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The Use of Transanal Rectal Advancement Flaps in the Management of Fistulas Involving the Anorectum

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Between 1981 and 1986, transanal rectal advancement flaps were employed in the surgical management of 39 anorectal fistulas at the Cleveland Clinic. Included were 23 low rectovaginal, 12 fistulas-in-ano and, four rectourethral fistulas. Nineteen fistulas occurred in patients with Crohn's disease while the other 20 included 11 due to obstetric or surgical injury. This technique has become the Clinic's standard management for low rectovaginal fistulas but is reserved for complex fistulas-in-ano. Active proctitis or malignancy are contraindications to the procedure. Surgery requires elevation of a broad-based rectal flap, curettage of the tract, and advancement and primary suture of the flap over the internal opening. Fistulas were eradicated in 27 cases (69.2 percent) including 11 of 19 due to Crohn's disease (57.9 percent) and 16 of the 20 (80.0 percent) from other causes (mean follow-up, 25 months). Rectovaginal fistulas healed in 60.0 percent of those with Crohn's disease compared with 76.9 percent of those due to other causes. Complex fistulas-in-ano in Crohn's disease did less well. Only two of six of these fistulas healed. Temporary stomal diversion was used on nine occasions and a successful outcome was achieved in only four, indicative of the greater complexity of these cases. It is concluded that the transanal rectal advancement flap can be an effective method of repair for fistulas of the anorectal region including selected cases due to Crohn's disease. [Key words: Anorectal fistula; Crohn's disease; Rectal advancement flap]

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DESPITE THE WEALTH of material written about fistulas involving the anorectum, most are relatively simply managed by standard surgical procedures. However, a proportion, including complex fistulas-in-ano and rectovaginal and rectourethral fistulas, demand alternative surgical techniques for a successful outcome. One such method of repair is the transanal rectal advancement flap that has been used at The Cleveland Clinic Foundation since 1981.

With the patient in the prone position, a transanal approach is used to raise a partial-thickness rectal wall flap off the underlying tissues. The flap is then advanced distally and sutured over the anorectal opening of the fistula. The surgery is simple, does not disturb the sphincter mechanism, and usually is performed without a diverting stoma.

The technique was first described in 1902¹ and a modified form of the procedure was presented by Laird in 1948.² The latter is the technique more closely followed in several recent reports of repair for low rectovaginal,³⁻⁵ anorectal,⁶ and rectourethral fistulas.⁷ Occasional reports of the successful use of this repair for fistulas occurring in patients with Crohn's disease^{3,8} have appeared. These reports have encouraged the Clinic to extend the use of this procedure to such cases. This series of 39 fistula repairs includes 19 in selected patients with Crohn's disease.

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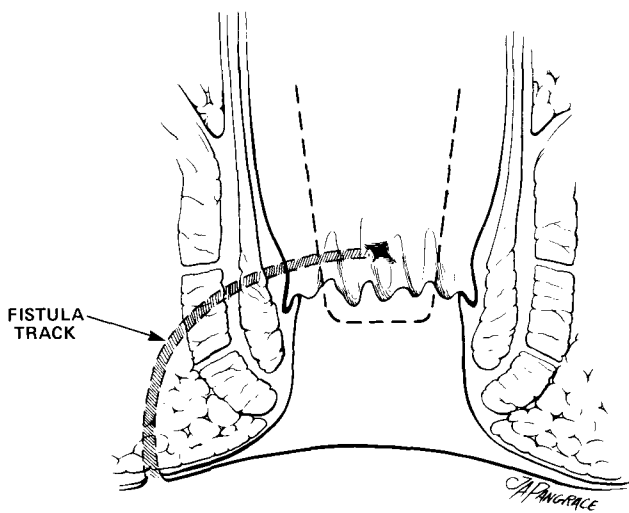


FIG. 1. Anorectum indicating site of anterior rectal advancement flap.

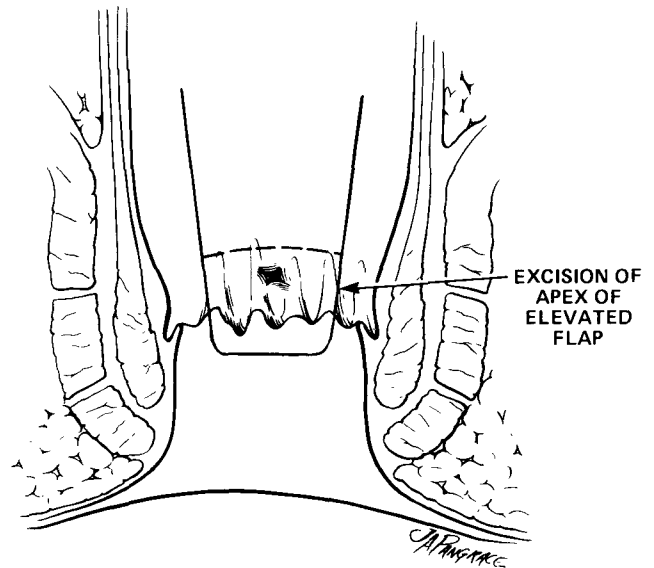


FIG. 2. Rectal advancement flap raised, apex of flap incorporating fistula orifice to be excised.

Technique and Management

Patients with rectovaginal, anorectal, and rectourethral fistulas require careful preoperative assessment. The exact anatomy of the lesion is determined by examination, under anesthesia where necessary, supplemented by other procedures such as cystourethroscopy in the case of rectourethral fistulas. Frequently the etiology is obvious, being clearly related to a difficult delivery or trauma from an episiotomy. In these cases, the anorectal sphincters must also be assessed for injury. The most common cause of these fistulas in this series was Crohn's disease, usually documented for some time before the appearance of the fistula, but occasionally the fistula will be the presenting symptom. In any case, these patients require thorough assessment of the alimentary tract for active disease elsewhere or macroscopic evidence of proctitis, as these are contraindications to performing transanal repair.

Stomal diversion is usually unnecessary, but preoperative mechanical bowel preparation and antibiotic prophylaxis with metronidazole and a second generation cephalosporin are required. Postoperatively, bowel activity may be limited by constipating drugs or a low residue diet.

Descriptions of the technique of transanal rectal advancement flap repair for rectovaginal fistulas have appeared elsewhere.^{3,4} The prone or Kraske position gives the optimum exposure to the anterior rectal wall. Further access is provided by gentle anal dilatation and anal retractors. Anteriorly, the submucosa of the rectal wall is infiltrated with 1:200,000 epinephrine; a broad-based rectal flap, consisting of mucosa, submucosa, and a part of the circular muscle fibers, is elevated in a cephalad direction for an average of 4 cm (Fig. 1). The apex of the

flap incorporates the rectal opening of the fistula and projects beyond this to include healthy tissue distal to the fistula orifice. This portion of the flap is then excised (Figs. 2 and 3). Tracts into the vagina or perineal skin are debrided or excised and the remaining circular muscle fibers are closed over the tract with interrupted absorbable sutures. The vaginal opening of a rectovaginal fistula is usually left open for drainage, but a small mushroom-tipped catheter is often inserted into the external opening of a fistula-in-ano. In the case of a rectourethral fistula, this debridement of the tract into the urethra is not advisable. Finally, the flap is advanced over the site of the tract and anchored in place with several absorbable sutures, usually 00 polyglactin (Fig. 4).

Patients and Methods

Between January 1981 and July 1986, 39 patients with fistulas were managed by transanal rectal advancement flap repair. A retrospective study of these cases was undertaken and follow-up data obtained.

There were 29 women and ten men in the group and their mean age at the time of diagnosis was 38.7 years. This series was comprised of 23 rectovaginal fistulas, 12 fistulas-in-ano, and four rectourethral fistulas. The etiology for each is recorded in Table 1. It is noteworthy that 19 of these fistulas were associated with Crohn's disease that met the standard diagnostic criteria of the disease.⁹

Of the 23 rectovaginal fistulas, the majority were classified as low fistulas, located at or near the dentate line. Two fistulas were located at the level of the anorectal ring and one was located in the rectum at the site of a low colorectal anastomosis performed after external beam

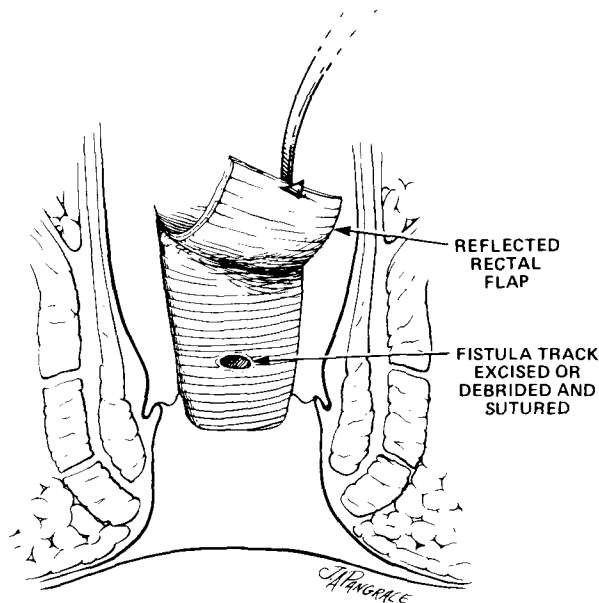


FIG. 3. Flap reflected demonstrating underlying fistula.

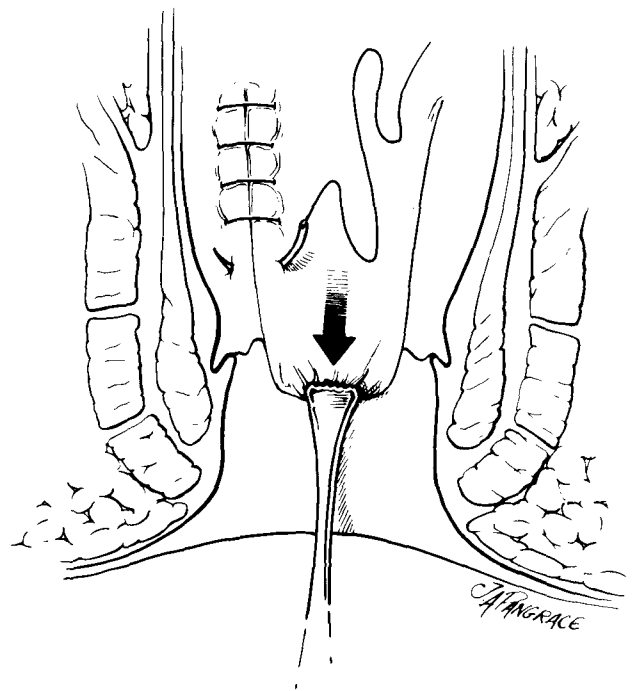


FIG. 4. Flap advanced and sutured over anorectal defect.

radiotherapy and anterior proctosigmoidectomy for rectal cancer. One fistula was located below the dentate line.

The 12 anorectal fistulas were treated by advancement flap repair because of their complex natures, which included multiple external openings or horseshoe components, high internal openings, previously failed surgical intervention in four, and the presence of proximal Crohn's disease in six patients. Each case was considered unsuitable for conventional fistula surgery.

Three of the four rectourethral fistulas arose spontaneously in association with Crohn's disease.¹⁰ The fourth followed electrocoagulation therapy of an early rectal cancer. All fistulas had rectal openings at or above the dentate line. The urethral orifice of these fistulas was located in the prostatic urethra in two and in the most proximal portion of the penile urethra in two.

In nine cases, the repair was performed on patients with a diverting stoma. In only two cases, however, was the stoma constructed specifically to provide fecal diversion for the repair. In four patients, a stoma had been constructed after resection of ileal or colonic Crohn's disease and in the remaining three, the stoma had been

constructed primarily for other reasons including incontinence due to an associated sphincter injury in one and proximal to a low colorectal anastomosis in another.

Results

The outcome of surgery was assessed in all cases. The mean period of follow-up was 25 months (range, three to 67 months).

In all, there were 27 cases where the repair healed with total eradication of the fistula and associated symptoms.

In 12 patients, the repair was unsuccessful and the fistulas recurred in the early postoperative period. Sixteen of the 20 patients without Crohn's disease (80 percent) and 11 of the 19 fistulas in patients with Crohn's disease (57.9 percent) had a successful outcome. Results according to site of fistula and presence of Crohn's disease are recorded in Table 2.

Four of 20 patients with fistulas from the miscellaneous etiologic group (*i.e.*, not due to Crohn's disease) had

TABLE 1. Distribution and Etiology of Fistulas Treated by Transanal Advancement Flap

Type of Fistula	No.	Crohn's Disease	Obstetric Trauma	Iatrogenic	Cryptoglandular Infection	Ulcerative Proctitis	Unknown
Rectovaginal	23	10	6	2	-	-	5
Anorectal	12	6	-	1	4	1	-
Rectourethral	4	3	-	1	-	-	-
TOTAL	39	19	6	4	4	1	5

TABLE 2. Results of Transanal Rectal Advancement Flap Repair According to Fistula, Site and Presence of Crohn's Disease*

Fistula Site	Patients without Crohn's Disease		Patients with Crohn's Disease		Total	
	No.	Percent	No.	Percent	No.	Percent
Rectovaginal	10/13	76.9	6/10	60	16/23	69.6
Anorectal	6/6	100	2/6	33.3	8/12	66.7
Rectourethral	0/1	0	3/3	100	3/4	75
TOTAL	16/20	80	11/19	57.9	27/39	69.2

*Recorded in numbers of patients with successful outcome.

unsuccessful repairs. Two women (35 and 54 years) had had multiple previous repairs for low rectovaginal fistulas arising from birth trauma. Despite a preexisting stoma in one, local sepsis led to early breakdown of the repair in each case. A 77-year-old woman developed a rectovaginal fistula at the site of a colorectal anastomosis after anterior proctosigmoidectomy and external beam radiotherapy (5,000 rads) for a rectal carcinoma. Advancement flap repair was unsuccessful. Finally, a 70-year-old man developed a rectourethral fistula after deep electrocoagulation of a small, anterior rectal carcinoma. Despite the presence of a defunctioning colostomy and the absence of recurrent neoplasm (the patient is alive and disease-free five years later), the repair was a failure.

There were eight failures among the 19 repairs performed for fistulas arising in patients with proven Crohn's disease. Two women (25 and 32 years) had low rectovaginal fistulas secondary to anal Crohn's disease with proctitis judged to be mild in severity. Neither patient had a stoma. In one case, local sepsis led to early wound breakdown. In the other, the patient is much improved symptomatically but although she has no vaginal discharge, she periodically passes some gas with a feculent odor per vaginum. This indicates that an occult fistula is present and the case has been recorded as a failure. A 39-year-old woman with Crohn's colitis underwent repair of a low rectovaginal fistula, but recurrence and worsening colitis led to proctocolectomy three months later. A 20-year-old woman with ileal Crohn's disease and a low rectovaginal fistula underwent ileal resection, end ileostomy, and rectal advancement flap repair. Although healing appeared sound, the fistula reopened after stoma closure.

Four patients with fistulas-in-ano in association with Crohn's disease had failed repairs. In a 21-year-old man with colitis, recurrence and the appearance of more fistulas led to proctocolectomy. A 59-year-old man underwent transanal repair of longstanding fistulas-in-ano, but these recurred soon after recurrence of ileal disease. These fistulas later healed spontaneously after ileal resection. A 29-year-old woman with anal Crohn's disease and a 40-year-old woman with two previous resections of ileal Crohn's disease presented with complex fistulas-in-ano.

Neither had a stoma and both repairs failed early in the postoperative period.

In the four cases where successful results were achieved after use of a stoma, the stoma had been closed for a mean of 15 months (range, three to 24 months) at the time of review.

Discussion

The transanal rectal advancement flap repair has proven to be a successful technique in the management of several types of fistulas involving the anorectal area. Experience with this technique at other centers is comparable to that produced here for rectovaginal fistulas,³ fistulas-in-ano,⁶ and rectourethral fistulas,⁷ although these series generally did not include patients with Crohn's disease.

Greenwald and Hoexter pointed out that the rectum is the high-pressure side of a high low-pressure shunt.¹¹ The transanal rectal advancement flap repair is effective because it presents a layer of intact, healthy tissue to the high-pressure zone and allows any associated anorectal pathology to be dealt with simultaneously. Neither of these essential requirements is met by traditional transvaginal repairs of rectovaginal fistulas.¹²

Some workers believe that anorectal surgery should be avoided wherever possible in Crohn's disease.¹³ However, others recommend the use of anorectal surgery in selected patients¹⁴ and the authors' experience with the transanal rectal advancement flap in such patients supports this concept. Furthermore, failure of the repair with suture-line breakdown leaves the patient in no worse condition than he or she was preoperatively.

It is clear that patient selection has an important role in the use of this procedure. Selection criteria should include the absence of macroscopic evidence of proctitis, particularly in patients with Crohn's disease, but also in those with other types of inflammation, such as that due to irradiation. Other essential criteria are that Crohn's disease elsewhere in the gastrointestinal tract be in remission and that the fistula be free of malignancy. In retrospect, some of the failures may have been due to poor patient selection. Of the 19 patients with Crohn's disease, five had clinical evidence of proctitis. Despite this being judged as

mild in severity in each case, only one had a successful outcome. Two patients with proximal Crohn's disease thought to be under medical control suffered reactivation of intestinal disease shortly after fistula repair. In each case, the repair broke down. Finally, in the non-Crohn's disease group, an elderly woman with a rectovaginal fistula secondary to radical surgery and external beam radiation for carcinoma had an unsuccessful result. Radiation effect was the probable cause of this.

Regarding the advisability of employing a temporary diversionary stoma, the small number of patients having this additional procedure prevent the authors from making firm recommendations. However, of the nine patients in the series who had a covering stoma, five had a failed repair. Although this may reflect that stomas were used in more difficult cases, it is clear that the presence of a stoma does not guarantee success. Despite this, it seems prudent to employ a stoma in the patient who has undergone multiple previous repairs and in those cases where there is any question in the surgeon's mind of the soundness of the repair at the end of the procedure.

Finally, success is more likely when close attention is given to certain principles of this repair technique. These include: precise anatomic definition of the fistula, careful hemostasis aided by epinephrine infiltration, elevation of a broad-based rectal flap with adequate blood supply, avoidance of excessive tension on the flap, and debridement or excision of the fistula tract followed by layered closure.

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