ISSN 2515-8260 Volume 9, Issue 7, Summer 2022

Title: 'An Observational Study on Surgical Outcome Predictors In Patients With Anal Fistula'

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ABSTRACT

Background- Anal sepsis is one of the most prevalent benign ano-rectal disorders and is one of the conditions that surgeons encounter frequently. A chronic or recurrent anal fistula may develop in up to 65% of patients who initially present with a perianal abscess.

Methodology- Retrospective Abstracted data included demographics, surgical history, type of fistula, number of fistula tracts, baseline continence, type of procedure, and post-operative complications, including septic complications and incontinence. Fistulas were classified by anal sphincter involvement as subcutaneous (no sphincter), intersphincteric (internal sphincter), low transsphincteric (50% of external sphincter), high trans-sphincteric (50% of external sphincter), or suprasphincteric (above the entire external sphincter).

Results - One hundred patients underwent an anal fistula operation during the study period. The median age was 45 years with a predominance of male patients (79%).53 days were the average follow-up. A higher risk of postoperative faecal incontinence was associated with horseshoe fistula (44%) compared to non-horseshoe fistula (13%).

Conclusion- Anal fistula surgery eliminates disease, preserves continence, and reduces morbidity. The study's scales favour fistulotomy. Anal fistula plugging had higher failure and disease persistence than fistulotomy and endorectal advancement flap. Postoperative infections were most common after plugging. Postoperative incontinence is more likely in patients over 45 with high fistulas. These findings can help surgeons choose the right operation for each anal fistula patient.

Introduction – Surgeons see a significant number of patients with anal sepsis, making it one of the most common benign ano-rectal disorders. Up to sixty-five percent of patients who initially present with a perianal abscess will go on to develop a chronic or recurrent anal fistula. This statistic applies to all patients. [1] The only method that has been shown to be successful in treating this condition is surgical intervention. Although eliminating the fistula is the primary objective of treatment, it is also essential to maintain anal continence, reduce the likelihood of postoperative complications, and cut down on the likelihood of the condition returning. [2-8] Significant difficulties for the surgeon can be caused by the anatomy of the fistula and the degree to which the anal sphincter muscle is involved in the condition. Fistulotomy, fistulectomy, en dorectal advancement flap, anocutaneous flap, fibrin glue injection, anal fistula plug, seton drainage, and ligation of the intersphincteric fistula tract are some of

the surgical options that are currently available (known as the LIFT procedure). [9-19] To this day, there is no standardised algorithm that can guide the treatment of patients who have anal fistula. Instead, the decision regarding which operation to perform is determined by patient-related factors, the patient's surgical history, as well as the surgeon's level of experience and familiarity with the various operations.

Evaluating our work with patients who had been treated for anal fistula as a result of cryptoglandular disease was the primary objective of this study. A secondary objective was to identify the factors that influence postoperative outcome.

Methodology- All operations were performed at tertiary care hospital of central India . Exclusion criteria were age younger than 18 years, noncryptoglandular fistula (ie, fistula due to inflammatory bowel disease, human immunodeficiency virus, malignant neoplasm, radio- therapy, and obstetrical trauma), and rectovaginal or rectourethral fistula. The outpatient and inpatient medical records were reviewed, and the abstracted data included demographics; surgical history; type of fistula; number of fistula tracts; baseline continence; type of procedure performed; post- operative complications, including septic complications and incontinence. Fistulas were classified according to anal sphincter involvement as subcutaneous (no sphincter), intersphincteric (internal sphincter), low transsphincteric (<50% of external sphincter), high transsphincteric (≥50% of external sphincter), or suprasphincteric (above the entire external sphincter). A horseshoe fistula was diagnosed when 2 fistulous tracts were present in both ischioanal fossae with 1 internal opening in the midline. Preoperative endoanal ultrasonography was performed preoperatively in patients with persistent or recurrent anal fistula after prior interventions and in patients with multiple external fistula openings. Because this study was limited to patients with anal fistula secondary to cryp- toglandular disease, all internal openings were at the level of the dentate line. The continence level was assessed and documented preoperatively and postoperatively in all patients. If pres- ent, incontinence was qualified as gas or stool incontinence. Patients who had both symptoms were listed under the more severe of the 2 symptoms (stool incontinence).

Results- One hundred patients underwent an anal fistula operation during the study period. Table 1 summarizes their characteristics. The median age was 45 years with a predominance of male patients (79%). In all, 59% of patients had undergone previous operations to treat anal sepsis (median number of operations, 2). Baseline stool or gas incontinence symptoms were seen in 7% of patients. Most of the patients (94%) had a single fistula. A low trans-sphincteric fistula was the most common type (46%), and a suprasphincteric fistula was present in 6% of patients. A horseshoe configuration was noted in 10 patients (10%).

Table 1. Characteristics of Patients With Anal Fistula

Characteristic		No. (%)
Age, median (range)		45 (22-73)
Sex	Male	79 (79)
	Female	21 (21)
Median duration of symptoms, wk		32
Previous operation for anal sepsis		59 (59)
Baseline incontinence		7 (7)
	Stool	5 (5.0)
	Gas	2(2)

	Subcutaneous	15 (15)
	Intersphincteric	12 (12)
Fistula type	Low transsphincteric	46 (46)
	High transsphincteric	21 (20)
	Suprasphincteric	6 (6)
	Single vs multiple tracts	90/10
	Horseshoe fistula	10

Table 2 displays 53 days were the average follow-up (range, 6 days to 40 months). The surgical intervention was ineffective in 28 patients (15.6%). From these 28 patients, 20 showed persistent discomfort within one month of the intervention and 8 within one to six months. 15% of patients had new postoperative incontinence, with gas incontinence occurring in 5% and stool incontinence in 16% of patients.

Table 2. Operative Intervention and Overall Outcome

Fistula operation	Fistulotomy	82 (82)
	Advancement flap	11 (11)
	Anal plug	7 (7)
	Failure	16(16)
	Postoperative incontinence	16 (16)
	Stool	11(16)
	Gas	5 (11)
Failure	Postoperative septic complications	7(7)

The relationships between the various variables and postoperative incontinence are shown in **Table 3**. A higher risk of postoperative faecal incontinence was associated with horseshoe fistula (44%) compared to non-horseshoe fistula (13%) (OR, 5.1 [95% CI, 1.8-14.5; P=.002). When compared to the younger group, those over 45 years old had a higher rate of postoperative incontinence (23.2%) (adjusted OR [AOR], 2.8 [95% CI, 1.0-7.7; P=.04]). When compared to subcutaneous fistulas, high transsphincteric and suprasphincteric fistulas were more likely to predict incontinence (AOR, 22.9 [95% CI, 2.2-242.0; P=.009] and 61.5 [4.5-844.0; P=.002], respectively).

Table 3. Predictors of Postoperative Incontinence in Patients With Anal Fistula

		Postoperative Incontinence %	**OR (95% CI)**	***P* Value**	**AOR (95% CI)**	***P* Value**
Age, y	≤45	12	1 [Reference]		1	
	>45	23	2.1 (0.9-4.9)	.07	2.8 (1.0-7.7)	.04
Sex	Male	15	1 [Reference]		1	

	Female	21	1.4 (0.6-3.7)	.46	1.6 (0.5-5.3)	.44
Previous operation	No	13	1 [Reference]		1 [Reference]	
	Yes	19	1.5 (0.6-3.5)	.37	1.0 (0.4-2.7)	.97
Fistula type	Subcutaneous	4	1 [Reference]		1 [Reference]	
	Intersphincteric	10	2.7 (0.2-32.3)	.43	2.6 (0.2-33.4)	.45
	Low transsphincteric	7	1.9 (0.2-16.5)	.57	2.4 (0.3-21.7)	.44
	High transsphincteric	40	15.3 (1.8-127.0)	.01	22.9 (2.2-242.0)	.009
	Suprasphincteric	55	28.8 (2.6-315.0)	.006	61.5 (4.5-844.0)	.002
No. of fistula tracts	Single	17	1 [Reference]		1 [Reference]	
	Multiple	11	0.6 (0.1-5.0)	.64	0.5 (0.1-6.0)	.61
Horseshoe fistula	No	13	1 [Reference]		1 [Reference]	
	Yes	44	5.1 (1.8-14.5)	.002	1.1 (0.3-4.4)	.92
Procedure	Fistulotomy	15	1 [Reference]		1 [Reference]	
	Advancement flap	27	2.1 (0.7-6.6)	.19	0.5 (0.1-1.9)	.29
	Anal plug	20	1.4 (0.3-7.0)	.69	0.4 (0.1-2.6)	.32

DISCUSSION- Because of the disease's anatomical location, the danger of postoperative stool incontinence, and the potential for septic complications, treating anal fistula is still difficult. Although healing the fistula is the main goal of surgical intervention, the procedure's morbidity is also crucial. Fistulotomy, with a reported success rate ranging from 87% to 94%, continues to be one of the most frequently carried out procedures for anal fistula. [2,4,5,7,9,10,20] Fistulotomy involves the division of the anal sphincter muscle to varying degrees, which increases the likelihood of postoperative incontinence and negatively impacts the patient's quality of life. Incontinence following fistulotomy has been reported in 6% to 40% of patients. [2,4-7,20,21] This discovery has led surgeons to pinpoint the patient subgroups that have a higher risk of developing post-fistulotomy incontinence and to provide these patients with sphincter-preserving procedures. Patients with baseline incontinence, those with a history of anal operations, women with anterior-based fistulas, patients with horseshoe fistulas or high tracts involving a substantial amount of sphincter muscle are among those who are predisposed to incontinence. [5,7-9,22,23] These patients can today get a number of sphincter-preserving surgeries, such as the transanal advancement flap, fibrin glue injection, anal fistula plugging, and the LIFT treatment. [11-19,24-30] Several big investigations, including a prospective clinical trial from St Mark's Hospital in London, England, found a low success rate of 14% despite

early results with fibrin glue injection appearing promising. [13,27-29] The long-term effects of the LIFT surgery are yet unknown, despite its recent introduction and encouraging short-term success rates of 57% to 94%. [17-19] All patients received fistulotomy or one of the two additional sphincter-preserving procedures, endorectal advancement flap or anal fistula plugging, during the course of our study. With a fistulotomy and an endorectal advancement flap, we had the greatest surgical results. The anal fistula plug had the lowest success rate. The anal fistula plug's early experiences were very encouraging, but more recent investigations have showed success rates between 20% and 34%, which are consistent with our findings. [9,14,15,25,26,30] In individuals with trans-sphincteric fistulas, two retrospective studies and one randomised prospective research compared anal fistula plugging with endorectal fistula. [25,26,30] In all 3 investigations, the endorectal advancement flap performed better than the plug, with success rates ranging from 62% to 88% as opposed to the plug's 20% to 34%. In our study, fistula closure occurred in 16% of patients treated with fistula plugging versus 84% of patients who received endorectal advancement flap. Furthermore, the highest prevalence of postoperative septic complications was linked to fistula plugging.

16 patients (16%) who had no history of baseline incontinence developed postoperative faecal incontinence. The presence of large trans- and suprasphincteric fistulas and age greater than 45 years old were independent predictors of postoperative faecal incontinence. These findings can be physically accounted either by aging-related loss of muscle tone or surgically-induced muscle mass reduction, both of which would have an impact on the level of continence. In univariate analysis, horseshoe fistula was linked to a greater incidence of post-operative incontinence, but it was not an independent risk factor after accounting for all other factors. Postoperative incontinence rates ranging from 21% to 29% were reported in two trials on horseshoe anal fistulas. [22,23] Finally, our study has a number of drawbacks. The patients were not randomly exposed to the various surgical treatments, and the study is retrospective in nature. Based on the patient's surgical history, the anatomy of the fistula, the body habitus, and the baseline degree of continence, the surgeon decided which procedure would likely close the fistula with the least postoperative morbidity. A sphincter-preserving operation was suggested when the patient was thought to be at a higher risk for incontinence, however fistulotomies were performed on the majority of patients. As a result, fewer patients underwent the transanal advancement flap and the anal fistula plug. These elements can all introduce prejudice. A sizable portion of the patients underwent anal fistula surgery prior to being sent to our tertiary care facility. The findings of our investigation must therefore be interpreted in light of these constraints.

Conclusion - Anal fistula surgery aims to eradicate disease, preserve continence, and limit morbidity. This study's scales favour fistulotomy over other procedures. Anal fistula plugging had the highest operative failure and disease persistence compared to fistulotomy and endorectal advancement flap. Plugging had the most postoperative septic complications. Postoperative incontinence is more likely in patients with high transsphincteric or suprasphincteric fistulas and those over 45. These findings

can guide future care for anal fistula patients and help surgeons choose the right operation for each patient.

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