Annals of Clinical and Medical Case Reports

Research Paper

ISSN 2639-8109 | Volume 11

A Comparative Study of Fissurectomy Versus Lateral Internal Sphincterotomy in Treatment of Chronic Anal Fissure Regarding Post-Operative Complications

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Received: 05 Oct 2023
Accepted: 15 Nov 2023
Published: 20 Nov 2023
J Short Name: ACMCR

Citation:

Javed S, A Comparative Study of Fissurectomy Versus Lateral Internal Sphincterotomy inTreatment of Chronic Anal Fissure Regarding Post-Operative Complications. Ann Clin Med Case Rep. 2023; V11(15): 1-5

Keywords:

Chronic anal fissure; Fissurectomy; Lateral anal sphincterotomy

1. Abstract

1.1. Introduction: An anal fissure (fissure-in-Ano) is a small, oval-shaped tear in the skin that lines the opening of the anus which is quite common in the general population. Anal fissures are either acute or chronic. Chronic fissures typically require surgical treatment, despite the emergence of new conservative techniques, such as nitric oxide donors. Surgical options include fissurectomy and lateral internal sphincterotomy (LIS).

1.2. Objective: To compare the postoperative complications following fissurectomy and LIS for the treatment of chronic anal fissure.

1.3. Methodology: A randomized control trial was conducted at the "Department of Surgery, Services Hospital Lahore" from March 10th, 2018 to September 10th, 2018. Patients with a single anal fissure not responding to medical treatment (GTN cream, diltiazem cream) were included in this study. Out of 200 patients in total, 100 patients were included in the fissurectomy group and 100 patients in the LIS group. Both procedures were done under general anesthesia. The first visit was scheduled after one week of the operation to assess post-operative bleeding and after 8 weeks for the assessment of postoperative pain and bowel incontinence

1.4. Results: In this study, the age range was 20 to 50 years, with the mean age in the fissurectomy group being 36.600± 5.96 years and in the LIS group being 33.510±7.52 years. In the fissurectomy group, the mean duration of complaint was 17.100±4.34 weeks, while in the lateral anal sphincterotomy group, it is 18.610±5.57 weeks. None of the patients experienced post-operative pain and post-operative bleeding in both of the groups (p=1.000), while post-operative bowel incontinence was observed in 8% of the patients in the fissurectomy group as compared to 2% in the LIS group (p=0.051)

1.5. Conclusion: In conclusion, LIS is the simplest and most effective treatment for chronic anal fissures resistant to medical treatment due to a lower incidence of complications, particularly bowel incontinence, recurrence of fissure, and higher patient satisfaction.

2. Introduction

An anal fissure is a common benign anorectal disease affecting adults and children. An anal fissure is a painful small tear in the posterior anoderm that spreads cephalad to the pectinate line. Anal fissures are either acute or chronic. Acute fissures occur with a sudden onset and heal within two weeks, whereas chronic anal fissures fail to heal within eight weeks [1]. It is frequently caused by a massive, hard, powerful bowel motion. It causes continuous cycles of anal pain and bleeding, which lead to dreadful and long-term anal fissures in nearly 40% of the patients who develop linear tears. It can usually be diagnosed by history only [2]. The usual symptoms are acute anal pain with defecation and a varying quantity of blood discharge. The pain typically continues for 15 to 30 minutes after a bowel movement. The bare internal musculus sphincter of the anus contracts many times, resulting in severe pain. If this condition continues, the muscle of the anus becomes hypertrophied and leads to non-healing anal fissures. Fissures are of two types: primary or secondary. The most common site for

the primary fissure is the posterior midline, whereas the uncommon anterior midline primary fissures frequently occur in females. [3] However, secondary anal fissures can develop anywhere in the anoderm and are associated with different disorders which frequently require surgical procedures and analysis of the root cause for the definitive cure. [4] It can be managed conservatively or surgically. Initially conservative surveillance is advised for both acute and chronic anal fissures. [5]. These include topical nitroglycerin, calcium channel blockers (diltiazem) or botulinum toxin injection into the anal sphincter. Other measures include warm sitz baths, topical anesthetics, a high-fibre diet and stool softeners [6]. Surgical options include fissurectomy, LIS and advancement flaps for chronic anal fissures. LIS was first proposed in 1951 by Eisenhammer. This method has given more than a 95% healing rate in the 3 weeks post procedure. [7] It is suggested for a resistant chronic anal fissure that shows no response to pharmacologic or conventional methods [8].It is normally done at only one site. A few studies compared the bi-lateral to uni-lateral internal anal sphincterotomy and found that bilateral LIS gives good results with regards to initial pain comfort, decreasing the anal pressure, and overall rate of cure within 4 weeks with no recurrence and has a higher satisfaction rate among patients than unilateral LIS. [9] From the several studies done in the past comparing both procedures, it is ascertained that LIS is a better treatment option for chronic anal fissure as the postoperative complications are more in fissurectomy than in LIS. Nevertheless, anal incontinence is one of the complications of LIS. In addition, research indicates that patients with treatment-resistant chronic anal fissures respond well to fissurectomy. [10] When considering surgical management for treating chronic anal fissures, fissurectomy is similar to LIS concerning post-procedure pain relief, healing of the wound and less recurrence [11]. Therefore, this study was carried out to compare the postoperative complications following fissurectomy and LIS to provide more evidence in terms of which surgical is better for chronic anal fissures.

3. Methods

This randomized controlled trial for six months from March 2018 to September 2018, was conducted at a general surgery department, Services Hospital, Lahore, after approval from the ethical committee and research department (IRB No. IRB/2017/361/SIMS). A sample size of 200 was determined. The subjects were randomly assigned by blind balloting into one of the two groups of 100 patients each, considering the significance level as 5%. Patients of both gender, aged from 20 to 50 years, with chronic anal fissures at one site and not responding to medical treatment (GTN cream, diltiazem cream) were included. Patients with a history of hemorrhoids, rectal polyps and carcinoma of the rectum, previous anorectal surgery, fecal incontinence, bleeding /coagulation disorder, diabetes mellitus, asthma, hypertension and ischemic heart disease were excluded. Written consent was obtained from all the patients for the procedure as well as for inclusion in this study. The standard demographic data of patients fulfilling the inclusion criteria were collected, and the balloting method was used for stratification. Figure 1 demonstrates the consort flowchart.

Both of the procedures, fissurectomy and LIS, were carried out under regional anesthesia. In the fissurectomy group, fissurectomy involved the excision of the scarred superficial skin around the anal fissure. All wounds were left open. No anal tampons were used. In the LIS group, a linear incision was made with a scalpel from the dentate line to just beyond the anal verge. Dissection was carried out until the internal sphincter, and a few fibres of the external sphincter were exposed. Under direct vision, the full thickness of the internal sphincter was divided from the level of the dentate line distally. Hemostasis was achieved with electrocautery. Both procedures were done under the supervision of a consultant surgeon with three years of post-fellowship experience. All the patients were discharged one day after surgery with the advice of a warm bath and bulking agents for a maximum of 2—3 weeks. Their first appointment was planned after one week to evaluate blood discharge and after eight weeks to evaluate postoperative pain and bowel incontinence.

Postoperative complications were defined in terms of postoperative pain experienced by the patient at the wound site at the end of eight weeks of follow-up on the Visual Analogue Scale (VAS) and postoperative bleeding from the surgical site seen on visual examination after one week of follow-up.

Furthermore, postoperative bowel incontinence was defined as when any one of the following conditions were present on history taking after eight weeks of the procedure, which included:

• Involuntary discharge of fecal matter or flatus without any awareness.

• Discharge of fecal matter or flatus despite active attempts to retain these contents.

• Undesired leakage of stool, often after a bowel movement with otherwise normal continence and evacuation.

The data was analyzed with the help of a statistical analysis program (IBM-SPSS V22). Mean was introduced for quantitative variables such as age, complaint duration and BMI. Percentages and frequency were calculated for qualitative variables such as gender, ASA grade and postoperative complications like post-operation pain, bleeding and incontinence. For comparison between postoperative complications of both groups, the “Chi-square” test was used, considered $p \leq 0.05$ as significant. Postoperative pain, bleeding, and bowel incontinence in both groups about age, gender of the participants, duration of complaints, weight and ASA score were compared in the results of this study.

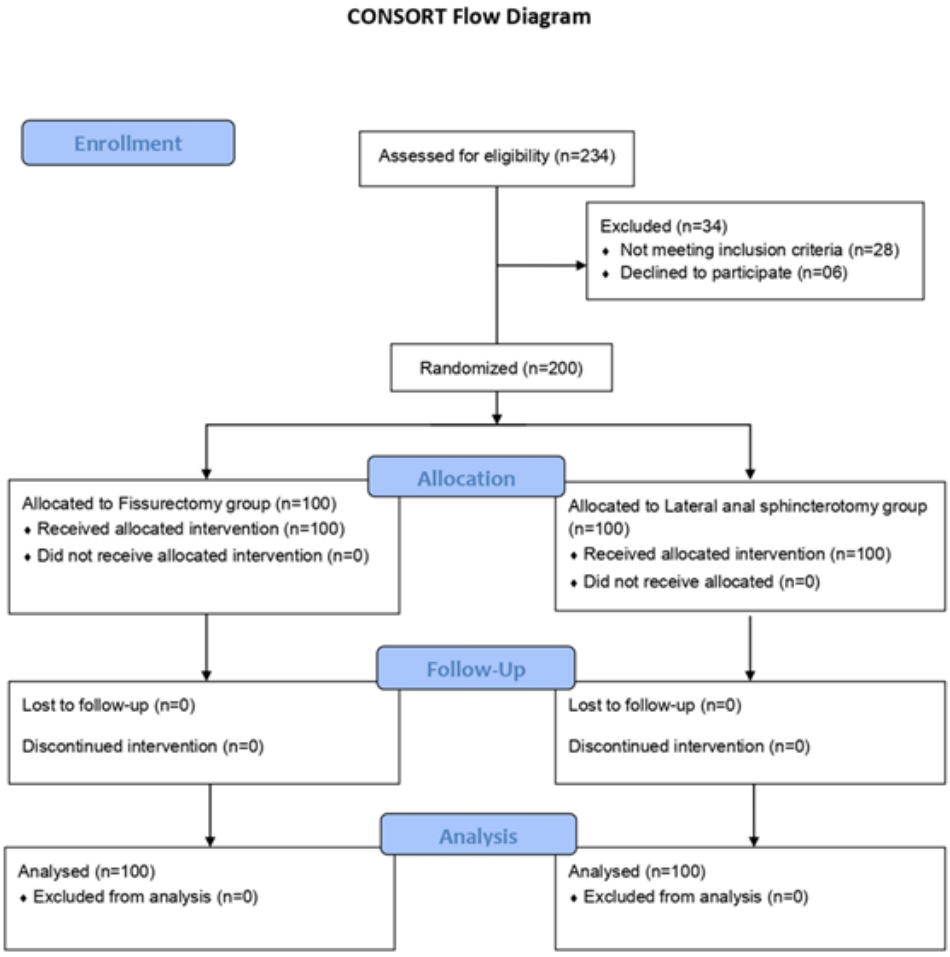

Figure 1:

4. Results

The age range in this study was from 20 to 50 years, with a mean age of 36.6±5.96 years in the fissurectomy group and 33.5 ± 7.54 years in the LIS group. The mean duration of complaint was 17.1 ± 4.34 weeks in the fissurectomy group and 18.6±5.57 weeks in the LIS group. The mean BMI was 26.28±4.04 Kg/m2 in the fissurectomy group and 25.69±3.64 Kg/m2 in the LIS group (Table 1).

Male gender was dominant in both groups with 63% in fissurectomy group and 66% in the LAS group whilst 37% of females were in fissurectomy and 34% in LIS group (Table 2).

At the end of the first week, no bleeding was observed in either group and at the end of the eighth week, postoperative pain was not seen in any patient of either group, according to VAS.

Postoperative bowel incontinence was seen in 8% of patients in the fissurectomy group as compared to 2% in the LIS group (p=0.051). Two patients from the fissurectomy group and two from the lateral sphincterotomy group with ages between 20—35 years were observed with bowel incontinence while six patients from the first group with ages between 36—50 years were facing this problem. According to the comparison between both genders, seven males from the fissurectomy group and only one male from LIS group were found with bowel incontinence, while one female from the former and one from the latter group had this issue. Eight patients from the fissurectomy group and one from the LIS group complained during 9—24 weeks. Only one from the LIS group complained about bowel incontinence after treatment after 24 weeks. The body weight of only one participant from the fissurectomy group was ≤ 70 Kg, while the weight of seven participants from this group and two from the other group was more than 70 Kg (Table 3).

Table 1: Mean ± SD of patients according to age, duration of complaint and BMI

Demographics	Mean ± SD Fissurectomy group n=100	Mean ± SD LIS group n=100
Age(years)	36.600± 5.96	33.510± 7.54
Duration of complaint (weeks)	17.100±4.34	18.610±5.57
BMI (Kg/m^2)	26.288±4.04	25.695±3.64

Table 2: Frequency and percentage of gender in both groups

Gender	Fissurectomy group n=100	LIS group n=100
Male	63 (63%)	66 (66%)
Female	37 (37%)	34 (34%)
Total	100 (100%)	100 (100%)

Table 3: Comparison of post-operative bowel incontinence

	Fissurectomy group n=100	LIS group n=100	P Value
Post-operative bowel incontinence			
Yes	8 (8%)	2 (2%)	0.051
No	92 (92%)	98 (98%)	
Age Group			
For the Age group 20-35 years			
Yes	2 (4.8%)	2 (2.7%)	0.568
No	40 (95.2%)	71 (97.3%)	
For the Age group 36-50 years			
Yes	6 (10.3%)	0 (0%)	0.083
No	52 (89.7%)	27 (100%)	
Gender			
Males			
Yes	7 (11.1%)	1 (1.5%)	0.023
No	56 (88.9%)	65 (98.5%)	
Females			
Yes	1 (2.7%)	1 (2.9%)	0.951
No	36 (97.3%)	33 (97.1%)	
Duration of Complain			
For 9-24 weeks			
Yes	8 (8.6%)	1 (1.4%)	0.039
No	85 (91.4%)	73 (98.6%)	
For > 24 weeks			
Yes	0 (0%)	1(3.8%)	0.598
No	7 (100%)	25 (96.2%)	
Weight			
For ≤ 70 Kg			
Yes	1(1.3%)	0(0%)	0.301
No	78(98.7%)	84(100%)	
For > 70 Kg			
Yes	7(3.3%)	2(12.5%)	0.143
No	14(66.7%)	14(87.50%)	

5. Discussion

An anal fissure is a small tear in an anoderm extending from the anal verge to the dentate line. At present, the exact etiology of anal fissures is uncertain; however, anal mucosal ischemia secondary to sphincter hypertonia may be one possible cause. The posterior anal canal is more prone to develop ischemia. LIS produces a long-lasting fall of anal resting pressure that restores mucosal perfusion resulting in healing. However, the actual initiative mechanism is unknown, and the mechanism that transits from acute to chronic fissure remains obscure. Repeated passage of large (diameter) and hard fecal matter may cause a defect in the anal lining that heals poorly. Surgical options for medical-resistant chronic anal fissures include LIS and fissurectomy. There are various techniques for internal sphincterotomy, ranging from total sphincterotomy to the one limited to the dentate line and a tailored approach, where its length is limited to the length of the fissure. We have adopted a tailored technique in this study. The central aspect of our study is that it deals with a single procedure without any combination with other modalities, like botulinum toxin injection, topical nitrate or a calcium channel blocker. In our study, none of the patients in either group had postoperative bleeding after one week of follow-up and patients in both groups had perceptible pain relief, and the decrease in mean pain score was not statistically significant (p=1.000) at the end of eight weeks of treatment. Moosavi et al. study described similar results regarding post-operative pain relief and bleeding, as 100% of patients treated with either procedure did not show any of these symptoms [12]. The study conducted by Shaikh et al. showed similar results, concluding that 1.49% of patients in the fissurectomy group had fecal incontinence, while none in the LIS group and 2.98% in the fissurectomy group had flatus incontinence in comparison to 1.28% in LIS group [13]. In addition, Shukla et al. study depicted that 26.7% of patients had post-operative incontinence in the fissurectomy group; however, only 3.3% were in the LIS group [14]. Elsebae mentioned in his study that bowel incontinence is not expected after LIS [15]. E. Granero et al., in their study of "Ideal lateral internal sphincterotomy", demonstrate a 100% cure rate when a complete LIS is performed. [16]. In our study, only 2% of patients with LIS experienced fecal incontinence compared to 8% with fissurectomy, proving LIS to be the safer procedure.

6. Conclusion

In conclusion, LIS is a simple and effective surgical option for chronic anal fissures resistant to medical treatment due to the lower incidence of complications, primarily bowel incontinence, and higher patient satisfaction rate as compared to fissurectomy.

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