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Original Research Article

COMPARATIVE STUDY OF FISTULECTOMY AND FISTULOTOMY IN MANAGEMENT OF LOW ANAL FISTULA

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ABSTRACT

Background: Aims and objectives: the study was conducted to compare fistulectomy v/s fistulotomy in the management of low anal fistulae.
Materials and Methods: The study is conducted among indoor patients of general surgery department in a tertiary care hospital of South Gujarat. 60 patients are included in the study which are divided randomly into 2 groups:
Group A – Patients undergoing Fistulectomy
Group B – Patients undergoing Fistulotomy.
Results: The mean operating time for fistulotomy is 42.83 minutes with SD of 8.38 while the mean operating time for fistulectomy is 50.17 minutes with SD of 7.71. Mean duration for wound discharge for fistulotomy comes to be 20.47 days with SD of 5.22; while the mean duration of wound discharge for fistulectomy comes to be 33.53 days with a SD of 5.58. This time was noted for each operated case and the mean wound healing duration for fistulotomy was 35.97 days with SD of 7.32 while the mean duration for fistulotomy was 47.07 days with SD of 7.72. Mean hospital stay for fistulotomy was 2.37 days while mean hospital stay for fistulectomy was 3.03 days.
Conclusion: From our study we can conclude that perianal fistula has a male predominance in incidence and more in young adults. Inter-sphincteric fistulae are more common than trans- sphincteric fistulae in patients suffering from low perianal fistulae.
Keywords: Fistulotomy, Fistulectomy, Fistula-in-ano, Pain.

INTRODUCTION

Hippocrates described the treatment for anal fistulae in 460 B.C., including incision and drainage and fistulotomy. Use of stalk of fresh garlic for examining fistulous tract was described by Adams in 1849. Celsus described use of a probe to check the path of the fistulous tract. John Ardene described merits of fistulotomy during middle ages. Importance of fistulotomy and dressing of the wound was emphasized by Percival Pott in 1765. Principles of treating anal fistulae that are widely used now were established by Frederick Salmon founder of St. Marks hospital.

Fistula is a Latin word meaning a pipe. Fistula-in-ano is a chronic abnormal communication, usually lined to some degree by granulation tissue, which runs outwards from the anorectal lumen to an external opening on the skin of perineum or buttock.

Anal fistulae may be of low type or high type. Low anal fistula is located in the lower third of anal sphincter. High anal fistula is a tract that runs through upper two-third of sphincter muscles.

Majority of low anal fistulae can be managed by either of the two methods, Fistulotomy (laying open the tract) or Fistulectomy (excision of tract) without any postoperative complications.

PARK'S CLASSIFICATION

It is the most widely accepted classification for fistula in ano. It is based on centrality of inter-sphincteric anal gland infection which results in a primary tract whose relation to external sphincter defines the type of fistula[1]

1. Inter-sphincteric fistulae:

These do not cross the external sphincter. These fistulae mostly run directly from internal to external opening across distal internal sphincter but may extend proximally in the inter-sphincteric plane to

end blindly with or without an abscess or may enter the rectum at a second internal opening

These are subdivided into 7 sub-categories.

- A simple tract that cross internal sphincter to site of infected anal gland and through the inter-sphincteric plane to external opening in perianal region.
- Simple tract with closed external opening and an abscess to para-rectal region without opening in rectum or an abscess.
- High tract entering rectum.
- High tract with supra-levator abscess.
- High blind tract with supra-levator abscess without perianal opening.
- High tract entering rectum without any perianal opening.

2. Trans-sphincteric fistulae:

It has a primary tract that pass through internal as well as external sphincter.

Subdivisions of trans-sphincteric fistulae

- A simple tract that enters anal canal at high or low level.
- Without perianal opening and recurrent abscess.
- High blind tract.
- High blind tract with supra-levator abscess.

3. Supra-sphincteric fistulae:

These are thought to be iatrogenic in nature and are difficult to distinguish from high trans-sphincteric fistulae. These fistulae are rare in occurrence.

4. Extra-sphincteric fistulae:

These run irrespective to sphincters and are a result of pelvic infection or pelvic trauma.

Iatrogenic extra-sphincteric fistula may be a result of over enthusiastic drainage of ischio-rectal abscess.

Aims and objectives

A comparative study conducted to compare fistulectomy v/s fistulotomy in the management of low anal fistulae in terms of:

1. Operating time
2. Post-operative pain
3. Wound discharge duration
4. Wound healing time.

MATERIALS AND METHODS

The study is conducted among indoor patients of general surgery department in a tertiary care hospital of South Gujarat. 60 patients are included in the study which are divided randomly into 2 groups:

Group A – Patients undergoing Fistulectomy

Group B – Patients undergoing Fistulotomy

All patients were followed up for a total duration of twelve weeks during the postoperative period. Patients were followed up at weekly intervals for the initial 6 weeks and at 2-week intervals for another 6 weeks. During each follow- up visit, the patient was assessed for postoperative pain, wound discharge and wound healing.

Sample size is calculated using open EPI software considering mean wound discharge duration 4.1 +/- 1.91 and 2.75 +/- 1.71 of fistulectomy and fistulotomy respectively from a previous study.

Confidence interval = 95% ; Power = 80% ; Sample size = 60

The operating time for the procedure was calculated from the start of the dye test to the beginning of dressing of the post-operative wound.

The severity of postoperative pain was assessed on a scale of 0 to 10 with help of the visual analogue scale (VAS). Pain scores were assessed at 24 hours and 48 hours post- surgery.

Postoperative wound discharge was defined as a non-infected serosanguinous secretion from the open postoperative wound. Wound infection was defined as the presence of erythema, induration surrounding the wound or constitutional symptoms such as fever. During each follow up the patients were examined for wound discharge. Duration for discharge to stop completely was noted in each patient.

Time required for complete healing of the postoperative wound was defined as the time for complete healing to take place with no area with an un-epithelized surface.

Inclusion Criteria

- Low trans-sphincteric anal fistulae
- Inter-sphincteric fistulae
- Subcutaneous fistulae
- Extra-sphincteric low anal fistulae

Exclusion Criteria

- High anal fistulae
- Patients not giving consent
- Obstetric fistulae
- Post radiation fistulae
- Fistulae due to Crohn's disease
- Fistulae due to tuberculosis
- Patients lost during follow up
- Pediatric patients.

RESULTS

In this study, 60 patients of low perianal fistula were included, out of which 30 patients were operated with fistulotomy and the other 30 patients were operated with fistulectomy. The following data summarises the details of observations noted during the study. The results of the study are as below.

Table 1: Age wise distribution

Age Group	Fistulotomy group		Fistulectomy group	
	No.	%	No.	%
<=30	7	23.33	12	40.00
31-40	7	23.33	10	33.33

41-50	5	16.67	4	13.33
>50	11	36.67	4	13.33
Total	30	100	30	100
Age Mean ±sd	44.1 ±15.48		36.4 ±13.22	

Age distribution among both the groups was almost similar with mean age of patients undergoing fistulotomy was 44.1 yrs & whereas mean age undergoing fistulectomy was 36.4 yrs.

Table 2: Gender distribution

Gender	Fistulotomy group		Fistulectomy group	
	No.	%	No.	%
Male	27	90.00	29	96.67
Female	3	10.00	1	3.33
Total	30	100	30	100

In this study it was found that more males presented with complains of perianal fistula than females. Out of study of 60 patients only 4 patients were females rest 56 were males. Out of these 4 females, 3 were operated with fistulotomy and 1 was operated with fistulectomy.

Table 3: Type of fistula

Type of Fistula	Fistulotomy group		Fistulectomy group	
	No.	%	No.	%
Inter-Sphincteric	22	73.33	21	70.00
Trans-Sphincteric	8	26.67	9	30.00
Total	30	100	30	100

This study includes only low anal fistulae hence its two subtypes are included here.
More patients with inter-sphincteric fistulae presented a compared to trans-sphincteric fistulae. Out of 60 patients, 43 patients had inter-sphincteric fistulae while only 17 patients had trans-sphincteric fistulae

Table 4: Operating time

Parameter	Fistulotomy group		Fistulectomy group	
	Mean	SD	Mean	SD
Operating time (minutes)	42.83	8.38	50.17	7.71

Comparison of Mean t-test P = 0.0008

The operating time for the procedure was calculated from the start of the dye test to the beginning of dressing of the post-operative wound. The mean operating time for fistulotomy is 42.83 minutes with SD of 8.38 while the mean operating time for fistulectomy is 50.17 minutes with SD of 7.71. On comparing both the groups, the p value comes out to be 0.0008 which is statistically significant. This shows that fistulotomy has a better operating time as compared to fistulectomy.

Table 5: Pain score at 24 hours

Parameter	Fistulotomy group		Fistulectomy group	
	Mean	SD	Mean	SD
Pain score at 24 hours	7.03	1.19	7.30	1.15

Comparison of Mean t-test P = 0.3752

All the patients were evaluated after 24 hours for post-operative pain using visual analog scale. The mean VAS for fistulotomy comes to be 7.03 while mean VAS for fistulectomy comes to be 7.30. on comparing both the groups, the p value comes out to be 0.3752 which is statistically not significant.

Table 6: Pain score at 48 hours

Parameter	Fistulotomy group		Fistulectomy group	
	Mean	SD	Mean	SD
Pain score at 48 hours	4.73	1.20	5.13	1.22

Comparison of Mean t-test P = 0.2055

Patients were assessed for post-operative pain at 48 hours using visual analog scale. The mean value of VAS at 48 hours for fistulotomy comes to be 4.73 while that of fistulectomy comes to be 5.13. Statistically this score is not significant as p value = 0.2055.

Table 7: Duration of wound discharge

Parameter	Fistulotomy group		Fistulectomy group	
	Mean	SD	Mean	SD
Wound discharge duration (days)	20.47	5.22	33.53	5.58

Comparison of Mean t-test P < 0.0001

Wound discharge for this study is described as non-infected serosanguinous secretion from the open postoperative wound. The patients were followed up for a total of 12 weeks and the day the patients stopped complaining about the discharge from the wound was noted. Mean duration for wound discharge for fistulotomy comes to be 20.47 days with SD of 5.22; while the mean duration of wound discharge for fistulectomy comes to be 33.53 days with a SD of 5.58. These findings were statistically significant as on comparing both the groups, the p value comes to be < 0.0001. This means that discharge from the wound stops significantly earlier in fistulotomy than in fistulectomy.

Table 8: Duration of wound healing

Parameter	Fistulotomy group		Fistulectomy group	
	Mean	SD	Mean	SD
Wound healing duration (days)	35.97	7.32	47.07	7.72

Comparison of Mean t-test P < 0.0001

Wound healing duration is the time for complete healing to take place with no area with an un-epithelized surface. This time was noted for each operated case and the mean wound healing duration for fistulotomy was 35.97 days with SD of 7.32 while the mean duration for fistulotomy was 47.07 days with SD of 7.72. this difference was statistically significant as p value comes to be < 0.0001. this concludes that wounds of fistulotomy healed significantly earlier than the wounds of fistulotomy.

Table 9: Hospital stay

Parameter	Fistulotomy group		Fistulectomy group	
	Mean	SD	Mean	SD
Hospital Stay (days)	2.37	0.56	3.03	0.89

Comparison of Mean t-test P = 0.0011

Hospital stay is the number of days for which the patient was admitted. Mean hospital stay for fistulotomy was 2.37 days while mean hospital stay for fistulectomy was 3.03 days which is statistically significant with a p value of 0.0011.

Table 10: Wound infection

Wound Infection	Fistulotomy group		Fistulectomy group	
	No.	%	No.	%
Yes	2	6.67	5	16.67
None	28	93.33	25	83.33
Total	30	100	30	100

Chi-Square - 0.647 P = 0.4212

Out of 60 patients, only 7 patients suffered from wound infection. Out of these 7 patients, 2 patients belong to fistulotomy group and 5 patients belong to fistulectomy group. This means that 6.67% patients operated with fistulotomy suffered from wound infection whereas,16.67% patients operated with fistulectomy suffered with post-operative wound infection. The comparison between these two surgical methods in terms of wound infection rate does not yield a statistical difference.

Table 11: Recurrence

Recurrence	Fistulotomy group		Fistulectomy group	
	No.	%	No.	%
Yes	1	3.33	3	10.00
No	29	96.67	27	90.00
Total	30	100	30	100

Chi-Square - 0.268 P = 0.6048

4 patients had recurrence out of the total 60 patients included in the study 1 belonged to fistulotomy group while 3 belonged to fistulectomy group. 3.33% patients operated with fistulotomy had recurrence and 10% patients operated with fistulotomy had recurrence. The comparison of recurrence rate does not yield a statistical significance as the p value comes to be 0.6048.

DISCUSSION

We have conducted our study in all patients with low perianal fistula. Total 60 patients were enrolled in this study. Data was recorded as per proforma sheet and analysed as per the excel sheet. Out of 60 patients, 30 patients were operated with fistulotomy and other 30 patients were operated with fistulectomy. This discussion is based on observations and analysis of results which is based on incidence, demographic profile, clinical profile, pre-operative laboratory findings, type of fistula, average operative time, pain score at 24 and 48 hours respectively, length of post-operative hospital stay, wound discharge duration, wound healing duration, wound infection rates and recurrence of perianal fistula.

1. Operative time

In the present study, the mean operative time for fistulotomy group was 42.83 minutes with a SD of 8.38 minutes while the mean operative time for fistulectomy group was 50.17 minutes with a SD of 7.71 minutes. This difference was found to be statistically significant with a p value of 0.0008. In the study Bhupendra Kumar Jain et al. no significant differences existed between the operating times (28.00 ± 6.35 minutes vs. 28.20 ± 6.57 minutes, P = 0.925).[2] In the study Olfat I et al. there was a statistically significant difference in the mean operative time, as it was 19.39 min in fistulotomy group and 40.67 min (P < 0.001) in fistulectomy group.[3] Considering the study Zuhair et al. the operating time for fistulotomy was ranging from 15 to 25 with a mean time of 17.3 minutes while the operating time for fistulectomy was ranging from 20 to 35 minutes with a mean time of 33 minutes. (P value 0.008).[4] In the study conducted by Ghulam Murtaza it was concluded that the median duration of surgery was significantly shorter in fistulotomy group 17 minutes (Interquartile range: 12-25 minutes) compared to fistulectomy group 25 minutes Interquartile range: 20-35 minutes (p<0.001).[5] In the study Ganesan R et al. the operating time in fistulotomy group was 12.13 minutes ± 2.11minutes and in fistulectomy group was 22.23±3.36minutes. The difference between 2 groups was statistically significant (p value <0.001).[6] Thus we can say from the above studies that operative time for fistulotomy is significantly less than the operative time for fistulectomy for low perianal fistulae.

2. Pain score at 24 hours

In our study the mean pain score after 24 hours for fistulotomy group is 7.03 with SD of 1.19 and the mean pain score after 24 hours for fistulectomy group is 7.30 with SD of 1.15. the difference between these pain scores after 24 hours is not statistically significant as the p value comes out to be 0.3752. in the study Bhupendra Kumar Jain et al. the mean pain score after 24 hours for fistulectomy is 4.05 while that for fistulotomy is 4.50 with p value of 0.221 that shows that the difference is not statistically significant.[2] In the study Ganesan R et al. the mean pain score at 24 hours for fistulotomy group is 5.00 with SD of 0.871 while that of fistulectomy is 5.90 with SD of 1.062 the difference between these 2 groups is statistically significant with a p value of 0.001.[6] The study Aslam et al. compares the mean post-operative score for different age groups; at age group <40 years, the mean postoperative pain score was found out to be significantly higher in fistulectomy group than in fistulotomy group (3.85 1.99 versus 2.00 2.08; p ¼ 0.013) while for the age group. > 40 years, mean postoperative pain was found out to be higher in group B (2.67 0.97) when compared with group A (2.00 1.15); however, this difference did not reach statistical significance (p ¼ 0.242).[7] Different studies show different results in post-operative pain after 24 hours for fistulotomy and fistulectomy. In this study post -operative pain at 24 hours interval is almost similar in both the procedures.

3. Pain score at 48 hours

The mean pain score after 48 hours postoperatively for fistulotomy group is 4.73 with SD of 1.20 and mean pain score after 48 hours postoperatively for fistulectomy group is 5.13 with a SD of 1.22; the comparison between these two groups does not yield statistical significance as the p value come out to be 0.2055. The study suggests that the pain score at the end of 48 hours is comparable in both the groups.

4. Wound discharge duration

Postoperative wound discharge was defined as a non-infected serosanguinous secretion from the open postoperative wound. The duration for which discharge was seen from the postoperative wound was noted for both the groups. The mean duration of wound discharge for the fistulotomy group is 20.47 days with a SD of 5.22 days and the mean duration of discharge for the postoperative site in case of fistulectomy group is 33.53 days with SD of 5.58 days. The difference between the two groups is statistically significant with a p value of < 0.0001. In the study Bhupendra Kumar Jain et al. post-operative wounds ceased to ooze earlier in fistulotomy group than in fistulectomy group (2.75 ± 1.71 weeks vs. 4.10 ± 1.91 weeks, P = 0.035). the above studies prove that the postoperative discharge duration is significantly less for fistulotomy as compared to fistulectomy.[2] This result can be attributed to the fact that fistulectomy requires extensive dissection and use of electrocautery which impairs wound healing.

5. Wound healing duration

It is defined as the time for complete healing to take place with no area with an un- epithelized surface. The mean duration for wound healing in fistulotomy group was 35.97 days with SD of 7.32 days; while the duration of wound healing in fistulectomy group was 47.07 days with SD of 7.72 days. These results on comparing yield a statistically significant difference with a p value of < 0.0001. In the study Bhupendra Kumar Jain et al. postoperative wounds

in fistulotomy group healed earlier in comparison to fistulectomy group wounds (4.85 ± 1.39 weeks vs. 6.75 ± 1.83 weeks, P = 0.035).[2] The result of the study Olfat I et al. shows significant decrease in the time needed for wound healing in fistulotomy group compared with fistulectomy group ($P < 0.05$).[3]

The study Zuhair et al. shows that the healing time for fistulotomy was found to be between 21-36 days (mean 26.38 days), while the healing time for fistulectomy was 32-46 days with a mean of 38.64 days (P. value 0.0001).[4] In the study by Ghulam Murtaza he finds that the median duration of wound healing was shorter in the fistulotomy group 15 days (Interquartile range: 7-20 days) compared to the fistulectomy group 30 days (Interquartile range: 15-42 days) (p<0.001).[5] The study Ganesan R et al. shows the wound healing time in fistulotomy Group was 24.20±2.95 days which was considerably less when compared to patients in fistulectomy Group where it was 31.50±4.34 days. The difference between two groups was statistically significant.[6] The study Aslam et al. shows mean wound healing time was shorter in fistulotomy group in comparison to fistulectomy group (p = 0.0005).[7] This result can be attributed to the fact that fistulectomy requires extensive dissection and use of electrocautery which impairs wound healing.

6. Hospital stay

The number of days a patient has to stay in hospital was noted for patients undergoing the surgery. The mean hospital stay for patients undergoing fistulotomy was 2.37 days with a SD of 0.56 day and the mean hospital stay for patients undergoing fistulectomy was 3.03 days with SD of 0.89; there is a statistically significant difference between these two groups with a p value o 0.0011. In the study Ganesan R et al. the post- surgery hospital stays in fistulotomy Group was 1.80±0.66days and in fistulectomy Group was 2.60±0.563 days. The difference was statistically significant (p value< 0.001)[6] . In the study conducted by Mohammad Adnan Nazeer the mean hospital stay for patients undergoing fistulotomy is 2 days while the mean hospital stay for patients undergoing fistulectomy is 3.5 days.[8] Thus from our own study and other studies mentioned above we can conclude that patients undergoing fistulotomy have significantly shorter hospital stay as compared to patients undergoing fistulectomy.

7. Wound infection

Wound infection is defined as the presence of erythema, induration surrounding the wound or constitutional symptoms such as fever. Postoperative wound infection is a major concern as it can hamper the wound healing and can increase the chances of recurrence. In this study, 7 patients suffered from postoperative surgical site wound infection out of total 60 patients; 2 patients belong to fistulotomy group and 5 patients belong to fistulectomy group i.e. 6.67% patients that underwent fistulotomy had post-operative surgical site wound infection and 16.67% patients undergoing fistulectomy had postoperative surgical site wound infection. The difference between the two groups is not statistically significant as the p value come out to be 0.4212. in the study Elsebai et al. 1 patient undergoing fistulectomy and 2 patients undergoing fistulotomy suffered from postoperative wound infection.[9] In the study Zuhair et al. 1 patient undergoing fistulectomy and 1 patient undergoing fistulotomy suffered from postoperative wound infection [4] . In the study Ganesan R. et al. 1 patient undergoing fistulotomy and 3 patients undergoing fistulectomy suffered from postoperative wound infection.[6] We find from the above studies that the postoperative wound infection incidence is higher in case of fistulectomy but the difference is not statistically significant.

8. Recurrence

In our study, 1 patient undergoing fistulotomy and 3 patients undergoing fistulectomy suffered from recurrence of perianal fistula. The difference between the two groups does not reach statistical significance as the p value come out to be 0.6048. In all these patients recurrence was seen at 6-8 weeks postoperative. In the study Elsebai et al. there was no significant difference between the two groups in terms of recurrence rate (p > 0.05).[9] In the study Zuhair et al. recurrence developed in 2 out of 32 patients (6.25%) who were treated with fistulotomy; while in 44 patients who were treated by fistulectomy, recurrence developed in 3 patients (6.82%).[4] In the study by Ghulam Murtaza it is stated that the incidence of recurrence was comparable in fistulotomy vs. fistulectomy (3[3.12%] vs. 4[4.16%]; p=0.70).[5] In the study Ganesan R. et al. recurrence rate in fistulotomy Group was 3.3% (n=1) whereas none of the patients in fistulectomy Group had recurrence. The difference was statistically insignificant (p=0.315).[6] From the above mentioned results from various studies we can conclude that the recurrence does not depend only on the type of surgery performed as there is no significant statistical difference.

CONCLUSION

From our study we can conclude that perianal fistula has a male predominance in incidence and more in young adults. Inter-sphincteric fistulae are more common than trans- sphincteric fistulae in patients suffering from low perianal fistulae.

Fistulotomy is significantly better than fistulectomy in terms of operating time, duration of wound discharge, wound healing duration and duration of hospital stay.

When compared in terms of pain scale at 24 hours, pain scale at 48 hours, postoperative wound infection rate and recurrence rate, no significant difference was found in the whole study.

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