2], S. Chao[3]
[1]*Buffalo, NY;* [2]*Ames, IA;* [3]*Flushing, NY*

Purpose/Background: Recent healthcare reform with adoption of Medicaid expansion by many states in 2014 attempted to increase access to health services. To our knowledge, no studies have evaluated the impact of this expansion for patient outcomes as it pertains to *C. diff* colitis. Total colectomy is a surgical intervention for patients with severe cases of *C. diff* colitis. We sought to determine how expanded health insurance coverage impacts surgical intervention for *C. diff* colitis.

P1614 Multivariate Analysis of Contributing Factors to Increased Postoperative Narcotic Use in Elective Colorectal Resections

Risk Factor	ΔMME	95% Confidence Interval	p-value
Open approach	5.80	-19.07 to 30.66	0.65
Female gender	-41.57	-65.69 to -17.44	<0.01
Increased age (1 year)	-3.70	-4.64 to -2.76	<0.01
Smoking	44.41	14.93 to 73.88	<0.01
Preoperative narcotic use	51.95	23.82 to 80.08	<0.01
Preoperative abdominal pain	45.21	19.36 to 71.05	<0.01
Epidural use postoperatively	94.13	42.47 to 145.78	<0.01
NSAID use postoperatively	21.82	-7.28 to 50.91	0.14

Methods/Interventions: We used the 2012-2016 National Inpatient Sample (NIS) database for this study, which represents data from 2 years prior to and 3 years after Medicaid expansion. We identified patients with *C. diff* with ICD-9-CM (2008-2015Q3) and ICD-10-CM (2015Q4-2016) diagnosis codes. Inclusion criteria were patients between ages 18-65, who had Medicaid or private insurance as the primary form of payment, and had received a total colectomy during the same admission. Univariate analysis was performed to compare the Medicaid patients to the private insurance patients on 14 factors: age, sex, elective admission, Medicaid expansion, Medicaid adoption rate, race, income quartile, and 7 other medical factors. A total of 5 patient outcomes were measured with both univariate and multivariate analysis (logistic and linear regression).

Results/Outcome(s): From the NIS database, we identified 399 patients that met the selection criteria. We did not observe any clear trend in the number of total colectomies performed on Medicaid or private insurance patients after the Medicaid expansion (Figure 1). Race, income quartile, smoking, diabetes were the only patient factors that were significantly different between the two insurance types, but we also included age, sex, elective admission, Medicaid expansion, Medicaid adoption rate in the multivariate analysis regression models. Logistic regression showed that private insurance group had lower rates for septic shock (aOR = 0.53, p-value = 0.012) compared to the Medicaid group. Medicaid expansion also had a significant impact for the rate of septic shock (aOR = 1.62, p = 0.044). Length of stay was not impacted by any of the factors included in the multivariate analysis. Private insurance was associated with a decrease in cost (-$10,407, p = 0.015) and non-white patients experienced an increase in cost ($14,814, p = 0.007). Medicaid expansion was not a significant factor in changing the length of stay or cost of the hospital stay.

Conclusions/Discussion: Our study showed that Medicaid expansion does not have any significant impacts on the number of total colectomies performed and the outcomes from surgical intervention for patients with *C. diff*. Traditional factors that impact patient outcomes such as insurance types and race had a more significant impact on the rate of surgical intervention for *C. diff* patients.

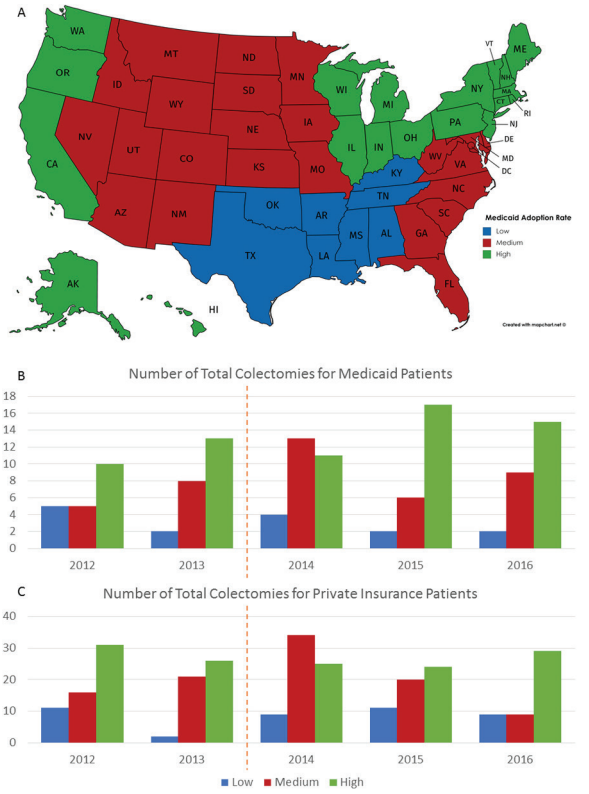


Figure 1. Number of total colectomies performed during 2012-2016 for patients with *Clostridium difficile* colitis. The red dotted line indicates the adoption of Medicaid expansion. A) Adoption rates for divisions of the United States: low adoption (0-33% of states in division, blue), medium adoption (34-66%, red), and high adoption (67-100%, green). B) Patients with Medicaid as the primary form of payment. C) Patients with private insurance as the primary form of payment. No clear trends were observed for the Medicaid or private insurance patients after the expansion.

ESTABLISHING A "WATCH AND WAIT" PROTOCOL AT A TERTIARY ACADEMIC CENTER: A WORD OF CAUTION.

P1610

L. Duraes, J. Efron, S. Gearhart, S. Fang, C. Atallah, T. Warczynski, R. Sahyoun, B. Safar
Baltimore, MD

Purpose/Background: Neoadjuvant chemoradiation followed by surgery is the standard of care for locally advanced rectal cancer. The response to neoadjuvant therapy varies, and ranges from complete tumor response in about 20% of the cases, to partial response and non-response. Much attention has been given to achieving complete response after neoadjuvant chemoradiation, as non-operative approaches for complete responders have been suggested to be effective in select patients. The aim of this study was to report the outcomes of patients who underwent a "Watch and Wait" protocol at our tertiary academic institution.

Methods/Interventions: Patients with rectal adenocarcinoma who achieved complete clinical response after neoadjuvant chemoradiation and opted to enter on a "Watch and Wait" protocol were evaluated. Only patients who had at least 12 months of follow up were selected. Patients were followed with MRI and flexible scopes every 3 months for the first year, and every 6 months after that. Oncologic results and factors associated with recurrence were evaluated.

Results/Outcome(s): Between 2013 and 2018, 17 patients were enrolled on a "Watch and Wait" protocol. The mean age was 54 years. 12 patients were male. At the time of diagnosis, 6 patients had clinical stage II, and 11 patients had clinical stage III. 12 patients underwent neoadjuvant treatment using 5FU as a sensitizer followed by long course radiation (50 .4 Gy). 5 patients underwent short course radiation (25 Gy delivered in 5 days) followed by consolidation chemotherapy (FOLFOX) for 8 weeks. The median follow-up was 32 months (17-81 months). Seven patients (41%) had tumor recurrence during follow up. The median time of recurrence was 13.4 months (10.7-20.2). Unfortunately, 2 patients (11.7%) had metastatic disease at the time of recurrence. 6 patients underwent salvage operation. Among those, 2 patients had pathological Stage1, 1 patient had p Stage 2, 2 patients had p Stage 3, and 1 patient had p Stage 4. Neither clinical stage nor type of radiation were associated with risk of recurrence. No patients died during follow-up period.

Conclusions/Discussion: Watch and Wait protocol may be used for selected patients under strict follow-up at tertiary academic institutions, however the risk of local and distal recurrence is high after one year. Patients should be aware of the risks before pursuing this conservative approach, and must be kept under close surveillance.

POSTOPERATIVE MORTALITY OF HIGH-RISK OCTOGENARIANS WITH COLON ADENOCARCINOMA.

P1616

N. Sell, Y. Qwaider, R. Goldstone, R. Ricciardi, C. Cauley, L. Bordeianou, D. Berger, H. Kunitake
Boston, MA

Purpose/Background: Surgery for colorectal cancer in octogenarians continues to increase in association with the growing elderly population within the United States. However, there is limited data on long-term postoperative outcomes and survival for this cohort of patients, which was the principal aim of this study.

Methods/Interventions: We abstracted data from our prospectively collected colorectal cancer division database at a tertiary care facility from 1/1/2004 through 12/31/2016. Next, we reviewed clinicopathologic data for all patients age 80 and older diagnosed with colon adenocarcinoma who underwent operative resection. Cox regression models of the entire cohort were constructed to examine survival based upon patient demographic and operative covariates.

Results/Outcome(s): Of 1,162 patients with colon adenocarcinoma who underwent resection between 1/2004 through 12/2016, 212 were age 80 (18.2%) or older. Of the 212, 40 patients (18.9%) died from any cause within one post-operative year. Patients who died within one-year were preoperatively more likely to have American Society of Anesthesiologists (ASA) 4 classification (13% vs. 3%; $p= 0.07$) or a Charlson Comorbidity Index (CCI) ≥ 5 (48% vs. 16%; $p<0.001$) as compared to those patients who lived beyond one year. Patients who died within one year more frequently presented with a gastrointestinal bleed (18% vs. 7%; $p=0.04$) and were more likely to undergo an urgent rather than an elective operation (35% vs. 14%; $p=0.002$). On pathology, patients who died within one year more often had Stage IV disease (20% vs. 2%; $p<0.001$), had positive lymph nodes (65% vs. 27%; $p<0.001$), and/or positive EMVI (63% vs. 25%; $p<0.001$), respectively. The overall survival of the group that died within one year was 137 days compared to 1974 days (5.4 years) for the remaining group ($p<0.001$). Both 30 day and 90 day mortality were higher in the short-lived cohort ($p<0.001$) and the incidence of disease recurrence (45% vs. 11%; $p<0.001$) and death due to colon cancer were also higher (43% vs. 12%; $p<0.001$). On adjusted multivariable regression of the entire cohort, elevated ASA, elevated CCI, EMVI positivity, recurrent disease and undergoing an urgent operation were all associated with worse survival (Table).

Conclusions/Discussion: Almost one-fifth of octogenarians who undergo operative resection for colon adenocarcinoma die within the first post-operative year. Poor survival outcomes after elective and emergency resections for octogenarians with a high ASA or CCI classification should be clearly communicated to set realistic expectations for patients and their families preoperatively. The patient's goals and values should be addressed preoperatively prior to urgent or emergent operations to ensure goal-concordant care.

Table. Multivariable Cox Regression for Overall Survival in Octogenarians who have Undergone Resection of Colon Adenocarcinoma

Variable	Hazard Ratio	95% CI	*P*-value
Sex			
Female	Reference		
Male	0.95	0.65-1.39	0.791
ASA			
ASA 2	Reference		
ASA 3	1.53	1.05-2.24	**0.028**
ASA 4	4.93	2.09-11.65	**<0.001**
Charlson Comorbidity Index			
0-2	Reference		
3-4	1.60	1.07-2.39	**0.023**
5-6	1.52	0.84-2.77	0.169
7+	2.86	1.41-5.78	**0.003**
Pathological AJCC Stage			
Stage I	Reference		
Stage II	1.01	0.64-1.60	0.959
Stage III	0.30	0.06-1.47	0.138
Stage IV	0.62	0.12-3.12	0.564
GI Bleed at Presentation	0.78	0.42-1.45	0.432
Urgent Operation	2.08	1.32-3.26	**0.002**
Positive Lymph Nodes	4.13	0.90-18.9	0.068
EMVI Positive	1.56	1.01-2.41	**0.046**
Recurrent Disease	1.92	1.08-3.42	**0.027**

ASA, American Society of Anesthesiologists; AJCC, American Joint Committee on Cancer; GI, gastrointestinal; EMVI, extramural venous invasion

ASSOCIATION BETWEEN EXTENT OF SURGICAL RESECTION AND OVERALL SURVIVAL IN PATIENTS WITH MUCINOUS NEOPLASMS OF THE APPENDIX.

P1617

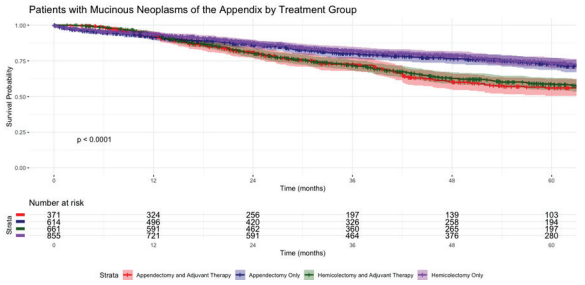
K. Freischlag[1], M. Turner[2], J. Migaly[2], C. Mantyh[2]
[1]*North Liberty, IA;* [2]*Durham, NC*

Purpose/Background: Appropriate extent of surgical resection for mucinous neoplasms of the appendix remains unclear. No previous studies have examined the clinical outcomes by extent of resection with population-level data.

Methods/Interventions: National Cancer Database (NCBD) was queried for adult patients who underwent surgery for mucinous adenocarcinoma from 2006-2016. Patients were stratified by hemicolectomy (Facility Oncology Registry Data Standards code 40) or appendectomy (FORDS code 30). Baseline characteristics were calculated with Kruskal-Wallis and Chi-squared techniques. The Kaplan Meier method and Cox proportional hazards model were utilized to estimate survival.

Results/Outcome(s): Overall, 3,010 patients were treated surgically for mucinous neoplasms of the appendix. Annual incidence increased from 185 patients in 2006 to 346 patients in 2016. 1,844 patients underwent hemicolectomy while 1,166 underwent appendectomy. Patients who underwent appendectomy had smaller and lower-grade tumors, higher rate of a positive margins (27.2% vs 17.8%, p<0.001), shorter length of stay (5 days vs 6 days, <0.001), and fewer lymph nodes assessed (1.0 vs. 16.0; p<0.001). There was no difference in 30-day mortality, 30-day readmission, or 90-day mortality. There was no difference in 5-year survival (66.0% vs. 66.6%, p=0.75) or mortality risk (Hazard Ratio 1.00, 95% CI 0.80-1.26). There was a significant survival benefit to having surgery at an academic center (HR 0.60, 95% CI 0.40-0.90). A higher portion of patients who underwent hemicolectomy received adjuvant therapy (42.2% vs appendectomy 36.7%, p=0.003), and all patients who received adjuvant therapy had significantly worse survival. Type of surgery did not significantly impact overall survival regardless whether the patient had adjuvant therapy (Figure 1).

Conclusions/Discussion: Overall, there was no significant difference in short-term nor overall survival by extent of resection. However, hemicolectomy was associated with improved oncologic metrics of fewer positive margins and more extensive lymph node assessment. Treatment at an academic center conferred a survival benefit. Prospective studies of homogeneous populations would provide further insight into optimal extent of resection.



Patients with Mucinous Neoplasms of the Appendix by Treatment Group

SYNOPTIC REPORTING IN RECTAL CANCER.

P1618

N. Kloos, G. Ladua, L. Chen, S. Gupta, T. Phang, M. Raval, A. Karimuddin, C. Brown
Vancouver, BC, Canada

Purpose/Background: Operative reports provide vital documentation of surgical procedures. However, crucial data is often missing or communicated in an obscure manner. Synoptic reporting is a clinical documentation method where critical operative information is prescriptively structured. The Commission on Cancer has introduced synoptic operative reports (SOR) for rectal cancer as an accreditation standard. The objective of this study is to assess the impact of SORs on the completeness of reporting of critical operative data in rectal cancer and the ease of access to this data.

Methods/Interventions: Three colorectal surgeons from St. Paul's Hospital developed a synoptic operative template which included 14 elements in 2007. In 2009, a Delphi process involving rectal cancer physicians was used to validate the current template; the process identified five

additional elements, forming an updated synoptic template (uSOR) template. Two time periods of operative reports were examined: rectal cancer operative reports done between January 2007 – June 2009, and a second cohort after adoption of the uSOR spanning January 2016 – June 2018. As synoptic reports were not mandated in these periods, analysis of adoption of the SOR and uSOR in each cohort was performed. As the uSOR included additional elements, we also compared the completeness of operative element reporting in three groups: traditional narrative operative reports (NOR), SORs and uSORs. Linear regression was used to evaluate differences in mean scores in the number of elements present between NORs, SORs, and uSORs and the time required to garner the elements from the reports.

Results/Outcome(s): In total, 458 rectal cancer operative reports were reviewed. Adoption of SOR/uSOR has improved over the 2 cohort periods, increasing from 35.0% (76/217) to 79.7% (192/241) ($p<0.001$). Trainees (fellows and residents) were more likely to dictate operative reports in a synoptic fashion compared to attendings (79.5% vs 43.0% $p<0.001$). Both SOR and uSOR synoptic strategies significantly improved completeness of data reporting when compared to NOR (mean of 16.645/19 & 18.959/19 vs. mean 9.300/19, $p<0.001$). Furthermore, time required to access the important operative elements was significantly less in the SOR/uSOR format (73.7 vs. 227.0 secs, $p<0.001$). Finally, despite the synoptic format of the original report, the new elements added through the Delphi process were not recorded effectively until they were added to the synoptic structure.

Conclusions/Discussion: Synoptic reporting in rectal cancer operations has increased over time at St. Paul's Hospital. Synoptic reports are significantly more comprehensive with data that is easier to access than reports that are solely narrative.

RISK FACTORS ASSOCIATED WITH POSTOPERATIVE COMPLICATIONS IN THE TREATMENT OF RECTAL NEOPLASIA BY TRANSANAL ENDOSCOPIC MICROSURGERY.

P1619

A. Tammany, J. Gallagher, K. Safcsak
Orlando, FL

Purpose/Background: Transanal endoscopic microsurgery (TEM) is a minimally invasive technique for the treatment of benign and early malignant rectal neoplasia. While TEM is less invasive than formal surgical resections, post-operative (post-op) complications may still occur. The primary purpose of this study is to identify the risk factors that contribute to complications within 30 days following TEM for the treatment of rectal neoplasia.

Methods/Interventions: A retrospective chart review of 71 consecutive adult patients undergoing TEM from May 2010-August 2017 was reviewed for 30-day post-op complications. The patients were then stratified into two groups: no post-op complications (NPOC) and post-op complications (POC). Demographics, ASA Class, neoadjuvant treatment, tumor distance from anal verge, circumferential tumor location, and pathology were collected. Thirty-day post-op complications were then identified, and treatments graded with the Clavien-Dindo classification. The two groups were compared using Mann-Whitney U test and contingency tables and data reported as median with interquartile range (IQR) or percentages. Odds ratio (OR) with 95% confidence interval (CI) was then calculated to identify risk factors for the 30-day post-op complications identified in this study.

Results/Outcome(s): Fifty-seven patients had NPOC and 14 patients had a total of 20 POC for an overall 19.7% complication rate. The most frequent complication was micturition requiring a Foley catheter (30%), followed by pain >7 days (20%), and infection or need for blood transfusion (10%). There was no difference in age or gender between the two groups. There was a significant difference in patients who developed complications within 30 days following TEM vs. patients with NPOC in ASA class IV (29% vs. 5% [OR 7.2, CI 1.4-37.2]; $p=0.02$), neoadjuvant chemoradiation therapy (43% vs. 14% [OR 0.3, CI 0.06-0.8]; $p=0.03$), posterior lesions (64% vs. 33% [OR 3.9, CI 1.1-13.3]; $p=0.03$), malignancy (86% vs. 33% [OR 0.08, CI 0.02-0.4] ; $p=0.006$), and tumor distance to the anal verge (5 (3-6) vs. 7 (5-10) cm; $p=0.04$). Utilizing the Clavien-Dindo classification for TEM post-op complications, there were 17 Grade I-II complications, no Grade III complications, and 3 Grade IV-V complications. Five (36%) patients with POC did require hospital readmission within 30 days of TEM. No patient required reoperation.

Conclusions/Discussion: Minimally invasive TEM for the treatment of benign and early malignant rectal neoplasia is a safe alternative to formal surgical resection. The majority of 30-day post-op complications was minor; Graded I or II. Risk factors identified for 30-day POC are ASA class IV, neoadjuvant therapy, posterior lesions, and malignant pathology.

DETECTION OF RECURRENT RECTAL CANCER BY ROUTINE SURVEILLANCE.

P1620

K. Bingmer, P. Dreher, J. Shearer, A. Ofshteyn, J. Bliggenstorfer, E. Steinhagen, S. Stein
Cleveland, OH

Purpose/Background: Approximately 20% of patients treated with curative intent for rectal cancer will experience local or distant recurrence. A variety of surveillance methods are recommended to detect early recurrence without evidence of which methods are most efficacious. We hypothesize that a majority of rectal cancer is detected

via routine surveillance imaging rather than due to clinical symptoms, laboratory findings, or endoscopic examination.

Methods/Interventions: All patients who underwent curative intent resection of clinical stage I-III rectal cancer from 2008-2018 at an academic medical center were reviewed. All surveillance methods were collected and modes of detecting recurrence were noted. Time to recurrence was calculated from surgical resection to pathologic confirmation of recurrence.

Results/Outcome(s): A total of 408 patients with non-metastatic rectal cancer underwent curative intent resection; 55 (14%) had a recurrence. These patients were 55% female and 89% white. Patients were most frequently diagnosed as cT3 (54%), with N0 (30%) or N1 (39%) disease; 41 (75%) patients underwent neoadjuvant chemoradiation. Of patients with recurrence, 47 (85%) had initial signs of recurrence on surveillance imaging, 10 (18%) had a rise in CEA, 7 (13%) presented with symptoms, 5 (9%) diagnosed on physical exam, and only 2 (4%) were diagnosed by routine endoscopy. 16 patients were diagnosed with a combination of modalities. Median time to recurrence was 16.5 months; there was no difference in time to diagnosis of local vs distant disease. 23 (42%) patients had a local recurrence, and 41 (75%) had distant recurrence (9 patients had both local and distant disease at time of recurrence). 10 (44%) of the local recurrences were intraluminal, and 14 (61%) were extraluminal, with one patient having both intraluminal and extraluminal recurrence. Distant recurrences were in the lung (49%), liver (41%), bone (2%), and other (12%). When comparing local and distant recurrence, there was no difference in gender, race, clinical stage, or rates of neoadjuvant therapy. Recurrence was most commonly detected by routine surveillance imaging in both local (58%) and distant (83%) disease.

Conclusions/Discussion: Routine surveillance is an important component of the care of rectal cancer patients treated with curative intent. This study demonstrates routine imaging is the most effective modality in detecting both local and distant recurrence. Larger studies to better characterize predictors of recurrence, costs and methods of detection of recurrence.

NEGATIVE LYMPH NODE STATUS IN STAGE IV COLON CANCER: ASSOCIATED FACTORS AND SURVIVAL IMPACT.

P1621

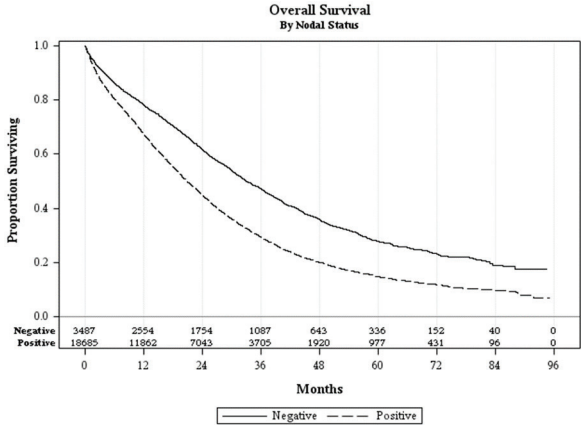
A. Masson, P. Goffredo, D. Thompson, S. Mott, J. Hrabe, I. Gribovskaja-Rupp, I. Hassan, M. Kapadia
Iowa City, IA

Purpose/Background: The prognostic significance of regional lymph node (LN) involvement in patients with metastatic colon cancer is not well established. Understanding factors associated with LN status may aid in risk stratification and management of patients with stage IV disease. The aim of the current study was to evaluate tumor and patient characteristics associated with pathologic negative regional nodal status in stage IV colon cancers, as well to analyze its impact on patterns of disease presentation and survival.

Methods/Interventions: The National Cancer Database was queried to identify patients diagnosed with stage IV adenocarcinoma of the colon between 2004 and 2015. Analyses were limited to patients who underwent segmental colonic resections. Factors associated with negative LN status were identified with univariate and multivariable logistic regression models, while the survival was estimated using Kaplan-Meier curves.

Results/Outcome(s): A total of 25,907 patients were identified: 15.6% had negative regional LN. The majority of patients were under the age of 70 (68.9%) with 74.8% being Caucasian and 49.4% of male gender. The median number of LN in the specimen was 17 (mean 19±11). No significant differences were observed between KRAS mutation (53.5% vs 56.2%) or microsatellite instability rates (17.5% vs 17.4%) between LN negative and positive tumors, respectively. After adjustment for available confounders, LN negative tumors were associated with older age, receiving care at an academic facility, having private health insurance, and having well-differentiated left-sided tumors without tumor deposits and perineural invasion. Compared to LN negative tumors, those with positive nodes were more likely to metastasize to the liver. However, the LN status did not impact predilection of metastases to other sites, such as lung, bone, and brain. LN negative cancer that underwent resection had a better prognosis as compared to those with node positive specimens (Figure 1).

Conclusions/Discussion: Lymph node negative Stage IV colon cancer patients presented with favorable prognostic features, such as low T stage, absence of tumor deposits or perineural invasion, well-differentiated, and more often involving the left colon with no preferential site of metastases. Conversely, LN positive tumors had more adverse histopathologic characteristics and more likely associated with liver metastases. KRAS mutations or microsatellite instability were not associated with nodal status. Despite not being able to adjust for chemotherapy regimens, tumor burden, and management of distant disease, regional nodal involvement in resected stage IV colon cancers was an adverse prognostic factor.



Kaplan-Meier curves showing survival in resected Stage IV colon cancer by nodal status

SINGLE CENTER OUTCOMES OF IMMEDIATE INTERNAL PUDENDAL ARTERY PERFORATOR FLAP FOR RECONSTRUCTION FOR ABDOMINOPERINEAL RESECTION DEFECTS.

P1622

K. Aldabek, I. McCulloch, C. Mullens, M. Climov, V. Dumasius, N. Jrebi
Morgantown, WV

Purpose/Background: Anorectal malignancy is commonly treated surgically with abdominoperineal resection (APR). Primary closure is the most used technique following APR, however, wound complications may occur in up to 66% of patients[1,2]. V-Y Fasciocutaneous flap also known as internal pudendal perforator artery flap (IPAP) is often used as an alternative to primary wound closure. Recent reports suggested that using local flaps such as IPAP flaps may decrease overall wound complications compared to primary closure[3]. The main purpose of this study is to examine the surgical outcome of using IPAP closure compared to primary closure following APR.

Methods/Interventions: A single institution, non-randomized, retrospective analysis of patients receiving APR was conducted. The treatment group included patients reconstructed using IPAP flap while the control group included patients who were reconstructed with primary closure following APR. Two colo-rectal and one plastic surgeon were performing the procedures. The analyzed surgical outcome parameters included abscess formation, wound dehiscence, and healing period. Comorbidities were calculated using Charlson Comorbidity Index (CCI)[4]. Statistical analysis was completed using SPSS, ANOVA and Chi-squared tests.

Results/Outcome(s): A total of 41 patients (IPAP flap n=23, primary closure n=18) were identified for the study. The mean time for complete wound healing for the IPAP and the control was 93.4 and 75.2 days, respectively. Wound dehiscence was observed in two patients (9%) from the IPAP flap group and two patients (16%) from the control group, in which one of them required surgical revision. Four patients (17%) in the IPAP flap treatment group developed abscesses that required antibiotic treatment compared to three patients (17%) in the control group. The IPAP flap group had higher cardiovascular comorbidities (48% vs. 0%) compared to the control. Significantly lower blood loss was observed among the IPAP flap group compared to primary closure (300 ml vs. 535 ml, p= 0.03). No statistically significant difference in wound dehiscence, healing period, and abscess formation was found between groups.

Conclusions/Discussion: Results indicated no significant difference in surgical outcome of using IPAP flap closure following APR including wound dehiscence, surgical site infection, and healing period compared to primary closure. The result of this study should be interpreted with caution since the study was a retrospective review and not randomized. Conversely, a previous report found lower wound dehiscence in patients who underwent IPAP flap[4]. Notably, IPAP flap patients had lower blood loss than primary closure patients. A limitation in this study is the possible inequality of the groups taking into consideration higher cardiovascular comorbidities of the treatment group which might have led to worse surgical outcomes compared to the primary closure group.

A NEW MRI MARKER CAN IDENTIFY T3 STAGE RECTAL CANCER: A PROSPECTIVE, MULTICENTER STUDY IN CHINA.

P1624

X. Zhang, X. Li, Y. Shi, Y. Sun
Beijing, China

Purpose/Background: Well-known T3 substage criteria, UICC(T3a-d) and RSNA criteria (T3a-c) is based on EMD (extramural depth of tumor invasion) measurement in rectal cancer. However, intra- and inter-observer reproducibility for the measurements of EMD was regarded as poor by Pooni A's study; Second, the data of T3 substage criteria were from western populations. Whether it is suitable for Chinese population remains unknown. Based on clinical practice, we found DBDM(the distance between the deepest tumor invasion and mesorectal fascia)was associated with prognosis in T3 patients. Therefore, we designed this study to determine whether DBDM can be used to identify T3 stage patients.

Methods/Interventions: Patient informed consent was obtained from all participants. Consecutive T3 stage rectal cancer patients with MRF(-) were included from four hospitals (January 2013 to September 2014). All patients received neoadjuvant chemoradiotherapy and then TME surgery. Two radiologists independently conducted measurements on baseline MRI. Inter-observer reproducibility was evaluated for measurements of DBDM, EMD, mesorectum thichness and other MRI indices. Participants

were followed up regularly after operation. The date of operation, last follow-up, death and cause of death, distant or local recurrence and site of recurrence were recorded. Kaplan-Meier method with log-rank estimate was conducted to compare survival curves between DBDM groups or T3 substages. ($P < 0.05$, SPSS 22.0).

Results/Outcome(s): 278 cT3 rectal cancer patients were included (186 males, 92 females, 56.9±10.9 years). Median follow-up duration after surgery was 57 months (4 - 71 months). 66 patients developed progression (including distant or local recurrence or death). Excellent agreement was obtained for DBDM measurements (ICC=0.93) and its dichotomy (k=0.98). Substantial agreement was obtained for the measurements EMD (ICC=0.78), but moderate agreement was obtained for cT3 substage dichotomy (k=0.57). A DBDM cutoff value of 7 mm was chosen as a reference value, as a progression rate of approximately 10% was considered as good prognosis. Patient with DBDM <7 mm had a significantly higher 5-year rates of death (14.9% vs. 1.7%, P=0.005) and distant metastasis (23.7% vs. 9.2%, P=0.011) than patient with DBDM ≥ 7mm. The mean thickness of the mesorectum from the four centers was 9.4mm. There was no difference observed in survival outcomes between patient classified as T3a/b and T3c/d, all >0.05 (Figure 1).

Conclusions/Discussion: This was the first study to define DBDM measurement (cutoff=7mm), and define its role in predicting survival outcomes. EMD-based T3 substage may be not applicable in Chinese population due to the thin mesorectum. The DBDM, as good predictor for prognosis and of excellent inter-observer reproducibility, is potentially useful to be considered for managing individualized treatment strategy for T3 rectal cancer patients.

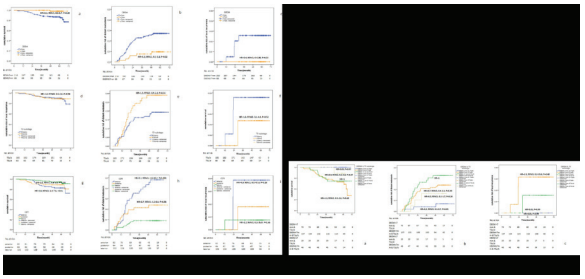


Figure 1: A. Kaplan-meier curves for pre-NCRT MRI parameters according to different survival outcomes. B. Kaplan-meier curves for subgroups defined by DBDM & T3 substage.

LIGATING RECTUM WITH CABLE TIE FACILITATES RECTUM TRANSECTION IN LAPAROSCOPIC ANTERIOR RESECTION OF RECTAL CANCER.

P1625

X. Deng, L. Bi, Z. Wang
Chengdu, China

Purpose/Background: Proper transection of the distal rectum is important for reconstruction of bowel continuity in rectal cancer surgery. However, in low rectal cancer, proper transection of rectum along with completely occlusion of the rectum for washout, were not always easy procedure, especially in those difficult pelvic patients. In this study, we introduced a modified technique for ligation of the distal rectum, and investigated its safety and efficiency.

Methods/Interventions: After complete mobilization and transection of the mesorectum, the cable tie was carefully positioned distal to the tumor, followed by washout and transecting the rectum with linear stapler. From September 2017 to June 2018, consecutive 67 mid-low rectal cancer patients with laparoscopic anterior resection underwent this technique. Clinical data of these patients,

P1625 Difference between cable tie group and clamp group

	Cable tie group (67)	Clamp group (132)	p
Age (mean±SD, year)	58.6±11.62	61.2±11.34	0.132
BMI (mean±SD, kg/m2)	23.0±3.17	23.3±3.15	0.544
Gender(male)	44(65.7%)	91(68.9%)	0.743
Tumor located above reflection	26(38.8%)	53(40.2%)	0.734
Tumor located at or below reflection	41(61.2%)	79(59.8%)	
Distal margin (mean±SD, cm)	3.19±1.77	2.54±1.36	0.005
Patients with one stapling transection	63(94.0%)	91(68.9%)	<0.001
male with one stapling	42/44(95.5%)	60/91(65.9%)	<0.001
female with one stapling	21/23(91.3%)	31/41(75.6%)	0.185
At or below reflection with one stapling	37/41(90.2%)	43/79(54.4%)	<0.001
Above reflection with one stapling	26/26(100%)	48/53(90.6%)	0.165
BMI>25 with one stapling	15/16(93.8%)	24/37(64.9%)	0.005
BMI<=25 with one stapling	48/51(94.1%)	67/95(70.5%)	<0.001
Number of cartridges (mean ± SD)	1.1±0.32	1.3±0.52	<0.001

including number of firings, pathological and operative variables, and postoperative outcomes were compared with 132 consecutive patients who underwent traditional surgery(clamping the whole rectum with grasping forceps with long jaws (De Bakey atraumatic forceps, jaw length 50mm, diam 10mm, Aesculap, Germany)) from January 2016 to August 2017.

Results/Outcome(s): Compared to traditional method, cable tie ligation significantly reduced the number of firings (1.1±0.32 vs. 1.3±0.52, p<0.001). A very high ratio of one firing transection of rectum was observed in cable tie group (94.0% vs 68.9%, p<0.001), even in patients with tumor at or below the peritoneal reflection (90.2% vs. 54.4%, p<0.001), male patients (95.5% vs. 65.8%, p<0.001), and obese patients (93.8% vs 64.9%, p=0.005). The mean distal margin was longer in cable tie group (3.19±1.77 cm vs. 2.54±1.36 cm, p=0.005), with no positive distal margin observed. The operation time, quality of mesorectum and morbidity between two groups were comparable. Two leaks (3.0%) in the cable tie group were observed, similar to 3.8% in the control.

Conclusions/Discussion: Ligation of rectum with cable tie reduces number of cartridges, and increases the rate of one stapler firing for rectal transection, even in these difficult cases like male, obese, and low rectal cancer patients. It is also useful for occlusion of rectum before washout. It's safe, feasible, and worthwhile for popularization.

THE PRONE-JACKKNIFE-POSITION-FIRST ABDOMINOPERINEAL EXCISION FOLLOWED BY THE TWO-TEAMS APPROACH WITH taTME: NEW STANDARDIZED TECHNIQUE FOR ACHIEVING PATHOLOGICAL CRM-NEGATIVE SPECIMENS.

P1626

M. Hamada, M. Yuki, F. Sumiyama, T. Kobayashi, Y. Matsumi, H. Miki, M. Sekimoto
Hirakata, Japan

Purpose/Background: Several studies on extralevator abdominoperineal excision for low rectal cancers resulted in disappointing outcomes not only in 3-year local recurrence rate but also in postoperative complications as compared with standard abdominoperineal excision (APE). In order to design the incision line for transection of the levator ani muscle and in order to obtain a negative pathologic circumferential resection margin (pCRM) according to the MRI T2 images, we present the prone-jackknife-position-first APE (pfAPE) followed by the two-teams approach with transanal total mesorectal excision (taTME) and compared its perioperative outcomes to our previous procedures of APE

Methods/Interventions: First, the operation is started at the perineal part in the prone jackknife position. Incision and dissection of subcutaneous fat that surrounds the outer surface of the levator ani muscle are performed according to Holm's procedure (a). After disarticulating the coccyx, the range of the incision line of the levator ani is adjusted according to the findings in the MRI T2 images (b-c). In the case of an anterior tumor, the puborectalis sling is exposed as anterior as possible (d-e); the puborectalis sling is incised to the lateral side of the prostate or vaginal wall (f). The dissection plane at the lateral side is extended cranially and caudally and the entire posterior surface of the anterior organs is exposed (g). This procedure makes it possible to avoid injury of the urethra and vaginal wall as much as possible (h). Connecting the dissection plane with the perianal incision, the specimen can be lifted up, and we can reach the peritoneal reflection in most cases (i). Next, we change the posture of the patient to the lithotomy position. Finally, using the two-teams approach with taTME, the specimen is extracted through the perineal side under laparoscopic surgery.

Results/Outcome(s): From February 2014 to July 2019, 22 cases of low rectal cancer underwent APE with curative intent. Nine cases underwent APE by "the up to bottom laparoscopic surgery", 8 cases underwent TaTME in the lithotomy position, and 5 cases underwent pfAPE. Age, gender, BMI, tumor distance from the anal verge, cT, pCRM value, operation time, and blood loss did not significantly differ among the three groups. Two of the 9 cases in "the up to bottom laparoscopic surgery" group were pCRM-positive (<1mm), and these two cases had anterior lesions. All 5 cases in the pfAPE group were pCRM-negative (≧1mm).

Conclusions/Discussion: pfAPE enables us to control the resection range of the levator ani muscle under direct vision. pfAPE can be standardized to obtain a pCRM-negative specimen by APE, especially for anterior lesions.

Table1: Perioperative outcomes of three APE procedures

Procedures	n	Age (yr)	Gender M/F	BMI (kg/m2)	tumor location AV (cm)	cT 1/2/3/4	tumor size(mx) cm	op time (min)	blood loss (ml)	pT x/2/3/4	pStage X/I/IIA/IIIA/IIIB/IV	CRM (mm)	CRM<1mm (+)	post op. complications	POHS days
① lap	9	67(48-86)	4/5	21.2(13.9-24.8)	0 (0-5)	0/2/3/4	30 (0-50)	313 (178-634)	138 (18-726)	1/3/5/0	1/3/3/0/2/0	4.0 (0-18.0)	2	IPA:1 (CDIIIa) NB:2 (CDII)	15 (11-18)
② taTME	8	87(57-94)	4/4	21.3(18.2-29.5)	0.5(0-2)	0/0/4/4	35 (18-75)	363 (284-664)	239 (26-733)	0/5/3/0	0/2/1/1/4/0	6.0 (1.0-13.0)	0	IPA:3 (CDIIIa) NB:1 (CDII)	15 (11-40)
③ pfAPE	5	74(59-77)	3/2	25.4(16.3-28.5)	0	0/1/0/4	20 (0-40)	368 (289-465)	272 (95-350)	0/2/2/0	0/2/2/0/1/0	4.0 (1.0-15)	0	SSI:2 (CDIIIa)	15 (12-25)

AV: tumor distance from anal verge, c,pT:TNM c,pT, mx:maximum, op. time: operation time, CRM:circumferential resection margin, IPA: intra-pelvic abscess, NB: neurogenic bladder

RISK FACTORS FOR REPAIR FAILURE OF DIVERTING ILEOSTOMY IN RECTAL CANCER SURGERY.

P1627

S. Baek, J. Kim, H. Choi, T. Lee, H. Park, J. Kwak, J. Kim, S. Kim
Seoul, Korea (the Republic of)

Purpose/Background: Protective diverting ileostomy is frequently performed to protect the anastomotic site in rectal cancer surgery. However, some patients fail to repair ileostomy and continue to have it as a permanent stoma. This study was designed to identify the patient characteristics and risk factors of ileostomy repair failure.

Methods/Interventions: From September 2006 to November 2018, we included patients with protective

diverting ileostomy who underwent radical resection with rectal cancer. We compared the patient and tumor characteristics of patients who underwent and did not undergo ileostomy repair within one year after surgery.

Results/Outcome(s): A total of 2513 patients underwent surgical resection for rectal cancer, of whom 740 had protective diverting ileostomy (29.4%). Among the 682 patients with more than 1 year f / u, 625 patients underwent ileostomy repair (91.6%) with the median duration of 3.1 months and 57 patients failed to perform (8.4%). The anastomotic complication and its sequelae were the most common cause of failure in Ileostomy repair (43.9%), followed by disease progression or recurrence (26.3%), follow-up loss (14.0%), non-surgical complication (8.8%) and postoperative mortality (7.0%). The ASA score was higher ($p = 0.023$), more preoperative chemotherapy were performed (12.3% vs 3.7%, $p = 0.004$) in the repair failure group. There were more complications such as preoperative perforation and bleeding in the repair failure group (5.3% vs 1.0%, $p=0.015$; 3.5% vs 0.3%, $p=0.016$). In the repair failure group, postoperative complications, especially leakage and intraabdominal abscess were frequent (29.8% vs. 7.4%, $p <0.001$; 10.5% vs 1.8%, $p <0.001$), and postoperative gas out, feeding, and hospital stay were significantly longer ($p <0.001$, $p = 0.002$, $p <0.001$). Postoperative chemotherapy was performed less frequently in repair failure group (45.6% vs. 60.2%, $p = 0.035$). In multivariate analysis, only preoperative perforation ($p = 0.043$, OR = 7.627), gas out ($p = 0.05$, OR = 1.371) and postoperative chemotherapy ($p = 0.001$, OR = 0.152) were significant risk factors for ileostomy failure.

Conclusions/Discussion: The protective diverting ileostomy after rectal cancer surgery could not often be repaired in patients with poor general condition or advanced stage preoperatively and with postoperative complications. In the patients with risk factor, the possibility of permanent stoma should be fully predicted.

USE OF END-LOOP STOMA TECHNIQUE IN PERITONEAL CARCINOMATOSIS.

P1628

A. Pai[1], N. Padmanabhan[1], G. Melich[3], S. J Marecik[2], J. Park[2]
[1]*Chennai, India;* [2]*Chicago, IL;* [3]*New Westminster, BC, Canada*

Purpose/Background: Ostomies are an integral part in the care of peritoneal carcinamotosis (PC) patients either as an elective or emergent procedure for fecal diversion. In most patients of PC with bowel obstruction mesentery is studded with tumor nodules which precludes the construction of an adequately everted and well perfused stoma. The delivery of loop of small or large bowel in patients with short, thickened and tumor studded mesentery can pose a challenge. Alternatively widening the abdominal or rectus sheath aperture poses a risk of stoma prolapse. Thickened and fibrosed mesentery precludes a double barrel stoma in the same trephine due to space constraints.

Methods/Interventions: A useful technique when there is undue tension on mesentery and in obese abdominal wall is an End-loop stoma described by Leela Prasad from University of Illinois at Chicago. Loop of bowel for stoma maturation is brought out through the proposed site and the bowel is divided with a GIA™ stapler. Staple line of the proximal loop is excised completely and matured in a standard fashion. Only 5 to 10 mm of staple line at the anti-mesenteric border of the distal limb is opened and brought out form a distal mucus fistula. Distal limb has the appearance of mini stoma and is fixed using two full thickness sutures to the dermis. A four point stitch encompassing full thickness and seromuscular layer of the distal stoma with full thickness and seromuscular layer of proximal stoma and is placed. This prevents distal loop retraction by fixing the distal and proximal loops. Limited abdominal incision around the stoma is adequate for stoma closure as the distal mucus fistula is brought out through the same trephine.

Results/Outcome(s): During the study period (October 2014- November 2019) we have employed this technique for 20 patients. All of them were done with palliative intent in advanced peritoneal carcinomatosis. None of them had stoma prolapse or retraction and minor complications like wound infection and skin excoriation was present which was managed conservatively.

Conclusions/Discussion: End-loop stoma replaces large, bulky, oddly shaped stomas with relatively flat, circular ones. Access to the distal limb is maintained for irrigation or further study. Importantly decompression of distal edematous limb is achieved as well. Intestinal continuity can be reestablished with a local operation rather than a formal laparotomy. This procedure of End-loop stoma is an useful technique to be employed in bowel obstruction in patients with Peritoneal Carcinomatosis.

CADAVERIC STUDY OF COLON LENGTHENING MANEUVERS FOLLOWING SIGMOIDECTOMY.

P1629

D. Yoon, K. Mirza, C. Wickham, K. Cologne, J. Shin
Los Angeles, CA

Purpose/Background: Colon lengthening maneuvers following sigmoidectomy allow for tension-free colorectal anastomosis. The goal of this study was to quantify the colon length gained for a colorectal anastomosis following open sigmoidectomy in cadavers.

Methods/Interventions: Open sigmoidectomy was performed in 10 fresh-tissue cadavers with the distal resection margin at the inferior border of the sacral promontory and the proximal margin at the junction between the descending and sigmoid colon. Left colon lengthening

maneuvers consisted of (1) high inferior mesenteric artery (IMA) ligation and left colon mobilization without splenic flexure takedown, (2) maneuver 1 plus splenic flexure takedown, and (3) maneuvers 1 and 2 plus high inferior mesenteric vein (IMV) ligation with mobilization of transverse mesocolon off the inferior border of the pancreas. Each maneuver was performed sequentially in the order listed. Length gained was measured by the distance between the original position of the proximal colon staple line and the staple line position below the sacral promontory when pulled into the pelvis.

Results/Outcome(s): The average body mass index of the cadavers was 23.6 kg/m^2, and the average sigmoid colon specimen length was 34.4 cm (range 13 to 58 cm). The average cumulative length gained following maneuvers 1, 2 and 3, respectively, was 11.0 ± 4.8 cm, 24.4 ± 13.1 cm, and 33.7 ± 15.6 cm. Cadaver body habitus, thickness of mesentery, degree of obesity, IMA length, and sigmoid specimen length had no correlation to length gained from each lengthening maneuver.

Conclusions/Discussion: This study quantifies the average cumulative length gained after sequential common colon mobilization maneuvers. As we know, each maneuver adds significant length to colon mobilization needed to reach the pelvis for low anastomoses. Length gained with each maneuver had no correlation to body habitus or degree of obesity.

DEVELOPMENT OF A RADIOMICS BASED SIGNATURE TO PREDICT PROGNOSIS OF COLORECTAL CANCER LUNG METASTASIS PATIENTS.

P1630

G. Cai
Shanghai, China

Purpose/Background: Accurate prediction of long term prognosis for colorectal cancer lung metastasis (CRLM) patients remains a challenge and no effective predictive model has been developed. More prognostic factors should be exploited to facilitate the risk stratification for CRLM patients. The aim of this study was to develop a radiomics features based signature to predict the long term overall survival (OS) and disease free survival (DFS) of colorectal cancer with metastasis limited to lung.

Methods/Interventions: We identified 118 CRLM patients who had measurable chest CT and lung was the only distant metastatic site. Over one thousand features were extracted automatically from the annotated CT based on pyradiomics and LASSO cox regression and SVM model was further used to identify the most valuable prognostic features and developed a predictive signature.

Results/Outcome(s): The developed radiomics signature was significantly associated with OS (P<0.001) and DFS (P<0.001). When used to predict long-term OS and DFS, the developed signature showed considerable predicting accuracy with AUC of 0.74 (95% CI 0.65-0.83) and 0.72 (95% CI 0.64-0.80), respectively.

Conclusions/Discussion: The combined nomogram model developed can effectively predict long term overall survival for CRLM patients. This prediction tool can help to identify high risk patients who require more aggressive therapeutic intervention.

IMPACT OF ADJUVANT CHEMOTHERAPY AFTER CURATIVE RESECTION OF STAGE IV COLORECTAL CANCER EXCLUDING LIVER METASTASIS.

P1631

M. Asari, S. Yamaguchi, N. Obara, L. Wang, T. Kato, K. Hara, H. Kondo, T. Ishii, Y. Hirano
Hidaka City, Saitama Prefecture, Japan

Purpose/Background: In Japan, the efficacy of adjuvant chemotherapy after curative resection for stage IV colorectal cancer with liver limited metastasis has been reported, but there is little evidence for adjuvant chemotherapy after curative resection for stage IV colorectal cancer other than liver metastasis. We investigated the impact of adjuvant chemotherapy on stage IV colorectal cancer survival and recurrence after curative surgery excluding liver metastasis.

Methods/Interventions: This study included 51 patients who underwent curative surgery for synchronous metastatic colorectal cancer excluding liver metastasis between 2007 and 2018. We classified the patients into those with adjuvant chemotherapy (AC group) and those without adjuvant chemotherapy (N group) and examined Overall survival (OS) and relapse-free survival (RFS).

Results/Outcome(s): Median follow-up time: 1131 days. There were 31 males and 20 females, with a median age of 64 years. Thirty patients were received adjuvant chemotherapy after curative surgery, and twenty-one patients were not. The metastatic sites were 27 cases of peritoneal dissemination, 12 cases of lung, 10 cases of extra-regional lymph nodes, 3 cases of the adrenal gland, and 1 case of the spleen. Relapses occurred in 30 cases. In peritoneal dissemination cases, the median survival time (MST) of RFS after curative surgery was 556 days in the AC group patients and was 91 days in the N group patients. The RFS was significantly better in the AC group than in the N group (p=0.037). The MST of OS was 1352 days in the AC group and 2081 days in the N group, which was not significantly different (p=0.76). In other metastasis cases, there were no significant differences in RFS and OS.

Conclusions/Discussion: In peritoneal dissemination cases, adjuvant chemotherapy for stage IV colorectal cancer may improve RFS after curative surgery.

STANDARDIZATION OF INDOCYANINE GREEN (ICG) ANGIOGRAPHY FOR COLON PERFUSION DURING LAPAROSCOPIC COLORECTAL SURGERY.

P1633

G. Son
Yangsan, Korea (the Republic of)

Purpose/Background: Background : This study aimed to establish the standardization of indocyanine green (ICG) angiography protocol for quantitative analysis of colon perfusion in laparoscopic colorectal surgery.

Methods/Interventions: Methods : ICG perfusion assessments were applied to colorectal cancer patients (n=114) using two systems with different light source, Zenon lamp (IMAGE1 S™, Karl Storz, Germany) and Laser source (1588 AIM camera system, Stryker, CA). ICG (0.2 mg/kg) was injected into the peripheral vein. Quantitative parameters were analyzed as maximal fluorescence intensity (FI_{MAX}) fluorescence slope (FS), $T_{1/2MAX}$ and perfusion time ratio ($TR=T_{1/2MAX}/T_{MAX}$). As environmental conditions, camera position, distance to colon, light source and image mode were compared with perfusion parameters to identify optimal condition of ICG angiography.

Results/Outcome(s): Results : FI_{MAX} and FS were related with camera position, distance to colon, and light source. $T_{1/2MAX}$ (sec) was shorted with Laser source than Zenon lamp (5.5±2.5 *vs.* 14.3±12.5, p=0.036). TR was affected was constant irrespective of the environmental conditions. On multivariate analysis, FI_{MAX} was independently associated with camera distance, laser source or spectral mode (p=0.012). Conversely, TR was not affected by the environmental conditions.

Conclusions/Discussion: Conclusions : Since fluorescence intensity of ICG angiography is highly influenced by the environmental conditions, standardization protocol of the ICG angiography is required for quantitative analysis.

DOES SURGICAL APPROACH EFFECT OUTCOMES IN TREATMENT OF RECTAL CANCER?

P1634

Y. Yurko, D. Schammel, C. Schammel, T. Bynarowicz, W. McGill, S. Self
Greenville, SC

Purpose/Background: Colon and rectal cancer is the second most common cause of cancer deaths in the US and while the death rate has been dropping for several decades, deaths among people younger than age 55 have steadily increased. Advances in surgical techniques and combined-modality therapy have led to significantly improved local control in rectal cancer. The goal of this study was to compare surgical and oncological outcomes of open versus robotic/laparoscopic approaches.

Methods/Interventions: RB approval, we retrospectively evaluated all patients diagnosed or treated with rectal cancer at a single institution between 3/1/2016 and 7/16/2019. We excluded patients with recurrent rectal cancer, those with stage 4 rectal cancer and those for whom complete clinical records were not available. Overall, 43 patients were included in the study with an overall mean age of 59 years. All patient were presented at GI MDC after the completion of preoperative staging.

Results/Outcome(s): Of those, 28 (65%) had robotic surgery while 15(35%) had open procedures. The mean BMI of those undergoing robotic surgery was significantly higher than those that had open procedures (30.62 versus 25.70; p=0.05). No significant differences in diagnosis or preoperative staging imaging modality were noted between the groups. A full pathological assessment of every specimen was performed with evaluation of nodal involvement, distal and circumferential margins. There were no differences between final nodal status, resection margins or re-operation rates between the groups. While length of stay was longer for those undergoing open procedures (6.14 days) compared to robotic (4.61 days), this difference was not significant (p=0.30). When the population was stratified by rate of recurrence, no significant differences were noted in BMI, preoperative clinical stage or surgical approach. Positive mesorectal lymph nodes (p=0.02) status was associated with recurrence. Only one patient with a recurrence had a positive margin at the index operation. Neo-adjuvant therapy was significantly associated with negative margins (p=0.02).

Conclusions/Discussion: Both open and laparoscopic surgeries have been proven to be safe and laparoscopic resections are associated with several short-term advantages. Locoregional recurrence of laparoscopic colon resections is similar to open surgery.

RECTAL CANCER HEIGHT MEASUREMENT: MRI VS SURGEONS VS GASTROENTEROLOGISTS.

P1635

A. Egunsola, J. Yang, R. Dring, N. La Gamma, M. Greenwald, j. procaccino, A. Zimmern, J. Ricci
Glen Oaks, NY

Purpose/Background: Compared to colon cancer, rectal cancer has a worse prognosis and a more complex treatment algorithm. Accurate localization of the tumor is imperative for appropriate treatment. The use of chemotherapy, radiation and the practice of neoadjuvant vs adjuvant therapy is dependent on the location of the lesion. Also, once a lesion is determined to be a rectal cancer, patients may be referred to specialized centers. Our aim was to see if there was a significant difference between radiographic, surgeon and gastroenterologist measurements. We also looked at different anatomical landmarks utilized between the disciplines.

Methods/Interventions: All patients with rectal cancer with available pelvic MRIs and endoscopy reports by either a gastroenterologist or a surgeon in 2019 at a single institution were included in this study. MRI measurements were recorded as distance (in cm) from the anal verge. Tumor heights measured by the gastroenterologist or surgeon were then compared against the MRI measurement. Using regression analysis, the distance from the anal verge (measured on MRI) was compared to the raw difference between tumor heights measured by the physician and MRI.

Results/Outcome(s): A total of 36 patients with rectal cancer were included. 26 of the patients had documented preoperative colonoscopies by gastroenterologists. 20 patients also had records of the tumor height measured by a surgeon prior to any treatment. 50% of patients with exams by surgeons had rigid sigmoidoscopies performed. Surgeons generally used anal verge or dentate line as their reference point. Gastroenterologist had less uniform reference points. Tumor height measured by the gastroenterologists was different compared to the MRI with a mean absolute difference of 2.82 cm (95% CI: 2.13, 3.51). In contrast, the difference in tumor height measurement by surgeons compared to MRI had a lower mean absolute difference of 1.91 cm (95% CI: 1.25, 2.57). Furthermore, the more proximal the lesion is, the greater the difference in the gastroenterologist's measurements compared to the surgeon's measurements (R2 0.134 vs. 0.001).

Conclusions/Discussion: The presumed location of a rectal cancer affects referrals and the treatment plan. Our study demonstrates that surgeon measurements more closely matched MRI than gastroenterologists. As such, it is important that all rectal cancer patients be referred to a surgeon at the time of diagnosis. Furthermore, we recommend that all surgeon's perform their own sigmoidoscopy and measurement of the lesions prior to any decisions on treatment Most importantly a uniform measurement is needed.

OUTCOMES AFTER EARLY RESECTIONAL SURGERY FOLLOWING TRANS-ANAL EXCISION OF RECTAL CANCER: A SINGLE-CENTER COHORT STUDY.

P1636

W. Perry, F. Grass, V. Sudhindran, S. Kelley, K. Mathis
Rochester, MN

Purpose/Background: There is increasing interest among patients and clinicians alike for utilizing organ-preserving strategies, such as trans-anal excision, for the management of early rectal cancer. Several institutions have explored outcomes following late recurrence and subsequent salvage surgery among those who received trans-anal excision. However, there is limited evidence regarding outcomes among trans-anal excision patients who require subsequent early resectional surgery. Such patients include those with the likes of positive tumor margins, high risk features, or under-staging trans-anal excision pathology. This study thus set about to assess the association between trans-anal excision undertaken in the months prior to rectal resection surgery on post-operative outcomes.

Methods/Interventions: Single-center retrospective cohort study of all patients undergoing curative and resectional surgery for rectal adenocarcinoma between January 1, 2000 and June 30, 2016. Patients with Stage IV tumors and who had surgery with palliative intent were excluded. The primary outcome was tumor recurrence. Secondary outcomes assessed were mortality and in-hospital complications. Kaplan-Meir plots and log-rank tests were used to estimate and compare 5 year survival. Cox proportional hazard models was performed to examine the association between prior trans-anal resection and primary and secondary outcomes. Subgroup analysis by tumor stage was conducted.

Results/Outcome(s): 1422 patients were included in the analyses: 32.8% female, median age 61 (IQR 51 - 69). Average follow-up time was 4.9 years. 28 patients (2%) had a trans-anal excision within 3 months prior to resectional surgery. Of these patients 3 (10%) had recurrence, 1 of which was local. There was a 13% mortality rate with an average time to mortality of 7 years. There was no significant difference in 5-year survival, recurrence, mortality or in-hospital complications among those that had prior trans-anal excision compared to those who had not. There was no significant difference in outcomes by tumor stage.

Conclusions/Discussion: This study suggests there is no significant difference in post-operative outcomes between patients who receive trans-anal excision prior to early resectional surgery compared to those who proceed straight to resectional management. Therefore, trans-anal excision may be a safe upfront treatment option for the management of early rectal cancer. This study is limited by the small number of patients who had prior trans-anal excision, and low frequency of examined outcomes in this population.

OUTCOMES AND REASONS OF NONCOMPLIANCE WITH TREATMENT OF ADJUVANT CHEMOTHERAPY FOR ADVANCED RECTAL CANCER.

P1637

M. Matos, J. Gallagher, E. Cha, R. Mueller, M. Ferrara, A. Machado-Hopkins
Orlando, FL

Purpose/Background: Background: There is a concern that high number of patient do not complete adjuvant chemotherapy which is an important element in the treatment for advanced rectal cancer. **Purpose:** To compare outcomes for recurrence and metastasis between patients who complete adjuvant therapy to those that don't.

Methods/Interventions: A prospective randomized cohort analysis was performed using the rectal cancer patients' medical records of those treated at the Orlando Health UF Cancer Center Database between 2012 and 2014. Based on NCCN guideline a total of 34 patients were recommended to receive adjuvant chemotherapy and 14 patients were noncompliant. Multiple variables were compared including socioeconomic data, distance from the cancer center, age, and sex. We use different sources of data collection: Intergy, Orlando Health, AdventHealth and Health Central Systems.

Results/Outcome(s): 41 percent of the patients with stage II/III rectal cancer did not complete adjuvant chemotherapy. Local recurrence in patients who did not complete postoperative chemotherapy was statistically increased ($p<0.05$). Metastatic recurrence in patients was higher compared to patients who completed adjuvant chemotherapy but not statistically significant ($p=0.079$) in this group of patients. Causes of non compliance was 71% of patient's choice, 14% was surgical complications and 14% was due to chemotherapy complications.

Conclusions/Discussion: The noncompliance of receiving adjuvant therapy appears to be having a significant adverse outcome on patient with advanced rectal cancers. Clearly better strategies need to be developed to optimize NCCN guidelines for these patients.

Table 1. Comparative outcomes of adjuvant therapy

	Completed Group	Not-Completed Group	p-value
Local Recurrence	3	8	p <0.05
Metastatic Recurrence	5	9	p = 0.079
Both local and metastatic	2	6	p = 0.052

CAVERNOUS SINUS SYNDROME CAUSED BY METASTATIC COLONIC ADENOCARCINOMA TO THE SINONASAL TRACT.

P1638

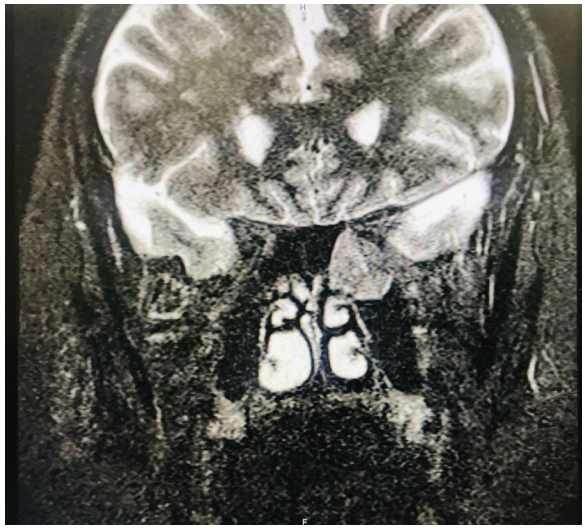
A. Garza, A. Pena
Edinburg, TX

Purpose/Background: Metastatic adenocarcinoma from the colon to the sinonasal tract is extremely unusual with very few cases reported in the English literature. The histological morphology can be indistinguishable from a primary sinosanal intestinal type adenocarcinoma with a colonic variant which could lead to delay in diagnosis and management. We describe the case of a patient who presents with cavernous sinus syndrome secondary to metastatic adenocarcinoma of the colon.

Methods/Interventions: 61 year old female with past medical history of Sjogren's disease and rheumatoid arthritis who was referred to neurosurgery complaining of left sided diplopia. MRI showed a 2.3 x 2.1 x 1.9 cm lobular enhancing mass involving the left ethmoid, sphenoid and maxillary sinus with extension into the anteromedial left middle cranial fossa and left cavernous sinus with partial encasement of the left cavernous internal carotid artery. She was diagnosed with possible meningioma and was taken to the operating room with ENT and Neurosurgery. She underwent a left maxillary antrostomy with sinus content resection, total ethmoidectomy with sphenoidotomy and orbital decompression. Pathology showed Sinonasal adenocarcinoma, intestinal type, colonic pattern with no Lymphovascular or perineural invasion.

Results/Outcome(s): In the post-operative period, the patient experienced generalized weakness and dehydration. She underwent further imaging with a CT of the chest/abdomen/pelvis and was found to have widespread masses scattered throughout both lobes of an enlarged liver, and osteolytic lesions in the spine, pelvis and right 12th rib. The patient underwent a colonoscopy with findings of a large non obstructing mass in the ascending colon which was biopsy proven adenocarcinoma of the colon. A few weeks after diagnosis the patient presented with pneumonia causing septic shock and the patient received palliative care until her death shortly thereafter.

Conclusions/Discussion: Sinonasal malignancies are extremely rare only accounting in 3% of upper respiratory tract malignancies. Among these, sinus primary adenocarcinoma accounts for 10 -20%. Many of these arise from salivary glands, but others may have different histologic patterns similar to those of adenocarcinoma of the colon. These are named intestinal type with an incidence of less than 4% of the sinuses malignancies. Metastatic tumors to the nasal cavity and paranasal sinuses are unusual with the most common being renal carcinoma. Metastatic colon adenocarcinoma to the sinus is exceedingly rare. The mechanism of metastatic spread was postulated by Baston in 1940 via the vertebral venous plexus that carries his name. There are only other 2 cases reported in the English literature with histopathologic confirmation of the diagnosis. In all cases, including our patient, extensive metastatic disease was present at the time of diagnosis with associated dismal prognosis.



HIGH RATES OF SMALL BOWEL CROHN'S DISEASE RECURRENCE AFTER TOTAL PROCTOCOLECTOMY FOR CROHN'S COLITIS.

P1639

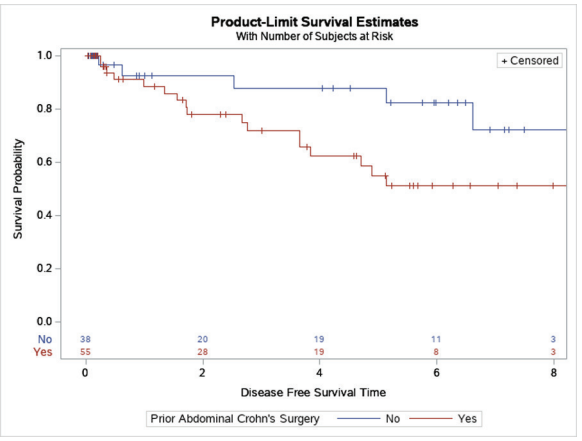
R. Hollis, N. Smith, I. Sapci, B. Click, M. Regueiro, T. Hull, A. Lightner
Cleveland, OH

Purpose/Background: Patients with Crohn's disease (CD) colitis often undergo total proctocolectomy and end ileostomy (TPC+EI). There is limited data regarding postoperative small bowel recurrence rates for patients after TPC+EI. We sought to primarily determine the rate of clinical, endoscopic and surgical CD recurrence following TPC+EI, and secondarily define risk factors for recurrence.

Methods/Interventions: A retrospective review of adult patients with CD (ICD-9/10: 555.9/K50.9) who underwent TPC+EI for Crohn's colitis at three hospitals within our health system between years 2009-2015 was conducted. Patients with a preoperative diagnosis of ulcerative colitis or indeterminate colitis were excluded. Data for clinical, endoscopic, imaging, and surgical recurrence were abstracted from patient charts. Estimates of time to recurrence were determined using the Kaplan-Meier method. Differences in disease free survival were tested using the log-rank test.

Results/Outcome(s): 93 patients with Crohn's colitis undergoing TPC+EI were included; the median age was 42 years [IQR: 29-54] and 55.9% were female. 73.2% of patients had been exposed to biologic therapy at some point prior to surgery, and 33.3% were exposed within 3 months prior to TPC+EI. During a median follow up of 4.5 years (range 0.03-9.4 years), subsequent imaging with CT or MR enterography was performed in 26.9% of patients and ileoscopy in 28.0%; 14% of patients received biologic therapy. Clinical, radiographic, endoscopic and/or surgical recurrence occurred in 23 patients at a median time to recurrence of 2.5 years; estimated 5 year recurrence was 32.1%. Reoperation for small bowel CD was performed in 9 patients at a median time of 3.9 years; estimated 5 year surgical recurrence was 15.3%. The rate of overall recurrence was significantly higher for patients with prior abdominal intestinal surgery for CD (FIGURE; p=0.03); previously described high risk factors for disease recurrence including penetrating phenotype, tobacco use, or prior small bowel disease were not associated with a significant increase in small bowel recurrence following TPC+EI ($p > 0.05$).

Conclusions/Discussion: A third of CD patients who undergo TPC+EI for Crohn's colitis have small bowel Crohn's recurrence. Patients who had prior abdominal intestinal surgery for CD may benefit from more intensive follow-up and postoperative medical prophylactic therapy. Further delineation of risk factors for disease recurrence is important to guide postoperative surveillance and prophylactic medical therapy.



CONCORDANCE BETWEEN PREOPERATIVE CLINICAL DIAGNOSIS AND HISTOPATHOLOGICAL DIAGNOSIS IN INFLAMMATORY BOWEL DISEASE PATIENTS UNDERGOING TOTAL COLECTOMY OR PROCTOCOLECTOMY.

P1640

E. Chacón, F. Bellolio, M. Molina, G. Urrejola, A. Zuñiga, R. Miguieles
Santiago, Chile

Purpose/Background: Concordance Between Preoperative Clinical Diagnosis and Histopathological Diagnosis in Inflammatory Bowel Disease Patients Undergoing Total Colectomy or ProctocolectomyInflammatory bowel diseases (IBD) include Ulcerative Colitis (UC) and Crohn's disease (CD). Usually categorization is difficult and requieres correlation between clinical course, endoscopy, biopsy and imaging. Differentiation between UC and CD could affect the medical and surgical treatments. The aim of this study is to evaluate the concordance between preoperative clinical diagnosis and postoperative biopsy in IBD patients undergoing total colectomy or proctocolectomy.

Methods/Interventions: Retrospective study. Review of a prospective IBD database from our institution. We included all patients with diagnosis of IBD that had a total colectomy or proctocolectomy between January 2008 and May 2019. Demographic data, preoperative diagnosis of IBD and postoperative pathological diagnosis were analyzed using SPSS version 25. We used kappa statistic to calculate the concordance between preoperative and histopathological diagnosis.

Results/Outcome(s): In the study period, 72 patients fulfilled the inclusion criteria, preoperatively categorized as UC in 45 cases, CD in 22 and Indeterminate colitis in 5. Concordance between preoperative clinical diagnosis and postoperative biopsy was 66,67% (Table 1), and the level

of concordance according to kappa is moderate (0,410, IC 95% 0,236-0,585). In the long term follow-up, 15,7% of UC patients change their diagnosis to CD, because of small bowel or perianal disease.

Conclusions/Discussion: 34,2% of patients changed their diagnosis after the histopathological analysis. These results highlight the complexity in the diagnosis of patients with colonic involvement in IBD.

Table 1 . Concordance between preoperative clinical diagnosis and histopathological diagnosis in inflammatory bowel disease

		Postoperative diagnosis			Total
		Ulcerative colitis	Crohn disease	Unclassifiable colitis	
Preoperative diagnosis	Ulcerative colitis	32	7	6	45
		71,10%	15,60%	13,30%	
	Crohn disease	4	14	4	22
		18,20%	63,60%	18,20%	
	Unclassifiable colitis	2	1	2	5
		40,00%	20,00%	40,00%	
	Total	38	22	12	72

Number of observed concordances	48 (66,67%)
kappa value	0,410 ← Moderate concordance
IC 95%	0,236 – 0,585

DECREASE IN THE NEED FOR COLECTOMY FOR MODERATE TO SEVERE CRISIS OF ULCERATIVE COLITIS.

P1641

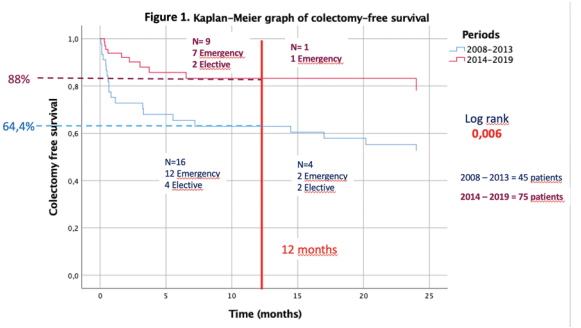
E. Chacón, F. Bellolio, A. Zuñiga, M. Molina, G. Urrejola, R. Miguieles
Santiago, Chile

Purpose/Background: Ulcerative colitis (UC) is characterized by intermittent exacerbations and remissions. Medical treatment include steroids and/or biologic therapy. If the patient does not respond to medical treatment, surgery plays a critical rol. The aim of this study is to describe the patients with moderate to severe acute ulcerative colitis (UC), in-hospital evolution and need for colectomy. Secondary objectives include a comparative analysis between patients with emergency total colectomy and those who respond to medical treatment, and need for emergency or elective colectomy in the follow up.

Methods/Interventions: Retrospective study. Analysis of all the patients admitted to our hospital with diagnosis of moderate or severe crisis of UC between January 2007 and May 2019. Truelove Witts (TW) criteria were used to categorize disease severity. Data were analyzed using SPSS version 25. All results are expressed as median and range, or proportions, since the data were not normally distributed. We analysed continuous variables using independent samples t test, Fisher's exact tests or Mann-Whitney U test depending on the distribution. We estimated 12-month colectomy-free survival with the Kaplan-Meier method and analysed differences in survival with the Mantel-Cox logrank test. The level of statistical significance was set at $p < 0.05$.

Results/Outcome(s): 120 patients had 160 admissions for acute UC moderate to severe, 54,2% was female, median admission per patient was 1 (range 1-3) and median age was 35 years (range 16-89). The median hospital stay was 6 days (1-49). Cytomegalovirus was found in 21 patients and clostridium difficile in 17 patients. Corticosteroids were used in all patients, 6,9% used biologic therapy, with favorable result in 86,3% for the total of crisis. From the 160 admissions, 13,8% required emergency total colectomy. In patients that responded to medical treatment, 8 had elective total colectomy in the follow up (median follow up 13,3 months, range 0-121). No differences were found in age, duration of the disease, T-W score or previous medical treatment, between emergency colectomy group and those who respond to medical treatment. The only difference between these two group was median hospital stay (xx vs xx colectomy and no colectomy respectively). The need for emergency total colectomy was compared between the years 2008-2013 and 2014-2019, showing a decrease from 24,6% to 7,8% (p=0,003, RR 3,16 IC 1,41-7,08). A kaplan-meir analysis was carried out for long term colectomy-free survival between both periods that confirmed these decrease (see graphic, p= 0,006).

Conclusions/Discussion: Medical treatment for moderate to severe acute UC had 86,3% success and a low percentage of patients required an emergency total colectomy. Emergency surgery decreased in the last years.



IMPACT OF BODY MASS INDEX FOR A LARGE AMOUNT OF RETAINED RECTAL MUCOSA AFTER STAPLED ILEAL POUCH - ANAL ANASTOMOSIS FOR ULCERATIVE COLITIS.

P1642

H. Kimura, R. Kunisaki, K. Tatsumi, K. Koganei, A. Sugita, I. Endo
Yokohama, Japan

Purpose/Background: Impact of Body Mass Index for a Large Amount of Retained Rectal Mucosa After Stapled Ileal Pouch - Anal Anastomosis for Ulcerative ColitisImpact of Body Mass Index for a Large Amount of Retained Rectal Mucosa After Stapled Ileal Pouch - Anal Anastomosis for Ulcerative ColitisImpact of Body Mass Index for a Large Amount of Retained Rectal Mucosa After Stapled Ileal Pouch - Anal Anastomosis for Ulcerative ColitisImpact of Body Mass Index for a Large Amount of Retained Rectal Mucosa After Stapled

Ileal Pouch - Anal Anastomosis for Ulcerative ColitisA stapled ileal pouch-anal anastomosis (stapled IPAA) after restorative proctocorectomy is easy to construct and has a good functional outcome in patients with ulcerative colitis (UC). However, a large amount of retained rectal mucosa may lead to a subsequent risk for inflammation and cancer. This study aims to determine the related factors associated with a large amount of retained rectal mucosa after stapled IPAA for UC.

Methods/Interventions: The medical records of 147 patients who had undergone one-stage total proctocolectomy and stapled IPAA for UC in our institution with length measurement from the dentate line to the anastomosis were retrospectively reviewed. The patients were divided into two groups according to the length of the retained rectal mucosa. The high anastomosis group was defined as having a retained mucosal length of more than 30 mm in the anterior or posterior wall, whereas the low anastomosis group was defined as having a retained mucosal length of less than 30mm in both the anterior and anterior wall. Clinical factors were compared between two groups, and the correlation between the extract factor and the length of the retained rectal mucosa was also revealed.

Results/Outcome(s): Fifty-nine women and 88 men, with a median age of 37 years at the time of surgery, were included in the study. The median length of retained mucosa was 20 mm in the anterior wall and 10 mm in the posterior wall. Univariate analysis showed no significant differences in sex, age at surgery, type of colitis, surgical indication or surgical procedure. Body mass index (BMI) (23.1 vs. 19.0; $p<0.001$), operation time (304 vs. 269; $p=0.011$), blood loss (320 vs. 250; $p=0.014$) were significantly higher in the high anastomosis group. Multivariate analysis showed that BMI was the only significant factor associated with high anastomosis (Odds ratio 1.34, $p<0.001$). There was positive correlation between the length of retained rectal mucosa and BMI in both the anterior and posterior wall (anterior wall: R-squared=0.262, $p<0.001$, posterior wall: R-squared=0.262, $p<0.001$).

Conclusions/Discussion: BMI is the most related factor for a large amount of retained rectal mucosa after stapled IPAA. In patients with a high BMI, the risk of a large amount of retained rectal mucosa should be explained, other anastomosis methods should be considered and possible weight loss should be considered.

THE CONTROLLING NUTRITIONAL STATUS SCORE: A PROMISING TOOL FOR NUTRITIONAL SCREENING AND SEVERITY PREDICTOR IN ULCERATIVE COLITIS PATIENTS.

P1643

J. de León Rendón, R. López Pérez, Y. Gutiérrez Grobe, B. Jiménez Bobadilla, N. Gracida Mancilla, J. Villanueva
Mexico, Mexico

Purpose/Background: The consequences of malnutrition in ulcerative colitis (UC) are multiple and include significant reductions in bone mineral density, prolongation of disease activity time, and shortening of the duration of clinical remission. The Controlling Nutritional Status Score (CONUT) is based on the determination of albumin, total cholesterol and absolute lymphocytes to offer high sensitivity and specificity in the detection of malnutrition. The aim of the present study was to determine the utility of the CONUT score as a nutritional screening method and predictor of severity in UC patients.

Methods/Interventions: A prospective study was conducted, which included 60 UC patients. All patients were adults, of both genders with diagnosis of UC confirmed by histology. Clinical records were reviewed to obtain the demographic, clinical and biochemical features of the disease. The severity of the disease was measured using the Truelove and Witts score (TW). The risk of malnutrition was assessed using the CONUT score (low risk, 0–4 points, moderate, 5–8 points, and high, 9–12 points).

Results/Outcome(s): Clinical and demographic features of UC patients included in our study are shown in table 1. When measuring the CONUT score, 93.3% of the patients presented a risk of malnutrition (mild 15 patients, moderate 26 patients and severe 15 patients). The patients with the highest CONUT score showed moderate to severe activity on the TW score, while those with a lower CONUT score had mild activity or inactivity (6.84±2.86 vs 4.1±3.02, $p=0.009$). A higher score of CONUT was associated with C-reactive protein (CRP) values >45 (7.37±2.45 vs. 4.97±3.19, $p=0.002$) and erythrocyte sedimentation rate (ESR) >30 (6.78±2.78 vs. 4.60±3.26, $p=0.009$). A cut point of 6-points CONUT score (AUC:0.75, $p=0.001$) was obtained by means of a ROC curve to discriminate between patients with inactive or mild UC compared with those with moderate to severe activity, with a sensitivity of 64% and specificity of 88%; the positive predictive value (PPV) and negative predictive value (NPV) was 93 and 47% respectively. A CONUT score >6 points confers risk of moderate to severe activity by the TW score (OR:12.25 (2.46–60.91) $p=0.001$). This same cut-off point (>6 points) confers risk to present elevated biochemical markers: ESR>30 (OR: 5.0 (1.51–16.56) $p=0.005$), with a sensitivity of 63% and specificity of 75, PPV 83% and NPV 50%; and CRP>45

(OR: 3.5 (1.2–10.19) p=0.02), with a sensitivity of 67% and specificity of 64%, PPV 60% and NPV 70%.

Conclusions/Discussion: CONUT score could be a promising tool for nutritional assestment and predictor of clinical/biochemical severity in UC patients, as it is related to the severity measured by the TW score and with values of CRP>45 and ESR>30, the latter being independent predictors of colectomy and severity in UC patients.

	Patients included in the study (n=60)
Demographics	
Age (years)	40.63 (19.0-72.0)
Sex (F/M) %	50/50
Smokers (%)	13.3
Age at diagnosis <40 years (%)	61.6
Extension (%):	
Proctitis	61.7
Left Colitis	8.3
Pancolitis	30.0
Clinical course (%)	
Intermittent	45.0
Active-inactive	36.7
Continuous activity	18.3
TWS (%)*	
Inactive	8.3
Mild	18.3
Moderate	60.0
Severe	13.3
*EIMs** (%)*	
Yes	31.8
No	68.2
*Frequency of EIMs** (%)*	
Arthralgia/Arthritis	26.7
PSC***	1.7
Spondylitis	1.7
Gangrenous Pyodeima	1.7
Current treatment (%)	
5-ASA****	55
Steroids	35
Thiopurine	8.3
Biologic	1.7
Surgery (%)	
Yes	23.3
No	76.7
Indication for surgical treatment (%)	
Drug treatment failure	16.7
Massive bleeding	3.3
Perforation	1.7
Dysplasia	1.7

*TWS: Truelove and Witts scale **EIM: extraintestinal manifestations ***PSC: primary sclerosing cholangitis ****5-ASA: Salicilates/olalas.

INTESTINAL CANCER IN PATIETS WITH SHORT DURATION CROHN'S DISEASE.

P1644

M. Shinozaki, R. Takahashi
Minato-ku, Japan

Purpose/Background: Patients with Crohn's disease (CD) have increased risk of developing intestinal cancer (IC). In patients with ulcerative colitis, cancer risk is thought to increase around 10 years after the onset of colitis. However, in patients with CD, significant proportion of those were with shorter CD duration, and little has been known about the clinical management. The aim of this study was to clarify the clinicopathological characteristics of IC associated with Crohn's disease with short duration.

Methods/Interventions: We searched for IC cases associated with CD from a Japanese medical database (Ichushi). We picked up 272 cases, where we selected the two groups: those with short duration (5 years or less; S-group; n=51) and those with long duration (15 years or more; L-group; n=135). The median durations of the two groups were 0 year and 20 years, respectively.

Results/Outcome(s): The age at cancer diagnosis was 51 years (interquartile (40-62)) and 45 (39-56) in S-group and L-group, respectively (p=0.028). Patients in S-group were significantly older at the time of cancer diagnosis (p<0.0001). The age at CD diagnosis was older in S-group than that in L-group (51 (38.5-62) years vs. 22 (9-68) years) with statistically significance (p<0.0001). Relating to disease location of CD according to the Montreal classification, the proportion of L1 and L2 were significantly more in S-group than L-group (31% vs. 18%, and 49% vs. 10%, respectively; p<0.0001). Penetrating type were significantly less in S group than that in L-group (28% vs. 59%; p=0.003) in terms of disease behaviour according to the Montreal classification. In Japan, we found that majority of the colorectal cancer associated with CD is located at anorectum. However, in S-group, the proportion of anorectal cancer was only 26%, whereas that in L-group was 69%, and the difference reached statistical significance (p<0.0001). Well to moderately differentiated adenocarcinoma accounts for 81% in S-group, while the ratio was 44% in L-group, and the difference was significant (p<0.0001). Mucinous carcinoma was predominant in L-group (39%), and the proportion was significantly lower in S-group (12%; p=0.0022). Clinical stage was similar in both groups, and the median was stage 2 (interquartile 1-3; p=0.071). Median survivals were 21 and 26 months, and overall survival was also similar between the two groups (p=0.51).

Conclusions/Discussion: Some features were different between S-group and L-group, while the prognosis was not satisfactory in both groups despite relatively early

clinical cancer stage. Older patients with short CD duration should be included as candidates of surveillance for neoplasia.

30-DAY MORBIDITY FOLLOWING TOTAL PROCTOCOLECTOMY WITH END ILEOSTOMY VS 3-STAGE ILEAL POUCH ANAL ANASTOMOSIS FOR UC IN THE ELDERLY.

P1646

P. Vaidya, B. Dionigi, S. Holubar, M. Regueiro, B. Click, T. Hull, A. Lightner
Cleveland, OH

Purpose/Background: Elderly patients with ulcerative colitis (UC) who are medically refractory or have colorectal neoplasia require operative intervention to remove the colon and rectum. Since advanced age alone is not a contraindication for ileal pouch anal anastomosis (IPAA) in the setting of normal continence, it is unclear which operative intervention for UC is associated with minimal risk.

Methods/Interventions: A retrospective review of an institutional, prospectively maintained database was performed. Inclusion criteria included adults >65 years of age undergoing a 3-staged completion proctectomy with IPAA (second stage of a 3-stage IPAA) or a Total Proctocolectomy with end ileostomy (TPC + EI) for UC between 2005 – 2019. Data collected included patient demographics, preoperative immunosuppressive medications within 12 weeks of surgery, length of hospital stay, 30-day postoperative infectious complications, 30-day readmission, and 30-day reoperation. The primary end point was incidence of 30-day postoperative surgical infectious complications (combination of superficial SSI, hematoma and intra-abdominal sepsis including abscess, anastomotic leak in the IPAA group). Secondary outcomes were 30-day reoperation and readmission.

Results/Outcome(s): 102 patients met inclusion criteria; 58 underwent TPC+EI and 54 underwent 3-stage IPAA. The median age at surgery was 67 years (range 65-78), and 73 years (range 65-85) respectively. The use of corticosteroids was significantly higher in the TPC + EI group (28% versus 11%; p=0.03) and biologics was increased but not significantly higher in the TPC+EI group (19% versus 13%; p=0.45). The incidence of 30-day overall surgical infectious complications was significantly increased in the TPC+EI group as compared to the 3-stage IPAA group (17% vs 2%; p=0.03), as was 30-day readmission (16% vs 4%; p=0.05). Operation type remained a significant predictor of 30-day overall surgical infectious complications on multivariable analysis; corticosteroids did not.

Conclusions/Discussion: The incidence of overall surgical infectious complications was significantly increased in the TPC+EI group as compared to the 3-stage IPAA group, suggesting that elderly patients may benefit from a staged TPC+EI to wean immunosuppression and improve the overall health status prior to proctectomy, as is done in a 3-stage IPAA.

TABLE 1: Comparison of demographics and 30-day post op outcomes between TPC+EI and 3-stage IPAA.

FACTORS	TPC + EI (N=58)	3-STAGE IPAA (N=54)	P VALUE
MEDIAN AGE (RANGE)	67 (65 – 78)	73 (65 – 85)	.31
MALE	31 (53.4%)	35 (64.8%)	.25
LENGTH OF STAY	7 (1 – 34)	6 (1 – 26)	.27
STEROIDS	16 (27.6%)	6 (11.1%)	.03
IMMUNOMODULATORS	0 (0.0%)	1 (1.85%)	.48
BIOLOGICS	11 (18.9%)	7 (12.9%)	.45
• **Infliximab**	3	7	
• **Adalimumab**	4	0	
• **Vedolizumab**	4	0	
OVERALL SURGICAL INFECTIOUS COMPLICATIONS	10 (17.24%)	2 (3.70%)	.03
	4	1	.37
• SUPERFICIAL SSI	3	0	.24
• HEMATOMA	3	1	.62
• INTRA-ABDOMINAL SEPSIS			
INTRA-ABDOMINAL SEPSIS	3 (5.17%)	1 (1.85%)	.62
• ABSCESS	3	0	.24
• PELVIC ABSCESS	0	1	.48
• ANASTOMOTIC LEAK	NA	0	NA
READMISSION	9 (15.51%)	2 (3.7%)	.05
• UTI	3	0	.24
• Dehydration	2	0	.50
• Abscess	1	0	1
• VTE (SMV Thrombus)	1	0	1
• Urinary Retention	1	0	1
• Ileus/SBO	1	1	1
• Pouchitis	0	1	.48
REOPERATION	1 (1.72%)	0 (0.0%)	1

THE EFFICACY OF ANTI-TNFαANTIBODY THERAPY IN CROHN'S DISEASE – THE VIEWPOINT OF IMPROVEMENT OF LESIONS.

P1647

A. Sugita, K. Koganei, K. Tatsumi, R. Futatsuki, H. Kuroki, E. Nakao, K. Arai, T. Fukushima
Yokohama, Japan

Purpose/Background: Anti-TNFαantibody therapy since 1998 has changed clinical course of Crohn's disease(CD) and improved patients' lesions with symptom relief. However, this therapy sometimes underwent without precise evaluation of CD lesions in the real world. This study was conducted to evaluate the efficacy of anti-TNFαantibody therapy for the several kinds of CD lesions by necessity of operation after treatment retrospectively and to analyze the indication of this therapy in terms of the improvement of CD lesions.

Methods/Interventions: One hundred and ten CD patients with anti-TNFαantibody therapy for more than 6 months in our institute were included. Median period of therapy was 41 months (7-193). The effect of this therapy were evaluated the necessity of the operation in each type of CD lesions after treatment and side effects, cost were also examined.

Results/Outcome(s): 1)CD lesions at the beginning of anti-TNFαantibody therapy were active inflammatory lesions without stricture or fistula in 47 patients, enterocutaneous fistula in 27, internal fistula in 2, massive intestinal bleeding in 6, complex anal fistulae in 8, postoperative recurrence of anal fistulae in 3, prevention for

postoperative recurrence of intestinal resection in 20 (multiple lesions in some cases). 2) The operation was performed in 47% of the patients after anti-TNFαantibody therapy. In terms of the necessity of the operation in each type of CD lesion, the efficacy ratio of anti-TNFαantibody therapy was 44% in active inflammatory lesions without stricture or fistula, 29% in enterocutaneous fistula in, 50% in internal fistula, 67% in massive intestinal bleeding, 25% in complex anal fistulae, 50% in postoperative recurrence of anal fistulae, 58% in prevention for postoperative recurrence of intestinal resection. 3) Serious side effects were infusion reaction in 9, pulmonary tuberculosis in 2, intestinal obstruction in 2. 4)Cost of anti-TNFαantibody therapy was $9221-14242/year for one person(50kg).

Conclusions/Discussion: Anti- TNFαantibody therapy was most effective in active inflammatory lesions without stricture or fistula and not effective in intestinal fistula and anal fistula in this study. The effect should be evaluated by the improvement of CD lesions according to image study. Side effects and cost should be considered for the selection of the treatment.

MINIMAL INVASIVE EMERGENCY SURGERY FOR ULCERATIVE COLITIS.

P1632

L. Salgado Cruz, J. Ortiz De Elguea, A. Chapa Lobo, H. Rangel, M. Guraieb Trueba, L. Romero Juarez
San Pedro Garza García, Mexico

Purpose/Background: Ulcerative colitis (UC) is a heterogeneous disease with many pharmaceutical options as medical treatment. 15-30% of patients with UC will not respond to medical therapy and will require a colectomy as definitive treatment. Emergent colectomy for UC has a mortality 11-16%.

Methods/Interventions: We did a retrospective analysis from 2015-2018 of our cases in which an emergent colectomy was done for UC.

Results/Outcome(s): 7 patients with the diagnosis of UC needed emergent surgery of which 71.4% (5) were men, average age was 38.1 years. 42.8% (3) had a moderate Truelove and Witts index and 57.1% (4) had a severe index. 42.8% (3) of patients had toxic megacolon and 14.28% (1) of patients presented with perforation and septic shock. 71.4% (5) of patients had a total laparoscopic colectomy, 28.5% (2) had a hand assisted total colectomy. Average operative time was of 215 min and the average bleeding was 324 cc. One patient who had a hand assisted total colectomy developed C. difficile infection and an aponeurotic hematoma which resolved with a second intervention. No cytomegalovirus or tuberculosis was reported.

Conclusions/Discussion: Literatures has confirmed the safety and viability of emergent total colectomy in UC. In our experience minimally invasive surgery is a good choice for patients with UC adding the benefits of a minimally invasive approach.

SECURING SAFELY SURGICAL FIELD FOR MOBILIZATION OF MASSIVE ADVANCED RIGHT-SIDED COLON CANCER USING A DUODENUM-FIRST MULTIDIRECTIONAL APPROACH IN LAPAROSCOPIC SURGERY.

P1648

K. Nagayoshi, S. Nagai, Y. Mizuuchi, H. Fujita, M. Nakamura
Fukuoka, Japan

Purpose/Background: To establish a safer and reproducible approach for right colectomy than conventional approach, we showed technical tips and assessed safety and feasibility of a duodenum-first multidirectional approach (DMA). DMA consists of three parts which combined with advantages from previous approaches including retroperitoneal approach, cranial approach and medial approach. At first, the procedure of mesenteric dissection is started from horizontal part of the duodenum. Secondary, taking down of hepatic flexure following fenestration to the dorsal dissected layer and division of colonic veins running into the gastrocolic trunk are performed from cranial side. Finally, central vessel ligation and lymph nodes dissection are performed from medial side.

Methods/Interventions: One hundred fourteen patients underwent laparoscopy-assisted right colectomy or right hemi-colectomy at Kyushu University Hospital were enrolled. Forty-eight patients underwent colectomy using multidirectional approach, including 14 patients using DMA and 34 patients using conventional multidirectional approach(CMA), and 66 patients underwent using conventional medial approach.

Results/Outcome(s): Surgical duration were significantly decreased in patients underwent DMA compared with those who underwent CMA (202 min v.s. 271 min, $P<0.001$). Limited to time required for mobilization, significantly shorter time was taken in patients underwent DMA compared with those underwent CMA (142 min v.s. 181 min, $P<0.001$). Meanwhile hemorrhage and postoperative complication did not differ between the two groups. In 75 patients who had advanced T3 or T4 tumor, DMA, CMA and conventional medial approach were respectively performed in 11, 21 and 43 patients. Both of operation time and time required for mobilization were significantly shorter in patients using DMA compared with patients using the other approaches (210 min, 271min, 295 min, $P<0.01$, 149min, 183min, 174min, $P=0.03$).

Conclusions/Discussion: The advantages of DMA are wide surgical plane that can easily access to the retroperitoneal space preserving the retroperitoneal tissues

and organs and higher-clearance of central lymph nodes dissection along the superior mesenteric vessels. DMA will provide better surgical field even in patients with bulky advanced tumor, resulted in shorter surgical duration compared with conventional approach. Standardization of this approach may achieve more safely procedure and a potentially shortened learning curve.

IMPACT OF ADVANCED SURGICAL ENERGY DEVICE ON OPERATIVE AND ONCOLOGIC OUTCOMES OF MINIMALLY INVASIVE COLORECTAL CANCER SURGERY.

P1650

S. Bae, W. Song, W. Jeong, S. Baek
Daegu, Korea (the Republic of)

Purpose/Background: The safety, efficiency and versatility of novel surgical energy device in colorectal cancer surgery were proved by many recent studies. The aim of this study is to analyze the impact of surgical energy device on not only operative, but also oncologic outcomes of minimally invasive colorectal cancer surgery.

Methods/Interventions: This study included of 217 patients who underwent laparoscopic and robotic colorectal resections with advanced energy devices (AED) and 80 patients who underwent operations with conventional monopolar energy device (MED) between August 2015 to December 2017. The propensity scoring matching for location of the lesion, preoperative carcinoembryonic antigen, and operative technique produced 66 matched pairs. Surgical energy devices included ultrasonic shear and advanced bipolar and ultrasonic device).

Results/Outcome(s): The operative time was significantly shorter in AED group than in the MED group (202.0±80.8 vs. 235.8±103.5, p=0.039) and blood loss were significantly less in energy device group (48.67±64.27 vs. 85.49±81.27, p=0.005). There were no apparent differences in tolerance of diet, length of hospital stay, rate of intraoperative and postoperative complications, reoperation, and the mean number of harvested lymph node. 3-years overall survival rate (85.1% vs. 96.4%, p=0.097) and 3-years disease free survival rate (79.2% vs. 87.5%, p=0.223) were lower in monopolar group, but this difference was not statistically significant. Recurrence pattern between two group were not significantly different.

Conclusions/Discussion: The use of AED may yield better intra-operative outcomes than conventional MED in minimally invasive colorectal cancer surgery. Mid-term oncologic outcomes were comparable between two groups.

ROBOTIC COMPLETE MESOCOLIC EXCISION - AUSTRALIAN EXPERIENCE.

P1651

T. Suhardja[1], P. Smart[2], A. Heriot[2], S. Warrier[2]
[1]*Dandenong, VIC, Australia;* [2]*Melbourne, VIC, Australia*

Purpose/Background: Hohenberger et al. (2009) introduced the concept of Complete Mesocolic Excision (CME) as the curative treatment for colon cancer. Proponents to CME, and central vessel ligation (D3) suggest that the technique improves lymph node harvest and provide a more accurate nodal staging. Potential benefits of performing extended lymphadenectomy (D3) are complete removal of the tumour bearing lymph nodes and removal of potential 'skip' lymph node metastasis. The uptake in the western countries have been limited. We present the early experience of CME in Australia.

Methods/Interventions: We present a 76 year old lady with a bulky ascending colon cancer. Her staging scans did not show any distant metastatic disease. She underwent a robotic CME after informed consent. We employed the use of preoperative mechanical bowel prep. Routine preoperative intravenous antibiotics and DVT prophylaxis was also used. Patient was placed in a supine position. Four 8mm robotic ports were placed in a standard right hemicolectomy configuration with the assistant/ Airseal port placed in the LIF. Superior mesenteric vein was first identified and close vascular dissection was performed. This was followed by high ligation of the ileocolic pedicle and complete medial to lateral mobilisation of the ascending colon. Hepatic flexure mobilisation was then completed from medially with dissection of the gastrocolic ligament and entering the lesser sac. Proximal and distal margin resections were performed with the robotic stapler. We routinely perform an intracorporeal isoperistaltic side to side, functional end to end anastomosis. Patient underwent ERAS postoperatively and went home day 4.

Results/Outcome(s): Histopathology showed a 4cm sized T3 Adenocarcinoma with clear margins, with 2 out of 47 involved lymph nodes. The result was presented at our multidisciplinary meeting. Patient had a discussion with the oncologist about adjuvant therapy, but decided against further systemic treatment. At one year surveillance colonoscopy and staging scans, no signs of local and distant recurrence can be seen.

Conclusions/Discussion: We showed the feasibility of performing a robotic CME in an obese western patient, resulting in a good lymph node harvest and postoperative outcome. This video highlights the ease of the use of the Da Vinci Xi robotic platform with its 3D imaging in order to perform close vascular dissection for CME.

DOES MINIMALLY INVASIVE SURGERY FARE EQUALLY WELL AS OPEN SURGICAL APPROACH FOR EXTENDED TME (TOTAL MESORECTAL EXCISION) PROCEDURE? A PROPENSITY MATCHED ANALYSIS.

P1652

P. Shetty, A. Desouza, A. Saklani
Mumbai, India

Purpose/Background: Locally advanced rectal adenocarcinomas account for 10-20%of all cases. Despite neoadjuvant therapy, substantial number of patients would still need to undergo extensive adjacent organ resections in order to obtain negative circumferential resection margins (CRM). This paper discusses the feasibility of performing such extensive resections by minimally invasive methods.

Methods/Interventions: This is a propensity matched analysis of the prospectively maintained database of operated rectal cancer patients undergoing e-TME between January 2013 and June 2019. eTME included resection of seminal vesicles, prostatic shave, partial cystectomy, post vaginal wall excision and vascular approaches. Patients who underwent beyond TME i.e. total pelvic exenteration or posterior exenterations were excluded from the study. The immediate post-operative outcomes, patterns of recurrence and survival analysis data were computed.

Results/Outcome(s): During the period of January 2013 to June 2019, 2400 primary rectal adenocarcinoma patients were operated with curative intent. Extended TME was performed in 160 patients (60 minimally invasive and 100 open cases). The propensity score matched analysis was done for age, stage and gender in a 1:1 ratio for the minimally invasive group vs. open group. 120 matched pairs were thus analyzed. Prostatic shave and posterior vaginal wall excisions were the most common adjacent organ resected en-masse (23% each) in the minimally invasive group while seminal vesicle excisions were more common in the open group (17%). Blood loss was significantly lesser in the minimal invasive group (470 +/- 290 mL vs. 1030 +/- 780 mL respectively). Immediate post-operative outcomes were similar in both the groups (Clavein Dindo Grade III/IV - 13.3% vs 8.3%; p value=0.279). There were no post-operative deaths in both the arms. The negative CRM rates were similar in both the groups (4% vs 7.7 %; p value=0.515). Median follow up was 14 months. The local and distant recurrence rates were also similar in the two groups (11.7% vs 15%; p value = 0.395 and 8.3% vs 15%; p vale = 0.197 respectively). The estimated 5-yr distance free survival (DFS) were 45 months (95% CI: 38-51) and 49 months (95% CI: 39-60) for minimally invasive and open groups respectively (p = 0.277). On multivariate variate analysis, age less than 40 years (HR - 4.5 CI: 1.8 -11.1; p value = 0.000) and pN+ (HR - 7.7 CI: 1.4 -43.3; p value = 0.012) affected DFS significantly.

Conclusions/Discussion: Extended TME procedures can equally be performed safely with minimally invasive techniques as compared to the open techniques in high volume tertiary center.

ROLE FOR ADJUVANT CHEMOTHERAPY FOR EARLY STAGE COLON CANCER WITH HIGH-RISK FEATURES AFTER SURGICAL RESECTION.

P1653

E. Wood, R. Kalu, A. Tang, C. Reickert, S. Nalamati, M. Asai
Detroit, MI

Purpose/Background: Adjuvant chemotherapy is the standard of care in the treatment of stage IIB and III colon cancer. It has also been demonstrated to offer survival benefit in the treatment of stage IIA disease with high-risk features such as poor differentiation, lymphovascular or perineural invasion, or inadequate lymph node harvest (<12). Our aim is to evaluate current treatment patterns for stage I and IIA colon cancer and to determine if there is a role for adjuvant chemotherapy for stage I disease with multiple high-risk features.

Methods/Interventions: The National Cancer Database from 2010-2016 was queried for all patients with pT1-3 N0 M0 colon adenocarcinoma who underwent formal surgical resection with negative margins. The primary outcome was overall survival based on tumor stage, adequacy of lymph node harvest, presence of high-risk features (defined as mucinous or signet cell carcinoma on histology, poorly differentiated or undifferentiated tumor grade, and lymphovascular invasion), and use of adjuvant chemotherapy. Survival analysis was conducted using Kaplan-Meier curves. Univariate and multivariable analyses were performed to determine the effect of systemic therapy on overall mortality.

Results/Outcome(s): A total of 133946 patients were identified. Patients were divided by T stage: T1 (n=28571), T2 (n=33280), T3 (n=72095). Inadequate lymph node sampling occurred in 18.6% of T1 tumors, 11.5% of T2 tumors, and 7.9% of T3 tumors. High risk features were seen in 22.6% of T1 tumors, 29.6% of T2 tumors, and 47.4% of T3 tumors. Overall, adjuvant chemotherapy was more likely to be used with higher T stage, inadequate lymph node sampling, and the presence of high-risk features. The difference in survival between those with adequate and those with inadequate lymph node sampling increased as T staging increased (Figure 1). The use of adjuvant chemotherapy in T3 tumors increased survival regardless of the presence of high-risk features in the tumor or the adequacy of lymph node harvest. However, this survival benefit did not translate to stage I tumors. The use of systemic therapy did not increase survival and may have harmed those individuals (Figure 2). On multivariate

analysis, adjuvant chemotherapy was associated with a decreased risk of mortality (HR 0.87 (0.82-0.93, p<0.001) for T3 tumors only.

Conclusions/Discussion: Patients with stage IIA (T3N0) colon cancer may benefit from adjuvant chemotherapy regardless of the adequacy of lymph node harvest or high-risk tumor features however the greatest reduction in mortality is seen in those patients with inadequate lymph node harvest. On the other hand, adjuvant chemotherapy should be avoided in patients with stage I colon cancer regardless of the presence of high-risk features. Surgery alone may still offer the best long-term survival for stage I disease.

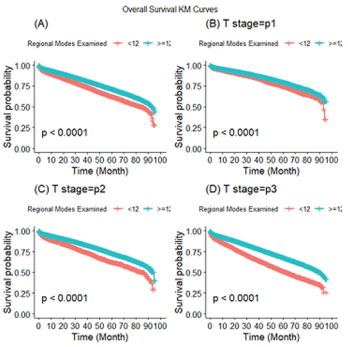


Figure 1. Overall Survival of patients with adequate and inadequate lymph node harvest by tumor stage

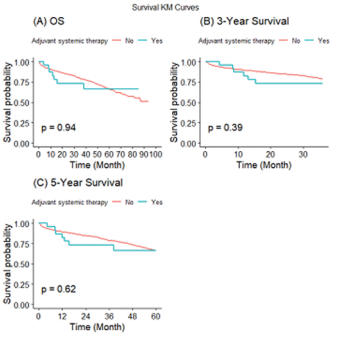


Figure 2. Survival of patients with T1 and T2 tumors who had inadequate lymph node sampling at the time of surgery and high-risk tumor features who were treated with adjuvant chemotherapy vs no adjuvant therapy.

PATHOLOGICAL EXAMINATION OF 5 MM RESECTION MARGIN OF ANORECTAL MALIGNANT MELANOMA: A PILOT STUDY OF 17 CASES.

P1654

N. Chen, A. Wu
Beijing, China

Purpose/Background: This study was designed to investigate the 5 mm resection margin of the surgical specimen from patients with anorectal malignant melanoma (ARMM) undergoing either wide local excision (WLE) or abdominal perineal resection (APR) from a single tertiary institute.

Methods/Interventions: The clinical and pathological data of ARMM patients who underwent surgical treatment from Aug. 2019 to Nov. 2019 were collected prospectively. 5mm resection (proximal, distal, and both lateral) margins were marked in the fresh surgical specimen. Pathological dissection of the tumor and 5mm resection margins were examined for tumor invasion microscopically.

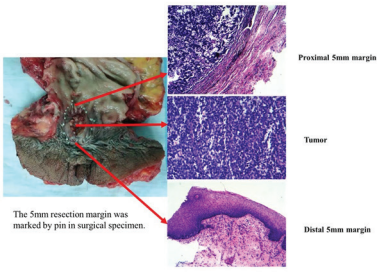
Results/Outcome(s): A total of 17 patients were enrolled in the study with the median age of 59 years old (from 43-74). A total of 17 patients were enrolled in the study with the median age of 59 years old (from 43-74). 7 (41%) were male, and 10 (59%) were female. One patient presented synchronous two sites of tumors, while the rest 16 cases with only tumor. Pre-operative staging revealed that 4 patients were diagnosed with metastatic diseases and 13 with local lesions. 9 lesions were over the size of 20 mm in diameter and 8 were no larger than 20mm. 2 of 17 cases with low invasion depth (%2mm). 15 patients underwent APR, of which 3 with lymph node metastasis, and 12 with negative nodes; 2 patients had LE with no evidence of positive lymph nodes. Patients were classified by *Falch* staging with (8/17) stage I, (4/17) stage II, (2/17) stage III and (3/17) stage IV. All (17/17) cases with 5mm resection margins were negative, even in cases with locally advanced disease. The follow-up duration was 1-15 months, with the median of 7 months.

Conclusions/Discussion: Anorectal malignant melanoma is a rear disease with poor prognosis. The optimal surgical strategy for patients with ARMM is still controversial, with the choice of either WLE or APR. Accumulating evidence demonstrated no survival benefit for APR with the curative intent, since most patients died from distant metastasis rather than local failure. The pathological examination of 5mm resection margins were all negative in our cohort, providing evidence for less invasive surgical management in selected patients.

Table 1. Clinical characteristics of 17 ARMM cases

Factors	No. of cases
Age	43-74 (59) yrs.
Gender	
Male	7
Female	10
Distance from the anal verge	
≤2cm	14
>2cm	3
Number of lesions	
1	16
>1	1
Synchronous metastasis	
Yes	4
No	13
Diameter of the lesion	
≤20mm	8
>20mm	9
Depth of invasion	
≤2mm	2
>2mm	15
Mitotic count	2-42 (8) /HHPF
Ulceration	
Yes	12
No	5
Lymph node metastasis	
Yes	5
No	12
Surgical treatment	
WLE	2
APR	15
Surgical duration	40-227 (130) min
Blood loss	5-200 (100) ml

Figure 1. Marked 5 mm resection margins



A NEW PERSONALIZED TOOL FOR PREDICTING SUCCESSFUL ANTERIOR RESECTION OF LOWER RECTAL CANCER (LAR) WITH TRANS-ANAL SPECIMEN EXTRACTION (NOSES).

P1655

Z. Zhen-Yu, Z. Zhu, B. Lu, C. Fu
Shanghai, China

Purpose/Background: Low anterior resection of rectal cancer (LAR) with trans-anal specimen extraction is a newly advocated surgical technique due to further elimination of abdominal wall incision and minimization of intra and postoperative complications with faster recovery and comparable oncological outcomes. However, combination of LAR with natural orifice specimen extraction surgery (NOSES) needs personalized decision making, for which the tools remain lacking. The study aims to identify independent predictors for NOSES and develop a validated predictive nomogram to quantify the possibility of successful NOSES before surgery.

Methods/Interventions: Retrospective univariate and multivariate analyses of our prospectively collected database for patients receiving laparoscopic LAR were performed. A total of 110 patients with low rectal cancer (≤7cm from anal verge) were surveyed between March and November of 2017 at the department of colorectal surgery, Shanghai East Hospital, yielding a final set of 89 eligible patients (NOSES = 41, Mini-incision = 48) by exclusion criteria. Soft tissue and pelvic parameters of patients were measured by preoperative MRI scans.

Results/Outcome(s): The results showed that successful NOSES were significantly associated female gender, decreased body mass index (BMI), tumor location (distance from the anal verge), mesorectum length (MRL) at the maximal cross sectional tumor diameter (MTD), maximal rectum diameter (MRD) where the tumor has MTD, longitudinal tumor diameter (LTD), maximal tumor diameter (TD), lymph node count (LNC), pT stage and increased bispinous diameter (BD) as well as pelvic transverse outlet (all P values < 0.05), in addition to a tendency with augmented conjugata of pelvic inlet (P = 0.077). No obvious differences between the two patient groups were observed in preoperative CEA, CA19-9, MTD, length of specimen (LOS), macroscopy, differentiation, venous invasion, neural invasion, positive LNC (PLNC), pN/M/TNM stages (all P values > 0.1) (Figure 1A). Multivariate stepwise logistic regression incorporating significant preoperative predictors in univariate analysis yielded a final independent covariate formula including BMI (P=0.006), tumor location (P=0.039), BD (P=0.004) and LTD (P=0.003) (Figure 1A and Figure 1B). The nomogram based on the formula (Figure 1C) achieved considerable discrimination of 0.847 and 0.821 before and after correction for overfitting. Bootstrap calibration demonstrated a good agreement between predicted and observed probability of successful NOSES (Figure 1D).

Conclusions/Discussion: In conclusion, the results indicated that successful LAR with trans-anal specimen extraction might be more likely accomplished in patients with female gender, lower BMI, soft tissue parameters and higher pelvic measurements. The nomogram might be useful in facilitating selection of proper patients for LAR with trans-anal specimen extraction.

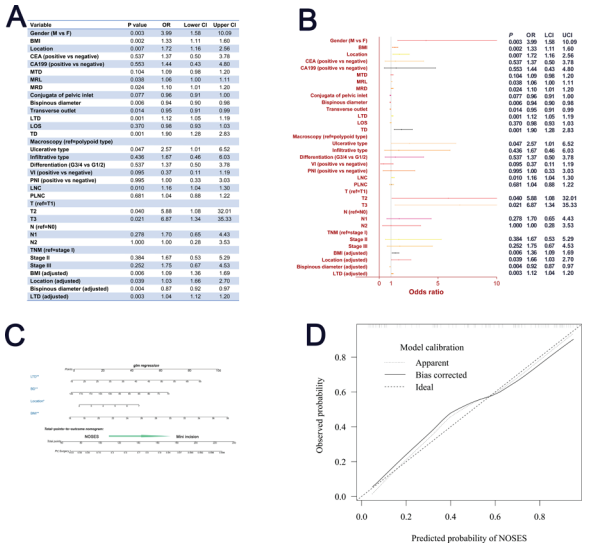


Figure 1. A, Results of univariate and multivariate logistic regression analyses; B, forest plot of logistic regression analysis; C, nomogram; D, calibration plot.

IS ROBOTIC SURGERY ADEQUATE IN OBESE MALES WITH LOW RECTAL CANCER? ANALYSIS OF A SUBGROUP FROM THE RESURRECT REGISTRY.

P1656

R. Bendl[1], H. Lee[2], M. Gachabayov[2], R. Bergamaschi[2]
[1]*Norwalk, CT;* [2]*Valhalla, NY*

Purpose/Background: Male gender, obesity, and low rectal cancer (MOL) are well-recognized risk factors for suboptimal histopathology metrics and constitute the rationale behind the surge of trans-anal total mesorectal excision (ta-TME), albeit recently challenged by the Norwegian moratorium. The aim of this study was to evaluate the histopathology metrics of robotic resection in this subgroup of patients with the combination of three risk factors.

Methods/Interventions: MOL patients were identified in a subgroup analysis of the REgistry of robotic SURgery for RECTal cancer (RESURRECT). Obesity was BMI>30 kg/m2. Low rectal cancer was within 6 cm from anal verge. Circumferential resection margin (CRM) was involved if ≤1mm. TME quality was classified as complete, nearly-complete, or incomplete.

Results/Outcome(s): Twenty-five of 947 patients enrolled in the RESURRECT registry were identified as MOL with mean BMI of 34.6±5.9 kg/m2 (range 30-47) and mean distance from the anal verge of 3.4±1.6 cm (range 1-6). Four patients underwent low anterior resection with stapled anastomosis and 21 patients underwent inter-sphincteric resection with transanal specimen extraction and coloanal hand-sewn anastomosis. Mean operating time was 356±87 minutes. Although CRM was negatively correlated with BMI (r =-0.53; p =0.021), the mean CRM was 5.1±4.9 mm with a 4% involvement rate (one patient with CRM=1mm). The rate of complete TME quality was 76% (19/25). Mean distal margin was 2.4±2.1 cm. There was no local recurrence at a mean follow-up of 29 months.

Conclusions/Discussion: Robotic surgery provided adequate histopathology metrics in obese males with low rectal cancer with no local recurrence at 29 months.

EXTENDED RESECTION AND PLASTIC REPAIR OF COLORECTAL CANCER.

P1657

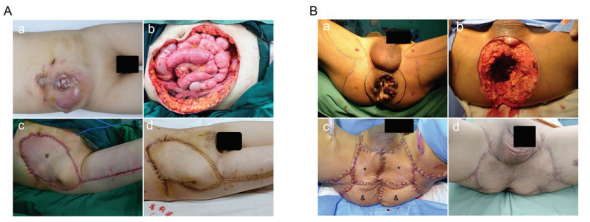
Z. Gao, J. Gu, F. Lei
Beijing, China

Purpose/Background: Colorectal cancer with the abdominal wall or perineum invasion is rarely observed in the clinic. Resection of these malignancies can lead to large abdominal wall or perineal defects that are often difficult for the surgeons to repair.

Methods/Interventions: We performed a retrospective study of 20 patients who underwent radical resection and plastic surgical reconstruction between March 2013 and Jan 2019 at Peking University Cancer Hospital and Peking University Shougang Hospital.

Results/Outcome(s): Among the 20 cases, 15 cases were colorectal cancer with abdominal wall invasion, 5 cases with the invasion of perineum from rectal cancer. Mean patient age was 52.5 years and 15.0% (3/20) of patients were female. Local R0 resection rates was 80.0% (16/20). After tumor resection, the diameter of the largest abdominal wall defect was about 15 × 14 cm. The diameter of the largest perineum defect was about 10 × 9 cm. In 50.0 %(10/20)of the reconstructions, a biological mesh was applied. 10 patients had no complications, while 7 patients had minor complications (Clavien-Dindo grade I-II). Reoperation (Clavien-Dindo grade IIIb) was performed in 3 patients (2 cases of second flap reconstruction, 1 case of ureteric reimplantation). The means of post-operative hospital stay was 28.9 days. The median time until wound healing was 18 days. 30-day mortality was nil.

Conclusions/Discussion: Local R0 resection and abdominal wall or pelvic floor reconstruction are safe and feasible. The difficulty of the abdominal wall or pelvic floor repair is not a concern with this type of reconstruction surgery.



CLOSURE OF RETROPERITONEAL SPACE IN LAPAROSCOPIC ANTERIOR RESECTION WITH FLEXDEX.

P1658

M. Khan, R. Cahill
Dublin 7, Ireland

Purpose/Background: Internal hernia casusing morbidity early after left sided colorectal resection are an uncommon but potential serious problem resulting in reoperation and sometimes death. More common after laparoscopic resections, compromise of the small bowel in this way can be difficult to realise clinically and may only be easily spotted whe the patient is frankly unwell.

Methods/Interventions: FlexDex is a surgical platform designed to assist surgeons in precise intracorporeal tasks. The system is attached to the surgeon's wrist and forearm and through a series of cables working via 3D gimbal converts upper limb movements to the insturment' end effector to allow "robotic" range of movement intraperitoneally. We looked to see if this was indeed the case in an non - slected sequence of 10 patients undergoing high or low anterior resection for malignancy. Methods: Patients underwent the added step of retroperitoneal closure over a three month basis in a consecutive manner following intracoporeal circular colorectal asnastomosis. No additional ports were required. The 12mm right iliac fossa used for colorecatal stapling was also used for the FlexDex system (8mm shaft diameter). Additional use was made of the 5mm right lumbar port with or without an addition tissue traction via an epigastric port. A 30 degree laparoscope was used and suturing commenced either caudad or cephalad until the midpoint was reached with a second suture the running from the oppoite end to meet the middle at which point they were tied.

Results/Outcome(s): Secure closure was possible in every case regardless of BMI. Added time was on average 12 minutes. All suture management was performed with the FlexDex. In one case a mesocolic vein was caught in the sutring but this was ably delat with by additional placement of a transfixing suture again with FlexDex. Over the series, it became clear cephalad commencement was preferable and vicryl suture was easier to place than maxon. Post operative length of stay range was 4 to 7 days with no early intrahospital complications. Interestingly, no ileus or other deviation from care in their recovery.

Conclusions/Discussion: Internal hernia can be troublesome although both its infrequency and the nuisance related to closure at the end of what can be a long case mitigates against routine closure. This is compounded by lack of a robust method to secure close other than suturing and the fact that not all surgeons are facile with intracorporeal suturing given that it uncommonly forms part of the usual laparoscopic colorectal skill set. "Straight stick" conventional laparoscopic suturing can be cumbersome, especially towards the end of an operation. With the right amount of practice, this novel device has allowed for quick adaptation and is a exciting new addition in the armament of laparoscopic instumenats available at out unit.

PREOPERATIVE NOMOGRAM FOR PREDICTING THE PROBABILITY OF TRANSRECTAL SPECIMEN EXTRACTION AFTER LAPAROSCOPIC RECTAL RESECTIONS FOR RECTAL CANCER.

P1659

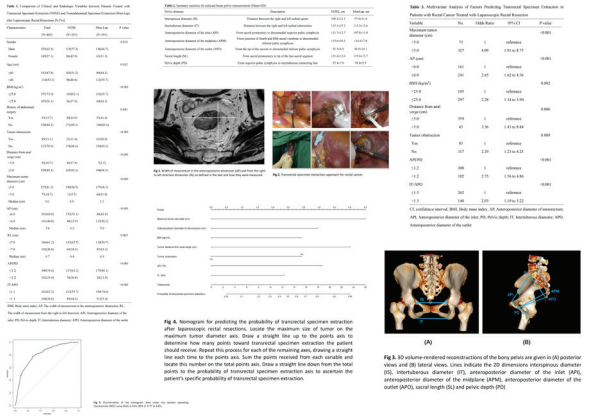
B. Huang, Z. Zhou, T. Du, Z. Zhu, Z. Leng, Z. Ren, C. Fu
Shanghai, China

Purpose/Background: Natural orifice specimen extraction (NOSE) has been developed to reduce wound-related morbidity and postoperative pain in laparoscopic rectal cancer surgery. In spite of the encouraging early outcomes, there were no evidence on which patients were appropriate for transrectal specimen extractions. The goal of this study was to develop a preoperative nomogram for predicting the probability of transrectal specimen extraction after laparoscopic rectal resections.

Methods/Interventions: The prediction nomogram model was developed in a cohort that consisted of 402 patients, including 201 patients treated with NOSE and 201 patients treated with transabdominal specimen extraction (Mini-Lap), who underwent laparoscopic surgery for rectal cancer, and data was gathered from January 2016 to June 2019. Patients with massive tumors (>7cm), high BMI (>30kg/m2) were excluded. The clinical data collected included age, gender, BMI, distance of tumor from the anal verge, tumor obstruction, history of abdominal surgery, maximum tumor diameter and width of mesorectum measured by pelvic MRI. In addition, parameters were measured in 3D volume-rendered reconstructions of the bony pelvis based on CT scanning. Logistic regression was used for multivariable analysis and was represented by a nomogram. The performance of the nomogram model was evaluated with respect to discrimination using bootstrap resampling.

Results/Outcome(s): Patients treated with NOSE were more likely to be female (P=0.018), free from tumor obstruction (P<0.001), and have a lower BMI (P<0.001), a smaller tumor size (P<0.001), a shorter distance of tumor from the anal verge (P<0.001), a thinner mesorectum in the anteroposterior dimension (P<0.001), a shorter and wider bony pelvis (P<0.001) and a more flattened pelvic outlet (P<0.001) than patients treated with Mini-Lap. Multivariable analysis suggested that lower BMI (P=0.002), free from tumor obstruction (P=0.009), shorter distance of tumor from the anal verge (P=0.006), smaller tumor size (P<0.001), thinner mesorectum in the anteroposterior dimension (P<0.001), shorter and wider bony pelvis (P<0.001) and flattened pelvic outlet (P<0.001) were significantly associated with increased probability of NOSE. The nomogram showed an area under the receiver operating characteristic curve (AUC) of 0.81.

Conclusions/Discussion: We presented and validated a prediction nomogram in our research, which has the ability to develop an individual probability of transrectal specimen extraction by integrating preoperative clinical and radiologic variables. Surgeons could perform a preoperative personalized prediction of the probability of transrectal specimen extraction with this easy-to-use nomogram system.



CLINICAL CHARACTERISTICS AND OUTCOMES OF PATIENTS WITH RESECTABLE, METASTATIC COLORECTAL CANCER TREATED WITH ADJUVANT FOLFIRI AFTER PROGRESSION ON NEOADJUVANT FOLFOX.

P1660

E. Luk, S. Satti
Jefferson, LA

Purpose/Background: Standard of care for colorectal cancer with resectable liver metastases is perioperative chemotherapy for a total of six months. The preferred chemotherapy regimen is oxaliplatin-based. However, the optimal therapy for those who progress on neoadjuvant chemotherapy but are still surgical candidates is unknown. Prior studies showed worse outcomes for those who progressed on neoadjuvant chemotherapy. We compiled this case series to report clinical characteristics

and outcomes of patients who progressed on neoadjuvant FOLFOX and were treated with adjuvant FOLFIRI.

Methods/Interventions: A retrospective chart review was performed for patients who underwent surgical resection with curative intent between July 1, 2012 and July 1, 2017 at Ochsner Medical Center. Inclusion criteria were as follows: metastatic colorectal cancer with liver involvement that was treated with neoadjuvant FOLFOX, surgical resection, and then adjuvant FOLFIRI.

Results/Outcome(s): Five eligible patients were identified. Four patients had extensive, multilobar disease with at least three liver metastases while one patient only had a single hepatic lesion. They received between four and six cycles of neoadjuvant FOLFOX. Four patients received 12 cycles of adjuvant FOLFIRI, and the patient with unilobar disease received just six cycles. One patient who required a two-stage surgical approach was also treated with HIPEC with the second surgery. Another patient with less than one millimeter margins also received 5-FU and bevacizumab for one year after FOLFIRI. Of the four that progressed, two occurred within 12 months of surgery and the other two within 18 months. All five patients were alive at 12 and 18 months. The two who received additional therapy such as HIPEC or extended therapy with one year of 5-FU and bevacizumab also had the longest survival.

Conclusions/Discussion: The addition of adjuvant FOLFIRI produced favorable clinical outcomes for time to progression and 12-month and 18-month survival rates compared to prior studies that have shown an expected median disease-free survival of three months for those who did not receive adjuvant chemotherapy and a 1-year survival of 28% for those that did (Gruenberger et al. 2008, Adam et al. 2004). Our findings are hypothesis generating for adjuvant chemotherapy with FOLFIRI for patients who progressed on neoadjuvant FOLFOX but still undergo curative resection. More intensive therapies such as HIPEC or extended chemotherapy may also improve outcomes.

Gruenberger, Birgit, et al. "Importance of Response to Neoadjuvant Chemotherapy in Potentially Curable Colorectal Cancer Liver Metastases." BMC Cancer, vol. 8, no. 1, 25 Apr. 2008, doi:10.1186/1471-2407-8-120. Adam, René, et al. "Tumor Progression While on Chemotherapy." Annals of Surgery, vol. 240, no. 6, Dec. 2004, pp. 1052–1064., doi:10.1097/01.sla.0000145964.08365.01.

Table 1. Patient characteristics and outcomes	Patient 1	Patient 2	Patient 3	Patient 4	Patient 5
Age at diagnosis (years)	50	43	65	61	67
Gender	Female	Female	Male	Male	Female
Site of primary	Right colon	Right colon	Right colon	Rectal	Left colon
Extent of liver resection (limited, extensive)	Extensive	Extensive	Extensive	Limited	Extensive
Margin size (<1mm, 1-5mm, 5-10mm, >10mm)	5-10mm	1-5mm	<1mm	1-5mm	1-5mm
Synchronous or metachronous	Synchronous	Synchronous	Synchronous	Synchronous	Synchronous
Number of liver metastases at diagnosis	3	4	3	1	4
Size of largest metastases (cm)	3.4	11.0	6.0	6.5	2.5
Unilobar or multilobar metastases	Multilobar	Multilobar	Multilobar	Unilobar	Multilobar
Pre-operative CEA (ng/mL)	27.7	336.6	2.3	1.5	Unknown
Post-operative CEA (ng/mL)	48.5	8.0	2.0	Unknown	Unknown
Number of neoadjuvant FOLFOX cycles	6	5	5	6	4
Number of adjuvant FOLFIRI cycles	12	12	12	6	12
Additional therapy	HIPEC	N/A	1 year of 5-FU /bevacizumab	N/A	N/A
Time to progression (months)	15	17	N/A	10	6
Time to death or last encounter (months)	23	22	N/A	23	22

TRANSANAL TOTAL MESORECTAL EXCISION (taTME) FOR RECTAL CANCER: THE QUALITY CONTROL OF SURGERY UNDER LEARNING CURVE.

P1661

X. Bai, G. Lin
Beijing, China

Purpose/Background: Transanal total mesorectal excision (taTME) is a surgical approach for mid-low rectal cancer with a learning curve estimated at 40-50cases. The long-term outcome of taTME for rectal cancer under learning curve remains controversial. The experience of taTME for rectal cancer under their learning curve is limited.

Methods/Interventions: A retrospective analysis of all taTME cases performed for rectal cancer at general surgery department of Peking Union Medical College Hospital from October 2014 to October 2016 was conducted. The transanal Surgeon is experienced in TME for more than 20 years and underwent training course of taTME. The demographic characteristics, details of surgical procedure, tumor characteristics, pathological characteristics, perioperative complications and long-term outcome were analyzed.

Results/Outcome(s): Among 40 patients, 65.0% were male and 72.5% had a BMI >25.0. Tumor were stage I(14), II(22), III(14). The average diameter of the tumors was 2.60 (1.80, 4.00) cm (1.0-5.0 cm) and the average distance from the anal verge was 5.00 (4.00, 6.00) cm (3.0-6.0 cm). 14 patients recieved neoadjuvant chemoradiotherapy. All the patients achieved R0 resection without transferring to open operation. The operation time was 182.32 (+36.54) min, the average bleeding was 40.00 (30.00, 55.00) ml, the average distance from distal incision to the lower edge of the tumor was 2.24 cm, the pathology of distal and proximal incision margin and circumferential incision margin were negative, and 14.52 lymph nodes were detected. The average hospital stay was 8.00 (7.00, 9.00) days. 36 patients (90%) received an median follow-up is 44.26 months after operation. At last follow-up, 9 patients (22.5%) had distant metastasis, 2 patients (5.0%) died, no local recurrence occurred. According to Williams' score, patients gradually improved their anal function after surgery, and 34 patients (85.0%) were graded A or B postoperatively.

Conclusions/Discussion: taTME has revolutionized the era of surgery for mid-to-low rectal cancer, which improve access to the pelvis in difficult to reach scenarios. If we could strictly grasp the indications and surgeons' qualification of taTME, this surgical procedure could produce satisfied margins and specimen quality. In these cases under learning curve, taTME performed by experienced surgeon achieves good long-term outcomes and facilitate R0 resection.

EARLY ILEOSTOMY CLOSURE AFTER PROCTECTOMY FOR RECTAL CANCER IS SAFE AND ASSOCIATED WITH A REDUCED HOSPITAL LENGTH OF STAY.

P1662

A. Matrachisia, T. Curran, V. George, P. Maxwell
Charleston, SC

Purpose/Background: Diverting loop ileostomy following proctectomy has been used to protect the anastomosis and reduce the clinical effects of a potential leak. Traditionally, diverting loop ileostomy was reversed 3 months after the index operation. However, recent literature has shown that early ileostomy reversal is associated with comparable morbidity, mortality and length of stay when compared to traditional timeline. Thus far, there is limited data on whether early stoma reversal is associated with a reduced 30-day readmission rate. Objective: The purpose of the study is to explore whether 30-day readmission rate was reduced in patients treated with rectal cancer who underwent early closure of stoma (8-14 days after stoma creation) compared with late ileostomy closure.

Methods/Interventions: A retrospective review was conducted on patients who underwent resection for rectal cancer with a diverting ileostomy at a single institution. All patients received either or both endoscopic and radiographic assessment of the anastomosis prior to ileostomy reversal. Patients who did not require adjuvant chemotherapy were considered for early ileostomy closure. Patients were then identified as either early closure of ileostomy (8-14 days) or late closure (>15 days). Clinical data were collected up to 30 days after each operation. Groups were compared with respect to preoperative characteristics, operative details and postoperative course.

Results/Outcome(s): The study identified 22 patients that underwent resection for rectal cancer; 7 of those received early ileostomy reversal. Body mass index was decreased in early reversal patients though demographics were otherwise similar (Table 1). Total time with ileostomy was reduced in the early group (11.1 days) vs late group (180. 6 days) $p < 0.01$. The length of stay post LAR was significantly lower in the early group (3.3 days) vs late group (5.5 days) $p = 0.01$. The total length of stay was significantly lower in the early group (6.6 days) vs late group (8.8 days) $p = 0.05$. Thirty-day readmission rate was lower in the early group (14%) as comparted to the late group (25% though this did not reach significance ($p=1.00$).

Conclusions/Discussion: Early closure of ileostomy (8-14 days) after rectal cancer resection is safe and decreases overall time with an ostomy. Further study is required to assess its impact on 30-day readmission rate.

OVARIAN SEROUS CARCINOMA PRESENTING AS BLEEDING COLON MASS 12 YEARS AFTER PRIMARY RESECTION.

P1663

J. Abdelsayed, J. Downs
Dallas, TX

Purpose/Background: Endometrial adenocarcinoma is the most common gynecologic malignancy. Uterine Serous Carcinomas, a subtype of endometrial adenocarcinoma, has a propensity for lymphovascular invasion and intra-abdominal peritoneal spread. Our understanding of their natural history is evolving. There are reports of distant recurrences after lengthy disease-free intervals identified in the literature. In this report, we present the case of an 83 year old woman with high grade endometrial serous adenocarcinoma presenting as a bleeding ascending colon mass 12 years after initial diagnosis and treatment.

Methods/Interventions: An 83 year old female presented to the emergency room with a report of near syncope and associated melena. Twelve years prior to presentation, the patient was diagnosed with an adnexal mass and underwent a total abdominal hysterectomy and bilateral salpingo-oophrectomy. Pathology revealed high grade serous papillary endometrial adenocarcinoma and she was classified as Stage IIIA per FIGO classification. Colonoscopy now showed an infiltrating submucosal mass with mucosal ulceration and bleeding in the proximal ascending colon. Biopsy revealed adenocarcinoma with loss of MLH1 & PMS2 mismatch repair proteins by immunohistochemical analysis. Metastatic workup was negative

P1662 Table 1

Characteristic	All patients	Early reversal	Late reversal	p-value
Patients (n)	22	7	15	
Age; mean (SD)	56.6 (9.8)	58.3 (10.2)	55.8 (9.9)	0.59
Female; n (%)	10 (44)	4 (57)	6 (38)	0.65
BMI, kg/m2; Mean (SD)	27.4 (6.0)	23.7 (6.5)	28.9 (5.1)	0.05
Smoking; n (%)	9 (39)	4(57)	5 (31)	0.36
Neoadjuvant radiation; n (%)	22 (96)	7 (100)	15 (94)	1.00
Lower border of tumor from anal verge, cm; mean (SD)	5.8 (2.9)	6.3 (3.0)	5.6 (2.9)	0.62

and her CEA was 6.4. The patient underwent a laparoscopic right hemicolectomy with ileocolonic anastomosis.

Results/Outcome(s): The mass was evaluated and was noted to be 4.5cm x 2.6cm with a thickness of 2.4cm. The tumor was noted to extend from the serosal surface and pericolonic adipose tissue to a focal area of mucosal ulceration. Thirty-one lymph nodes were sampled and were negative for metastatic disease. The malignant cells stained positive for p53, PAX-8, WT-1, CK7, & estrogen receptor and notably were negative for CK20, CDX2, & progesterone receptor. Given this profile, the tumor was confirmed as a serous adenoma of gynecologic origin involving adenocarcinoma of the proximal colon. Her postoperative CA-125 level was 156. She recovered from her operation and was evaluated by gynecologic oncology with plans for initiation of chemotherapy.

Conclusions/Discussion: We commonly see right colon cancers presenting with bleeding and anemia. Colon cancer is by far the most common disease presenting in this fashion. We present this case as an illustration of alternative pathologic entities mimicking the pattern commonly seen with colon cancer. We have seen other malignancies including melanoma, lymphoma and breast cancer present in this manner. Our patient had a right colon tumor which proved to be of apparent gynecologic origin. It is uncertain whether this represents a new primary tumor or recurrence of her endometrial cancer. This case highlights the difficult and unpredictable nature of this disease, the importance of life long surveillance strategies, and the possibility of unusual tumors of the colon presenting with bleeding and anemia.

INTRACORPOREAL ANASTOMOSIS DOES NOT INCREASE SURGICAL SITE INFECTION RATE IN LAPAROSCOPIC COLON CANCER SURGERY.

P1664

W. Ji, J. Kim, K. Hong, J. Um
Ansan, Korea (the Republic of)

Purpose/Background: Laparoscopic surgery is recommended for colonic malignancies due to better clinical outcomes and comparable oncologic result. However, totally laparoscopic surgery including intracorporeal anastomosis (ICA) is not popular way in many institutions because easier manipulation of extracorporeal anastomosis (ECA) by extraction of the tumor with colon of appropriate safe length in both direction for the anastomosis externally. Totally laparoscopic colon resection has some advantages in terms of incision length, free choice of extraction site and so on. But ICA may bring concern of the surgical site infection (SSI) because we have to do enterotomies inside the abdominal cavity. This study aimed to compare the SSI rate between ICA and ECA.

Methods/Interventions: We retrospectively analyzed colon cancer patients who underwent radical surgery in Korea University Ansan hospital from January 2017 to September 2019. We excluded patents who had sigmoid colon cancer, rectal cancer, perforated lesion, obstruction, emergency surgery, antibiotic treatment before surgery from any reason and other infective disorders. We compared SSI rate and other clinical variables between ICA and ECA group

Results/Outcome(s): 373 patients had radical surgery for colorectal cancer in the study period and 163 patients were eligible for this study. ECA was done in 132 patients (81.0%) and ICA was done in 31 patients (19.0%). There was no statistically significant differences in clinicopathologic variables between two groups. SSI was identified in three patients in ICA group and nine patients in ECA group ($p=0.29$), Anastomotic leakage was noted in a patient in ICA group and three patients in ECA group ($p=0.43$).

Conclusions/Discussion: There was no significant difference in SSI rate and anastomotic leakage between ICA and ECA group in colon cancer patients. More studies with better quality are needed and we must apply other efforts to lessen the SSI rate for the colon cancer surgery as well.

FULL THICKNESS LOCAL EXCISION AFTER NEOADJUVANT THERAPY FOR RECTAL CANCER: HOW WIDE SHOULD THE EXCISION BE?

P1665

Z. Zhang[2], A. Abdalla[1], A. Alame[2], P. Mazzara[2], A. Aref[2]
[1]*Grosse Pointe Woods, MI;* [2]*Detroit, MI*

Purpose/Background: Full Thickness local excision (LE) in patients with complete response after neoadjuvant therapy is one method to preserve the rectum after the diagnosis of locally advanced rectal cancer. Understanding the relationship between the residual microscopic disease (RM) and the residual gross mucosal abnormality (RG), which is the only visible mark at the time of surgery, is important to guide the extent of surgical resection.

Methods/Interventions: We performed an IRB approved retrospective review of the electronic medical records and pathology slides of patients diagnosed with rectal cancer and treated with neoadjuvant chemoradiation in our center between 2011-2018. We observed the relationship between the RM and RG.

Results/Outcome(s): There were 57 patients with LARC who received chemoradiation between 2011-2018. Sixteen patients had complete pathological response (28%) and were excluded from the study. The total number of patients under study is 41. Patients with T2, T3, T4, T stage missing were 1, 36, 3, 1 respectively. There were 24, 14, 3 patients with negative, positive and missing lymph nodes staging respectively. The median distance between

the anal verge and the tumor was 6(0-20) cm. The median size of the tumor was 4.5(2-15) cm. Type of surgery were 31 low anterior resections, eight abdominoperineal resections, three LE. The median duration between the end of radiation and surgery was 68 (30-140) days. Pathological staging was ypT1:5, ypT2:14, ypT3: 21, ypT4:2. The average size of the RG is 2.8 cm, the average size of the RM is 1.2 cm. The RG was most commonly in the form of an ulcer in 31 patients (76%). Other forms of RG included nodules, masses or rectal perforation. The RG was found in the preoperative tattoo region in only 13 patients. No microscopic disease was found solely outside the RG or in the mesorectal fat underneath the RG.

Conclusions/Discussion: Our study suggests that when LE is contemplated to confirm the complete pathological response status without any therapeutic goal, the surgical excision should be confined to the borders of the RG and it is not necessary to excise any normal tissue around the RG or dissect deeply into the mesorectal fat as is commonly done in some published series. More extensive dissection will not add to the accuracy of the assessment of the pathological response status and may well add to the postoperative morbidity following LE or, if needed, completion TME.

DOES LONG TERM BOWEL FUNCTION CHANGE AFTER COLECTOMY FOR COLON MALIGNANCY?

P1666

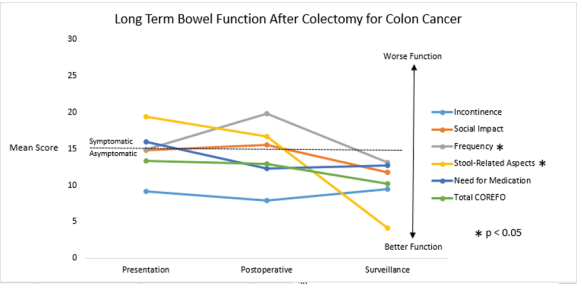
P. Gray, J. Goldwag, M. Eid, L. Wilson, M. Wilson, S. Ivatury
Lebanon, NH

Purpose/Background: Current understanding of bowel function after colectomy for colon cancer is informed by conflicting data, making preoperative patient counseling difficult. Our previous work demonstrates bowel movement frequency increases by postoperative follow up, while overall function does not change. Long term changes are unknown. We aimed to evaluate patient-reported bowel function at surveillance visits, comparing this to baseline and postoperative function.

Methods/Interventions: This is a single center retrospective review of a prospectively collected database from July 2015 to June 2019. Included patients underwent colectomy for colon malignancy, defined as adenocarcinoma located entirely proximal to the rectum, and had completed the Colorectal Functional Outcome (COREFO) questionnaire at presentation, postoperative, and surveillance visits. The COREFO questionnaire is a validated instrument assessing bowel function in five domains (incontinence, frequency, social impact, stool-based aspects, and need for medication) and global function. A higher score indicates worse function and a score above 15 is considered symptomatic. The three score pairs were compared independently using paired t-tests. We included quality of life analysis using the Patient Reported Outcome Measurement Information System (PROMIS) Global Health Questionnaire for patients who had completed the measure at surveillance.

Results/Outcome(s): Thirty six patients met inclusion criteria for this study. The mean age was 67 ± 13.7 years with 58% women. Mean time from presentation to postoperative questionnaire was 85 days (IQR 41-80). Time from postoperative to surveillance questionnaire was 223 days (IQR 103-357). Time from presentation to surveillance questionnaire was 309 days (IQR 207-409). Stool-related aspects (pain with defecation, blood in stool, and irritated anal skin) improved significantly from presentation to surveillance (mean presentation score 19.4, IQR 0-33.3; mean surveillance score 4.17, IQR 0-8.3) as well as from postoperative to surveillance (mean postoperative 16.6, IQR 8.3-22.9; mean surveillance 4.2, IQE 0-8.33). Bowel movement frequency improved significantly from postoperative to surveillance (mean postoperative 19.8, IQR 0-25; mean surveillance 13.19, IQR 0-21.8). No other domain changed over the course of treatment and surveillance. There were quality of life scores at surveillance for 18 patients (50%). These showed quality of life equivalent to the general U.S. population (mean physical health score 48.1, IQR 37.4-55; mean mental health score 48.9, IQR 41.7-53.3).

Conclusions/Discussion: This study demonstrates improved bowel function after colectomy for colon cancer around one year from presentation, driven by improvements in bowel movement frequency and stool-related aspects. Preoperative patient counseling should include these findings.



BEYOND TME - EXTRA-ANATOMIC APPROACHES FOR RECTAL CANCER: A 10 YEARS SINGLE CENTER EXPERIENCE.

P1667

X. Pare, N. Tasse, S. Drolet, P. Bouchard
Quebec, QC, Canada

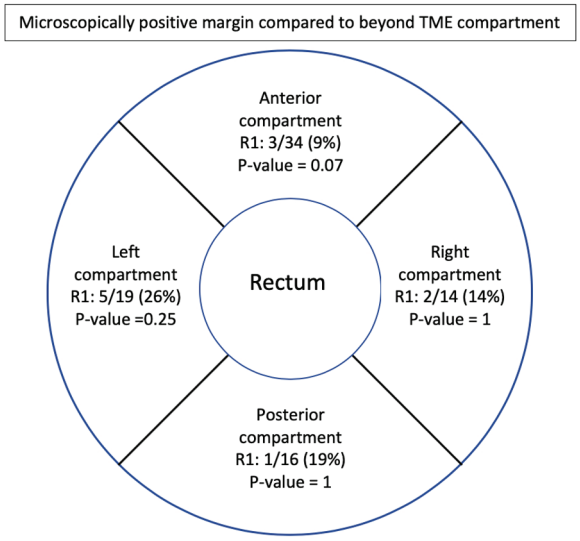
Purpose/Background: TME surgery as described by Dr Heald has revolutionized rectal cancer surgery. It is associated with decreased local recurrence and improved survival. However, some locally advanced primary or

recurrent rectal cancer can require beyond TME surgery to achieve negative margin resection. The aim of our study was to evaluate the outcome of beyond TME surgery for locally advanced or recurrent rectal cancer.

Methods/Interventions: All patients having surgery for primary or recurrent rectal cancer between 2009 and 2018 were identified through medical record. All patients having beyond TME excision (including en-bloc exenteration of bladder, uterus, vagina, sacrum, iliac vessels or lateral sidewall component) were identified after operative and pathologic report revision. Standardized retrospective chart review was performed. The primary outcomes were perioperative morbidity and mortality, margin resection status and five years overall survival (OS).

Results/Outcome(s): A total of 55 patients having a beyond TME rectal excision were identified. There was 42 (76%) patients having surgery for primary rectal cancer and 13 (24%) for recurrent cancer. The majority of patient (87%) had neoadjuvant chemoradiation. Thirty-two patient had sphincter salvage procedure. Nine patients had a grade 3 severe complication according to clavien-dindo classification. There were no perioperative mortality. There were no grossly positive margin (R2) and microscopic positive margin (R1) occurred in 9 patients. Five years overall survival with Kaplan-Meier analysis was 62%. There was no difference in 5y OS according to margin status.

Conclusions/Discussion: Beyond TME surgery is associated with an acceptable rate of complication in our series. In carefully selected patient the rate of negative margin is high with extra-anatomic approaches. A good 5y OS is associated with these approaches in patients with negative margin.



USE OF TRICLOSAN-COATED BARBED MONOFILAMENT SUTURE (TCBMS) TO REDUCE SURGICAL SITE INFECTION (SSI) IN ELECTIVE COLORECTAL SURGERY.

P1668

C. Cózar Lozano, S. Garcia-Botello, J. Martí-Arévalo, M. Bauzá Collado, V. Pla Martí, D. Moro Valdezate, D. Casado, A. Espí Macías
Valencia, Spain

Purpose/Background: SSI is the most common complication after colorectal surgery with rates of up to 20% in the literature. Bacterial adhesion of surgical sutures is related very closely with the development of SSI, having an effect on morbidity and mortality rates. Many strategies have been described to reduce SSIs including monofilament or antibiotic coated sutures, together with the increase in laparoscopic surgery which has led to the design of high-strength absorbable, antibacterial knotless tissue control devices. TCBMS has the advantage of simultaneously combining two SSI reduction strategies. Our aim is to compare the SSI rates with and without the use of TCBMS.

Methods/Interventions: Patients scheduled for elective laparoscopic colorectal surgery were included prospectively between May 2018 and June 2019 prior institutional review board approval and informed consent. Patients were divided into 2 groups according to the suture used for fascial closure: Group 1: (TCBMS) and Group 2: conventional sutures (CS) (Polyglactin 910 polyfilament, Polydioxanone monofilament or Polyglycolic acid monofilament). Preoperative antimicrobial prophylaxis was carried out with iv Cefuroxime 1.5g and Metronidazol 1.5g. CDC criteria were used for the diagnosis of SSI with a 30-day follow-up. Statistical analyses were performed with IBM SPSS version 25.0. A descriptive analysis was performed and non- parametrics tests (X^2 and U-Mann Whitney tests) were used for comparisons. Risk factors for SSI were defined by log-rank test. The data were presented as odds ratios (OR) with 95% confidence intervals (CI) and $P < 0.05$ was considered statistically significant.

Results/Outcome(s): A total of 177 patients were consecutively included. Both groups were the same with regards to preoperative demographic data. TCBMS was used in 81 (45%) patients. Global SSI rates were 5.6% (n=10). SSI rate was 1.2% in Group 1 and 9.4% in Group 2 (Odds Ratio [OR] 1.728, 95% [CI] 1.342-2.224, p=0.022). Group 2 was associated with a Relative Risk of developing SSI of 1.4 (95%CI 1.12-1.97). Preoperative hemoglobin (p=0.021), Charlson index (p=0.025), postoperative transfusion (p=0.031) and TCBMS (p=0.014) were independent prognostic factors for the development of SSI.

Conclusions/Discussion: Sutures design characterized by inhibiting adhesion, colonization and subsequent spread of microorganisms throughout surrounding tissues could

be a key strategy to reduce the SSI rate. TCBMS is an independent prognostic factor for the development of SSI and should be considered for abdominal fascial closure in colorectal laparoscopic surgery. Further well designed randomized controlled studies are required to confirm these findings.

EARLY REVERSAL OF DIVERTING ILEOSTOMY AFTER LOW ANTERIOR RESECTION AND TOTAL MESORECTAL EXCISION FOR RECTAL CANCER.

P1669

S. Aguiar, P. Mendonça, B. Kupper, P. Stevanato, T. Bezerra, W. Nakagawa, R. Takahashi
Sao Paulo, Brazil

Purpose/Background: There's a consensus that diverting stoma is almost mandatory in patients submitted to low anterior resection after neoadjuvant chemoradiation. The time for reversing the stoma remains unclear. We are presenting the results from a protocol of early closure of diverting ileostomy.

Methods/Interventions: A prospective cohort were carried out between September, 2015 and February, 2018. Patients considered eligible for early reversal should be operated within 14 days after the primary radical surgery. The main endpoints were: 30-days postoperative morbidity; interval between the radical surgery and beginning of adjuvant chemotherapy.

Results/Outcome(s): Among 136 patients with locally advanced rectal adenocarcinoma, treated with preoperative chemoradiation followed by surgery with low colorectal anastomosis, we could closure the ileostomy within 14 days in only 15 patients (group 1). In 12 patients, ileostomy was reversed between 15 and 30 days (group 2); there was another group of patients in whom ileostomy was reversed after 30 days, but still before chemotherapy (group 3). There was no difference in the morbidity rates among the groups. The interval between radical surgery and chemotherapy was significant higher if the reversal was done after 30 days.

Conclusions/Discussion: Reversing ileostomy within 14 days is as safe as reversing up to 30 days after the radical surgery; reversing after 30 days is not recommended if adjuvant chemotherapy is indicated, as it is associated with significant delay in beginning chemotherapy.

DOES THE TUMOUR LOCATION AFFECT PROGNOSIS IN COLON CANCER?

P1670

K. Alyatama, M. Qasem, M. Alhunaidi, M. Hajiyah, S. Al Ben Ali, A. Alkandari, J. Alabbad
Kuwait, Kuwait

Purpose/Background: Primary tumor location has been proposed as an independent prognostic factor in colon cancer during recent years. Some researchers are suggesting considering that right sided colon cancer and left sided colon cancer as a different disease entity. The aim of this study is to compare the survival between right and left sided tumors and to determine the indecency of tumor location on the prognosis of colon cancer.

Methods/Interventions: A retrospective review of 252 patients diagnosed with colon cancer between 2006 and 2014. Data was collected from a prospectively maintained national cancer registry at Kuwait Cancer Control Centre (KCCC). The data collected included the patient's demographics, pathologic stage, molecular tumour profiling,

P1670 Table 1

	L N=159	R N=93	p-value
Stage:			0.597
Stage 1	8 (5.41%)	7 (7.78%)	
Stage 2	53 (35.8%)	38 (42.2%)	
Stage 3	70 (47.3%)	36 (40.0%)	
Stage 4	17 (11.5%)	9 (10.0%)	
Local recurrence:			0.453
Yes	11 (7.14%)	10 (10.8%)	
No	143 (92.9%)	83 (89.2%)	
Distant metastasis:			0.735
Yes	41 (26.5%)	22 (23.7%)	
No	114 (73.5%)	71 (76.3%)	
Mortality:			0.997
Yes	12(7.54%)	6(6.45%)	
No	147(92.45%)	87 (93.54)	

operative details, adjuvant treatment, last follow up, last followed up patient status, presence of metastasis, systemic therapy records and mortality. The measured outcomes were disease recurrence, metastasis and mortality. Chi-square analysis was performed using the SPSS software to determine the association between the recurrence of colon cancer, metastasis and mortality and the location of the primary tumour.

Results/Outcome(s): The study identified 252 patients with colon cancer. A total of 159 (63.1%) patients had left sided colon cancer and 93 (36.9%) had right sided colon cancer. Males had a slighter higher incidence of colon cancer in our study with 138 (55.20%) in comparison to females111 (44.40). Survival analysis by tumour location of the colon cancer did not show any statically significant differences on the basis of prognosis. This was measured using the variables tumour recurrence, metastasis and survival status. Table 1 summarized the comparison and analyzed variables.

Conclusions/Discussion: We found significant clinicopathological features associated with different sides of the colon respectively. However, we couldn't identify any impact on the survival or prognosis of the side of the lesion in colon cancer.

TRANSANAL ENDOSCOPIC VACUUM THERAPY FOR CHRONIC RETRORECTAL ABSCESS AFTER LOW ANTERIOR RESECTION WITHOUT LIFE QUALITY IMPACT.

P1671

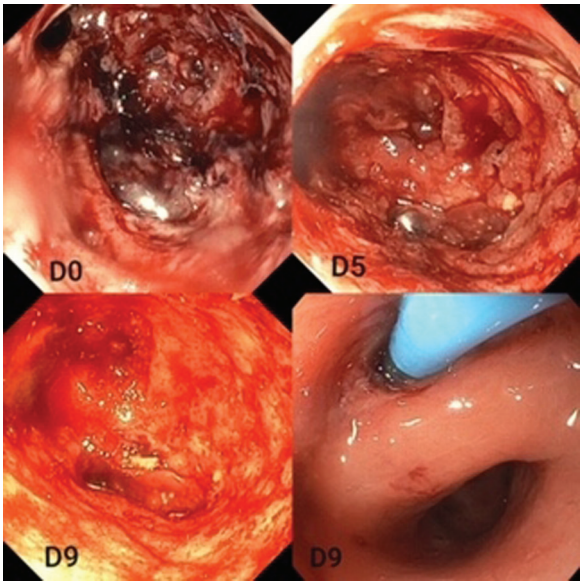
E. Oliveira, H. Guedes, G. Fernandes, J. Oliveira
Brasília, Brazil

Purpose/Background: Despite improvements in surgical techniques, staples, dissection devices and adoption of protective ileostomy the colorectal anastomotic leakage persists as a common and serious complication of low anterior resection (LAR), with high rates of reoperation. The incidence of symptomatic leakage occurs in up to 17,5% of LAR with a mortality rate ranging from 6% to 22%. Endosocpic vacuum therapy was initially proposed in 2003 as a great alternative and minimally invasive internal drainage, for rectal abscess or anastomotic leakages with closure results up to 85%. The basis of treatment envolves macrodeformation, microdeformation, changes in perfusion, exudate control and bacterial clearance, like as skin wounds vacuums therapies.

Methods/Interventions: A 57 years male was submitted to radiotherapy, chemotherapy and low anterior resection without ileostomy for adenocarcinoma of rectum 08 years ago. On post operative follow up, the patient presented LAR syndrome with pelvic pain, incontinence and mucus discharge. In 2019, during metastatic disease treatment, the patient was diagnosed with an abdominal sepsis, retrorectal abscess and anastomotic leakage confirmed by flexible retoscopy. Treatment was done with I.V. antibiotics and endoscopic intracavitary vacuum therapy, using a pediatric gastroscope (4.8 mm), dilatation of the fistula to 08 mm, breakdown of abscess septs with the tip of scope and biopsy forceps, chemical cavitary debridement using hydrogen peroxide and insertion of intracavitary transanal "one pore film" adapted vacuum device, with 125 mmHg continuous aspiration in high intensity. The internal drainage was endoscopically revisited 03 times in 09 days. with great clinical patient improvement and significant abscess cavity reduction. At the end, it was inserted a simple and short plastic pigtail stent and the patients was discharged.

Results/Outcome(s): During all the vacuum therapy the patient maintained oral food intake and evacuation, without impact in his quality of life or new abdominal infection focus. A 30th day endoscopic follow up showed spontaneous retrorectal abscess drainage, 10 mm fistula diameter and similar cavity volume. No infections signs was noted. The stent was replaced by two 10 Fr x 03 cm plastic pigtail stents. The patient is asymptomatic until today.

Conclusions/Discussion: Endoscopic vacuum therapy is an interesting treatment option for persistent chronic colorectal anastomotic fistula and abscess, besides LAR syndrome and without impact in quality of life or in paralells treatments. In present case, the abscess occurred 08 years after surgery and was successfully treated with endoscopic vacuum approach.



Endoscopic evolution of retrorectal abcess on the procedure day, 5th, 9th day post procedure.

SCREENING FOR INSTITUTIONAL BIAS: DO RACE, ETHNICITY, AND AGE AFFECT NATIONAL COMPREHENSIVE CANCER NETWORK (NCCN) RECOMMENDED THERAPY COMPLETION RATES FOR RECTAL CANCER?

P1672

P. Rosen
Orlando, FL

Purpose/Background: Prior studies have demonstrated variable rates of NCCN treatment recommendation compliance. We aim to sample our institutional cancer database to elucidate demographic and socioeconomic hurdles to cancer care.

Methods/Interventions: A prospective cohort analysis using rectal cancer patient's records of those treated at Orlando Health, University of Florida Cancer Center, between 2012 and 2014, was carried out.

Results/Outcome(s): 39 consecutive patients who received inpatient treatment were selected. 15 were found to have completed the NCCN recommendations, 24 patients did not complete the NCCN guidelines. 67% of those who completed were caucasion. 71% of the those who did not complete were caucasian. (p=0.79) Those who did complete were 47% male while those who did not complete were 50% male. (p=0.85) Those who completed had an average age of 56.9 years. Those who did not complete were 58.5 years of age on average. (p=0.67) The median household income of the zip code of those who completed was 54,643 while the median household income of those who did not complete was 54,454 (p=0.96).

Conclusions/Discussion: Our limited data sampling of our institutional cancer registry demonstrates that the demographics of those who completed NCCN recommended therapy versus those who did not complete therapy were roughly similar. Further analysis is necessary to determine the reasons why some patients do not complete treatment.

QUALITY OF LIFE AND FUNCTIONAL OUTCOME AFTER TRANSANAL TOTAL MESORECTAL EXCISION.

P1673

H. Al Adawi, M. Raval, A. Karimuddin, T. Phang, C. Brown
Vancouver, BC, Canada

Purpose/Background: Rectal cancer surgery aim to cure with minimal impact on patients' functional outcomes and quality of life. Transanal mesorectal excision (TaTME) was recently utilized with potentially equivalent outcomes to laparoscopic and open rectal surgery. However very limited data is available on functional and quality of life outcomes. This study aim to report a single centre experience of patients quality of life and functional outcomes post TaTME

Methods/Interventions: Consecutive patients who underwent TaTME between 2013 to 2019 at single center by 4 colorectal surgeons were included in the study. We included patients who underwent TaTME for low to mid rectal cancer 6 months after their diverting ileostomy was closed. The study was based on questionnaires in which all patients were asked to complete seven questionnaires related to Quality of life and functions (EQ-5D-3L, EORTC-QLQ C30, EORTC-QLQ C29, Low Anterior Resection Syndrome score (LARS), International Prostate Symptom Score IPSS, Vaizey incontinent score and the International Index of Erectile Function Questionnaire (IIEF) for male patients.

Results/Outcome(s): A total of 35 patients were included in the study. EQ-5D-3L, EORTC-QLQ C30, EORTC-QLQ C29 demonstrated an overall comparable result for quality of life with currently published data for laparoscopic TME. The average of all health quality domains in the quality of life questionnaires were within the same ranges of published data for laparoscopic TME. In terms of urinary functions 45% (n=16) of patients reported mild urinary symptoms and only 14.2% (n=5) patients had severe symptoms. 45.7% (n=16) patients developed major LARS, 40% (n=14) developed minor LARS and only 14.2% had no LARS symptoms. One patient had perfect continent according to Vaizey incontinent score and one patient was totally incontinent while majority of patient's had variable degree of incontinence. One male patient had no erectile dysfunction (E.D), 5 male patients had severe E.D and 9 patients had mild to moderate E.D.

Conclusions/Discussion: Comparing our findings to the current literature, Patients undergoing TaTME for mid to low rectal cancer have comparable quality of life outcomes 6 months after their diverting loop ileostomy closure to patients undergoing laparoscopic TME. Anorectal, urinary and sexual functions seem to be higher compared to the current published data for laparoscopic TME. Large multicentre studies addressing these outcomes are needed.

TRANSANAL TOTAL MESORECTAL EXCISION, THE FIRST SINGLE SURGEON EXPERIENCE OF 104 CASES.

P1674

S. Ilana, A. Ghuman, D. Sands
Weston, FL

Purpose/Background: Despite the evolution of surgical techniques, laparoscopic low anterior resections with total mesorectal excision (TME) can still be very challenging. Various anatomical factors such as low and ultra-low tumor location, narrow pelvis, male gender, high body mass index and tissue distortion after neoadjuvant treatment can make this a difficult operation. The transanal

TME (TaTME) approach for these cases has well-established advantages and some studies have also shown better quality of rectal specimen compared to laparoscopic TME. A surgeon experienced in laparoscopic TME and transanal microsurgery combined with the appropriate training is necessary to start the TaTME approach. The aim of this study was to evaluate our experience of a single surgeon in a high volume center performing TaTME.

Methods/Interventions: This was a retrospective cohort study of all consecutive elective TaTMEs at our institution from October 2013 to July 2019. Descriptive analysis was performed of the demographics, operative variables, pathological results, and outcomes.

Results/Outcome(s): A total of 104 patients [72 (69.2%) males, mean age 58.3 years, BMI 26.6kg/m2] underwent TaTME at our institution. Staging MRIs were done for 93.2% of our cohort and revealed 14.4% stage I, 27.8% stage II, 51.5% stage III, and 6.2% stage IV (hepatic metastasis) disease. MRI also revealed predicted positive circumferential margins in 36.1% and a mean tumor height of 6.2cm from the anal verge. Eighty-seven (83.7%) patients received neoadjuvant treatment. A two- team approach was performed in all patients with majority of the abdominal approach cases being laparoscopic (88.3%); there was one conversion to open, 7.8% were hand assisted, and none were performed robotically. Mean operative time was 357.3 minutes.57 (54.8%) were hand sewn and 46 (44.2%) were stapled anastomoses; 1 (0.96%) patient had a permanent stoma. All anastomoses were diverted. There were 8 (7.7%) intraoperative complications: 3 splenic injuries, 2 seromyotomies, 1 cystotomy and 1 urethral injury. Mean length of stay was 6.9 days. The 30-day morbidity was 33.65% and no 30-day mortality. Pathology revealed complete and near complete TME grade in 89(85.5%) patients. Two patients (1.9%) had positive circumferential radial margins and an average of 25.4 lymph nodes were harvested. Median follow up was 18.2 months, with 3.8% local and 14.4% distant recurrence rates. Overall mortality was 2.88% including one for stage IV pancreatic cancer.

Conclusions/Discussion: We demonstrated acceptable surgical complication rates (7.7%) and oncologic outcomes (85.5% complete and near complete TME and only 3.8% local recurrence) in our single surgeon TaTME experience. This is one of the largest single surgeon series to date.

NATIONAL CADAVER WORKSHOP CAN IMPROVE THE SURGICAL ACQUISITION OF LATERAL PELVIC NODE DISSECTION BY MINIMALLY INVASIVE APPROACH: KOREAN LATERAL PELVIC NODE DISSECTION STUDY GROUP.

P1675

H. Kim[1], G. Choi[1], J. Oh[2], Y. Lee[2], I. Lee[2], B. Kye[2], J. Park[1], S. Park[1]
[1]Daegu, Korea (the Republic of); [2]Seoul, Korea (the Republic of)

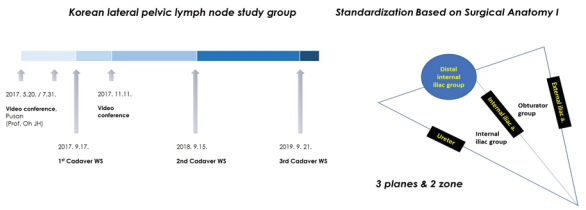
Purpose/Background: Lateral pelvic lymph node dissection (LPND) is suggested for the treatment of metastatic lymph nodes in pelvic sidewall after neoadjuvant chemoradiotherapy (CRT). However it is infrequently performed only in a few hospitals in Korea although it includes complicated procedures. Therefore it is hard to be trained individually in doing LPND. Korean LPND study group started to hold video and cadaver workshops to educate Korean colorectal surgeons from May 2017.

Methods/Interventions: Two experts for LPND were joined the workshop with commenting about unedited video clips or demonstrating cadaver surgery. Standardized surgical procedure based on anatomical planes were suggested to all participants. This procedure included five steps. First step was making medial plane (plane A) upto the bladder including ureter, hypogastric, and pelvic splanchnic nerves. A structure like a thin layer was separated from pelvic sidewall. Second step was making lateral plane (plane B) bounded by the external iliac vessels, psoas, and obturator internus muscles. Lymphoareolar tissues were separated from this plane without bleeding. Third step was making medial plane (plane C) of octurator area by seperating lymphoareolar tissue from the branches of the internal iliac artery. Fourth step was dissecting pelvic lymph nodes (LPNs) in the obturator area between planes B and C without injury of obturator nerve and lumbosacral nerves which became a dorsal boundary. Fifth step was dissecting lymph nodes in the internal iliac area between planes A and C. The distal area of internal iliac vessels (around inferior vesical artery) should be completely dissected because it is most frequent area of metastatic LPNs.

Results/Outcome(s): Between May 2017 and September 2019, four video and three cadaver workshops were held with attending approximately 25 colorectal surgeons from 11 hospitals more than once. Six surgeons who perfomed less than 10 cases of LPND before 2017 and actively attended to the workshop newly performed 36 LPNDs during study period. They had significant increase of the number of harvested LPNs from 5.2 to 8.1 ($P=0.009$). However, this number was less than the number of LPNs which was harvested by an expert (G.-S. Choi) during same period (8.1 vs. 11.2, $P=0.005$). The most prominent change between two periods was the completeness rate

of lymph node dissection in distal internal iliac group although lymph nodes in obturator group was completely removed even before starting the workshop.

Conclusions/Discussion: The National video and cadaver workshops helped unexperienced colorectal surgeons to perform LPND completely. It should be continued to overcome learning curve and to prevent incomplete lymph node dissection in pelvic sidewall and postoperative horrible complications.



ZIP CODE-RELATED INCOME DISPARITIES IN PATIENTS WITH COLORECTAL CANCER.

P1676

Y. Qwaider, N. Sell, R. Ricciardi, C. Cauley, L. Bordeianou, D. Berger, H. Kunitake, R. Goldstone
Boston, MA

Purpose/Background: Screening and early detection reduce morbidity and mortality in colorectal cancer. Our aim is to study the effect of income disparities on the clinical characteristics of patients with colorectal cancer in Massachusetts.

Methods/Interventions: Patients were extracted from a database containing all surgically treated colorectal cancers between 2004 and 2015 at a tertiary hospital in Massachusetts. Data on median ZIP code-related income from the United States Census Bureau (2013–2017 estimates) was found and correlated with our cohort. We split patients into 2 groups: "above-median income" and "below-median income" according to the median income of Massachusetts ($74,167). Dichotomous variables were compared using the $\chi 2$ test or the Fisher's Exact test and continuous variables with the Student's t test. Survival was compared between the two groups using Kaplan–Meier curves and the log-rank test.

Results/Outcome(s): The analysis included 817 patients (423 males [52%] and 394 females [48%]). The above-median income group consisted of 528 patients (65%) and the below-median income group consisted of 289 patients (35%). The mean age of presentation was 64 ± 15 years for the above-median income group and 67 ± 15 years for the below-median income group (p=0.04). Patients with below-median income were screened less often (p<0.001) and presented more frequently with metastatic disease (p=0.02) and a higher ASA score (p=0.002). Patients with above-median income survived, on average, an estimated 15 months longer than those with below-median income (p<0.001). The survival distribution was statistically significantly different between the groups for stage III disease (p=0.004), but not stages I, II, or IV (p=0.3, 1, and 0.2, respectively). For stage III disease, a lower proportion of below-median income patients received chemotherapy (61% vs. 79%, p=0.002) and a higher proportion underwent nonelective surgery (5% vs. 2%, p=0.007). Interestingly, there was no significant difference between the rates of screening (p=0.4), adjuvant chemotherapy treatment (p=0.4) and presentation with metastatic disease (p=0.2) for patients with below-median income before and after the implementation of Massachusetts Affordable Care Act in 2006 and its amendment in 2010 (p=0.3, 0.5 and 0.1, respectively).

Conclusions/Discussion: In Massachusetts, patients with colorectal cancer residing in lower-income areas are screened less frequently than those who live in higher income areas, even with the implementation of the Affordable Care Act. Consequently, they present with more advanced disease and have worse outcomes, especially when analyzing those who present with stage III disease. In order to eliminate income disparities in health outcomes, inequalities beyond medical insurance and access to care must be addressed.

Table 1. Five-year and overall survival of patients with colorectal cancer stratified by stage and income (*N*=817).

Stage	Income	5YS (%)	OS (months)	*p* value
I (*n*=194)	Below-median (*n*=60)	80	118	0.3
	Above-median (*n*=134)	86	134	
II (*n*=252)	Below-median (*n*=89)	83	133	1
	Above-median (*n*=163)	87	130	
III (*n*=257)	Below-median (*n*=89)	63	102	**0.004**
	Above-median (*n*=168)	76	126	
IV (*n*=114)	Below-median (*n*=51)	24	49	0.2
	Above-median (*n*=63)	38	61	

Abbreviations: OS, overall survival; 5YS, five-year survival.

ADENOSQUAMOUS CARCINOMA OF THE COLON AND RECTUM: A NATIONAL CANCER DATABASE (NCDB) ANALYSIS.

P1677

J. Williams, J. Switchenko, S. Maithel, D. Kooby, G. Balch, C. Staley, M. Shah
Atlanta, GA

Purpose/Background: Adenosquamous carcinoma (ASC) of the colon and rectum is a rare but clearly defined histology of colorectal cancer. Prior studies have been limited to small case studies and retrospective reviews. We aimed to examine the clinical characteristics associated with this pathology and determine its prognostic significance on overall survival (OS) in comparison to adenocarcinoma. In addition, we assessed pathologic response rates in the rectum after neoadjuvant therapy (NAT) for ASC compared to adenocarcinoma.

Methods/Interventions: All patients ≥18 years with ASC or adenocarcinoma of the colon and rectum were identified in the National Cancer Database (2004-2015). Demographic and clinical characteristics were compared between the two histologies, and multivariable regression analyses performed to investigate the implications of ASC subtype on OS and pathologic response to NAT in the rectum.

Results/Outcome(s): A total of 596,430 patients were identified, 442 of which had ASC. The most common location of ASC was the rectum (N=150, 33.9%). Compared to adenocarcinoma, ASC of the colon was associated with older age at diagnosis (median 69 vs 64 years, P<0.001), larger tumor size (mean 6.52 vs 4.95 centimeters (cm), P<0.001), regional lymph node (LN) positivity (59.9% vs 37.8%, P<0.001), and poorly differentiated tumors (75.2% vs 20.8%, P<0.001). Of those with rectal cancer, age at diagnosis was not significantly different between the two histologies (median 62 vs 60 years, P=0.808), but a higher proportion of patients with ASC were female (48% vs 39.6% female, P=0.035). Similar to colon cancer, patients with ASC had larger tumors (median 5.55 vs 4.46 cm, P=0.012), more frequent regional LN involvement (56.4% vs 39.4%, P<0.001), and poorer differentiation (62.2% vs 13.9%, P<0.001). On multivariable analysis ASC histology was an independent predictor of worse OS for both colon (odds ratio (OR) 1.62, 95% confidence interval (CI) 1.20-2.18; P=0.002) and rectal (OR 1.46, CI 1.07-1.99; P=0.017) cancer. For patients with rectal cancer, treatment response after NAT (downstaging or complete pathologic response on final pathology) was not different between the two subtypes: PCR OR 1.01 (CI 0.54-1.90; P=0.964) and down-staged OR 1.77 (CI 0.78-4.01; P=0.169).

Conclusions/Discussion: Ours is the largest study on adenosquamous carcinoma of the colon and rectum to date. This subtype is associated with more aggressive features but is also independently predictive of worse overall survival when compared to the much more common adenocarcinoma histology on multivariable analysis. In the rectum, this finding does not appear to be related to poorer response to neoadjuvant therapy.

ADEQUATE TREATMENT OF LOCALLY ADVANCED RECTAL CANCER IN THE AGEING POPULATION: A NEW CHALLENGE. A POPULATION BASED STUDY.

P1678

L. de Nes[1], H. de Wilt[2], P. Vissers[3]
[1]*Amsterdam, Netherlands;* [2]*Nijmegen, Netherlands;* [3]*Utrecht, Netherlands*

Purpose/Background: Radical surgery often accompanied with neoadjuvant (chemo)radiation ((C)RT) or chemotherapy is therapy of choice in locally advanced rectal cancer. The best choice of treatment is challenging in the ageing population because of frequently concomitant comorbidity. We aimed to analyze differences in treatment, referral patterns and outcome between young people and elderly with locally advanced rectal cancer in the Netherlands.

Methods/Interventions: Population based data from hospitals in the south-west of the Netherlands between 2008 and 2016 were extracted from the Netherlands Cancer Registry. Association between age and treatment differences was analyzed using logistic regression. Kaplan-Meier and Cox- regression models were used to determine overall survival. Influence of volume of cT2-3N2 and cT4Nx tumor resections by hospitals was taken into account as well. Hospitals were divided according the amount of locally advanced rectal resections annually performed (≤4, 5-9, 10-19, ≥20).

Results/Outcome(s): In total 6524 patients were evaluated for analysis. Majority of patients was <70 years (64.2%) and median age was 66 years (22-95). Younger patients were more likely to undergo a resection (89.1% vs 70.9%, p<0.0001). Neoadjuvant CRT was administered in 52.9% of patients <70 years versus 29.8% in the group >70 years (p<0.0001). There was no difference in neoadjuvant RT treatment between both groups (31.4% vs 32.6%, p=0.35). Referral for resection to a higher volume center occurred more frequently in younger patients (22.5% vs 17.7%, p<0.0001). Also, in hospitals with a volume ≥20 patients received more often neoadjuvant treatment and had higher pT-stage. Multimorbidity was substantial higher in elderly (53.4% vs 24.7% (p<0.0001). On multivariate cox analysis age >70 years (HR 1.49 95% CI 1.15-1.94, p=0.03) and multimorbidity (HR 2.38 95% CI 1.91-2.97, p<0.0001) were associated with poorer survival. There was no significant difference in OS in relation to hospital volume for both age groups.

Conclusions/Discussion: Elderly patients with locally advanced rectal tumors received less intensive treatment and were less often referred to a higher volume hospital for surgery. Among older patients multimorbidity results more often in poor outcome.

A RECTAL CANCER MULTIDISCIPLINARY CLINIC—PATIENT QUALITY OF LIFE.

P1679

G. Nisly, T. Warczynski, E. Paredes, B. Safar, S. Gearhart, C. Atallah, J. Efron, S. Fang
Baltimore, MD

Purpose/Background: The National Accreditation Program for Rectal Cancer (NAPRC) sets the standard for a rectal cancer center of excellence through a multidisciplinary approach to cancer care. This study evaluates patient perceptions of rectal cancer and their quality of life

(QOL) while they are evaluated in a rectal cancer multidisciplinary clinic (RC MDC).

Methods/Interventions: This is a single site prospective study at an academic tertiary care referral institution that evaluates all adult patients in a RC MDC. A supportive care needs survey administered during these visits evaluated the following areas: psychologic, health system and information, physical and daily living, patient care and support, and sexuality. Differences in distribution of QOL symptoms and supportive care needs were assessed using Fisher's exact tests. Statistical significance level was set at p less than 0.05.

Results/Outcome(s): Thirty-one RC MDC patients completed the Supportive Care Needs Survey from November 2018-August 2019 with a 33% survey response rate. Sixty-five percent (N = 20) of these patients were male with an age range of 32-88 years. Eight percent (N = 2) of the RC MDC patients presented with stage I rectal cancer, 28% (N = 7) had stage II cancer, 56% (N = 14) had stage III cancer, and 8% (N = 2) had stage IV cancer. Of these patients, 26.7% (N = 8) had recurrent cancer. Eighty-seven percent (N = 27) of patients were accompanied by spouses, friends, and family. When administered the supportive care needs survey, the most common psychological symptoms patients experienced were anxiety (64.5%, N = 20/31), lack of energy/tiredness (66.7%, N = 20/30) and insomnia (58.0%, N = 18/31). The most common anxiety sources for patients and their families were due cancer prognosis, the prospect of chemotherapy, and the prospect of surgery. The patient's greatest fears were "concerns about the worries of those close to you" (90.3%, 28/31), "fears about the cancer returning" (83.3%, 25/30), and "uncertainty about the future" (80.6%, 25/31). Evaluating the health system, all of the patients ranked their greatest need as "being informed about the test results as soon as feasible." The patients also felt that it was important to "be informed about things you can do to help yourself to get well" (72.4%, 21/29). As the stage of rectal cancer increased, there was a statistical increase in sadness ($p = 0.048$) and frustration ($p = 0.010$) in patient social support. Patient anxiety level increased as stage of cancer increased ($p = 0.032$). Anxiety level for the prospect of surgery increased significantly with cancer stages II and III ($p = 0.001$).

Conclusions/Discussion: There is abundant literature that verifies that a RC MDC that follows standard guidelines set by NAPRC improves patient outcomes. It is also important to assess patient supportive care needs and QOL to improve upon the patient experience in rectal cancer treatment.

TREATMENT OF ANAL FISSURES REFRACTORY TO CONSERVATIVE MANAGEMENT: A DICHOTOMY AT TWO ACGME-ACCREDITED COLORECTAL SURGERY TRAINING PROGRAMS.

P1680

M. Audett
Edison, NJ

Purpose/Background: A lateral internal sphincterotomy (LIS) has consistently been the "gold standard" of therapy for anal fissure as it offers consistently high healing rates, but comes at the cost of fecal incontinence rates of anywhere from 8-30%. An alternative therapy for chronic fissures is botox injection (chemodenervation), which offers a lower healing rate but causes significantly less fecal incontinence. We hypothesized that despite the data suggesting the high efficacy of LIS, there would be a significant difference in the management of anal fissures

P1680 Trends in Surgical Options Over Time

	New Jersey	Swedish
2015 (07/01-12/31)	31	62
Chemodenervation	24	19
LIS	6	43
2016	63	104
Chemodenervation	60	11
LIS	3	93
2017	63	104
Chemodenervation	58	10
LIS	5	94
2018	94	107
Chemodenervation	82	17
LIS	12	90
Totals	250	377
Chemodenervation	224 (89.6%)	57 (15.1%)
LIS	26 (10.4%)	320 (84.9%)

refractory to conservative management amongst two different ACGME-accredited colorectal surgery training programs.

Methods/Interventions: A retrospective chart review was completed at multiple institutions. CPT and ICD codes were examined for patient encounters between July 1, 2015 and December 31, 2018. Exclusion criteria included any patient with inflammatory bowel disease or any immunosuppressed patients.

Results/Outcome(s): After exclusion criteria was met, 377 patients at Swedish and 250 patients in New Jersey (NJ) were examined. Over the course of the study, a total of 224 patients (89.6%) underwent chemodenervation in NJ and 26 patients (10.4%) underwent LIS. A total of 57 patients (15.1%) underwent chemodenervation at Swedish and 320 patients (84.8%) underwent LIS. There was no difference in terms of type of intervention undertaken at either site based on age or gender except that women who underwent chemodenervation in NJ were younger than those who underwent LIS (43 vs 48.9 years). There was no statistical difference in either group in terms of how patients with recurrent disease were managed. More patients who required another procedure had previously undergone chemodenervation (82.3% at Swedish and 60.3% in NJ). Whereas 71.4% of those patients underwent a subsequent LIS in Swedish, only 26.3% of those patients underwent a subsequent LIS in NJ.

Conclusions/Discussion: Each institution clearly showed a preference for a given operative intervention, and this was demonstrated at both at the initial operation and at any subsequent operations. While chemodeneravation has the benefit of less fecal incontinence, it has not been proven to have the efficacy of LIS. LIS clearly has not fallen out of favor and remains an option for patients with anal fissure recalcitrant to conservative management. It would be interesting to further extrapolate data from this group and follow patients longer term for evaluation of their fecal incontinence rates, as this is potentially a side effect that can take years to develop. Further areas to study could potentially also include how botox is being delivered in each group to determine if there is an ideal location or amount of botox to inject for maximum efficacy.

LONG-TTERM CLINICAL RESULTS WITH THE USE OF ANAL FISTULA PLUG FOR THE TREATMENT OF TRANSSPHINCTERIC ANAL FISTULAS.

P1681

Z. Wang, H. Jiagang, Y. Tao
Beijing, China

Purpose/Background: Anal fistula plug is a new method which using a biological substance to close anorectal fistula. It has advantages of simple operation, less postoperative pain and less damage to anal sphincter. However, long-term clinical efficacy of anal fistula plug remains to be proven. This study aims to asscess the long-term therapeutic effect in patients treated with anal fistula plug, and explore the risk factors impacting fistula healing.

Methods/Interventions: This was a retrospective analysis of a prospective database and was conducted at Beijing Chaoyang Hospital affiliated to Capital Medical Univercity, People's Republic of China. The study population comprised 207 patients treated between August 2009 to September 2012 for transsphincteric anal fistulas. Patients with transsphincteric anal fistulas were treated with anal fistula plugs. The main outcome measures were healing rate of anal fistula and the risk factors impacting anal fistula healing.

Results/Outcome(s): 207 patients with transsphincteric anal fistulas had anal fistula plug procedures, and 135 (65%) patients were followed up successfully. The overall healing rate was 56% (75/135), and the mean follow-up time was 8 years (range, 75-119 months). On multiple logistic regression analysis, the duration of fistula was significantly associated with fistula healing ($P < 0.05$). On condition that the duration of fistula is longer than 3 months, receiving the treatment of plug as early as possible is more conductive to anal fistula healing. Of the 66 patients with initial anal fistula plug failure, 6 (9%) had anal fistula healing spontaneously without receiving any other treatment after 2 or 3 years.

Conclusions/Discussion: As a minimally invasive procedure, anal fistula plug can effectively promote healing of transsphincteric anal fistulas, and the long-term efficacy of the treatment is worthy of recognition. So it is worth popularizing and applying on clinic.

FILAC™ FOR PERIANAL FISTULAS BY DOUBLE RING LASER PROBE FROM A SINGLE INSTITUTION.

P1682

J. Wu, Z. Wang, L. Jin, H. Yang
Shanghai, China

Purpose/Background: Perianal fistula is a difficult anorectal disease. Fistula recurrence and fecal incontinence after surgery are morbidities feared by surgeons. Many techniques for sphincter preservation such as LIFT procedure,Advancement flap and VAAFT have been used in an effort to overcome these problems. We aimed to investigate the efficacy and safety of the FiLaC™ method in treating perianal fistula in our study.

Methods/Interventions: 33 patients(32 males, 1 female)with type I and II fistula-in-ano according to the Parks classification who underwent FiLaC™ diode laser treatment between September 2017 and July 2019 were retrospectively analyzed for healing rate, postoperative morbidity (pain, bleeding, urinary retention, infection) and recurrence rate. FiLaC™, a 12-watt double ring laser

probe(Biolitec, Germany) with a wavelength of 1470 nm and a power of 100-120 joules/cm, was applied to the patients through the fistula under the general anesthesia. Suture Closure of internal opening by 3-0 Vicryl. Clinical trial no.ChiCTR-IOR-17012085.

Results/Outcome(s): The median age was 36 years(range 24-61years). Among these patients, 6 had inter-sphincteric fistulas, 27 had transsphinteric fistulas. The median energy consumption was 401.4 joules(range 204.7-759.5 joules)and laser release time was 40.7 S(range 17.8-85.8 S).Primary healing was observed in 23 patients (69.7%). The median follow-up time was 11 months (range 4-26 months). Postoperatively, 19 patients had wound pain, 26 patients had minor discharge and 3 patients had oozing from the wound. No patient had wound infection or urinary retention. 10 patients were early failures (persistent symptoms) and 2 patients relapsed. 14 patients had visual analog scale (VAS) score of 0 after surgery. The median VAS score of operating day was 2 (0, 6), 2 (0, 4) on post-operative day 1, 1 (0, 2) on postoperative day 3, and 0 (0,1) on postoperative day 5. No patient reported postoperative incontinence (Wexner score).

Conclusions/Discussion: The FiLaC™ procedure for anal fistula can preserve the sphincter, with mild postoperative pain and excellent satisfaction. It is a safe, effective and simple operation.

laser procedure for anal fistula

MUCOPEXY - RECTO ANAL LIFTING (MURAL): A PROMISING OPTION TO TREAT DIFFERENT ANORECTAL DISEASES?

P1683

C. Pagano[1], M. Venturi[2], M. Messina[2], G. Benegiamo[1], P. La Piana[1], C. Vergani[2]
[1]*Vizzolo Predabissi, Italy;* [2]*Milan, Italy*

Purpose/Background: In the last two decades transanal stapled surgery achieved good results in the treatment of various anorectal diseases, nevertheless a number of severe complications have been reported. The present study assessed the mid term results of a novel endorectal non-excisional technique in a large series of patients with symptomatic hemorrhoids, rectocele and complete rectal prolapse.

Methods/Interventions: From May 2013 to November 2019 patients were submitted to Mucopexy - Recto Anal Lifting (MuRAL), involving arterial ligation and a 6-column mucopexy by following a standardized procedure sequence. In patients with rectocele a modified Block suture was also performed at 12 o'clock position by involving mucosa and sub-mucosa. In patients with rectal prolapse each mucopexy column was completed with a 2-0 Prolene stitch. Operative time, hospital-stay, NRS, complications, ODS and satisfaction scores, and recurrence rate were recorded.

Results/Outcome(s): Five hundred eighteen (518) patients were treated in three goups: A) 440 with hemorrhoids grade III/IV, B) 66 with rectocele and internal rectal prolapse, and C) 12 with complete external rectal prolapse. In patients of Group A, B and C, respectively mean operative time was 23.0 minutes (range 13-45), 35.7 (14-70), and 39.5 (20-55), with P <0.01 by ANOVA; acute urinary retention was observed in 4.8%, 4.5% and 8.3% of patients (P=NS by Chi-Square); mean duration of hospital stay was 1.2 days (range 0-4), 1.9(0-6) and 2.7(0-8), P <0.01 by ANOVA. NSR score in the first week was <4.5, without significant differences between the groups. Two patients of Group A (0.5%) required re-hospitalization and transfusion for bleeding; mean time of daily activity resumption was 7 days (range 2-10), 12 (9-16) and 14 (8-18), with P< 0.01 by ANOVA; at one-year 89.5%, 81.8% and 66.6% of patients reported an excellent/good satisfaction score (P=NS by Chi-Square). Patients of Group B had significant improvement of 6 and 12-month ODS score (P <0.01 by Wilcoxon). Twenty-one patients of Group A (4.8%) showed a recurrence of one or more hemorrhoidal prolapsed column, no recurrence of rectocele and 6.1% of recurrent prolapsed hemorrhoids were observed among patients of Group B, one patients of Group C (8.3%) had a recurrent external rectal prolapse.

Conclusions/Discussion: MuRAL alone, or in association with modified Block procedure, seems to offer an attractive treatment option in patients with symptomatic hemorrhoids, rectocele and/or complete rectal prolapse

due to the minimal invasiveness of the procedure, absence of severe complications and an acceptable rate recurrence. Operative time, mean duration of hospital stay, mean time of daily activity resumption are longer in patients with rectocele, or rectal prolapse. In the event of recurrence a redo MuRAL can be easily performed. Further randomized studies are needed.

ECONOMIC IMPACT OF PERIANAL FISTULIZING CROHN'S DISEASE IN US ADMINISTRATIVE CLAIMS DATA.

P1684

G. Chen[1], S. Shrestha[3], L. Wang[3], S. Cazzetta[1], Q. Rana Khan[1], D. Schwartz[2], K. Null[1]
[1]*Deerfield, IL;* [2]*Nashville, TN;* [3]*Plano, TX*

Purpose/Background: Perianal fistula (PAF), a complication of Crohn's disease (CD), is considered an indicator of high disease severity and is associated with poor prognosis.[1] We aim to determine the US-specific estimates of cumulative prevalence of patients with PAF CD and examine the economic impact of the disease by comparing economic outcomes with matched non-PAF CD patients.

Methods/Interventions: This is a retrospective claims study of data from the IBM MarketScan Commercial and Medicare dataset from October 1, 2015, to September 30, 2018. Eligible patients were 18 to 89 years of age with ≥2 diagnoses of CD at least 30 days apart and had continuous health plan enrollment for ≥12 months pre-index (index date=first PAF diagnosis or procedure [PAF cohort]; the non-PAF cohort was assigned the same index date as the matched PAF CD patients based on birth year and sex first, then further matched on presence or lack of CD diagnosis during pre-index period, CD disease location, and duration of follow-up period) and ≥12 months post-index date. Descriptive analysis was used for all study variables. Healthcare resource use (HRU) and costs were compared among matched study cohorts (up to 1:4 case:control) and reported as per patient per month (PPPM). A generalized linear model (GLM) was used to adjust for covariates to estimate HRU and costs among matched cohorts.

Results/Outcome(s): The cumulative prevalence of PAF CD (n=81,862) was 7.7%, accounting for 0.01% of the US population over the 3-year study period. Economic impact was assessed in PAF CD (n=1,218; mean age 42 years; 52.4% male) and matched non-PAF CD patients (n=4,095; mean age 43 years; 50.9% male). Both unadjusted and GLM-adjusted values were consistent. Most all-cause HRU and costs in both cohorts were GI-related. The GLM adjusted percentages of PAF patients with at least 1 GI-related inpatient, outpatient, or pharmacy visit were 45.7% (mean length of stay in days PPPM=0.32), 99.9%, and 90.7%, respectively, compared to 12.4% (0.05), 96.5%, and 81.9% of non-PAF patients (p<.0001). Mean (PPPM) IBD-related surgeries in PAF and non-PAF patients were 0.12 and 0.005 (p<.0001), respectively. Mean (PPPM) total GI-related medical and pharmacy costs in PAF patients were $3762.45 and $2071.58, respectively, compared to $1188.78 and $1216.36 in non-PAF patients (p<.0001). These GLM results (Table) confirm the significant differences in HRU and costs between PAF CD and non-PAF CD patients.

Conclusions/Discussion: Our estimates of prevalence of PAF CD in the United States are consistent with previous reports.[1] When matched for age, sex, and potential predictors for CD severity, the overall HRU and costs are significantly higher for patients with PAF CD

P1684 GLM-Adjusted HRU and Cost Estimation for PAF CD or Matched Non-PAF CD Patients

Treatment*	PAF CD (N=1218)	Non-PAF CD† (N=4095)
GI-related HRU (mean patient %)		
≥1 inpatient visit	45.7	12.4
≥1 outpatient visit	99.9	96.5
≥1 pharmacy visit	90.7	81.9
Number of GI-related HRU PPPM		
Inpatient length of stay (in days)	0.32	0.05
Number of IBD-related surgeries	0.12	0.005
GI-related costs PPPM (US dollars)		
Pharmacy	2071.58	1216.36
Total medical (inpatient + outpatient)	3762.45	1188.78

Note: All p values <.0001.

*Covariates: Mean age, CCI (Charlson Comorbidity Index), liver disease, renal disease, COPD (chronic obstructive pulmonary disease), CD disease location.

†Non-PAF CD patients were matched to PAF CD patients by birth year, sex, presence or lack of CD diagnosis during pre-index period, CD disease location, and duration of follow-up period.

compared with non-PAF CD patients, highlighting the economic burden of the disease. **Reference** Schwartz, D. A., et al. (2019). *Inflamm Bowel Dis*. (11):1773-1779.

UTILIZATION OF BIOLOGIC EXTRACELLULAR MATRIX FOR TREATMENT OF PILONIDAL DISEASE.

P1685

S. Hota[1], S. Parascandola[2], M. Tampo[3], K. Cavallo[4], S. Boulos[4], V. Obias[4]
[1]Norfolk, VA; [2]Bethesda, MD; [3]Manila, Philippines; [4]Washington, DC

Purpose/Background: There is no consensus on the optimal treatment strategy for pilonidal disease. The goal of excision is to eliminate recurrence. Excision of involved tissue often leaves a large defect and the wound healing process can be lengthy. One option for expediting the process of healing an open wound is laying a biologic extracellular matrix (ECM). The matrix provides a scaffolding for granulation tissue and creates a healthy wound base. Theoretically, the use of the biologic ECM lowers the risk for wound infection and abscess recurrence.

Methods/Interventions: This study is a retrospective review of a single surgeon's experience with the use of biologic ECM in the treatment of pilonidal disease. Patients who had a pilonidal cystectomy using the modified Bascom technique between 2009 and 2019 were divided based on whether a biologic ECM was placed in the wound bed at the conclusion of the procedure. This yielded 35 patients who had the matrix placed and 47 patients who did not. Their peri- and post-operative outcomes including disease recurrence were compared and statistically analyzed with $p<0.05$ considered significant.

Results/Outcome(s): There were 82 patients included in this study who underwent a modified Bascom pilonidal cystectomy at a single institution with or without the use of a biologic ECM. There were no significant differences between the groups when considering smoking status, ASA scores, use of immunosuppressants, and history of recurrent pilonidal abscesses. There were no significant differences in the incidence of post-operative wound infections ($p=0.394$). The pilonidal recurrence rate was statistically similar between the groups at 1-year and overall ($p=1$ and $p=0.338$) respectively.

Conclusions/Discussion: The use of biologic extracellular matrix in the wound base following a pilonidal cystectomy did not have a significant impact on the rate of wound infections or recurrence in this study. Pilonidal cystectomy using the modified Bascom technique is equally efficacious in reducing recurrent pilonidal disease whether biologic ECM is placed in the wound bed or not.

A SURVEY OF CURRENT MEDICAL CHAPERONE USE BY US COLON AND RECTAL SURGEONS DURING OUTPATIENT CLINIC ANORECTAL EXAMS.

P1686

F. Dore, S. Hill, P. Sturrock, K. Alavi, J. Maykel, J. Davids
Worcester, MA

Purpose/Background: Medical chaperones may be used due to the private nature of anorectal examinations. This study sought to determine the frequency and reasons for chaperone use by board-certified colon and rectal surgeons in the United States.

Methods/Interventions: An anonymous online survey was approved by the ASCRS Executive Council and distributed via the ASCRS e-mail list as a convenience sample. The survey queried surgeon demographics, practice characteristics, factors impacting chaperone use and medical record documentation. Surgeon characteristics were compared using ANOVA and chi square. Multivariable logistic regression was used to determine predictors of chaperone use.

Results/Outcome(s): Of 1,380 e-mailed board-certified colon and rectal surgeons, 390 (28%) completed the survey. Median years in practice was 14 (IQR 7-25), and 73% were male. Work settings were primarily academic (38%), private (34%), and community (23%). Anorectal encounters comprised 70% of total practice volume (median; IQR 50-77%). Overall, 65% reported chaperone use ≥90% of the time regardless of patient sex, and 56% felt that chaperones for anorectal exams should be mandatory. Only 24% reported that their institution had a formal policy regarding chaperone use. Medico-legal purposes was the top cited motivation for use (64%), while chaperone availability (58%) was the most common limiting factor. When used, chaperone presence was specifically documented in the medical record by only 38%. Surgeon and patient gender impacted likelihood of chaperone use. For same-gender patients, 81% of male surgeons were "less likely" to use a chaperone versus 46% of females ($p<0.001$). For opposite-gender patients, 92% of male surgeons were "more likely" to use a chaperone versus 19% of female surgeons ($p<0.001$). "Almost always" use of chaperones during training was reported by 59%, and chaperone use during training was the only predictor of current chaperone use in a multivariable model.

Conclusions/Discussion: Chaperones are not consistently used for anorectal examinations by practicing US colon and rectal surgeons. Practice variations occur as a function of surgeon and patient gender, chaperone availability, and training models. At this time, the medicolegal implications of this variability remain uncertain.

Surgeon Characteristics	<90% Chaperone Use (n=134)	≥90% Chaperone Use (n=254)	p-value
Gender, n (%)			0.22
Male	103 (77%)	176 (71%)	
Female	31 (23%)	72 (29%)	
Years in practice, mean (SD)	17.4 (10.1)	15.8 (11.9)	0.18
Clinic volume, half-day, mean (SD)	13.3 (4.9)	13.8 (14.3)	0.73
Anorectal volume percentage, mean (SD)	64.5 (18.7)	64.7 (19.8)	0.96
Work setting, n (%)			0.92
Academic	48 (35%)	98 (39%)	
Community	34 (25%)	57 (23%)	
Private practice	45 (33%)	86 (34%)	
VA, military, other	6 (5%)	12 (5%)	
Chaperone use in training, n (%)			<0.001
≥90%	36 (26%)	194 (77%)	
50-89%	35 (26%)	34 (13%)	
10-49%	27 (20%)	12 (5%)	
≤9%	38 (28%)	12 (5%)	
Institutional policy, n (%)	28 (21%)	63 (25%)	0.30

For work setting, VA = Veterans Affairs hospital and those who responded other were either working at multi-specialty groups or in combined settings.

MANAGEMENT OF OBSTETRIC ANAL SPHINCTER INJURY: COLORECTAL SURGEONS PERSPECTIVE IN AUSTRALIA AND NEW ZEALAND.

P1687

D. Oh[2], T. Ncube[1], C. Wright[2], C. Young[2]
[1]Canberra, ACT, Australia; [2]Camperdown, NSW, Australia

Purpose/Background: Obstetric anal sphincter injuries (OASIS) are a significant complication of vaginal delivery. The aim was to explore the management of OASIS in Australia and New Zealand (ANZ) by colorectal surgeons, and whether current standards of care are being met.

Methods/Interventions: 300 colorectal surgeons of the Colorectal Surgical Society of ANZ (CSSANZ) were mailed questionnaires. Areas of interest included surgeon demographics, exposure to OASIS, understanding of recommendations, and opinions regarding the importance of various symptoms, factors and modalities of assessment in OASIS. Statistical analyses were performed via SPSS Statistics Version 23.

Results/Outcome(s): There were 94 completed questionnaires (response rate 31.3%). 84% of surgeons practiced in metropolitan centers while 16% practiced in rural centers. Most surgeons reported minimal exposure to OASIS during their fellowship training (60.6%). A vast majority of surgeons (91.4%) stated that they are not routinely called to manage 4th degree obstetric injury patients in the acute setting. However, 70.2% of surgeons reported that they routinely review women who have had OASIS. 61% reported that follow up of OASI patients in their center were with both colorectal surgeons and obstetrician and gynaecologists (OBGYN), while 31.9% reported that follow up was by OBGYN only. 56.4% were unaware if their OBGYN department followed a standard protocol for OASI management. Metropolitan-based surgeons reported higher rates of their OBGYN department following a protocol (p=0.013) and greater access to investigative tools (p<0.001), when compared to rural surgeons. Most surgeons (>90%) believed patients with grade 3 tears and above, particularly those who were symptomatic, should be referred for anal sphincter assessment. However, only 78.3% reported that they would refer women with asymptomatic grade 3c tears for assessment. Figure 1 summarises the surgeon-rated importance of various symptoms, factors and modalities of assessment in the management of OASI patients (Likert scale ranging from 1 or unimportant, to 5 or extremely important). Persistent fecal incontinence (mean score 4.92; σ=0.27), history taking (mean score 4.61; σ=0.75), and explaining the injury to the patient (mean score 4.57; σ=0.56) were the most important aspects to consider in OASI management.

Conclusions/Discussion: This study shows that most ANZ colorectal surgeons have had minimal OASI management training. Colorectal surgeons are more commonly involved in the follow-up assessment and care of OASIS patients post-partum than acutely. With high rates of incontinence associated with internal anal sphincter involvement, the role of sphincter assessment in grade 3c tears should be revisited. Management protocols involving a multidisciplinary team of both colorectal surgeons and OBGYN should be clearly defined, and the gap between management in metropolitan and rural centers needs to be reviewed.

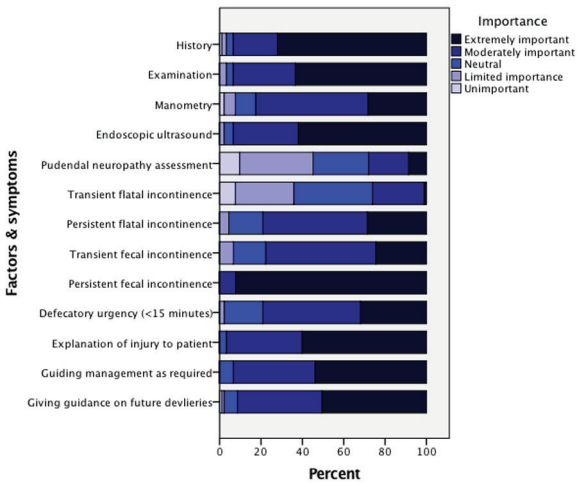


Figure 1. Surgeon-reported importance of various symptoms or factors in obstetric anal sphincter injury assessment and management

INITIAL EXPERIENCE WITH VIDEO-ASSISTED ANAL FISTULA TREATMENT IN THE PHILIPPINES.

P1688

M. Onglao, M. Lopez, H. Monroy
Manila, Philippines

Purpose/Background: Fistula-in-ano is one of the oldest, and most common, anorectal conditions. Despite continued research and development, fistulotomy still remains to be the gold standard of treatment in most cases; however, post-fistulotomy incontinence remains an issue. In 2006, Meinero introduced a minimally-invasive

sphincter sparing procedure--video-assisted anal fistula treatment (VAAFT). Initial studies on this method had promising results, with a success rate of 67 to 92 percent. Minimal complications were reported. In 2016, the Division of Colorectal Surgery at the Philippine General Hospital (PGH) obtained the VAAFT equipment (Karl Storz, Germany). At the time of this writing, the PGH remains to be the only institution in the country to have the equipment and experience in the conduct of VAAFT.

Methods/Interventions: All adult patients undergoing the VAAFT procedure (composed of a diagnostic phase as described by Meneiro et al, and an operative phase for control of the internal opening) at the Philippine General Hospital from 2016 to 2018 were included in the study. Baseline demographic and clinical data, fistula type (simple vs complex) and classification (using the Parks classification), and previous surgeries were retrieved from in-hospital and operative records. Operative time, identification of the internal opening, method of internal opening closure, and occurrence of immediate postoperative complications (e.g. bleeding, cellulitis, scrotal edema, urinary retention) were determined. The status of the fistula was assessed at 1-month, 3-months, and 6-months from operation based on their outpatient follow-up records. The primary outcome measured was healing rate and recurrence rate. Secondary outcomes measured were 30-day morbidity, post-op complications and incontinence using the Wexner score.

Results/Outcome(s): A total of 20 patients who underwent the VAAFT procedure were included in the study. 18 patients (90%) had a preoperative diagnosis of complex fistula, 13 patients (65%) had previous fistula surgery. Primary healing rate was 55 percent at 1 month, 63.16 percent at 3 months, and 78.95 percent at 6 months postoperatively. Eighteen patients (94.74%) maintained perfect continence (Wexner score = 0) at 6 months. Only 2 patients had minor complications after the procedure (i.e. chipped tooth on extubation, and adverse drug reaction to analgesics).

Conclusions/Discussion: Our study results suggest that VAAFT is a safe, minimally-invasive technique for the treatment of anal fistula that is able to preserve anal sphincter function. It has an acceptable healing rate, with minimal complications.

LIGATION OF THE INTERSPHINCTERIC FISTULA TRACT(LIFT) FOR HIGH TRANSSPHINCTERIC ANAL FISTULA: RETROSPECTIVE ANALYSIS OF TEN YEARS EXPERIENCE IN SINGLE INSTITUTION.

P1689

W. Shao
Nanjing, China

Purpose/Background: This study aims at evaluating the long-term outcomes of the ligation of intersphincteric fistula tract (LIFT)procedure to treat high transsphincteric anal fistula

Methods/Interventions: This was a retrospective review of ten years experience in single tertiary center where 60 patients with high transsphincteric anal fistula treated by the ligation of intersphincteric fistula tract (LIFT) technique from November, 2009 to September, 2019 with long-term follow-up.

Results/Outcome(s): 60 patients with high transsphincteric fistula were treated with ligation of the intersphincteric fistula tract(LIFT) procedure. The median follow-up was 85.5 months(1-120 months),4 patients (6.7%) were lost to follow-up. Of the 56 patients, there were 40 males and 16 females, with a median age of 33.5 years(18-60years). The primary healing rate was 40 out of 56 patients (71.4%).16 patients(28.6%) fail to heal, six of them converted to intersphincteric fistula, which were cured by simple fistulotomy and ten patients completely failed with the transsphincteric anal fistula persistence or recurrence during long-term follow up. Only 1 patient suffered a minor faecal incontinence with seepage.

Conclusions/Discussion: Ligation of the intersphincteric Fistula Tract(LIFT) appears to be an effective sphincter-preserving approach to the treatment of high transsphincteric anal fistula with minimal impact on continence.

ANAL DYSPLASIA AS AN INCIDENTAL FINDING: THE IMPORTANCE OF SPECIMEN EVALUATION.

P1690

S. Kavalukas, F. Yang, S. Wexner, J. Nogueras
Weston, FL

Purpose/Background: The incidence of anal squamous cell carcinoma (SCC) has increased and is currently reported at 8300 new cases per year in the USA. Anal epithelial neoplasia (AIN), particularly AIN 3, has been identified as a precursor lesion to SCC. While there have been studies on the prevalence of incidentally found SCC in hemorrhoidectomy specimens, there have been no studies to date on the incidence of AIN or any grade of dysplasia. The purpose of this study is to establish a baseline incidence of dysplasia that may provide helpful

information for future epidemiologic studies of SCC, as well as identifying any risk factors that could predispose to this condition.

Methods/Interventions: A retrospective chart review was performed for all patients who underwent hemorrhoidectomy from 2005-2019 at a tertiary colorectal referral center. Pathology regarding what type of dysplasia, medications, and diagnoses that may predispose to immunosuppression were collected. Additional information was gathered regarding surveillance exams and additional biopsies in patients with AIN.

Results/Outcome(s): 810 patients of a mean age of 51.7 (range 20-91) years underwent hemorrhoidectomy; 391(48%) were female and 419(52%) were male. 18(2.2%) of patients had abnormal pathology [low-grade squamous intraepithelial lesion (LSIL) =2, high-grade squamous intraepithelial lesion (HSIL) =1, AIN1=1, AIN2=2, AIN3=9, SCC=2, adenocarcinoma=1]. Nine of the 18 patients were male (average age 44.4 yrs) and 9 were female (average age 58.5 yrs). 37(4.5%) of the entire cohort had some risk factors for immunosuppression: chronic steroid use (9), HIV (13), biologic medications (6), transplant recipients (2) and immunocompromising diseases (4). Only 4 of the 18 AIN patients had an immunosuppression risk in that all 4 of these patients were HIV positive. Unfortunately in only 2 of the 419 male patients had a sexual history been documented, including male having sex with male (MSM) population. Surveillance following excision was undertaken for an average of 6 (range 1 to 12) months, during which time 4 patients underwent repeat biopsy. In only 1 of these 4 patients was persistent AIN3 identified.

Conclusions/Discussion: Anal dysplasia found in an otherwise asymptomatic population has a prevalence of 2.2%, which may be important when considering the rising incidence of anal squamous cell cancer. This finding supports the routine examination of benign anorectal specimens undergoing microscopic examination. Interestingly, the majority of the patients identified had no immunosuppressant risk factors. However a major limitation of this study was the lack of documentation of sexual history. Better documentation is needed to help guide future investigation and clinical management.

SUPRAANAL ANODERM PRESERVING HEMORRHOIDECTOMY.

P1691

F. Pakravan, E. Karakas, C. Spyrou
Krefeld, Germany

Purpose/Background: Although a variety of operative procedures exist for the treatment of hemorrhoidal disease, e.g. Stapled Hemorrhoidopexy, transanal open Hemorrhoidopexy, occasionally symptomatichemorrhoidal cushions persist with anoderm protrusion.in these cases, we propose a new technique of supraanal anoderm preserving Hemorrhoidectomy.

Methods/Interventions: From Oct2018 to Oct2019, 21 patients (12 males,9 females, aged 52+_15 years were seen, 12 afterstapled Hemorrhoidopexy and nine following transanal open Hemorrhoidopex after a mean follow up of 1.6+_ 0.8years Operative technique: With the patient in the lithotomy position, a wedged submucosal hemorrhoidal excision is performed through transverse incisions 0.5 cm proximal to the dentate line. The resultant defect is closed with a continuous absorbable suture. No cautery is used. The procedure is done on an outpatient basis.

Results/Outcome(s): 15 patients had no complications, 4 had thrombosis external hemorrhoids and two had partial suture line dehiscence which were treated conservatively At last follow up no patient complained of any symptoms such as bleeding or protrusion. (do you want to state the average follow up period)

Conclusions/Discussion: The proposed operation is safe, effective and requires no costly instruments. It is performed quickly and under direct vision. The favorable results of Supraanal Anoderm preserving Hemorrhoidectomy are quite encouraging and warrants further investigation.

PATTERNS OF HEALING, FAILURE OR RECURRENCE BY THREE-DIMENSIONAL ANORECTAL ULTRASONOGRAPHY FOR ASSESSMENT OF ANAL FISTULA BEFORE AND AFTER THE LIFT PROCEDURE.

P1692

S. Murad-Regadas, J. Mendonça Filho, L. Borges, A. Vilarinho, L. Veras, F. Regadas Filho, M. Macedo, F. Nogueira
Fortaleza, Brazil

Purpose/Background: LIFT procedure is performed by many surgeons. However, there isn`t any image study describing the postoperative results. So, this study aims to classify and quantify preoperatively the length of sphincter muscle to be transected using LIFT technique for treatment of anal fistula and describe the patterns of healing, failure and recurrence rate by three-dimensional anorectal ultrasonography(3D-US).

Methods/Interventions: Patients with crypto-glandular fistula underwent a LIFT procedure. It was included clinical characteristics, Cleveland Clinic Fecal Incontinence score(CCFIS), 3D-US images before and after surgery and the results. The 3D-US defined the patterns after LIFT procedure: healing(fibrosis in the intersphincteric space and in the previous position of the tract; failure(defined as nonhealing of the surgical wound in the intersphincteric and/or extrasphincteric space as a cavity with no internal opening found, or persistent anal fistula through the original external opening or intersphincteric) and recurrence(reappearance of the anal fistula).

Results/Outcome(s): A total of 54 patients were submitted to LIFT procedure, mean age 36±11.8(range, 17-62y); 51 with transsphincteric fistula and 3 supra-sphincteric. Of them 32(59%) were female. The median percentage of the anterior external anal sphincter(EAS) and the posterior EAS-PR compromised by the tract was 65%(range 33-100%) and 57(range 40-100%) respectively. The 3D-US revealed a primary healing rate in 38(70.4%), 12(22.2%) with failures(3 transsphincteric fistulas, one intersphincteric fistula, 5 with a cavity in the extrasphincteric space and 2 in the intersphincteric) and 4(7.4%) with recurrence(3 transsphincteric and one intersphincteric fistulas)Table. Of the 12 failed patients, 7(13%) cases were enabled clinical treatment with local application of albocresil. A total of 45(83.4%) patients had healing in a median time of 8(range, 5–29)weeks due to delayed closure in 6 cases. The median time to recurrence was 26(range, 20–33) weeks. Three intersphincteric fistulas were treated by fistulotomy and in 6 with transsphincteric fistulas, 3 were treated by re-LIFT combined with fistulotomy and 3 with only re-LIFT. One of them had a failure with persistent intersphincteric fistula, treated by fistulotomy. The 3D-US revealed defect of internal anal sphincter in 7(4 treated by fistulotomy and 3 re-LIFT combined with fistulotomy). Of them, minor postoperative fecal incontinence symptoms were identified in 2 patients, with CCFIS between 0-4.

Conclusions/Discussion: The 3D-US was shown to be useful in the preoperative assessment of fistulas by quantifying the percentage of muscle to be transected, follow up after treatment identified the healing tissue and the type of failure or recurrence, contributing to the adequate choice of anal fistula management.

TRANSANAL MINIMALLY INVASIVE SURGERY (TAMIS) FOR TREATMENT OF RECTAL ANASTOMOTIC STENOSIS AFTER COLORECTAL CANCER SURGERY.

P1693

W. Zhou, G. Cao, Z. Song
Hangzhou, China

Purpose/Background: Anastomotic stenosis is a relatively common complication after colorectal cancer surgery with anastomosis. The reason for anastomosis stenosis includes postoperative anastomosis leakage, radiotherapy, inappropriate stapling and proximal colon ischemia. Digital or instrumental dilatation and endoscopic balloon dilatation are currently major treatments of such stenosis. However, the recurrence of these procedures is high even with repeated dilatations. Recently, there were some case reports mentioned using transanal minimally invasive surgery (TAMIS) was a novel application to treat anastomotic stenosis after rectal cancer surgery. Here, we report our institutional experience of TAMIS approach for anastomotic stenosis treatment.

Methods/Interventions: This is a single institutional retrospective analysis. Eligible patients with rectal anastomotic stenosis after colorectal surgery were admitted to Sir Run Run Shaw Hospital (SRRSH) between September 2017 and June 2019. After evaluated anastomotic stenosis by colonoscopy or trans anal gastrointestinal radiography. Patients underwent TAMIS radial incision and cutting. The postoperative complications, stenosis recurrence, and stoma closure conditions were evaluated.

Results/Outcome(s): Nine patients, aged 52-80 years old (mean=67.6), underwent TAMIS for anastomotic stenosis. All patients have colorectal cancer history with end to end anastomosis. The average distance from the anal verge was range from 5-12cm (mean=7.9 cm). Eight

P1692 Three-dimensional anorectal ultrasonography finding before and after LIFT procedure for assessment of anal fistula. EAS- external anal sphincter / EAS-PR- external anal sphincter plus puborrectalis muscles

	Female	Male
Ultrasound finding Before and after Surgery N=54 (100%)	32 (59%)	22 (41%)
Anterior / posterior tract position	29 / 3	12 / 10
Percentage of anterior EAS to be compromised by the tract median (range)	70% (40-100%)	58% (33-100%)
Percentage of posterior EAS-PR compromised by the tract median (range)	60% (40-65%)	57% (50-100%)
Primary healing N = 38 (70.4%)	23 (42.6%)	15 (27.8%)
Failures (total) N=12 (22.2%)	07 (13%)	05 (9.2%)
Cavity in the extrasphincteric space N=5 (9%)	02 (3.7%)	03 (5.6%)
cavity in the intersphincteric space N=2 (2%)	01 (1.9%)	01 (1.9%)
Transsphincteric fistula N= 3 (5.6%)	03 (5.6%)	00
Intersphincteric fistula N= (3.7%)	01(1.9%)	01(1.9%)
Recurrence (total) N= 4 (7.4%)	02 (3.7%)	02 (4%)
transsphincteric fistula N=3 (5.6%)	02(3.7%)	01 (2%)
Intersphincteric fistula N= 1 (1.9%)	00	01(2%)

of nine (89%) patients successfully performed TAMIS radial incision and cutting. The average operation time was 50 minutes. The mean diameter of the stenosis was 0.31. Four patients have completely obstructed rectal lumens. There was no morbidity or mortality observed during the perioperative period. Only one patient received transverse colostomy one month after TAMIS because of proximal colon ischemia. Eight patients have protective loop ileostomy in the primary colorectal cancer surgery. After TAMIS treatment, stoma closure was performed in seven of eight (88%) patients. No stenosis recurrence or obstruction was observed in follow up (3-25 months).

Conclusions/Discussion: TAMIS provides a superior operative field, dimension and instrument, it is a safe and effective treatment for rectal anastomotic stenosis, especially suited for severe fibrotic stenosis or completely obstructions.

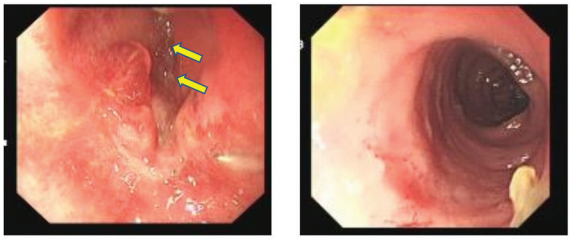


Figure 1. Colonoscopy image showing the anastomotic stenosis after colorectal cancer surgery(Left)and three months after TAMIS procedure(Right)

A NEW NON-INVASIVE METHOD FOR COLORECTAL CANCER DETECTION: THE BREATH BIOPSY.

NT1

D. Altomare, A. Picciariello, N. De Vietro, A. Aresta, M. Rotelli, P. Trerotoli, L. Vincenti, M. DeFazio, C. Zambonin
Bari, Italy

Purpose/Background: An effective colorectal cancer (CRC) screening can reduce mortality by early detection of cancers and colonic polyps. Occult blood detection in the feces by FOBT/FIT has a very low patients' compliance and unsatisfactory specificity. An altered Volatile Organic Compounds (VOCs) pattern in the exhaled breath has been recently reported to be a potential noninvasive diagnostic tool for cancer detection. This study aims to evaluate the reliability of a breath test **(breath biopsy)** for CRC screening and early diagnosis using a new breath sampler.

Methods/Interventions: the breath of 83 CRC patients (mean age 69,7, 51,8% males) with histologically proven adenocarcinoma of the colon and rectum, of any stage and of 90 healthy controls (mean age 58,8, 51,8% males) with negative colonoscopy performed <24 months before the study was collected using the ReCIVA Breath Sampler© (Owlstone Medical, UK). This new portable device is able to capture different volumes of the exhaled breath fraction using infrared CO_2 sensors when respiratory rate is between 15-25 breath pm. Five hundred mL of the breath alveolar fraction, without environmental contaminations, was gathered in sorbent tubes retaining C4-C30 compounds. The VOCs were thermally desorbed within 24 hours and analysed in a gas chromatography-mass spectrometer. The discriminatory ability of VOCs in detecting CRC patients, was evaluated by a ROC analysis for each single VOC followed by cross-validation through a leave-one-out method, and applying a stepwise logistic regression analysis.

Results/Outcome(s): The two groups were well matched for sex and comorbidities but significantly different for mean age. Out of 38 VOCs identified, 8 VOCS [Methyl-Benzene (10.88±0.08 min as retention time), Ethyl-Benzene (13.04±0.03), octanal (16.07±0.06), benzoic acid (20.58±0.08), 1,3 bis(1-methylethenyl) benzene (21.39±0.09), unidentified compound (22.75±0.04) and Tetradecane (23.16±0.05)] were found to have a significant discriminatory ability in detecting CRC patients.. The statistical model testing cancer versus no-cancer using the 8 discriminant VOCs and age of the patients resulted statistically significant (likelihood 151.03, p<0.0001), the R-square was 0.59 and the AUC of the model was 0.963 **(fig 1)**. The cross-validation of the model resulted in 88% correct true positive classification, 89.5% true negative and the predictive value was 89%.

Conclusions/Discussion: Early detection of colorectal cancer remains challenging. However, our study demonstrated that the analysis of exhaled VOCs can effectively discriminate CRC patients from healthy volunteers with high reliability. In fact, a pattern of 8 exhaled VOCs, when combined with the age (>65y) was demonstrated to have a reassuring predictive value of 89%. This finding can help to set-up an online, smart and inexpensive sensory device, able to give a digital answer (cancer/NO cancer) in order to proceed or not with further investigations such as a colonoscopy.

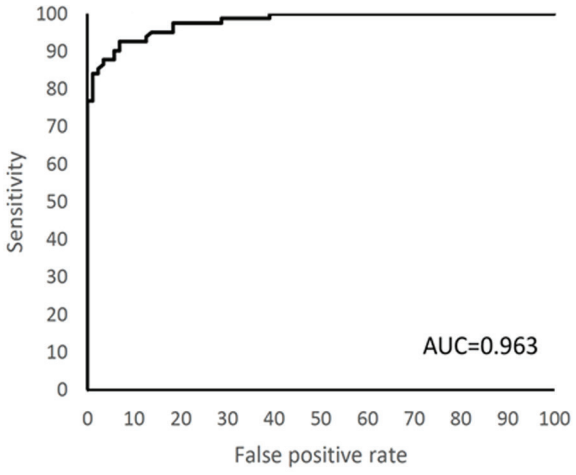


Figure 1 : ROC curve analysis , likelihood 151.03, p<0.0001, AUC 0.983

Figure 1

PROSPECTIVE EARLY PHASE CLINICAL TRIAL FOR ASSESSING THE FEASIBILITY AND EFFICACY OF ICG-COATED ENDOSCOPIC CLIPS FOR TUMOR LOCALIZATION IN LAPAROSCOPIC COLORECTAL SURGERY.

NT2

D. Sohn, D. Lee, K. Han, C. Hong, H. Park, J. Oh
Goyang, Korea (the Republic of)

Purpose/Background: In minimally invasive surgery, accurate tumor localization is important. The purpose of this study was to evaluate the feasibility and efficacy of ICG-coated endoscopic clips for tumor localization in laparoscopic colorectal surgery.

Methods/Interventions: Thirty patients who received minimally invasive colorectal surgery for colorectal cancer were enrolled. Patients were included if it was necessary to mark the location of colorectal lesions prior to surgery. The following cases were excluded: the endoscope was not passed through bowel obstruction or the lesion was located in the distal rectum palpated by digital rectal examination. Endoscopic clipping was performed within 2 days prior to surgery. During the colonoscopy procedure, ICG-coated endoscopic clips were applied at 120 degrees, 3 points, just distal to the primary lesion. The primary endpoint was localization success rate (clip visibility). Visibility was defined based on identifying at least one ICG-coated clip

using an ICG camera system during minimally invasive surgery. The secondary outcomes included the clip detachment rate and the procedure-related complication. The study protocol was approved by the institutional review board and the Korean FDA. This research is registered in ClinicalTrials.gov (NCT03924349).

Results/Outcome(s): A total of 30 consecutive patients were confirmed to be eligible for the study. After 3 patients were excluded due to equipment availability and treatment plan changes, 27 patients (24 laparoscopic surgeries, 3 robot-assisted laparoscopic surgeries) were included in the final analysis. The 27 patients included 11 men and 16 women with a median age of 60 (range, 40–77) years. Lesions are located in the ascending colon (n = 3), transverse colon (n = 2), sigmoid colon (n = 17), rectosigmoid colon (n = 3) and rectum (n = 2). Of the 27 cases, 22 cases were successfully visualized intraoperatively with ICG-coated clips (success rate = 81.5%). There were no cases of pre-operative clip detachment, and all three clips were confirmed on surgical specimens in all patients. There were no cases of procedure-related complications.

Conclusions/Discussion: Application of ICG-coated endoscopic clips is feasible and is a promising method for tumor localization in laparoscopic colorectal surgery.

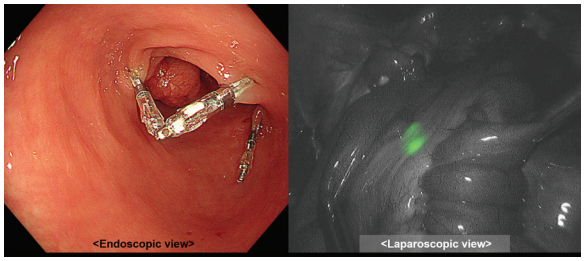


Figure. Endoscopic and laparoscopic views of ICG-coated clips

THREE-DIMENSIONAL MODELING WITH VIRTUAL REALITY AS A TOOL FOR PRE-OPERATIVE PLANNING IN COLORECTAL SURGERY.

NT3

L. McKean[1], D. Samaha[1], M. Stillwell[2], R. Tupler[2], K. Sarkar[2], C. Whitlow[1]
[1]*New Orleans, LA;* [2]*Jefferson, LA*

Purpose/Background: In the past decades research exploring the role of 3-D printing and Virtual reality in medicine has been growing exponentially. This has been utilized in enhancing training, tissue designing and lately even with production of biological tissue. In the world of Colorectal Surgery with its complex Pelvic Floor anatomy this has been used to recreate patient-specific 3D anatomical models to enhance the understanding of complex pelvic anatomical structures and its relationships in Rectal Cancer as well as with complicated Perirectal Fistulas all shown to improve preoperative surgical planning and patient education.

Methods/Interventions: Subjects were recruited by chart review and surgeon request. Magnetic resonance (MR) of the pelvis with contrast was obtained and de-identified in a standard process in conjunction with the Ochsner Radiology Department. 3D Slicer, an open-source software, was used to segment DICOM data and create a 3D stereolithography (STL) object. Physicians viewed STLs in Virtual Reality using an internally developed application and commercially available head-mounted displays (HMDs).

Results/Outcome(s): Models guarantee an enhanced understanding of the anatomical structures and are found useful during preoperative planning for both complex perirectal fistulas specifically with Crohn's disease as well as for Rectal Cancer. Other areas that we are currently exploring are in creating models to assist with Sacral Nerve Stimulator implantation making pre operative reconstructions of the Sacrum, in addition to patient customized models to help patients and families understand their specific conditions increasing emphasis on personalized medicine.

Conclusions/Discussion: Three dimensional modeling is an innovative tool that provides direct visualization of the anatomy, helps enhance understanding of complex anatomical structures and spatial relationships overcoming the limitations of more traditional 2-Dimensional materials with the result of improving preoperative planning. Cost, quality and length of time to obtain the models can be one of the main limits of 3D printing, but Virtual Reality eliminates the time and cost of production of 3D printed models making it accessible to a higher number of patients.

REDUCED READMISSION FOR DEHYDRATION IN PATIENTS USING A "SMART" OSTOMY BAG AND PEER COACHING PROGRAM.

NT4

Q. Yowell[3], R. Fearn[1], S. Mehta[3], M. Sampson[2], S. Eisenstein[2]
[1]*London, United Kingdom;* [2]*San Diego, CA;* [3]*Irvine, CA*

Purpose/Background: Ostomates are vulnerable to complications during the postoperative period and dehydration is the single largest cause for readmission. Novel remote monitoring technology using a "smart" stoma bag can provide patients and their clinical team with real-time data on stoma functioning, which may promote early detection or prevention of complications. Lifestyle changes associated with an ostomy can also significantly impact ostomates' psychological health and social functioning. We aimed to evaluate whether adoption of new medical technology can be facilitated by a peer coaching program in a sample of post-operative ostomy patients and the impact on readmission.

Methods/Interventions: Patients undergoing ostomy surgery (n=27) were recruited to join the study and paired with a Patient Coach, all of whom have personal experience with a stoma. Patient Coaches provided post-operative support with ostomy-related education, psychosocial adjustment, technical troubleshooting, and coordinating care with the patient's clinical team. Patient Coaches communicated with the patient via text or phone and recorded notes about patient interactions on a secure database. Patients were contacted by their Coach on a regular basis and the frequency of interactions was determined by the patient. Adverse outcomes reported to the Coach were analyzed to determine readmission or complication rates.

Results/Outcome(s): All 27 patients engaged in the Patient Coach program. The mean duration of coaching was 104 days (range 3-282). For patients that continued to utilize the remote monitoring technology throughout their Patient Coaching journey (12), those that transmitted over 50 hours of data had on average more interactions with their coach per week (M 2.70, SEM 0.17) than patients that transmitted between 1 – 49 hours of data (M 1.73, SEM 0.35). Patients that discontinued use of the technology during the study had on average fewer total interactions with their Patient Coach (M 39, range 2-50) than those who continued use (M 78, range 17–117). Patient Coaches provided support for technology utilization, issues of physical or psychosocial health and supply of stoma care products. 30-day outcomes were available for 18 patients and two admissions were recorded (17%), both for intestinal obstruction.

Conclusions/Discussion: The frequency of Patient Coach interactions suggests that participants found the peer coaching support to be a useful resource during their postoperative journey. Peer coaches' ability to help patients navigate new technology and facilitate behavior change may make them valuable partners to mHealth interventions. The readmission rate is lower than that historically reported and no cases of dehydration occured providing a strong indication of benefit. Future studies utilizing this technology will incorporate patient reported outcome measures to further quantify the benefit.

MINIATURE ROBOTIC CADAVERIC COLECTOMY USING A NOVEL SINGLE PORT MIRA ROBOTIC PLATFORM.

NT5

D. Oleynikov, S. Farritor
Omaha, NE

Purpose/Background: Robotic colorectal surgery has been synonymous with intuitive surgical for the past 20 years. A number of newer systems are in various stages of development, but most are also large externally powered robotic platforms. In this video we demonstrate the use of a miniature robotic platform developed by Virtual Incision Corporation (Lincoln, NE) in a cadaveric model

Methods/Interventions: A 2 pound miniature robotic platform was developed to perform single incision colectomy and has been used in animal and cadaver preclinical studies. This video demonstrates steps to a cadaveric left colectomy using the novel miniature robotic system.

Results/Outcome(s): After insertion the robotic system is easily docked to a fixed external holding arm and is shown in this video to perform modified left colon resection with creation of an extra corporeal anastomosis. A total of 24 cadavers have been used to perfect the technique and to assure safety and feasibility for FDA IDE trial. Average time on the consul was 35 minutes with completion of the mobilization and take down of both the IMA and IMV pedicle using bipolar and cautery shown in the video.

Conclusions/Discussion: Miniature robotic single port colon and surgery is feasible with this novel platform in a cadaveric model. The consul times are comparable to standard Minimally Invasive approaches. Complete mobilization of the colon is possible without significant technical challenges.

CAN THE GASTROINTESTINAL ACTIVITY BE ASSESSED OBJECTIVELY?

NT6

A. Unal, A. Rencuzogullari, C. Cengizler, O. Yalav, M. Güven, I. Eray
Adana, Turkey

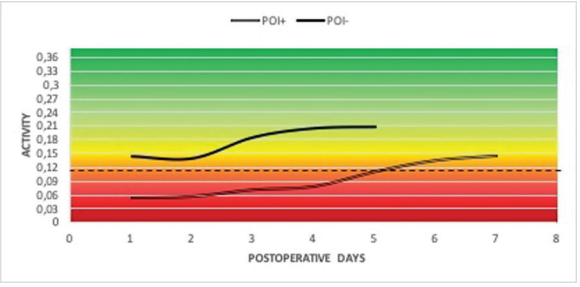
Purpose/Background: Postoperative ileus;is unpredictable, prolongs hospital stay and increases the cost."Gastrointestinal Activity Monitoring Device"(GAMD) has been developed to estimate postoperative ileus, to decide objectively appropriate time and manner for feeding of patients. With this device, it was aimed to determine in which patients progressed of postoperative ileus and to be used as an objective parameter to change daily surgical practice in the postoperative period.

Methods/Interventions: This study includes a progressive experimental research method using GAMD developed in cooperation with the General Surgery and Biomedical Engineering Department at Cukurova University. This study has three stages. Firstly, to obtain gastrointestinal activity sound, a calibrated instrumentation amplifier and acoustic equipment were suitably designed by the Department of Biomedical Engineering. Gastrointestinal activity was recorded acoustically and digitized sounds were analyzed using sound software. Secondly, to evaluate the gastrointestinal activity, three study groups were identified as the postoperative ileus group(POI+), no-ileus group(POI-) after the colorectal resection surgery and the control group(CG) who have never undergone surgery before. GAMD has been used to record the daily bowel activity on CG, POI+ and POI- over the age of 18 years

for 10 minutes during 5-7 days. Finally, to examined the statistical relationships between activity ratios and the patient's clinical findings(oral intake, gas/stool removal times, etc.)the numbers and ratios of activity were determined for each study group.

Results/Outcome(s): The distribution of 52 individuals in CG, POI+, POI- are 20, 12, 20, respectively. The mean intestinal activity of the groups was determined as 0.20act/s, 0.14act/s and 0.08act/s for CG, POI- and POI+ groups, respectively. There was a significant difference in activity among the groups (p<0,01). The threshold value(0.12 act/sec) was determined in terms of the number of healthy and postoperative patients. Oral intake of patients with activity above the threshold was allowed. POI- group was found to increase the mean number of activities and tolerated oral intake as postoperative days progressed (p<0,05). In the POI+ group, it was found to tolerate oral intake at 3±0.9 days postoperatively and patients above the threshold were found to tolerate oral intake according to listening results. There was no correlation between the presence of intestinal activity and the first gas-stool output(p>0.05).

Conclusions/Discussion: Since there is no standard approach for monitoring postoperative intestinal motility, GAMD may represent a clinically accessible approach to monitoring noninvasive aggregation of intestinal function. Considering that gastrointestinal motilitiy, acquired through GAMD, is unrelated to the commonly used clinical variables consisting of first gas/stool output, incorporating the GAMD outcomes may improve postoperative decision-making process with respect to the oral feeding and decrease POI.



POI- and POI+ patients' activity intensity scale showing the average number of activities

BEST : AN INNOVATIVE MINIMALLY INVASIVE SPHINCTER SAVING SURGERY FOR HIGHLY COMPLEX FISTULA IN ANO.

NT7

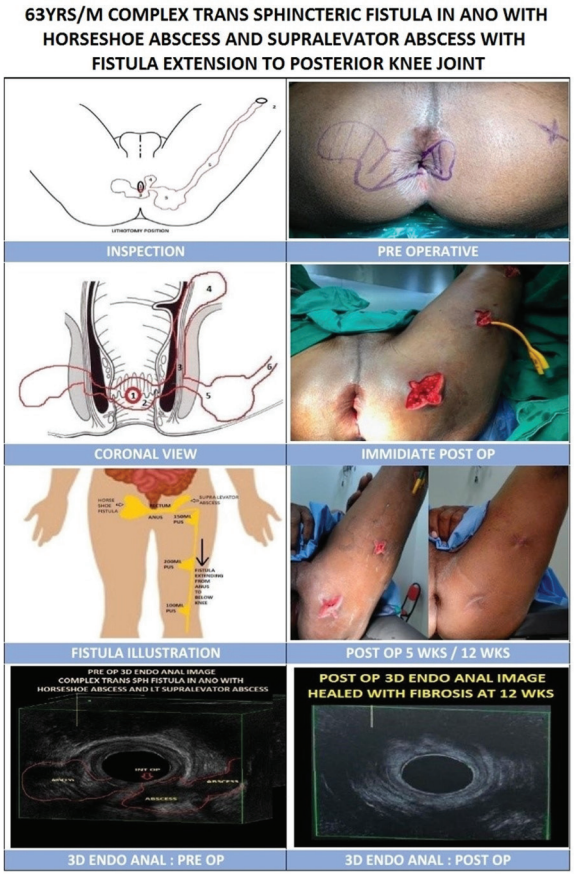
A. Porwal
Pune, India

Purpose/Background: Recurrence & Incontinence is the biggest challenge in treating complex fistulas. Hence there is need of innovative technique with less post operative complications, no risk of recurrence and incontinence. BEST- Balloon Expansion & Separation Technique is an innovative, sphincter saving procedure. The device will be further explained in the presentation. Foleys catheter was used to replace the BEST device in this pilot study. It was kept in such a way that it allowed efficient drainage and debridement in first 3 weeks of weekly follow up.

Methods/Interventions: A prospective study with purposive sampling was planned. After Ethical committee approval, patients with complex fistula were enrolled, assessed and treated wiith BEST. Internal opening & Intershincteric space is debrided using diode laser 200 to 300 J of energy. The entire length of the fistula tract is debrided. Foleys Catheter balloon is placed in the Intersphincteric space and the balloon is inflated by 2-3ml saline in such a way that it helps in closure of the Internal opening and efficient drainage. All surgeries were performed Under the guidance of 3D Endo Anal Imaging. Anal Manometry was done before surgery and 3months post surgery for all patients. 3D endo imaging was repeated at 3Months after surgery for all patients.

Results/Outcome(s): Fifty three patients were enrolled. Mean age was 43.66 years; range (29-67). Male female ratio was 47:6. The mean follow up was 9 month (6 - 12 months). Types of Fistula were, horseshoe 84%, recurrent in 76%, multiple tracts 64%, anterior fistula 36%, supralevator extension 56%, associated with Crohn's 2%, ulcerative colitis 2%. The success rate was 98.11% (49). 6% (3) underwent EUA Between 3-4 weeks but got cured by 12weeks. Recurrence rate was 1.88% (1) who underwent repeat BEST at 4months and got cured at 6month. Neglible pain without Incontinence and outcome significantly improved the quality of life of all highly complex fistula patients.

Conclusions/Discussion: The BEST is an innovative novel procedure to cure highly complex fistula in ano. It is sphincter saving, easy to understand and comfortable for patients. It is not only aiming to the internal or external opening or multiple tracts or abscess cavities, but taking great care to the removal of intersphincteric pathology which causes recurrence. Partial fistulectomy wound gives passage to clean the intersphincteric plane from lateral aspect and the destruction of the internal opening and wedge shaped wound helps cleaning the same plane from medial aspect. Abscess cavities and tracts extending to the deep anal space will be taken care by the Balloon by draining the inner and deepest cavity in initial post operative period and avoiding early and false closure of the cavity. When the drainage purpose of the balloon is achieved, cavities starts healing faster without closure of superficial tracts. Curettage of debris and granulation layer allows healing and filling up the cavity.



Horse Shoe Supralevator Fistula with extension upto knee joint cured by BEST

NATURAL ORIFICE TRANSANAL ENDOSCOPIC RECTOPEXY: A NOVEL OPTION FOR PROCIDENTIA.

NT8

A. Chandra, P. Rajan, N. Kumar, A. Dangi, S. Kumar, S. Rungta, V. Gupta, P. Joshi
Lucknow, India

Purpose/Background: We describe a novel technique - Transanal endoscopic rectopexy as a new endoluminal treatment for complete rectal prolapse.

Methods/Interventions: This technique involves A) Ventral suture rectopexy done through the anus using percutaneous trans-fascial sutures fixing the anterior wall of prolapsed rectum to the undersurface of anterior abdominal wall endoscopically, and B) Posterior fixation of the rectum by creating a submucosal tunnel in the rectal wall 5cm below sacral promontory and tack fixation of the rectal muscle through this submucosal tunnel to the underlying sacral promontory. Entire procedure is done endoluminally under fluoroscopic and endoscopic guidance.

Results/Outcome(s): A total of 25 consecutive patients (16 males and 9 females) with a mean age of 46.4± 16.46 (21 – 80) years, having a Body Mass Index<28 kg/m^2 with complete rectal prolapse underwent the procedure. Last 13 patients in whom this modified approach was used have been included for analysis. Duration of the symptoms ranged from 1 month to 35 years. All the patients are under follow up till date (range 1 – 16 months). Nine patients had constipation and four patients reported incontinence before the procedure. There was significant improvement in both constipation and incontinence postoperatively. All patients had improvement in manometric pressures (resting and squeeze pressures) after the procedure. On dynamic Magnetic Resonance Defecography imaging, a significant decrease in anorectal descent was observed in all patients. Patients also experienced a significant improvement in their quality of life indices, reflected in their personal interviews. Two patients developed postoperative low grade fever, one within 24 hours and one after 5 days which responded to conservative measures. Two patients had partial recurrence, one in fifth post operative day and another after 3 months, for which subsequent endoscopic ventral fixation was done at a lower level.

Conclusions/Discussion: This is a new endoluminal treatment for fixing complete rectal prolapse without the use of an artificial mesh, avoiding laparoscopic incisions or scars. It not only corrects the anatomical prolapse but also improves associated symptoms of constipation and incontinence. The procedure avoids peri-rectal dissection, which obviates the risk of autonomic nerve injury. Larger randomized multicentric studies with longer follow up are warranted to further validate this new technique.

USE OF A NOVEL ARTICULATING GRASPER WITH ADVANCED ENDOLUMINAL SURGICAL PLATFORM FOR COLORECTAL POLYP ESD: PRECLINICAL TRIAL.

NT9

S. Urakawa, K. Momose, Y. Kono, J. Milsom
New York, NY

Purpose/Background: Complex colorectal polypectomy e.g. endoscopic submucosal dissection (ESD) is a challenging technique with high complication rate and long learning curve. Likely related, more than 25,000 colectomies for benign conditions are performed each year in the United States. To overcome the challenges of endoscopic complex polypectomy, we have evaluated a unique endoluminal surgical platform (Dilumen C2.1, Lumendi Ltd, Westport CT USA) using an endoluminal interventional grasper (Ig, Lumendi) which is designed for this platform in a preclinical model.

Methods/Interventions: Endoscopic double balloon oversheath with two additional channels (Dilumen C2.1) and flexible articulating grasper (Ig) were cleared by the Food and Drug Administration. Using an ex vivo experimental 3D model with porcine colon, we created a 4 cm pseudopolyp at the ascending colon posterior wall. With an Olympus pediatric colonoscope equipped with Dilumen

C2.1, we used Ig and endoscopic ESD knife (Dual knife, Olympus) to remove the pseudopolyp with a 5 mm margin, following the navigation to the Cecum. Nine operators participated in this study: 5 operators, as GI physicians, had significant experience with human ESD, not with our endoluminal surgical platform, the other 4 operators, as GI surgeons, had significant experience with this platform, not with human ESD. We evaluated procedure time (e.g. navigation time, grasping time, dissection time, total procedure time), the number of grasping and complications (e.g. muscle layer damage), comparing C2.1 ESD group to standard ESD group (using only conventional colonoscope and ESD knife) and GI physicians to surgeons. As standard ESD group, the data of ESD of 3 cm pseudopolyp at the same position were used.

Results/Outcome(s): A total of 24 procedures were performed, all completed (16 in C2.1 ESD group and 8 in standard ESD group). Mean total procedure time was 43.8 and 57.4 min, respectively in C2.1 and standard ESD group. Especially, dissection time was much shorter in C2.1 ESD group (25.8 vs 43.8, $p=0.08$). Mean grasping time was 2.3 minutes and mean number of grasping was about 2. C2.1 ESD group had less number of shallow muscle layer damage (0.3 vs 3.4, $p=0.002$) **(Table)**. In addition, mean dissection time (21.1 vs 30.4 min, $p=0.02$) and total procedure time (39.1 vs 48.5 min, $p=0.03$) were shorter in GI doctors, compared to surgeons **(Table)**.

Conclusions/Discussion: Both GI physicians and surgeons can use a new endoluminal surgical platform to remove large polyps more quickly than using a standard method, even with a larger "polyp". This provides a grasper, an innovation moving towards achieving an endoluminal "surgical platform," which in turn may lead to lower colectomy rates for benign diseases.

ROBOTIC TOTAL INTRACORPOREAL PROCTECTOMY WITH ILEOANAL J-POUCH ANASTOMOSIS.

NT10

E. Haas, R. Saracho, B. Dimas, J. LeFave
Houston, TX

Purpose/Background: Minimally invasive procecures have been performed for creation of ileoanal J pouch. These procedures typically require advanved laparoscopic skills to overcome the barriers of pelvic surgery. The robotic platform helps overcome many of these limitations by affording access and exposure. We introduce a variation in which the entire procedure is accomplished using intracorporeal technique by utilizing the rectum as a natural orifice.

Methods/Interventions: Completion proctectomy with formation of ileoanal J pouch anastomosis was performed as a second-staged procedure for ulcerative colitis. We used the robotic XI platform and accomplished many of the key steps utilizing the rectum as a natural orifice. We present video representing these key steps in a sequential fashion. The procedure was initiated with a 5 mm accessor port placed in the right upper quadrant followed by an 8 mm umbilical port and 2 eight mm left quadrant ports. Once the ileostomy was released, an additonal 8 mm port was placed through the ileostomy site. The steps of the procedure are presented.

NT9

Comparison between C2.1 and Standard ESD	C2.1 ESD Group (N=16)	Standard ESD Group (N=8)	P
Navigation Time (min)	3.7 ± 1.9	N/A	N/A
Size (mm)	52.4 ± 2.6	41.4 ± 1.7	<0.0001
Grasping Time (min)	2.3 ± 1.2	N/A	N/A
Number of Grasping	1.8 ± 1.5	N/A	N/A
Dissection Time (min)	25.8 ± 8.1	43.8 ± 28.2	0.08
Total Procedure Time (min)	43.8 ± 10.0	57.4 ± 29.9	0.36
Number of Muscle Injuries	0.3 ±0.6	3.4 ± 3.4	0.0014
Comparison between GI Physicians and Surgeons	Physicians Group (N=8)	Surgeons Group (N=8)	P
Navigation Time (min)	3.8 ± 2.1	3.7 ± 1.9	1.00
Size (mm)	51.9 ± 1.8	53.0 ± 3.2	0.59
Grasping Time (min)	2.4 ± 1.0	2.9 ± 1.4	0.40
Number of Grasping	1.0 ± 0.76	2.6 ± 1.7	0.05
Dissection Time (min)	21.1 ± 6.1	30.4 ± 7.	0.02
Total Procedure Time (min)	39.1 ± 8.1	48.5 ± 9.8	0.03
Number of Muscle Injuries	0.1 ± 0.4	0.4 ± 0.7	0.49

Results/Outcome(s): Our patient successfully underwent a robotic total intracorporeal proctectomy with ileoanal J pouch formation. The steps of the procedure are represented through video. All key steps were accomplished using intracorporeal techniques including proctectomy, creation of the J pouch and formation of the ileoanal J pouch anastomosis. The rectum was utilized as a natual orifice for delivery of the linear stapler to help accomplish many of these steps and was also used to extract the specimen.

Conclusions/Discussion: We present the first reported J pouch procedure in which all steps were successfully achieved usuing robotic intracorporeal techniques. This procedure is a less invasive option than conventional techniques and takes advantage of the rectum as a natural orifice to provide direct access and exposre for J pouch creation.

INITIAL CLINICAL EXPERIENCE OF ROBOTIC LOW ANTERIOR RESECTION WITH DA VINCI SP PLATFORM.

NT11

G. Noh, M. Han, S. Chung, R. Lee, K. Kim
Seoul, Korea (the Republic of)

Purpose/Background: Single-incision laparoscopic surgery has gained popularity because it causes less postoperative pain with better patient recovery and superior cosmetic effect for colorectal disease. However, this technique is challenging due to its restriction in the triangulation and retraction. The da Vinci SP surgical system (dVSP) was recently introduced to overcome these limitations. The purpose of report was to introduce our experience with the first case of robotic low anterior resection for rectal cancer using dVSP.

Methods/Interventions: A 56-year-old male with rectal cancer underwent robotic low anterior resection with the dVSP and the medical records and surgical movie clip were reviewed retrospectively.

Results/Outcome(s): All procedures were completed using a single-incision approach with an additional port for laparoscopic stapler access. Operative time was 300 minutes and estimated blood loss was 50.0 ml. There was no intra-operative complication. The patient recovered without any complication and was discharged to home at postoperative day 9.

Conclusions/Discussion: The dVSP is feasible and safe to perform robotic low anterior resection. It can maximize cosmetic effect with maintaining surgical principle of low anterior resection. Further accumulation of data might confirm the validity of this surgical platform.