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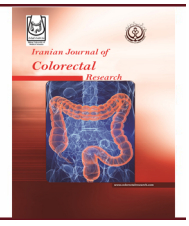

Comparative Analysis of Fistulotomy and Fistulectomy in Managing Low Anal Fistulas

Mohammad Shahbaz*[1]*, MBBS, MS; Osman Musa*[1]*, MBBS, MS; Nisar Ahmad Ansari*[1]*, MBBS, MS

[1]*Department of Surgery, Era's Lucknow Medical College and Hospital, Lucknow, Uttar Pradesh, India*

Corresponding authors:
Mohammad Shahbaz,
Department of Surgery, Era's Lucknow Medical College and Hospital, Lucknow, Uttar Pradesh, India. **Tel:** +91 8510078211
Email: mohammadshahbaz120@gmail.com

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Abstract

Background: An anal fistula is a pathological connection between the anal canal and perianal tissue, typically developing from an infected anal crypt. Regarding its surgical management, controversy persists regarding whether a fistulectomy should be performed instead of a fistulotomy in the case of a low-lying simple anal fistula. Hence, we compared fistulotomy and fistulectomy in managing low anal fistulas.
Methods: In this prospective comparative study, 90 patients aged >18 with a low-lying anal fistula were included. Out of 90 patients, 45 underwent fistulectomy, and 45 underwent fistulotomy as the treatment for low anal fistula and were followed up for three months. Mean operative time, healing time, flatus incontinence, and pain (on a visual analog scale) were compared.
Results: The mean age of the patients was 39.66±10.80 years, with male dominance (86.7%) in both groups. The mean operative time of patients of the fistulectomy group (35.31±7.48 min) was significantly longer (P=0.005) than that of the fistulotomy group (31.33±5.39 min). In the fistulectomy group, the mean healing time was significantly higher (28.69±4.56 days) as compared to the fistulotomy group (24.87±4.79 days) (P<0.001). The pain score was significantly higher in the fistulectomy group than in the fistulotomy group (P<0.001). However, flatus incontinence was similar between the groups (P>0.05). There were no cases of recurrence in either group.
Conclusion: Our study indicates that fistulotomy is a better option for managing low anal fistulas due to a shorter operative time, earlier healing, and fewer complications.

Keywords: Rectal fistula, Rectal diseases, Gastrointestinal diseases, Fistulectomy, Fistulotomy

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Introduction

An anal fistula is a pathological connection between the anal canal and perianal tissue, typically developing from an infected anal crypt (1). It is a chronic inflammatory condition characterized by a tubular structure with one end opening into the anorectal canal and the other opening into the perineum/perianal epidermis. In Indian traditional medicine, it is known as a *bhagandar* and enlisted among the *aṣṭamahāgada* (eight intricate diseases) (2). Each year, almost 1 in 10,000 persons are affected by this condition. The frequency of anal fistula is higher in men than in women. Up to 5% of proctological consultations involve this condition. Those with a history of anal ulcers frequently

develop anal fistulas. They result from improper healing of anal abscesses, which develop secondary to an infection of anal glands (3).

The symptomatic profile of anal fistulas includes perianal cellulitis, anorectal pain, pruritus ani, smelly or bloody drainage of pus, and, sometimes, difficulty controlling bowel movements. All these symptoms cause a lot of discomfort, stress, and agony, severely affecting patients' quality of life (4). The treatment strategies include fistulotomy, draining seton, anal fistula plugging (AFP), ligation of intersphincteric fistula tract (LIFT), drainage, and flap procedures (5).

It remains controversial whether a fistulectomy should be performed instead of a fistulotomy in the case of a low-lying simple anal fistula. In the early clinical trials, the fistulectomy was not preferred owing to the longer healing time (6). However, there is a lack of good systematic studies to compare the two treatment modalities, owing to which even the meta-analyses are inconclusive (7-9). Hence, the present study compared fistulotomy and fistulectomy in managing low anal fistulas at a tertiary care center in North India.

Patients and Methods

This prospective comparative study was carried out at the Department of Surgery, Era's Lucknow Medical College & Hospital (ELMC & H), Lucknow, after obtaining approval from the Institutional Ethical Committee (ELMC & H/R.Cell-EC/2019/149, dated 15/05/2019) and informed consent. During 2020-21, 90 patients with a low anal fistula underwent either fistulectomy or fistulotomy, with an equal number of patients in each group.

All patients aged >18 years with a low anal fistula were included. However, patients with a recurrent fistula, complex fistula, hemorrhoid, pilonidal sinus, or chronic disease (e.g., tuberculosis, Crohn's disease, uncontrolled diabetes mellitus, immunodeficiency, or malignancy) were excluded. A total of seven patients were excluded from the study.

Details regarding age and sex were noted, and a general examination of the patients was carried out, including an assessment of blood pressure and vital signs. A thorough medical, surgical, and drug history was obtained from the patients. Routine blood investigations were carried out. All patients were assessed for renal function (serum creatinine, urea, sodium, and potassium), liver function (serum bilirubin, alanine transaminase, aspartate transaminase, and alkaline phosphatase), and blood sugar status (fasting, post-prandial, and hemoglobin A1c).

Patients with stable hemodynamics and normal blood investigations underwent the mentioned surgical interventions. Operative time was noted, and intraoperative complications, if any, were looked upon. During the postoperative stay, pain and infection were noted. Pain assessment was done on a visual analog scale (VAS) ranging from 0 to 10. The maximum value during the postoperative period was taken as the representative value. A surgical site infection was recorded as per the Centers for Disease Control and Prevention (CDC) criteria. All the patients were followed up two weeks, one month, two months, and three months after the operation. Time taken for healing was noted. Assessment of pain was repeated at each follow-up. Any swelling at the surgical site was also noted. All the patients were enquired about flatus incontinence. Signs of recurrence, if any, were recorded.

Statistical Analysis

Microsoft (MS) Excel (2013) and Statistical Package for the Social Sciences version 21.0 (SPSS Inc., Chicago, Illinois, United States) were utilized to conduct the statistical analysis. The Kolmogorov-Smirnov test was used to test the normality of quantitative variables. Descriptive statistics are presented as proportions/percentages for categorical variables, and for continuous variables, as mean and standard deviation. We compared continuous variables using the student t-test. Fisher's exact and chi-squared tests were used to compare categorical variables. A P-value of 0.05 or lower was deemed statistically significant.

Results

The mean age of the study participants was 39.66±10.80 years, specifically 38.00±10.59 in the fistulectomy group and 41.31±10.87 in the fistulectomy group (P=0.147). Males (86.7%) dominated both groups over females (13.3%), with a similar gender distribution in the two study groups (P=0.215). The mean systolic blood pressure, heart rate, diastolic blood pressure, and respiratory rate were similar between the groups. The two groups had comparable complete blood count, renal function, liver function, and blood glucose tests (Table 1).

The mean operative time of patients of the fistulectomy group was significantly longer than that of the fistulotomy group. On the VAS scale, the pain experienced by patients of the fistulectomy group (4.49±1.53) was significantly higher than that of the fistulotomy group (3.1 6±0.98). Though postoperative infections were observed in a higher proportion of patients in the fistulectomy group (6.7%) as compared to the fistulotomy group (0.0%), this difference was not significant (Table 2).

In the fistulectomy group, the mean healing time was significantly longer (28.69±4.56 days) than in the fistulotomy group (24.87±4.79 days). Follow-up pain levels (on the VAS) were significantly higher in the fistulectomy group at all follow-up intervals except at two months. None of the patients in the fistulotomy group reported pain at two months and three months of follow-up (Table 3).

At all follow-ups, swelling was observed in a higher proportion of cases of the fistulectomy group than in the fistulotomy group, i.e., at week 2 (24.4% vs. 6.7%), at one month (3.3% vs. 2.2%), at two months (6.7% vs. 0.0%) and at three months (2.2% vs. 0.0%) (Table 4). The

Table 1: Comparison of clinical and hematological parameters between study groups

SN	Parameter	Fistulectomy (n=45)		Fistulotomy (n=45)		Statistical significance	
		Mean	SD	Mean	SD	't'	'P'
Hemodynamic parameters	Heart rate (bpm)	78.22	8.61	77.09	6.85	0.691	0.491
	SBP (mmHg)	120.53	9.69	123.29	7.84	-1.483	0.142
	DBP (mmHg)	79.76	4.93	78.56	6.78	0.960	0.340
	Respiratory rate (/min)	20.64	1.48	20.62	1.74	0.065	0.948
Hematological Profile	Hemoglobin (g/dl)	12.74	0.77	12.70	0.85	0.220	0.826
	White blood cells (/cumm)	7660.00	1092.62	7733.33	1216.93	-0.301	0.764
	Platelet count (Lakhs/cumm)	2.23	0.44	2.11	0.50	1.252	0.214
Renal Function Tests	Serum urea (mg/dl)	27.64	4.89	25.87	5.53	1.616	0.110
	Serum creatinine (mg/dl)	0.72	0.12	0.70	0.12	0.699	0.486
	Serum sodium (mEq/L)	136.37	3.27	135.98	3.09	0.570	0.570
	Serum potassium (mEq/l)	3.88	0.22	3.83	0.20	1.097	0.276
Liver Function Tests	Serum bilirubin (mg/dl)	0.93	0.20	0.95	0.19	-0.349	0.728
	SGOT (U/l)	28.15	7.09	29.19	6.03	-0.752	0.454
	SGPT (U/l)	29.79	5.90	28.82	6.38	0.750	0.455
	Alkaline phosphatase (IU/l)	75.72	2.71	75.30	2.99	0.706	0.482

t=Student t-test statistic. Abbreviations: serum glutamic oxaloacetic transaminase (SGOT), serum glutamic pyruvic transaminase (SGPT), diastolic blood pressure (DBP), systolic blood pressure (SBP)

Table 2: Intraoperative and immediate postoperative outcomes in the two study groups

Parameter	Fistulectomy (n=45)		Fistulotomy (n=45)		Statistical significance	
	Mean	SD	Mean	SD	't'	'P'
Operative time (min)	35.31	7.48	31.33	5.39	2.894	0.005*
Postoperative pain (VAS)	4.49	1.53	3.16	0.98	4.924	<0.001*
Postoperative infection	3 (6.7%)		0 (0.0%)		χ^2=3.10; p=0.078	

t=Student t-test statistic; χ=Chi-square test; VAS: visual analog scale (out of 10)

Table 3: Comparison of healing time and follow-up pain between the two groups

	Fistulectomy (n=45)		Fistulotomy (n=45)		Statistical significance
	Mean	SD	Mean	SD	P value
Healing time (days)	28.69	4.56	24.87	4.79	<0.001*
Pain (VAS)					
Week 2	2.13	1.06	1.58	1.18	0.021*
1 month	1.60	1.40	1.00	1.11	0.027*
2 months	0.27	0.94	0.00	0.00	0.060
3 months	0.20	0.46	0.00	0.00	0.004*

Student t-test was used. VAS: visual analog scale (out of 10)

Table 4: Comparison of flatus incontinence and flatus incontinence between the two groups during follow-up

Follow-up		Fistulectomy (n=45)		Fistulotomy (n=45)		Statistical significance
		N	%	N	%	P value
Flatus Incontinence	Week 2	0	0.0	0	0.0	–
	1 month	3	6.7	1	2.2	0.306
	2 months	3	6.7	0	0	0.078
	3 months	1	2.2	0	0	0.315
Swelling	Week 2	11	24.4	3	6.7	0.020*
	1 month	6	13.3	1	2.2	0.049*
	2 months	3	6.7	0	0.0	0.078
	3 months	1	2.2	0	0.0	0.315

The chi-squared test was used

difference in the occurrence of swelling among patients of the above two groups was significant only at the follow-ups at weeks two and four. None of the fistulotomy group patients had swelling after two months. While the fistulectomy group had a slightly higher rate of flatus incontinence during the follow-up, differences in flatus incontinence between patients of the two groups were not significant at any follow-up (P>0.05). There was no case of recurrence in either of the two groups.

Discussion

Low-lying anal fistulas are marked by the presence of perianal abscesses accompanied by pain and discharge of pus and blood. They cause significant discomfort and reduce the quality of life of affected patients. Anal fistulas are known to affect people of working ages, affecting individuals' personal and working lives (4). Surgical intervention is suggested as the long-term remedy with full resolution of the problem and fewer chances of recurrence. However, several surgical approaches have been suggested for this purpose. With the advancements in pain management, antibiotic regimens, and operating skills, fistulectomy has gained new ground for its use in managing low-lying anal fistulas.

In the present study, the age of patients ranged from 21–58 years. The mean age of patients was 39.66±10.80 years, and the majority were males (86.7%). Although anal fistulas are found in all age groups, including infants, the maximum incidence is in young males in the productive years of their life. The two study groups were comparable regarding demographics, clinical characteristics, and laboratory parameters, eliminating the confounding effects of such variables.

We found that the mean operative time was significantly longer with fistulectomy (35.17±7.48 minutes) than with fistulotomy (31.33±5.39 min). The difference in nature of the two procedures is the major reason for this time difference. While fistulotomy involves only the opening of the fistula tract, fistulectomy requires a complete excision of the fistulous tract, which requires additional time. In line with our findings, the contemporary literature documents operating times ranging from 12.13 to 28.6 minutes for fistulotomy and from 22.23 min to 34.2 min for fistulectomy (6, 10, 11).

In the present study, mean postoperative pain scores were also significantly higher in fistulectomy than in the fistulotomy group (4.49±1.53 vs. 3.16±0.98). Vyas et al. (12) measured postoperative pain in terms of the number of postoperative days the patient experienced pain and reported it to be 2.16 days for fistulotomy compared to 5.95 days for fistulectomy. Other studies used a mean pain score to indicate postoperative pain. Saber *et al.* (10) reported mean pain scores for fistulotomy and fistulectomy to be 4.8 and 6.2, respectively. Ganesan *et al.*(6) reported them as 5.0 and 5.9 for fistulotomy and fistulectomy, respectively. Both these studies reported the difference between the two groups to be significant. However, Barase and Shinde (11) reported the mean pain scores as 3.5 and 3.8, and Katiyar et al. (13) reported them as 4.57 and 4.34, respectively, yielding statistical similarity. In general, similar to the present study, most of the studies reported the pain scores to be significantly higher in fistulectomy than in fistulotomy, attributable to the more aggressive and extensive nature of the fistulectomy surgery.

In the present study, no postoperative infections were seen in the fistulotomy group, compared with 6.7% in the fistulectomy group. However, this difference was insignificant. Infection rates ranging from 2.2% to 10.5% for fistulotomy and from 3.8% to 40.5% for fistulectomy were reported by three different studies (8, 12, 14); greater postoperative infection rates were observed with fistulectomy in all three studies, though this reached statistical significance only in the Vyas *et al.* study (40.5% vs. 10.5%) (12). Sheikh et al. (14) reported this figure at 2.2% for fistulotomy and 3.8% for fistulectomy, whereas Ganesan et al. (6) reported 3.3% and 10%, respectively. One of the possibilities concerning the high infection rate in the study by Vyas *et al.* (12) could be the long-term cumulative assessment of infections rather than postoperative infections during the healing period, as observed in the present study and perhaps in other studies. Such high rates of infections, even in the long term, are unacceptable and seem to indicate poor postoperative care. None of the previous studies reported such high infection rates (9, 10, 15-20)

The mean healing time in our study was significantly shorter (24.87±4.79 days) for fistulotomy than fistulectomy (28.69±4.56 days). Though Sheikh *et al.* (14) reported the healing time to be longer with fistulectomy (4.57 weeks) than with fistulotomy (4.04 weeks), they found no statistical significance. However, similar to our study, Vyas et al. (12) found this difference to be significant (4.08 vs 6.94 weeks). Saber *et al.* (10) and Ganesan *et al.* (6) also reported shorter mean healing times with fistulotomy than the fistulectomy group (4.28 vs. 5.98 weeks and 3.46 vs. 4.5 weeks, respectively). Hence, our findings regarding healing time align well with contemporary and prior literature (6, 10, 14).

The present study had a follow-up duration of 3 months, with visits at two weeks, one month, two months, and three months. Pain, swelling, and flatus incontinence during follow-up were more common with fistulectomy than with fistulotomy. In fact, in the fistulotomy group, pain and swelling resolved entirely after one month, with the groups showing significant differences regarding these two postoperative complaints. Concerning flatus incontinence, 3 (6.7%) patients in the fistulectomy group complained of this problem, persisting by the final follow-up in one patient. On the other hand, in the fistulotomy group, only one patient complained of this issue merely during the one-month follow-up. Nonetheless, this difference did not reach significance.

The present study recorded no recurrence during the three months of follow-up. Similarly, Saber *et al.* (10) reported only 2% recurrence with fistulotomy compared to 0% with fistulectomy, yielding an almost negligible recurrence rate. However, most other studies recorded higher recurrence rates in both groups. Sheikh *et al.* (14) reported 10.7% with

fistulotomy and 15.5% with fistulectomy, Vyas *et al.* (12) reported 5.3% and 18.9%, respectively, Ganesan *et al.* (6) reported 3.3% and 0%, respectively, and Katiyar *et al.* (13) reported 4% recurrence in both the groups. Most of these studies had a longer follow-up duration (6 months or more) than ours, which was limited to 3 months, in which we did not encounter any recurrences. Due to fistulectomy's more aggressive and radical nature, it is assumed to have lower recurrence rates. However, most studies did not find a significant difference between the two groups.

Overall, we found fistulotomy to be a superior treatment option than fistulectomy for patients with a low anal fistula due to its shorter surgical duration, faster recovery, and fewer complications. With these findings and their comparison with previous studies, we feel that fistulectomy does not provide any additional benefit despite being a more aggressive procedure that requires longer operative and healing times, has a higher risk of postoperative complications, and has an equivalent recurrence rate.

A key limitation of the present study is its relatively small sample from a single center. Another limitation is the short follow-up, where recurrences may have been detected with longer follow-ups. Further studies on a larger sample size with a longer follow-up duration are recommended to compare the long-term efficacy of both procedures.

Conclusion

Overall, we found fistulotomy to be a superior treatment option than fistulectomy for patients with a low anal fistula due to its shorter surgical duration, faster recovery, and fewer complications. With these findings and their comparison with previous studies, we feel that fistulectomy does not provide any additional benefit despite being a more aggressive procedure that requires longer operative and healing times, has a higher risk of postoperative complications, and has an equivalent recurrence rate.

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Authors' Contribution

MS and OM contributed to the study's conception and design. MS and OM undertook material preparation, data collection, and analysis. NA wrote the first draft of the manuscript, and all authors commented on consecutive versions. All authors read and approved the final manuscript.

Conflict of interest: None declared.

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