

# Lateral Internal Sphincterotomy for Fissure in Ano: A Retrospective Long-Term Review

Dr Rankeen Raj<sup>1</sup>, Dr Vishnuprasad R<sup>2</sup>

<sup>1</sup>MS (General Surgery), INHS Sanjivani, Naval base Kochi, Kerala

<sup>2</sup>MD (Community Medicine), Station Health Organization, Jodhpur

Corresponding Author: Dr Rankeen Raj

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## ABSTRACT

Anal fissure is a common benign disease which affects patient's quality of life. Lateral internal sphincterotomy is a routine surgical treatment for it, but it has been reported to have long term recurrence and incontinence. Even though many studies are available in this subject, long term studies spanning over a decade is uncommon. In this case series analysis, the historical patient records of those who underwent lateral internal sphincterotomy in the last 10 years was analyzed, patients were contacted telephonically and information was recorded. A total of 306 patients were analyzed. In the post-op period 3.9% of patients had incontinence to flatus and 2% had incontinence to liquid feces which improved over 4-8 weeks. 8.8% of patients had recurrence. There were no wound related post op complications. None had long term incontinence. 88.6% were highly satisfied by the surgery. Female patients exhibited higher satisfaction (95.7%) and a lower recurrence rate (2.1%). Patients in the 18-30 age group demonstrated lower recurrence rates (4.5%) when compared to >60 years (50%). Recurrent episodes of constipation in the post-surgery period were strongly associated with a high fissure recurrence rate. Lateral internal sphincterotomy is a valuable surgery providing adequate pain relief, high healing rates, low complications, low recurrence rates and high patient satisfaction.

**Keywords:** Anal fissure; Lateral internal sphincterotomy; Fecal Incontinence; Constipation.

## INTRODUCTION

Fissure in Ano is a longitudinal tear in the anoderm below the dentate line and is a commonly encountered benign condition affecting the anorectal region. The main presenting symptoms are pain during defecation and rectal bleeding, and emotional stress associated with it reduces the quality of life. <sup>[1]</sup> Local trauma is considered as a main cause of it. It is reported that anal pain, non-healing of the fissure and local ischemia can be caused by severe hypertonicity and hypertrophy of the internal anal sphincter. <sup>[2]</sup> Chronic fissure in

ano typically require more than 8-12 weeks to heal, and in addition, a hypertrophic papilla and a sentinel tubercle are often present alongside the fissure. The tear exposes the sphincter muscle fibers at its base. <sup>[1]</sup> In general, the treatment approach for fissure in ano typically involves decreasing sphincter pressure using surgical or medical applications; and there is no consensus on the ideal therapy for chronic anal fissures. <sup>[3]</sup>

The American Society of Colon and Rectal Surgeons (ASCRS) guidelines recommend initial nonsurgical management, which

includes stool softeners, a high-fiber diet, and a warm sitz bath. However, a significant proportion of patients fail the conservative management.<sup>[4]</sup> Lateral internal sphincterotomy (LIS) is regarded as the gold standard for managing fissure in ano when conservative treatments have failed.<sup>[5,6]</sup> LIS procedure (open or closed) involves whole length or partial division of the internal anal sphincter which causes it to relax.<sup>[7,8]</sup> Thus, it provides pain relief and healing of the fissure. Besides its efficiency, LIS also has some complications. While incontinence, which is the most dreaded complication, showed temporary resolution in majority of cases, 3% of the patients experienced persistent incontinence at the end of the 72-month follow-up period.<sup>[9]</sup>

The objective of this study was to address five key inquiries: the efficacy of LIS, the incidence rate of fecal or flatus incontinence post-LIS, the long-term recurrence rate after LIS, and the level of patient satisfaction following the procedure. The rationale for this retrospective study is grounded in the necessity to evaluate long-term outcomes and patient satisfaction following LIS for the treatment of fissure-in-ano. Understanding patient satisfaction can inform clinical practices and improve patient care protocols by highlighting potential areas for enhancement in both surgical techniques and postoperative management. This study, therefore, seeks to provide evidence-based data to guide treatment strategies and improve overall patient outcomes in the management of fissure-in-ano.

## **MATERIALS & METHODS**

This retrospective study was conducted in a tertiary care military hospital, during Oct-Dec 2023 after approval by the Institutional Ethics Committee. Patients who underwent LIS for fissure-in-ano at our tertiary care military hospital over the past ten years were identified through a comprehensive search of the hospital's medical records. Patient data was initially selected based on diagnostic codes for acute and chronic

fissure-in-ano. We employed a detailed questionnaire to collect data, which included questions about demographic information, symptoms duration, postoperative recovery, and any recurrent symptoms. Patient satisfaction was assessed using a 10-point Liked Scale, where scores were categorized as low (1-5), moderate (6-8), and high (9-10) satisfaction. Other variables such as age, gender, and recurrence were categorized into appropriate age groups, gender categories, and presence or absence of recurrence, respectively. In cases where data were missing, particularly with non-responses to questionnaire items, such entries were excluded from the corresponding variable analysis to prevent bias. The primary outcome measure was patient-reported satisfaction post-LIS, which aimed to evaluate the effectiveness of the procedure and the overall patient experience. All patients of acute and chronic fissure-in-ano, who underwent LIS in the last 10 years and those willing to participate in our study were included. A total of 328 patients underwent LIS during this ten-year period. Of which 17 patients could not be contacted due to change in phone numbers and 5 patients were dropped from the study due to incomplete data. An informed consent was obtained from each patient. All patients with multiple fissures, fissures due to secondary causes, those patients who could not be contacted, and those unwilling to participate were excluded from the study. Finally, 306 patients were included in the study

## **STATISTICAL ANALYSIS**

The data was recorded on an Excel sheet. Statistical analysis was carried out using the software IBM SPSS Version 26.0 (Armonk, NY). Proportions were calculated for categorical variables. Differences in proportions were tested for statistical significance using the chi-square test. A p-value <0.05 was considered statistically significant.

**RESULT**

In terms of age distribution, most patients (43.5%) fell within the 18-30 year range, followed by 28.1% between 31-45 years, 24.5% between 46-60 years, and a smaller proportion (3.9%) aged over 60 years. Regarding gender, 46.1% were women, while 53.9% were men. These could be attributed to more young military men in the study population. All the patients initially presented to the Outpatient Department with pain while passing stools. 26% also had associated bleeding. There were no

immediate post-op complications like bleeding, hematoma, or infections. In the post-op period, 3.9% of patients had incontinence to flatus and 2% had incontinence to liquid feces. All these patients improved by 4-8 weeks. No one had long-term incontinence. 29.4% of patients continued to have on-and-off complaints of constipation which they had before surgery. Additionally, 8.8% of patients experienced a recurrence of fissure post-operatively. (Table 1)

Variable	Frequency (%)
<b>Age (in years)</b>	
18-30	133(43.5)
31-45	86 (28.1)
46-60	75 (24.5)
>60	12 (3.9)
<b>Sex</b>	
Women	141 (46.1)
Men	165 (53.9)
<b>Pre-op Characteristics</b>	
History of pain	306 (100.0)
History of bleeding per rectum	80 (26.1)
<b>Post Op characteristics</b>	
Post op bleeding	0
Perianal hematoma	0
Perianal abscess	0
Incontinence to Flatus	12 (3.9)
Incontinence to Feces	6 (2.0)
Pain relief and healing of fissure	306 (100)
Constipation after Surgery	90 (29.4)
Recurrence of fissure	27 (8.8)
<b>Total</b>	306

**Table 1: Distribution of study participants based on demographic and clinical characteristics**

Most patients in the 18-30 year age group reported high satisfaction (94.7%), with a statistically significant difference across age categories ( $p < 0.001$ ). A similar trend was observed for sex, where women exhibited higher satisfaction (95.7%) compared to men (82.4%), with a significant p-value of 0.001. Notably, patients without a history of preoperative bleeding per rectum demonstrated higher satisfaction (88.9%) than those with such a history (87.5%), although the difference was not statistically significant ( $p = 0.910$ ). Postoperatively, the absence of incontinence to flatus,

incontinence to feces, constipation, and recurrence were associated with higher satisfaction levels, all with statistically significant p-values ( $<0.001$ ). For instance, patients without incontinence to flatus reported 91.2% high satisfaction, while those with this postoperative complication had only 25.0% high satisfaction. Similarly, the absence of constipation after surgery was associated with 96.3% high satisfaction, while patients experiencing constipation exhibited only 70.0% high satisfaction. (Table 2)

Variable	Patient satisfaction			Total (%)	p value
	High (%)	Moderate (%)	Low (%)		
<b>Age</b>					
18-30	126 (94.7)	1 (0.8)	6 (4.5)	133 (100)	<0.001
31-45	80 (93.0)	2 (2.3)	4 (4.7)	86 (100)	
46-60	61 (81.3)	3 (4)	11 (14.7)	75 (100)	
>60	4 (33.3)	2 (16.7)	6 (50)	12 (100)	
<b>Sex</b>					
Women	135 (95.7)	3 (2.1)	3 (2.1)	141 (100)	0.001
Men	136 (82.4)	5 (3.0)	24 (14.5)	165 (100)	
<b>History of bleeding per rectum pre-operatively</b>					
No	201 (88.9)	6 (2.7)	19 (8.4)	226 (100)	0.910
Yes	70 (87.5)	2 (2.5)	8 (10)	80 (100)	
<b>Incontinence to flatus in the post- op period</b>					
No	268 (91.2)	0(0)	26 (8.8)	294 (100)	<0.001
yes	3 (25)	8 (66.7)	1 (8.3)	12 (100)	
<b>Incontinence to faeces in the post- op period</b>					
No	271 (90.3)	2 (0.7)	27 (9.0)	300 (100)	<0.001
Yes	0 (0)	6 (100)	0 (0)	6 (100)	
<b>Constipation after surgery</b>					
No	208 (96.3)	7 (3.2)	1 (0.5)	216 (100)	<0.001
Yes	63 (70.0)	1 (1.1)	26 (28.9)	90 (100)	
<b>Recurrence after surgery</b>					
No	270 (96.8)	8 (2.9)	1 (0.4)	279 (100)	<0.001
Yes	1 (3.7)	0 (0)	26 (96.3)	27 (100)	
<b>Total</b>	271 (88.6)	8 (2.6)	27 (8.8)	306 (100)	

Table 2: Association between clinical characteristics and patient satisfaction

Patients in the 18-30 year age group demonstrated the lowest recurrence rate (4.5%), while those aged >60 years exhibited a significantly higher recurrence rate of 50%. Similarly, a significant difference in recurrence was observed between women and men ( $p < 0.001$ ), with women having a lower recurrence rate (2.1%) compared to men (14.5%). The

recurrent episodes of constipation in the years following surgery was strongly associated with fissure recurrence ( $p < 0.001$ ). Patients without history of constipation experienced no recurrence (0.0%), while those who had episodes of constipation in the years following surgery had a recurrence rate of 30%. (Table 3)

Variable	Recurrence after Surgery		Total (%)	p value
	No (%)	Yes (%)		
<b>Age</b>				
18-30	127 (95.5)	6 (4.5)	133 (100)	<0.001
31-45	82 (95.3)	4 (4.7)	86 (100)	
46-60	64 (85.3)	11 (14.7)	75 (100)	
>60	6 (50)	6 (50)	12 (100)	
<b>Sex</b>				
Women	138 (97.9)	3 (2.1)	141 (100)	<0.001
Men	141 (85.5)	24 (14.5)	165 (100)	
<b>Constipation after surgery</b>				
No	216 (100)	0 (0)	216 (100)	<0.001
Yes	63 (70)	27 (30)	90 (100)	
<b>Total</b>	279 (91.2)	27 (8.8)	306 (100)	

Table 3: Association between clinical characteristics and recurrence after surgery

## DISCUSSION

In 1971, Notaras introduced the technique of LIS.<sup>[10]</sup> The pathophysiological changes leading to fissure-in-ano start with stretching of the mucosa of the anal canal above its normal elasticity leading to a tear and ulceration. Then, a spasm in the muscle fiber of the internal sphincter occurs and the spasm will lead to severe anal pain and separation of the edges of the fissure apart. This sequence of events results in the formation of chronic anal fissures in about 40% of patients.<sup>[11]</sup> The common site of fissure in the ano is the posterior midline of the anal canal. This is attributed to the decreased blood supply in the anoderm at this site, which is less than 50% that in other sites of the anal canal.<sup>[2,12]</sup> The primary objective of sphincterotomy is to enhance blood flow to the anoderm by reducing maximum anal sphincter pressure by 18-50%. This technique has shown a success rate ranging from 82% to 100%, resulting in significant improvement.<sup>[13]</sup>

Pain is the most consistent symptom in fissure in ano and almost all the patients suffer from it.<sup>[14]</sup> Studies have found that the pain relief rates were 100% for the LIS group by six to eight weeks, with 93% experiencing relief within two weeks, and all patients reporting relief by the end of the eighth week.<sup>[15,16]</sup> In our research also, it was noted that all patients complained of pain and 26.1 % had associated bleeding. All patients experienced pain relief after LIS and wound healing was completed in a timeframe of six to eight weeks. Even though intraoperative rectal bleeding, perianal abscess, and perianal hematoma are some of the known complications of LIS, none of our patients had any immediate post-op complications.<sup>[14,17]</sup> Prophylactic antibiotics, a good surgical technique for dissection of the internal sphincter, the use of electrocautery for cutting the sphincter, and placing a haemostatic anal pack for a couple of hours post-op can help prevent such complications.

Fecal incontinence is the most worrisome complication of LIS. Fecal incontinence

after LIS is usually mild and temporary, lasting from a few weeks to six months. However, some authors have reported persistent fecal incontinence for up to twelve months after LIS surgery.<sup>[18-20]</sup> The risk of incontinence has varied among reports from as low as 0 to as high as 24% and in most reports the risk has been less than 10%.<sup>[5,9,21,22]</sup> In a retrospective review of 298 patients who underwent a lateral internal sphincterotomy, persistent flatus incontinence was reported in 30% and persistent fecal incontinence in 8% of patients at five years following the procedure.<sup>[23]</sup> There are reports that partial-length LIS showed lower rates of minor incontinence (2%) compared with whole-length LIS (11%).<sup>[14,24,25]</sup> In our study, only 3.9% experienced incontinence to flatus and a mere 2.0% had incontinence to liquid stools temporarily, and all of them improved by eight weeks. None of the patients had permanent incontinence in the long term.

Despite the high success rate in fissure healing after LIS, recurrence may occur between 1.6% and 6%. The most common cause of recurrence is inadequate sphincterotomy. The location and gender of the fissure also influences the recurrence with higher recurrence rate in anterior fissures and in young men.<sup>[17,21,26,27]</sup> Studies have followed up both partial and whole-length LIS with no evidence of recurrence after one year.<sup>[14]</sup> In our study, 8.8% of patients experienced recurrence. Patients in the 18-30 age range demonstrated the lowest recurrence rate (4.5%), while those aged >60 years exhibited a significantly higher recurrence rate of 50.0%. Similarly, a significant difference in recurrence was observed between women and men ( $p < 0.001$ ), with women having a lower recurrence rate (2.1%) compared to men (14.5%). The recurrent episodes of constipation after healing of the fissure were found to be strongly associated with fissure recurrence ( $p < 0.001$ ).

Studies have shown that 93-99% of the patients who underwent LIS were satisfied with their treatment.<sup>[28,29]</sup> In our study,

88.6% were highly satisfied with the surgery whereas 8.8% had a low satisfaction rate. Majority of patients in the 18-30 age group reported high satisfaction (94.7%), with a statistically significant difference across age categories ( $p < 0.001$ ). A similar trend was observed for sex, where women exhibited higher satisfaction (95.7%) compared to men (82.4%), with a statistical significance ( $p < 0.001$ ). Postoperatively, the presence of incontinence to flatus, incontinence to faeces, constipation, and recurrence was associated with lower satisfaction levels, all with statistically significant p-values ( $p < 0.001$ ). Its retrospective design, surgeries performed by different surgeons, and recall bias can be counted as limitations.

## CONCLUSION

Lateral internal sphincterotomy as a treatment for acute and chronic fissure in ano gives good symptomatic relief and has high healing rates. It is associated with less complications, low recurrence rate, and has high patient satisfaction. Conscious effort to avoid over cutting of the sphincter ensures that there is no long-term incontinence. Young women seem to be most benefitted, as they exhibited highest satisfaction rates and least recurrence. Even after a successful surgery, the persistence of constipation was found to be significantly associated with recurrent fissure in ano, hence it should be prevented at all costs.

## Declaration by Authors

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