

The use of rerouting operation in the treatment of high arching transsphincteric and suprasphincteric anal fistula: an observational study

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Background

Perianal fistula is a common disease that has no medical treatment, and cure is only achieved by surgery. Fistulotomy is associated with minimal recurrence; however, incontinence is not uncommonly reported. Many sphincter-saving procedures can avoid fecal incontinence; however, they are associated with significantly higher recurrence. Anal fistula rerouting, described in 1985, entailed staged transposition of the fistulous track to the intersphincteric or submucous space, after which fistulotomy was done. Apparently, minimal recurrence and minimal incontinence could be achieved; however, the operation did not gain much popularity.

Patients and methods

This prospective study reports the results of rerouting operation in 54 (45 males; age 22–69 years) with high arching transsphincteric and suprasphincteric fistulae. All patients underwent two-stage rerouting operation: in stage I, the track was transposed to the intersphincteric space, and in stage II, the intersphincteric fistula was laid open.

Main outcome measures were as follows: continence was assessed using Wexner score after complete healing of the first-stage and second-stage wounds, and every 3 months thereafter for 1 year. Recurrence was defined as persistent purulent discharge from an external opening or from the anal canal. The least follow-up was 9 months.

Results

Three (5.5%) patients had recurrence; two were treated by fistulotomy and the other refused further intervention. Four (7.4%) patients had minor incontinence. One patient developed track gangrene that was treated by track excision and completed staged rerouting successfully.

Conclusions

Rerouting operation for high arching transsphincteric and suprasphincteric fistulae is associated with low recurrence and minimal incontinence.

Keywords:

perianal fistularerouting, suprasphincteric, transsphincteric

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Introduction

Perianal fistula is a chronic anorectal infection that predominantly affects patients in their active years of life. Some cases of specific anal fistula, such as Crohn's fistula, could be treated medically; however, surgery is the only curative treatment for cryptogenic anal fistula. Operations for anal fistula can be divided into sphincter-preserving and sphincter-sacrificing techniques. The former is known to be associated with more recurrence and less incontinence, whereas the latter is associated with less recurrence and significant postoperative incontinence [1–3]. Incontinence associated with sphincter-sacrificing operations is related to the amount of sphincter divided, and in high arching transsphincteric and suprasphincteric fistulae, the continence mechanism may be seriously affected after fistulotomy [2,4].

Rerouting operation was first described by Mann and Clifton [5]. The procedure aimed at converting transsphincteric fistulae into intersphincteric or submucous fistulae, which can then be laid open safely with minimal, or without, sphincter division. It was hoped that rerouting operation can achieve the minimal recurrence of fistulotomy while preserving continence. However, the operation did not gain much popularity, and we are not aware of any published reports about this procedure, that appeared in the English literature, since it was first published. In the present study, we are reporting our results of using rerouting operation to treat

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patients with high arching transsphincteric and suprasphincteric fistulae.

Patients and methods

This prospective observational study included all patients with transsphincteric and suprasphincteric fistulae who were referred for surgery from January 2016 till May 2018. Operations were performed in the Colorectal Surgery Unit, El Demerdash Hospital, Ain Shams University and Dar El Shifa Hospital, Ministry of Health, Cairo, Egypt. Noncryptogenic fistulae, horseshoe fistulae, intersphincteric fistulae, and low fistulae that can be safely treated by lay open were excluded from the study. The study was approved by Research Ethics Committee of the Department of General Surgery, Ain Shams University. All the patients signed an informed written consent. Fistulae were assessed clinically and by MRI when the clinical diagnosis was unclear. Preoperative continence status was assessed using the Wexner incontinence score [6]. Preoperative incontinence did not exclude patients from the study, but its degree was reported to be compared with postoperative continence status.

All patients had two-stage rerouting operation. All operations were done, or directly supervised by a single consultant anorectal surgeon (A.A. Abou-Zeid) (Figs 1–3). Operations were performed under spinal or general

anesthesia. All operations were done in the lithotomy position. The site of the operation was prepared and draped. The first stage started by coring out the fistulous track using a combination of cutting and coagulation diathermy. Dissection stopped at the point where the track traversed the external sphincter, when a circumanal incision was made at the anal verge, centered on the point where the fistulous track pierced the external sphincter. The intersphincteric space was entered and dissected to the depth where the fistulous track can be felt. The track was then dissected from the external sphincter by simple muscle splitting, and it was pulled to the intersphincteric space. The opening in the external sphincter was obliterated by few interrupted stitches using absorbable suture material. If the transposed track was too long, its distal part was excised. A seton was inserted, if possible, in the transposed intersphincteric track to help its identification in the second stage. Seton insertion was abandoned if it entailed rough manipulation that might risk injuring the mobilized track, which should be avoided at every expense. The lateral part of the skin wound was partially closed if it was sufficiently big, otherwise it was kept open for proper drainage.

The second stage was performed after complete healing of the first-stage wound. Under general or spinal anesthesia, and in the lithotomy position, the intersphincteric fistula was probed and laid open. This entailed division of the lowermost fibers of the internal

Figure 1

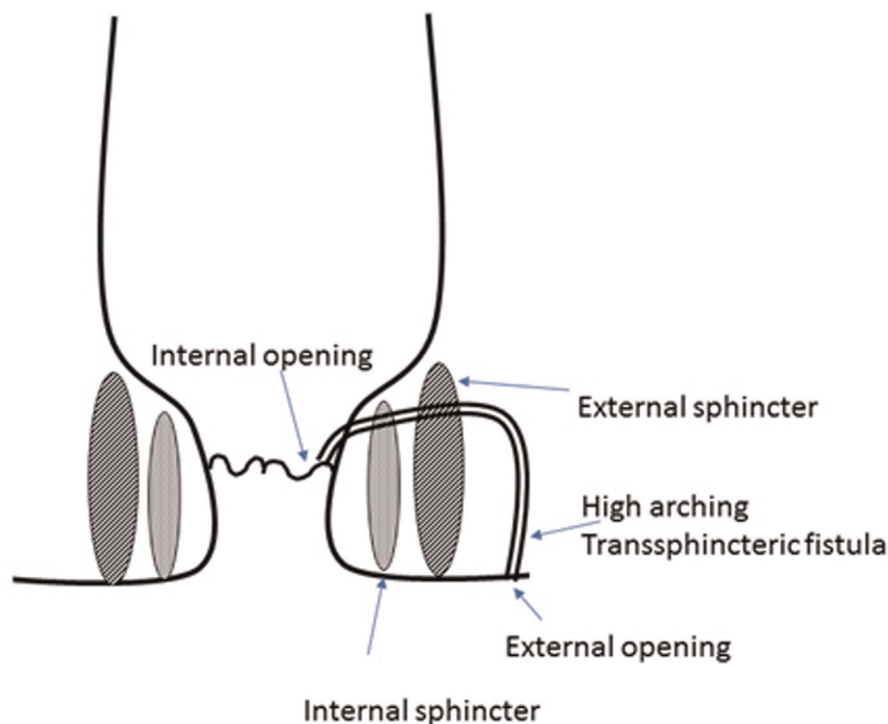
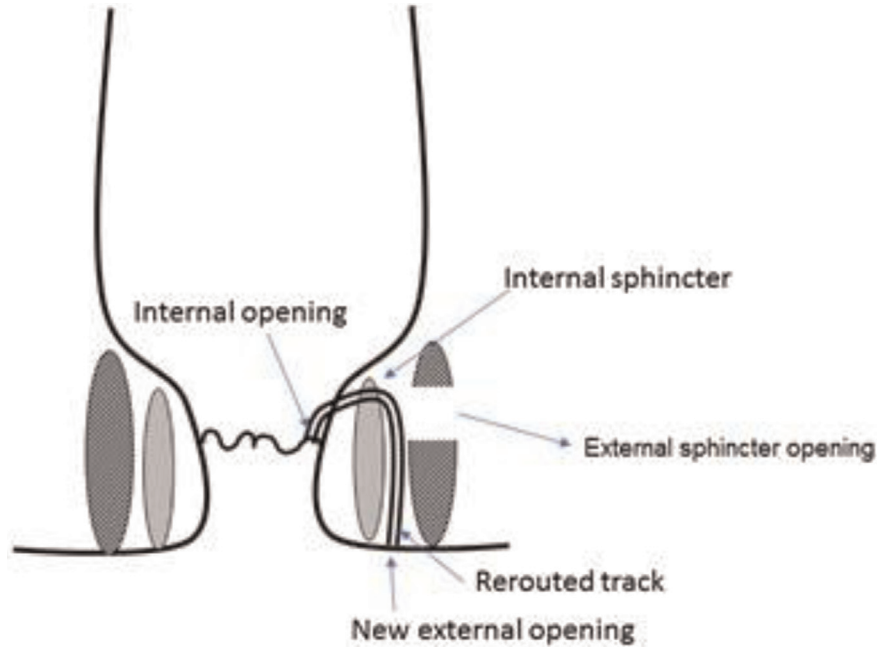


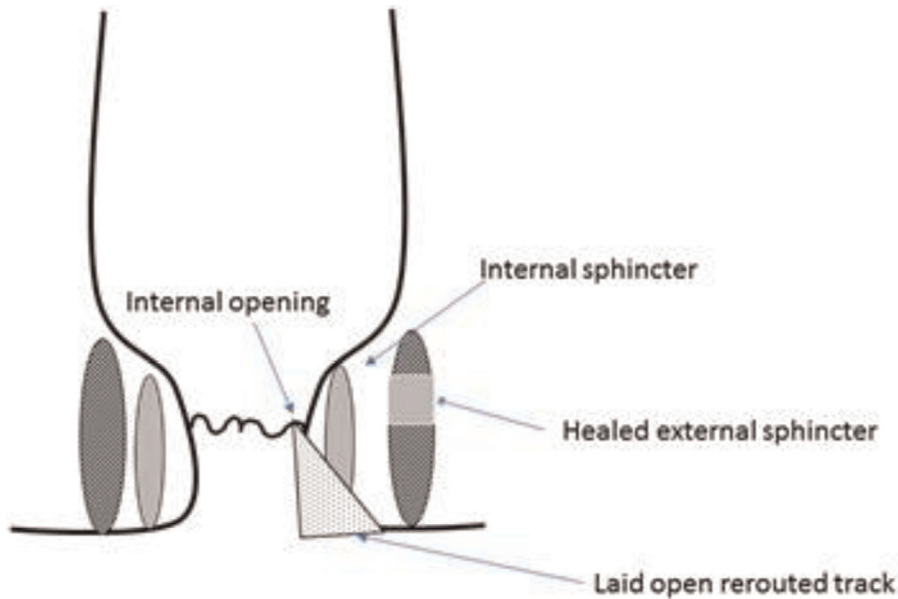
Diagram representing high arching transsphincteric fistula.

Figure 2



Stage I rerouting: transsphincteric fistula is transferred to intersphincteric fistula.

Figure 3



Stage II: lay open of intersphincteric fistula.

sphincter. The track was curetted and a small cut back was done to ensure proper drainage and sound healing.

Postoperative care

Hot sitz baths were advised one to three times daily. Laxatives were prescribed for 3 weeks. No specific protocol for postoperative analgesia was used. Postoperative antibiotics were not used routinely. The patients were discharged the second postoperative day

after the wounds were inspected and dressed. Patients were taught about home wound care, and their wounds were evaluated twice weekly for 1 week, weekly for 1 month, and monthly until complete wound healing. If there was any doubt regarding unsound healing, or local abscess formation, MRI was ordered, and the patients were examined under anesthesia for proper evaluation. The same policy of postoperative care was followed after every stage of surgery.

Postoperative follow-up

Continence was assessed and reported after complete healing of the first-stage and second-stage wounds, and every 3 months thereafter for 1 year. Recurrence was defined as persistent purulent discharge either from an external opening or from the anal canal. Any suspected fistula recurrence or persistent unexplained anal pain was assessed by MRI and examination under anesthesia for accurate evaluation. The minimum follow-up period in this study was 9 months (range, 9–24 months). The duration between the two stages of the procedure ranged from 3 weeks to 9 months.

Results

A total of 54 patients (45 males; mean age 47 years; age range, 22–69 years) with high arching transsphincteric or suprasphincteric fistulae, who completed all stages of rerouting operation with sufficient follow-up time, were the subject of the present study. The demographic data of the study group are shown in Table 1. Five patients were excluded from the study for different reasons: the fistulous track was found intraoperatively to be superficial and was treated by simple fistulotomy

Table 1 Demographic data of patients

Categories	n ^a (%)
Sex	
Male	45 (83.3)
Female	9 (16.7)
Type of fistula	
Transsphincteric	37 (68.5)
Suprasphincteric	17 (31.5)
Previous fistula surgery	
Primary fistula	44 (81.5)
Recurrent fistula	10 (18.5)
Site of external opening	
Anterior	31 (57.4)
Posterior	23 (42.6)
Number of external openings	
Single	48 (88.9)
Multiple	6 (11.1)
Preoperative Wexner score	
0	43 (79.6)
1	6 (11.1)
2	3 (5.6)
3	2 (3.7)

($n=1$), the seton that was placed in the rerouted fistula after the first stage divided the sphincter spontaneously ($n=1$), and three patients were treated by fistulotomy and primary sphincter repair. Four patients waiting for the second stage were also not included in the study.

A transsphincteric, rather than intersphincteric, fistulous track persisted after the first stage in four (7.4%) patients. All those patients had their fistula tracks inadvertently injured during dissection in the first stage. All four patients were treated by another successful two-stage rerouting.

Recurrence after finishing all stages of the operation occurred in three (5.5%) patients. In two patients, the recurrent tracks were simple intersphincteric tracks that were treated by fistulotomy, and the third patient refused further intervention.

The postoperative continence status and Wexner score did not differ from the preoperative continence status and score in 50 patients. Four (7.4%) patients experienced minor postoperative incontinence in the form of gas incontinence in three patients and staining of the underwear in one patient. This did not improve all through the follow-up period. The Wexner score of those four patients is shown in Table 2.

Gangrene of the mobilized rerouted track occurred in one patient. This was treated by simple debridement that did not hinder proceeding to the second stage.

Discussion

Anal fistula is a common disease that causes pain, discomfort, anal discharge, and recurrent abscess. In addition, more serious complications, such as necrotizing fasciitis, have been occasionally reported in patients with fistula [7]. Lay open of the fistulous track is the classic operation for the treatment of anal fistula that is associated with minimal recurrence [8–12]. The low recurrence rate after fistulotomy is probably because this procedure eliminates the internal opening, a significant factor in fistula recurrence [13].

Table 2 Preoperative and postoperative Wexner score in patients who developed postoperative incontinence

Patients	Preoperative	After 1st stage	Postoperative after 2nd stage			
			3 m	6 m	9 m	12 m
Patient 1	2	3	4	4	4	4
Patient 2	2	2	4	4	4	4
Patient 3	3	3	5	5	5	5
Patient 4	3	4	5	5	5	5

Evaluation of postoperative incontinence is expressed in months (m).

The internal opening is not eradicated in any of the sphincter-saving procedures for anal fistula; it is merely blocked if fibrin glue or fistula plug is used, covered in mucosal advancement flap operation, stitched in VAFT and LIFT techniques, or burnt in operations using LASER technology. The noneradicated internal fistula opening can reopen any time it becomes infected, an event that cannot be confidently avoided in the inherently contaminated medium of the anal canal. It is thus not astonishing that recurrence rate is higher after sphincter-saving fistula surgery as compared with fistulotomy [14–18].

Despite the low recurrence rate after fistulotomy, a major drawback of this operation is the inevitable division of part of the anal sphincters, which can lead to postoperative fecal incontinence in 10–52% of patients [1,4,8,19,20]. It thus seems that recurrence and incontinence are two faces of the same coin that accompany surgery for anal fistula, the more that is done to avoid one, the more it is likely to get the other. Incontinence is, however, minimal if only a small part of the sphincter is divided [20].

Postoperative fecal incontinence is a major cause of deterioration of the quality of life after anal fistula surgery [21,22]. The degree of postoperative deterioration in the quality of life is again directly proportional to the amount of sphincter divided and the severity of incontinence [23]. Thus, fistulotomy can be done safely in low fistula as it is associated with minimal sphincter division, minor fecal incontinence in a small percentage of patients, and minimal or no deterioration in the quality of life [24].

All patients in the present study had high arching transsphincteric or suprasphincteric fistulae. Those types of patients are expected to develop major incontinence if treated by fistulotomy, or significant recurrence if treated by sphincter-saving procedure. This was not the case when, in the present study, we used the staged rerouting operation, as only 5.5% of patients developed recurrence and 7.4% had postoperative minor incontinence. The acceptable results of rerouting operation regarding recurrence and postoperative incontinence is probably because it combines the low recurrence rate of fistulotomy with the minor postoperative incontinence rate of minimal sphincter division.

If the fistulous track is inadvertently injured while coring it out in the first stage of the procedure, the likely postoperative scenario is that infection extends from the injured track to the hole in the external

sphincter through which the track was cored out, and a transsphincteric fistula, simulating the original fistula, will probably be seen in the second stage. This actually happened in four (7.4%) of our patients. All those events occurred early in the study, and all four patients were treated by another two-stage rerouting, and none of them had fistula recurrence.

This same scenario is also expected if we combined rerouting with lay open of the fistula track in one stage. The minor fecal leak that can be associated with division of the lower part of the internal sphincter can cause infection to extend through the hole in the external sphincter to cause recurrence. For this reason, we performed the operation in two stages.

Track gangrene occurred in one patient 3 days after discharge from hospital after the first stage of the operation. The mobilized fistulous track in that patient was thinned out extensively to allow it to pass through the small slit in the external sphincter before it was transposed to the intersphincteric space. This probably jeopardized the vascularity of the track which became gangrenous in its distal part. The patient was taken to theater, and the gangrenous part of the track was excised. The patient completed the stages of rerouting successfully. We learned not to thin out the track extensively in similar situations. Instead, we increased the splitting of the external sphincter fibers to accommodate any track, no matter how thick it was. We did not encounter any similar event after adopting this modification. Although transposition of the track to the submucous space, as originally described by Mann and Clifton [5] in one of their patients, would completely obviate division of any part of the sphincter, we found this step usually associated with unintended injury of the internal sphincter and its overlying mucosa that risks fistula recurrence. We consequently avoided using this technique.

The limited number of patients and the short follow-up period are the main limitation of the present study. We are recruiting more patients, and we are scheduling all our patients for long-term follow-up program for more robust results. We are also including more types of fistulae.

Conclusion

Rerouting operation is suitable for patients with high arching transsphincteric and suprasphincteric anal fistulae. It is a minimal sphincter-sacrificing operation that is associated with low recurrence and minimal incontinence, thus combining the advantages

of fistulotomy and sphincter-preserving fistula surgery. We hope that longer follow-up and operating on more patients will support these results.

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Conflicts of interest

There are no conflicts of interest.

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