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**Lateral Subcutaneous Internal Anal
Sphincterotomy for Anal Fissure***

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AN ANAL FISSURE is an ulcer of the anal canal which may extend from the anal verge to the dentate line. It is usually exquisitely painful, so the best treatment is that which is the most expedient but also provides negligible recurrence and minimal disability of anal function. Lateral subcutaneous internal anal sphincterotomy best fulfills these criteria and we strongly recommend it as the primary operation for anal fissure.

Technique

Using caudal or local anesthesia, with the patient in the prone jack-knife position, the perianal region is prepared. The fissure is assessed by inspection and palpation. Spe-

cial note is taken of any large sentinel tag or hypertrophied anal papilla, as they will be dealt with also. An intersphincteric abscess underlying the fissure is a contraindication to the operation and, if present, a dorsal sphincterotomy is done.¹¹ This is not common.

An anal retractor is inserted. The lower edge of the internal sphincter becomes easily palpable as a prominent band and is also often visible. The left lateral region is infiltrated with 1 per cent lidocaine (Xylocaine) with epinephrine, 1:100,000, in both the submucosal and intersphincteric planes up to the level of the dentate line (Fig. 1A and B). A 2-cm radial incision is made in the perianal skin overlying the internal sphincter (Fig. 1C). The pearly-white lower border of the internal sphincter is readily identified after a few fibers of corrugator cutis ani are divided. The submucosal and intersphincteric planes are developed (Fig. 1D). The sphincter is then divided with

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scissors up to the level of the dentate line (Fig. 1E and F). Hemostasis is secured and the wound closed with two or three catgut sutures (Fig. 1G).

If any large sentinel tag or hypertrophied anal papilla is present, it is also excised.

The patient remains in the hospital until the first stool is passed and then goes home with a prescription for an oral bulk stool softener. He is reviewed in the office in one week. No special anal care is necessary.

Clinical Material

Twenty-one patients have undergone a lateral sphincterotomy since July 1972 at Ochsner Foundation Hospital. There were 12 male and nine female patients. Their ages ranged from 20 to 68 years. The fissure was situated posteriorly in 17, anteriorly in three, and both anteriorly and posteriorly in the remaining patient. As well, large hemorrhoids were present in three, sentinel tags in nine, and hypertrophied anal papillae in six of the patients, respectively.

Lateral sphincterotomy alone was performed in seven with excision of a papilla and/or tag in eleven and with closed hemorrhoidectomy in the remaining three.

Results

The prone jack-knife position with caudal or local anesthesia was found to provide suitable conditions for easy performance of the sphincterotomy.

All of the patients noticed relief of pain immediately after the effect of the anesthesia had worn off, although a third had some persisting perianal discomfort. All patients commented on the relative ease and much reduced discomfort of the first post-operative stool.

All fissures healed without stenosis within four weeks, some as early as 14 days. So far, all patients have been cured by the operation and no fissure or fissure-like

symptoms have recurred, although the follow-up period has been short.

The only complication to date has been a case of cellulitis of the perianal wound that quickly subsided with the administration of ampicillin.

Pathogenesis of Anal Fissure

The cause of anal fissure is not completely known. Broadly, there are two fundamental theories. The first considers that trauma to the anal canal results in a tear of the mucosa and that local factors prevent healing of the fissure. The second considers the primary problem to be infection in the anal glands and crypts which gives rise to a chronically draining sinus.

The traumatic tear of the anal canal usually follows a hard stool, but other factors, such as straining on a prolapsed hemorrhoid, purgation from diarrhea, or even trauma from an enema tip, may be present. The tear is initially superficial, with longitudinally running fibers in the base. These tears frequently heal, especially if the stools are soft and straining is avoided.

The usual site of the fissure is midline posteriorly, which is said to be due to the lack of support of this region due to the configuration of the external sphincter muscle and also to the angulation of the anal canal to the rectum resulting in the impingement of the leading edge of the stool on the posterior margin first.⁸ The rarity of lateral fissures even after anal operations inflicting lateral wounds (*e.g.*, hemorrhoidectomy) suggests that lateral tears readily heal. Most likely the posterior position is the least well-drained area of the anal canal and, with pocketing, a chronically infected, poorly drained abscess develops in the fissure.¹³ The hypertrophied anal papilla and the sentinel tag develop as a result of this inflammation.

What place the internal sphincter plays in the pathogenesis of fissure remains con-

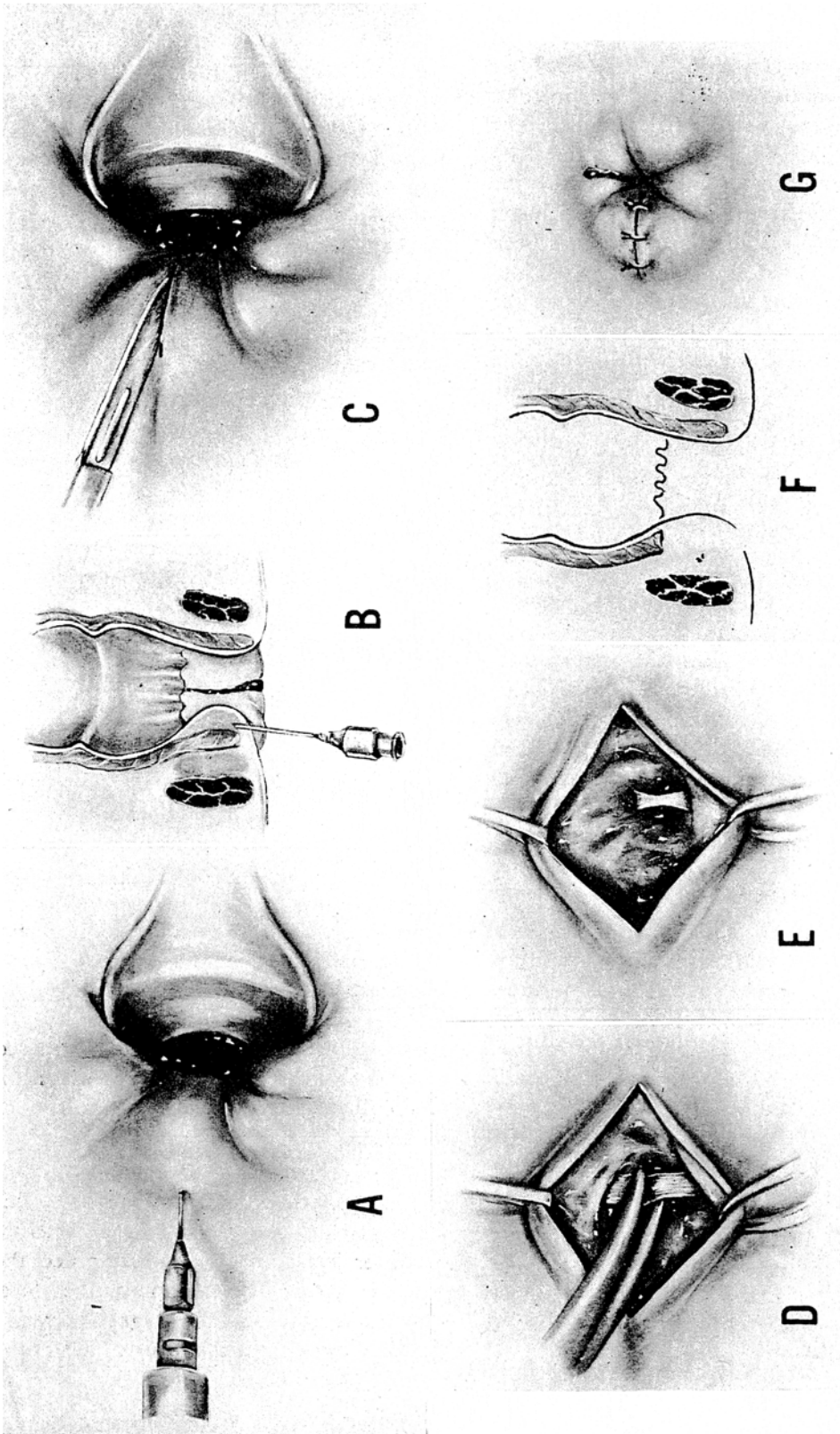


FIG. 1. Technique of lateral subcutaneous internal anal sphincterotomy for anal fissure.

troversial. Surgeons felt that this tight sphincter was the subcutaneous part of the external sphincter until the true anatomy was demonstrated by Eisenhammer² in 1951. Miles¹⁶ referred to this tight band as the "pecten," but it is now clear that the "pecten" is the fibrosed lower border of the internal sphincter.⁶ The internal sphincter resists digital dilatation, and this has been interpreted as spasm. This spasm is considered to prevent adequate drainage of the infected anal ulcer and hence predispose to chronicity. It is also thought that the spasm is responsible for the pain. This explanation was not confirmed by measurement of anal canal pressures⁸ and more probably stimulation of the fissure, e.g., passage of a stool or introduction of the examining finger, triggers contraction of the external sphincter.²⁰

In summary, the initial mucosal tear is traumatic. The passage of stool is delayed from fear of exacerbating the anal discomfort, resulting in a larger and harder stool which, when eventually passed, further tears the fissure. The site and the spasm of the sphincters from the slightest stimulus prevent adequate drainage of the infected wound, leading to chronicity with fibrosis of the underlying tissues, including the internal sphincter.

Anal abscesses (in the anal glands) with the development of anal fistulas are not uncommon accompaniments of anal fissures. However, it is probable that the infection of the anal fissure bed spreads to the anal glands, perhaps by obstruction of the ostia of the ducts rather than the other way around, as the infection theory of anal fissure would have us believe. Further support for the secondary infection of the anal gland is the histologic appearance of fissurectomy specimens, reported in 1967.²¹ Although many anal glands were identified underlying the fissure in the specimens, none was inflamed.

Establishment of Lateral Sphincterotomy

Eisenhammer,² in 1951, was the first to recommend internal anal sphincterotomy as the treatment of anal fissure. He performed an intra-anal division of the lower four fifths of the internal sphincter and left the wound open. He preferred the lateral or posterolateral position for the sphincterotomy. By 1959, he³ had reduced the extent of the sphincterotomy performed to the lower half of the sphincter, that is, up to the level of the dentate line.

Following his correct identification of the internal sphincter in the base of the fissure (and not the subcutaneous external sphincter as previously thought, it became apparent that many previously reported anal incisions and sphincterotomy operations were indeed internal anal sphincterotomies. Miles¹⁶ gives credit to Boyer as the first person (in 1818) to recommend sphincterotomy for anal fissure. Hardy¹⁰ believes that the anal incision operation reported by Dupuytren in 1833 was also an internal sphincterotomy. Goodsall⁷ championed open anal sphincterotomy through either the fissure base or posterolaterally, saying "it almost invariably cured the fissure." In the United States, Martin,¹⁴ in 1923, suggested submucous sphincterotomy by "plunging a knife through an iodized area of skin well posterior to the anus." To say the least, his ideas were not well received by the profession at that time. All the above operations were originally considered to be *external* sphincterotomies, but in all probability they were really internal sphincterotomies.

Miles¹⁶ advocated "pectenotomy" after digitally everting the anus. He knew his division was not through the external sphincter but through what he called the "pecten band." He performed the "pectenotomy" through the right posterior quadrant away from the fissure. He¹⁶ noted

TABLE 1. Summary of Results of Lateral Subcutaneous Internal Anal Sphincterotomy in the Treatment of Anal Fissure

Reference	No. Patients	Average Days in Hospital	Fissure Healing Time (Weeks)	Per Cent Cured	Minor Defects of Anal Control			
					Mucus	(No. Patients) Flatus	Feces	None
Hawley, 1969 ¹¹	24	5	3	100	0	0	0	24
Hoffman and Goligher, 1970 ⁹	99	Outpatient	<4	97	7	6	1	87
Notaras, 1971 ¹⁹	73	—	3	100	4	2	1	66
Miller, 1971 ¹⁷	99	Outpatient	80% <2	100	2	2	1	96

that the pecten is "recognized by its pearly white appearance." We now know that this pearly-white structure is the lower border of the internal sphincter.

Goligher *et al.*,⁶ in a detailed study of the anal musculature, confirmed Eisenhammer's findings. Following this, sphincterotomy was popularized under its correct title in Britain, although most surgeons also considered fissurectomy as described by Gabriel⁴ an essential step in the procedure. Hughes¹² shortened the long hospital stay by applying a skin graft to the wound. The sphincterotomy at this time was usually performed through the fissure, and enthusiastic reports followed its use as an outpatient procedure.¹³ However, minor defects in anal function postoperatively were noted in significant numbers, probably due to the "keyhole" deformity produced.^{4, 10, 13} These anal function defects caused some surgeons to prefer simple anal stretching as the primary procedure despite less certainty of curing the fissure.⁵

The first suggestion appearing in the literature of a lateral subcutaneous internal sphincterotomy for anal fissure was made by Parks²⁰ in 1967. He used a left circumferential perianal incision and divided the sphincter under vision. The skin wound was closed primarily. He noted less postoperative pain and fewer problems with anal function compared with dorsal sphinc-

terotomy. A further modification, attributed to Notaras,¹⁸ is the blind lateral subcutaneous anal sphincterotomy using a tenotomy knife and leaving virtually no anal wound. Following these preliminary reports, several papers attesting to the superiority of lateral subcutaneous internal sphincterotomy over previous procedures have appeared (Table 1).

Discussion

Our early experience with this operation concurs with the results from Britain, where it has proved superior in more rapid relief of anal pain, shorter hospital stay, shorter fissure healing time, lower recurrence rate, and fewer disabilities of anal function postoperatively.

It is essential to have accurate knowledge of anal anatomy for this operation, and for this reason we have favored the open identification of the sphincter prior to division. Notaras¹⁹ suggested that the open perianal operation may predispose to more postoperative hematomas, although we have not found this to be true, and neither did Hawley.¹¹ Miller¹⁷ reported six hematomas in 99 operations using the blind sphincterotomy technique, but others⁹ using the same technique did not have any.

Wound infection has been reported before, although the incidence was only 1 to 2 per cent.^{9, 17}

We have practiced concomitant hemorrhoidectomy when prolapsing hemorrhoids were present. This seems wise, as strangulated hemorrhoids following lateral sphincterotomy in the early postoperative period have been reported several times.^{9, 17, 19}

It is of interest that in a review of a very large number of surgically treated anal fissure cases, Mazier¹⁵ was unable to identify the best procedure. However, he had a very diverse group of patients treated by a large number of different operations or different combinations of procedures in each operation, so that identifying the most beneficial procedure was nearly impossible.

The rapid relief of pain, the few complications, and the lack of need for special anal care make this operation attractive as an office procedure, and it is of interest that in two^{9, 17} of the reports to date, it was carried out as an outpatient procedure in Britain.

The "momentary" nature of blind sphincterotomy has obvious attractions over the open operation, and this has been stressed by others.^{9, 19} Possibly as experience in the sphincterotomy increases we may also change to this procedure.

Summary

Lateral subcutaneous internal anal sphincterotomy is recommended as the primary operation for anal fissure. The technique of the procedure is presented and results in 21 patients are reviewed.

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