

An 8 Years' experience in surgical treatment of anal fistula

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Abstract

Aim: To review our experience with patients who had been operated for perianal fistula based on cryptoglandular etiological basis and to reveal risk factors affecting postoperative results.

Material and Methods: A total of 65 perianal fistula patients, who underwent surgical treatment, were screened for this retrospective study.

Results: The mean age was 45.4 ± 10.6 years, with a predominance rate of male patients. The previous surgery rate for anal sepsis was 44.6%. The median (min-max) follow up time was 19 (15–103) weeks, and the duration of symptoms was 18 (6–250) weeks. The most common fistula type was intersphincteric (36.9%), and fistulotomy was the most preferred surgery (50.8%). New postoperative incontinence was found in 6 (8.2%) of patients, 5 (83.3%) of them had gas incontinence. The healing rate in the follow-up period was unsatisfactory for 12 (18.5%) patients. The significant risk factors for failure were $BMI \geq 30$ kg/m² ($p < 0.001$), complex fistula with multiple fistula tracts ($p < 0.001$), duration of symptoms ≥ 12 wk ($p = 0.012$), a history of previous surgery for anal sepsis ($p = 0.001$), the presence of baseline incontinence ($p = 0.003$), procedures except for fistulotomy ($p = 0.009$).

Conclusion: The risk factors most associated with failure were obesity ($BMI \geq 30$ kg/m²) and multiple fistula tracts. Other significant risk factors leading to failure were duration of symptoms ≥ 12 wk, a history of previous surgery for anal sepsis, the presence of baseline incontinence, complex fistula type, and non-fistulotomy procedures. This study suggests the need for comparative, randomized controlled studies that investigate methods and their outcomes, particularly in complex fistulas.

Keywords: fistulotomy, LIFT, Perianal fistula

INTRODUCTION

Anal sepsis is one of the most common benign anorectal disorders and originates in the gland ducts. This condition extends from the anal lumen region to the structures surrounding the anal canal (1). The incidence of chronic fistulas after an anal abscess that causes anal sepsis varies between 15.5% and 37.0% (2,3). The main treatment for perianal fistulas is surgery. The expectations from the surgery are to provide a permanent solution without causing incontinence. It is not always possible to achieve these two goals at the same time. Therefore, an accurate assessment of an experienced surgeon is required to perform the operation suitable for the fistula type and to prevent postoperative incontinence (4). Incontinence may develop due to previous sphincter damage and the amount of damaged muscle. Several alternative treatment strategies have been practiced, targeting the absence of recurrence and preserve the continence, including fistulectomy, fistulotomy, draining or cutting setons, rectal mucosal advancement flaps (RMAF), ligation of the intersphincteric fistula tract (LIFT), anal fistula plug

and fibrin glue injection (5). Today, there is no consensus on fistula treatment yet. The most influential factors in the choice of operation are fistula type and previous interventions based on patient-related factors, and the surgeon's experience.

This study aimed to review our experience with patients who had been operated for perianal fistula based on cryptoglandular etiological basis and to reveal risk factors affecting postoperative results.

MATERIAL and METHODS

The study protocol and ethics were approved by the institutional review board of Kartal Kosuyolu Higher Specialty Training and Research Hospital (Nr. 2020.4/14-319), which was in accordance with the principles of the Declaration of Helsinki.

A total of 65 perianal fistula patients, who underwent surgical treatment in Emsey and Kartal Kosuyolu Higher Specialty Training and Research Hospital between April 2012 and January 2020, were screened for this retrospective

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study. All operations were performed by a single colorectal surgeon or under his management. The study included patients aged ≥ 18 years and cryptoglandular fistula. Exclusion criteria were fistula due to malignant neoplasm, inflammatory bowel disease, rectovaginal or rectourethral fistula, radiotherapy, human immunodeficiency virus, and obstetrical trauma. The following data were obtained from the patient records; age, sex, body mass index (BMI), duration of symptoms (week), previous surgery for anal sepsis, baseline incontinence, the number of fistula tracts, horseshoe fistula, fistula type, procedure, postoperative incontinence, and failure.

Fistula types were determined according to sphincter involvement as subcutaneous (no sphincter), intersphincteric (internal sphincter), low transsphincteric ($<30\%$ of external sphincter), high transsphincteric ($>30\%$ of external sphincter), or suprasphincteric (above the entire external sphincter). Horseshoe fistula was defined as an internal orifice in the posterior midline with a circumferential or U-shaped tract extending to ischioanal spaces via the deep anorectal space. High transsphincteric and suprasphincteric types have been accepted as complex fistulas. Fistulas below this level that cross 30% of the external sphincter were defined as simple fistulas (4,6). Pelvic magnetic resonance imaging (MRI) was used in appropriate cases as an imaging method in the preoperative and postoperative periods. Incontinence was reported as gas or stool incontinence. If the two symptoms were present at the same time, then it has been accepted as stool incontinence. Patients were prepared using a rectal enema, the first of which was administered one night before and the other two hours before the operation. All operations were performed in a lithotomy position under general or spinal anesthesia. A single dose of 1st generation cephalosporin was administered one hour before the procedure.

The surgical techniques in this study were as follows; fistulotomy, seton stitch, LIFT (ligation of the intersphincteric fistula tract), rectal mucosal advancement flap (RMAF) and the modified Hanley procedure for horseshoe fistula. Fistulotomy was defined as laying the fistula with cautery and curettage of the tract. The seton procedure was performed in two steps. First, the vessel loop was passed through the fistula orifices and connected with silk sutures. Then tightening was done once or twice a week from the start of 2nd week after surgery. Secondly, the vessel loop was removed one month later, and the tract was curetted, and the vascular tape was placed in its place and fixed with silk sutures. The weekly tightening process was repeated until the tape dropped. However, if baseline incontinence is present, seton cutting was not preferred. In simple cases, the LIFT procedure was carried out in the first session. In contrast, in complicated cases, it was carried out in two steps. Drainage setone was inserted to patients with active infection or a recent history of an anal abscess. In these patients, LIFT was

performed after 6-8 weeks. A partial core-out fistulectomy up to the external sphincter was performed in both the seton and LIFT procedures in appropriate cases, and the edge of the wound was marsupialized with 3/0 vycril sutures. In the RMAF technique, primarily, the internal opening was identified using hydrogen peroxide, and a wedge excision, including the mucosa and submucosa of the internal orifice, was performed. Subsequently, edges were released, and the opening was closed by single, absorbable sutures. All patients were followed for at least four months. Recurrences or persistent symptoms occurring within this period were noted as an operational failure. In the modified Hanley procedure description, a superficial mucocutaneous incision is applied between the coccyx and the internal opening at the level of the posterior dentate line to achieve deep postanal space (7). In our limited number of cases with horseshoe fistulas, all external openings were extended, and a counter incision was done. All incisions were connected with a vessel loop as a drainage seton. Then, the sphincter complex was pushed anteriorly to preserve. The posterior midline incision was extended to the ischioanal space and was curetted here. Subsequently, a vessel loop as a cutting seton was inserted, extending from internal opening to ischioanal space, encircling the sphincter structures.

Statistical Analysis

The SPSS (Statistical Product and Service Solutions) software version 22 for Windows (SPSS Inc. Chicago, IL, USA) was used for statistical analyses of the study. Kolmogorov-Smirnov test was used to analyze if the variables were normally distributed. While mean \pm SD was used in "age" and "BMI" where the normal distribution was monitored, median (min-max) values were used in "duration of symptoms" and "follow-up" without normal distribution. The relationship between categorical variables and failure was performed with Chi-square and Fisher's exact test. Pearson's correlation test was used for the correlation analysis of failure with variables in patients with normal distribution and Spearman's correlation test in patients without normal distribution, A p-value lower than 0.05 was accepted as statistically significant.

RESULTS

A total of 65 perianal fistula patients were enrolled in the study over the eight years as retrospective. Table 1 summarizes their characteristics and Table 2 mean and median values of numeric variables. The mean age was 45.4 ± 10.6 years, with a predominance rate of male patients (M: F=5.5). The previous surgery rate for anal sepsis was 44.6%. The median follow up time was 19 (15-103) weeks, and the duration of symptoms was 18 (6-250) weeks. The symptom of baseline incontinence was seen in 5 (7.7%) of the patients. The BMI (mean \pm SD) of all patients was 28.1 ± 3.5 . While the rate of patients with multiple fistulas was 20.0%, the rate of horseshoes was 3.1% (Figure1).

Table 1. Characteristics of 65 patients with anal fistula		
Variables	n=65 (100%)	
Preoperative		
Age, years	<45	35 (53.8%)
	≥45	30 (46.2%)
Sex	Male	55 (84.6%)
	Female	10 (15.4%)
BMI	<30	47 (72.3%)
	≥30	18 (27.7%)
Duration of symptoms, wk	< 12 wk	20 (30.8%)
	≥ 12 wk	45 (69.2%)
Previous surgery for anal sepsis	Yes	29 (44.6%)
	No	36 (55.4%)
Baseline incontinence	Stool	2 (3.1%)
	Gas	3 (4.6%)
	No	60 (92.3%)
No. of fistula tracts	Single	52 (80.0%)
	Multiple	13 (20.0%)
Horseshoe fistula	Yes	2 (3.1%)
	No	63 (96.9%)
Fistula type	Subcutaneous	11 (16.9%)
	Intersphincteric	24 (36.9%)
	Low transsphincteric	15 (23.1%)
	High transsphincteric	10 (15.4%)
	Suprasphincteric	5 (7.7%)
Intra-/Post-operative		
Procedure	Fistulotomy	33 (50.8%)
	Seton stitch	14 (21.5%)
	LIFT	12 (18.5%)
	Advancement flap	4 (6.2%)
	Modified Hanley	2 (3.1%)
Postoperative incontinence ^a	Stool	1 (1.5%)
	Gas	5 (7.7%)
	No	59 (90.8%)
Failure	Yes	12 (18.5%)
	No	53 (81.5%)

BMI: Body Mass Index (kg/m²); ^aExcludes patients with baseline incontinence

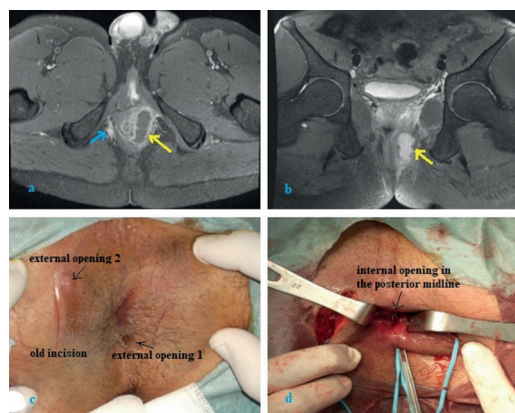


Figure 1. (a) T2-weighted pelvic MRI with fat saturation, the axial plane of the horseshoe fistula, the blue arrow shows the fistula tract and yellow arrow the chronic abscess (b) The coronal plane of the horseshoe fistula with a chronic abscess in the ischioanal space (c) External openings (d) Preparation for the modified Hanley procedure

The most common fistula type was intersphincteric (36.9%), and fistulotomy was the most preferred surgery (50.8%) (Figure 2). New postoperative incontinence was found in 6 (8.2%) of patients, 5 (83.3%) of them had gas incontinence. Postoperative stool incontinence was observed in only one patient who underwent cutting seton. In two of those with gas incontinence (one case in both LIFT and RMAF), the situation was permanent. The healing rate in the follow-up period was unsatisfactory for 12 (18.5%) patients. Table 3 shows the relationship of patients with failure with demographic, clinical, and operative variables. Accordingly, in this study, no significant association was found between age, sex, and failure ($p>0.05$). In contrast, Chi-square analysis revealed a significant relationship between BMI, duration of symptoms, previous surgery for anal sepsis, presence of baseline incontinence, number of fistula tracts, fistula type and procedures, and failure ($p<0.05$). The details of this relationship were evaluated in Table 4 by correlation analysis. Accordingly, with increasing BMI, duration of symptoms over 12 weeks, and the increasing number of fistula tracts, it was observed that the incidence of failure rate increased significantly ($p<0.001$). On the other hand, there was a significant positive correlation between the presence of previous anal sepsis surgery, the presence of baseline incontinence, and failure ($p<0.001$). The complex type of fistula was observed to increase the failure rate ($p<0.001$). Similarly, procedures other than fistulotomy correlated significantly with increased failure rate ($p<0.001$).

Table 2. Mean and median values of numeric variables	
Variables	Mean ± SD or Median (min-max)
Age, years	45.4 ± 10.6
Duration of symptoms, wk	18 (6-250)
BMI	28.1 ± 3.5
Follow up, wk	19 (15-103)

BMI: Body Mass Index (kg/m²); SD: standart deviation



Figure 2. Fistula types. Fistulotomy in a-d and drainage seton insertion in e-f

Table 3. The relationship between categorical variables and failure

Variables	Variables	p
Sex ^b	<45	0.730
	≥45	
BMI ^b	Male	1.000
	Female	
Duration of symptoms, wk ^b	<30	<0.001
	≥30	
Previous surgery for anal sepsis ^a	<12 wk	0.012
	≥12 wk	
Baseline incontinence ^b	Yes	0.001
	No	
No. of fistula tracts ^b	Stool	0.003
	Gas	
Fistula type ^b	Single	<0.001
	Multiple	
Procedure ^a	Simplec	0.004
	Complexd	
Procedure ^a	Fistulotomy	0.009
	Others	

BMI: Body Mass Index (kg/m²); ^aChi-square test; ^bFisher's exact test; ^cSimple= Subcutaneous, Intersphincteric, Low transsphincteric; ^dComplex= High transsphincteric, Suprasphincteric

Table 4. Correlation analysis between the variables and failure

Variables	Failure	
	r	P
Age, years ^a	-0.042	0.740
BMI ^a	0.545	<0.001
Duration of symptoms, wk ^b	0.491	<0.001
Presence of previous surgery for anal sepsis ^a	0.427	<0.001
Presence of baseline incontinence ^a	0.458	<0.001
No. of fistula tracts ^a	0.555	<0.001
Fistula type ^a	0.471	<0.001
Procedure ^a	0.398	0.001

BMI: Body Mass Index (kg/m²); ^aPearson's correlation test; ^bSpearman's correlation test

DISCUSSION

This retrospective study, which provides eight years of personal experience with perianal fistulas, was carried out to contribute to the literature and identify the factors that influence postoperative results. The findings showed that BMI, duration of symptoms, previous surgery for anal sepsis, baseline incontinence, number of fistula tracts, fistula type, and procedure might affect postoperative results.

In the treatment of perianal fistula, the surgeon experiences a dilemma between eliminating the septic problem and not causing incontinence. In the case of low anal fistula

(submucosal, intersphincteric, and low transsphincteric), a fistulotomy is the most frequently used treatment option. In higher fistulas, other methods are used instead of fistulotomy to protect the sphincter (4). In the series of Tatli et al. (8) involving 201 diverse perianal fistula patients, the fistulotomy rate was reported as 67.7%. Complete recovery rates of this intervention are around 90% (9). In the large series of 844 patients by Rosa et al. (10), the fistulotomy rate was about 70%, the recurrence and incontinence rate was 5% and 7%, respectively. Pescatori et al. revealed that marsupialized wounds were less bleeding and smaller when the healing process was completed (11). In this study, fistulotomy was the most frequently used method with 50.8%. In the present study, the marsupialization was particularly preferred for large wounds.

When the seton techniques in the literature are researched, it is possible to see different types of seton applications such as loose seton, cutting seton, or drainage seton insertion before LIFT procedure. In the latter, seton helps the perianal sepsis to drain, and the fistula tract matures with fibrosis (4). On the other hand, Mitalas et al. (12) applied a drainage seton for two months before advancement flap and could not contribute to epithelium formation. It should be noted that the number of cases here is minimal.

Cutting seton is a suitable method for low transsphincteric fistula, and incontinence is observed on average in 12% of cases (4). It can also be used in the modified Hanley procedure of horseshoe fistula (13). In complex fistulas, RMAF is a safe method that preserves the sphincter with a 70% success rate (14). RMAF, in recurring cases of high transsphincteric fistulas, may be an alternative method with low complication rates (15). LIFT is mainly preferred for intersphincteric and trans-sphincteric type fistulas, the success rate can be up to 94%, and it is a method with a meager incontinence rate. In cases where LIFT fails in complex fistulas, recurrent LIFT, fistulotomy, or RMAF can be used as an alternative method (4). In complex fistulas, there are no "gold standard algorithms" for which method to choose as primarily or alternatively.

Some risk factors that may increase the risk of recurrence or operational failure have been investigated. These can be grouped under three categories; 1) Patient-related factors, 2) Fistula-related factors, and 3) Surgeon-related parts. Similarly, our results, studies show that there is no clear relationship between age, gender, and failure in the anal fistula (4,16). As in our results, Schwandner (17) found that patients with a BMI > 30 kg/m² compared to non-obese patients had a significantly higher failure rate (28% vs. 14%, respectively, p<0.01). Zimmerman et al. (18) reported that those who underwent two or more previous fistula repairs had more recurrences than those who did not (71% vs. 22%, respectively). Other important risk factors for failure are, presence of baseline incontinence, complex fistula with multiple tracts and internal openings, surgeon's experiences, selected procedure type with a low success rate (4).

CONCLUSION

In our study, the most common fistula type was intersphincteric, while the most frequently applied procedure was fistulotomy. The risk factors most associated with failure were obesity (BMI \geq 30 kg/m²) and multiple fistula tracts. Other significant risk factors leading to failure were duration of symptoms \geq 12wk, a history of previous surgery for anal sepsis, the presence of baseline incontinence, complex fistula type, and non-fistulotomy procedures. This study suggests the need for comparative, randomized controlled studies that investigate methods and their outcomes, particularly in complex fistulas.

Conflict of interest: The authors declare that they have no competing interest.

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