

ORIGINAL ARTICLE

ENDOANAL ADVANCEMENT FLAP REPAIR FOR HIGH-LEVELLED ANAL FISTULAE: CLINICAL AND MANOMETRIC RESULTS

By

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Aim: *The aim of this prospective study was to evaluate the functional outcomes after endoanal advancement flap (EAF) in treatment of high leveled anal fistulas.*

Methods: *From October 2001 to December 2005, 32 patients with high anal fistulae underwent EAF. They were 26 males and 6 females, with a mean age 37.75 ± 7.2 years. Seven patients had recurrent fistulae and five had minor anal incontinence. All patients underwent coring fistulectomy followed by endoanal advancement flap that was sutured to the anoderm below the level of the internal opening. Patients were followed up for 20.16 ± 5.87 months. Continence was evaluated using a special questionnaire.*

Results: *EAF was successful with a complete healing in 24 patients (75%) whereas; the overall recurrence rate was 25% after a second operation. Also, 25 patients (78.3%) experienced improved or unaffected anal continence, whereas, seven patients (21.9%) experienced minor degrees of anal incontinence. Manometrically, all patients showed significant decrease in mean resting pressure (MRP) (P: 0.000) while there was no significant changes in mean squeeze pressure (MSP) (P: 0.069) or in the functional anal canal length (P: 0.753).*

Conclusion: *EAF allows the treatment of trans-sphincteric fistulae as well as supra-sphincteric fistulae without sacrificing anal sphincter function, which is likely to be superior to alternative procedures even in case of recurrence.*

Keywords: *mucosal flap repair, trans-sphincteric fistula, suprasphincteric fistula.*

INTRODUCTION

The anal canal maintains a zone of high pressure generated by sphincter muscles which can be evaluated with a sensitive probe and recording device.⁽¹⁾ The internal sphincter muscle normally contributes 85 percent of the anal pressure, which significantly decreases in the operation of lateral internal sphincterotomy for anal fissure.⁽²⁾ The external anal sphincter contributes to the pressure only when a bolus enters the upper part of anal canal and for short periods of voluntary contraction.⁽³⁾ Since both sphincters may be involved in the surgical

treatment of anal fistula, disorders of continence remain a threat after division of this muscle mass.⁽⁴⁾ So that, surgical treatment should aim at complete elimination of the fistula while maintaining as optimal function of the sphincter muscle as possible.⁽⁵⁾ Simple low fistula (low trans-sphincteric and inter-sphincteric) may be treated by simple fistulotomy with minimal risk to fecal incontinence. High anal fistulas (high trans-sphincteric or supra sphincteric) have been treated by a number of techniques (fistulotomy, rerouting fistulous tracks, loose and tight Seton sutures), with variable results in terms of recurrent fistula and disturbance of continence.⁽⁶⁻⁸⁾ Core

fistulectomy and repair of the primary defect with endorectal advancement flap has been suggested as an alternative technique for the treatment of high fistulas.⁽⁹⁾

The aim of this prospective study was to evaluate the functional outcomes after endoanal advancement flap repair for trans-sphincteric anal fistulas as regards healing, recurrence rate, and continence state.

PATIENTS AND METHODS

From October 2001 to December 2005, 56 patients with high anal fistulae of crypto-glandular origin were referred to and treated in our colorectal surgery unit, Mansoura university hospital.

Only 32 patients had passed the exclusion criteria (acute sepsis, recently formed fistulas <4 wks, active proctitis, hemorrhoids, strictured ano-rectum or severe sphincteric defects) to whom endoanal advancement flap (EAF) repair was carried out.

They were 26 males and 6 females, with a mean age 37.75 ± 7.2 years (range 23-51 years). Of the thirty-two patients, seven patients had recurrent fistulae and five of them had anal incontinence grade A3 in two patients and B2 in three other patients according Pescatori scoring system⁽¹⁰⁾ (where incontinence for flatus = A, liquid stool=B, and solid stool=C & 1=occasionally, 2=weekly, 3=daily incontinence).

All patients underwent a full history taking and thorough clinical and laboratory investigations. This included complete anal examination with palpation of the fistulous tract, procto-sigmoidoscopy, fistulogram, endoanal ultrasound⁽¹¹⁾ and anorectal manometry⁽¹²⁾ and finally, patients were diagnosed as suffering from high anal fistulas that was confirmed later during surgery as high trans-sphincteric (28 patients) as well as supra-sphincteric (4 patients) anal fistulae.

All of our patients were informed about the nature of their disease and the current operation that would be carried out and all of them agreed and signed an informed consent.

All patients had a routine preoperative bowel preparation and prophylactic antibiotics (1-gram third generation cephalosporin and metronidazole 500mg were administered intravenously). With the patients under general or spinal anesthesia, they were operated upon in the lithotomy or jack-knife position according to the site of the fistula. The operation commenced with injection of

hydrogen peroxide through the external opening with an anal retractor inserted to visualize the anal canal. After identification of the internal opening, gentle probing of the primary track assessed the height of the fistula. The primary track was dissected from its external opening towards the internal opening staying close to the fibrous tissue (Fig. 1). Any secondary tracks encountered were either excised or curetted. Excision of the internal opening with all the tissues of cryptogenic origin was done followed by suturing the internal sphincter using vicryl 2/0. A semicircular flap comprised of mucosa and submucosa with a few circular muscle fibers of the internal sphincter was raised from the dentate line and mobilized at least 4 cm cephalad to minimize any tension on the suture line (Fig. 2). The flap was advanced over the closed end of the track and anastomosed to the anoderm below the level of the internal opening with interrupted vicryl 3/0 sutures (Fig. 3). Patients with recurrent anal fistulae with defects in the external sphincters confirmed by endoanal ultrasound were subjected to sphincteric overlap repair as well.

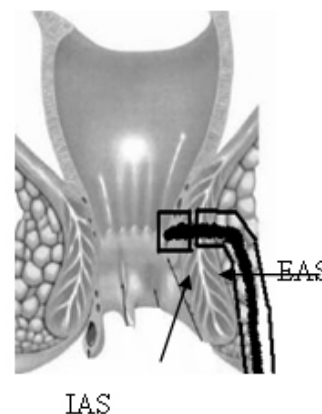


Fig 1. Coring of the external part of the fistula.

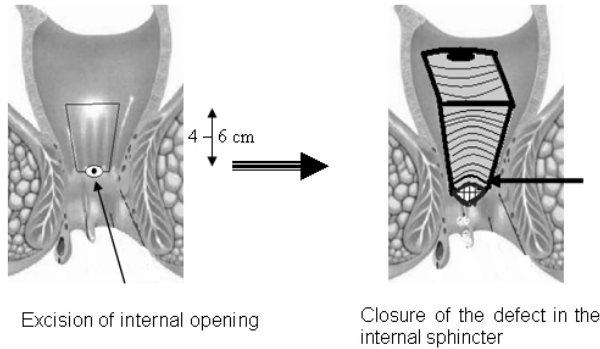


Fig 2. Elevation of the endoanal flap.

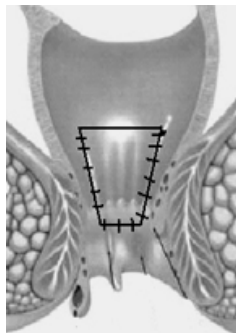


Fig 3. anastomosis to the anoderm below The level of the internal opening.

After operation, patients received I.V fluids for three days with the antibiotics that continued for 5 days. Rectal pack was removed after 24 hours. Patients were allowed then to drink freely for further 5 days followed by normal diet and bulk laxatives. The external wound was dressed and irrigated daily.

All patients were followed up for a period of about 11-30 months (mean: 20.16 ± 5.87 months). This included complete clinical and laboratory investigations specially anorectal manometry.

Fecal continence was evaluated in all patients using a questionnaire that was based on Pescatori scoring system for anal incontinence.⁽¹⁰⁾

Statistical analyses were performed using, non-parametric tests; (two sample, paired) and (two sample, paired) Wilcoxon's signed rank test for quantitative data. Values are expressed as mean + standard deviation. P-value < 0.05 was considered significant.

RESULTS

In the period from October 2001 to December 2005, 32 patients with anal fistulae were selected and admitted to our colorectal surgery unit and underwent endoanal advancement flap. They were 26 males (81.3%) and 6 females (18.6%), with a mean age 37.75 ± 7.2 years. They presented with high trans-sphincteric (28 patients) and supra-sphincteric (4 patients) anal fistulae. Of the thirty-two patients, seven patients (21.9%) had recurrent fistulae with anal incontinence in five patients, grade A3 (2 patients) and B2 (3 patients) according to Pescatori scoring system.⁽¹⁰⁾

There were no major postoperative complications and the early postoperative morbidity was in the form of local hematoma in 3 patients (9.4%), local abscess formation in 2 patients (6.3%), and dehiscence of the suture line in 6 patients (18.8%) Table 1.

Table 1. Early postoperative complications following endorectal advancement flap.

	No	Percentage
Early:		
Flap hematoma	3	9.4%
Abscess formation	2	6.3%
Flap break down	6	18.8%

Primary healing was complete in 21/32 patients (65.7%) within 6-8 weeks, whereas, 11 patients (34.4%) had recurrence or non healing of their fistulae. We noticed that recurrence had occurred in 8/25 patients (32%) of the primary cases while it had occurred in 3/7 patients (42.9%) with the previously recurrent fistulae. The cause of

recurrence was supposed to be due to difficulties to identify the internal opening, the curved course of the fistulas as well as the scary area in recurrent fistulas.

A second endoanal flap was performed to all patients who developed recurrence with a complete healing in 24/32 patients (75%). Recurrence had occurred in 5/25 (20%) and 3/7 patients (42.9%) with previously primary and recurrent fistulae respectively with an overall recurrence in 8/32 patients (25.0%) Table 2.

Table 2. Recurrence in patients after advancement flap.

	1st recurrence		2nd recurrence	
	No.	%	No.	%
Primary fistulae	8/25	32%	5/25	20%
Recurrent fistulae	3/7	42.9%	3/7	42.9%
Total	11/32	34.4%	8/32	25.0%

On the other hand, 25 patients (78.3%) experienced improved or unaffected anal continence, whereas, seven patients (21.9%) experienced minor degrees of anal incontinence, grade A and B in four patients (12.5%) and three patients (9.4%) respectively. It was noticed also that one patient was improved after repair of the sphincter from stage B2 to B1. None of our patients needed a covering colostomy Table 3.

Table 3. Incontinence in our patients according to Pescatori scoring system.

Grade	Preoperative		Postoperative	
	No.	%	No.	%
0 (fully continent)	27	84.4%	25	78.3%
A (gas incontinence)				
A1	---	---	1	3.1%
A2	1	3.1%	2	6.3%
A3	1	3.1%	1	3.1%
B (liquid stool)				
B1	---	---	1	3.1%
B2	3	9.4%	2	6.3%
B3	---	---	---	---
C (solid stool)				
C1	---	---	---	---
C2	---	---	---	---
C3	---	---	---	---
Total	5	15.6%	7	21.9%

As regards the postoperative manometric studies, we noticed that all of our patients showed significant decrease in the mean resting pressure (MRP) while there were no significant changes in the mean squeeze pressure (MSP) or

in the functional anal canal length (ACL) when compared to the preoperative values Table 4.

Table 4. Results of anorectal manometry.

	Preoperative	Postoperative	P-value
MRP (mmHg)	84.22 + 13.39	74.90 + 13.86	0.000
MSP (mmHg)	198.69 + 26.50	195.88 + 29.80	0.069
ACL (cm)	3.62 + 0.58	3.63 + 0.54	0.753

MRP: mean resting pressure, MSP: mean squeeze pressure, ACL: functional anal canal length. P-value is considered significant when < 0.05.

DISCUSSION

The principle goals in the treatment of trans-sphincteric anal fistula are eradication of the fistulous track and, at the same time, maintenance of continence.⁽¹³⁾

The traditional method of laying open the fistula track is undoubtedly successful in achieving eradication of the fistula, but leads to imperfections in anal continence in about 6 to 34% of patients.⁽¹⁴⁾ This may arise in two ways, first, the resting anal pressure decreases in the lower part of the anal canal due to division and sacrifice of healthy anal sphincter muscle,⁽¹⁵⁾ and second, the surgical incision can cause deformity or guttering of the anal margin, which may further compromise continence. Hence, surgeons have thought for alternative methods of treatment, which to date include; fistulectomy,⁽⁶⁾ re-routing⁽⁸⁾ or the use of Seton.^(16,17) However, each of these alternatives is associated with its own disadvantages.

Simple fistula excision may ignore the internal opening.⁽⁶⁾ Re-routing of the fistula may also damage the sphincter mechanism.⁽⁸⁾ The staged cutting Seton technique is thought to promote fibrosis, so preventing wide separation of both ends of the divided external anal sphincter and minimizing the risk of incontinence. However, the reported incidence of impaired continence is high varying between 40 and 60 percent.^(18,19,20)

Proposal of the use of endoanal advancement flap in the treatment of trans-sphincteric fistulas argues that, this procedure ensures obliteration of the internal opening and thereby healing of the fistula with preservation of the entire anal sphincter.

Noble, in 1912, initially reported a similar technique for the treatment of rectovaginal fistula. Meanwhile, Elting (1912) also used this similar technique to treat 96 anal fistulas without recurrence. He outlined two cardinal principles; first, separation of the fistulous track from the communication with the bowel, and second, the adequate closure with removal of all diseased tissue in the rectum. In 1948, Laird described a flap of mucosa, submucosa and

some fibers of the internal anal sphincter. Several other modifications of this technique have been reported with healing rates up to 100%.⁽²¹⁾

In this study, complete healing has occurred in 65.7% and 27.3% after one and two surgical procedures respectively with an overall success rate of 75.0% where as, we had recurrence in 25.0% of our patients. Recurrence was more in those with previously recurrent anal fistulae (42.9%) versus (20%) with previously primary fistulae.

EAF repair presented in this study entailed some specific problems like flap tip breakdown at the beginning of or in course of the second postoperative week. Although spontaneous closure had occurred in one patient, but still flap tip breakdown and abscess formation could be great factors that were incriminated in recurrence of fistulae in our patients. In addition, there were some technical difficulties to use EAF especially in those with unidentified internal orifices following injection of hydrogen peroxide as well as those with recurrent fistulae because of the scary, rigid and severely deformed anal canal. On the second operation, we tried to elevate a thicker flap including thicker layer of the internal sphincter that added positive results in our patients.

Interestingly, we have noticed that complete healing was more common in patients who obeyed the strict dietary and sanitary recommendations and who continued their postoperative antibiotic treatment. In our opinion, this observation could be of value in further evaluation of recurrence following fistula surgery.

Some authors using similar techniques reported variable recurrence rates ranging from zero to 30% and those who reported the highest recurrence rates owed this poor outcome to the fact that most of their patients had undergone previous operations.^(21,22) So, when comparing with the recurrence rate in our patients (25.0%), it seems to be more or less within the scope of these results.

In addition, Garcia-Aguilar et al⁽²³⁾ reported incontinence rates, 54% for trans-sphincteric fistulas [55% for those with 51-75% involvement of the external sphincter and 75% for those with more than 76% involvement]. In our study, 7/32 patients (21.9%) experienced occasional minor continence disorders, which were contributed to the over stretching of the anal sphincter during operation. One patient presented with incontinence before surgery reported an improvement in the incontinence score from B2 to B1 while the others remained unchanged after operation. So that, results in terms of recurrence and continence disturbance are apparently favorable.

To date, the effect of EAF repair on the anorectal manometric parameters has not been widely assessed. MRP, which is mainly a function of internal anal sphincter,

was significantly decreased after operation. This might be the result of basing the flap on a portion of the internal sphincter.

Management of the external component of the track is open to discussion; excision of the track by coring out may require a short time for external drainage and produce more rapid resolution of the fistula. In contrast, Gustafson and Graf⁽²⁴⁾ reported that curettage instead of coring out of the primary track would possibly lessen the risk of sphincter damage, but may increase the risk for inadequate drainage and subsequent none healing. In our experience, coring out fistulectomy did preserve the sphincter muscle and produced a satisfactory outcome.

Hence, the technique of endoanal advancement flap repair allows the treatment of trans-sphincteric fistulae as well as supra-sphincteric fistulae without sacrificing anal sphincter function and preserving the anal canal pressure, anal canal length and maintaining the integrity of the anal margin yielding good functional results, which are likely to be superior to alternative procedures even in case of recurrence.

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