

# Initial Outcome of Lateral Internal Sphincterotomy with or without Fissurectomy in the Surgical Management of Chronic Anal Fissure

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## Abstract

## Original Research Article

Chronic anal fissure is a common proctological condition characterized by severe pain and bleeding during defecation. Surgical intervention is often required for chronic cases unresponsive to conservative treatment. This study aims to compare the outcome of lateral internal sphincterotomy (LIS) with and without fissurectomy. In this single-centered study, 50 purposively selected patients with chronic anal fissures were divided into two groups: Group A underwent LIS with fissurectomy, while Group B underwent only LIS. The primary outcomes measured were postoperative anal pain relief and fissure healing rates, while secondary outcomes included hospital stay duration and the occurrence of complications such as anal discharge, pruritus, bleeding spot, urine & stool incontinence. Group A showed a significant reduction in postoperative pain within 3 days (60% of patients) compared to Group B, which showed relief within 6-8 days (32% of patients). Fissure healing times were faster and hospital stay duration were shorter in Group A, with a mean duration of  $5.12 \pm 1.616$  days versus  $8.32 \pm 3.18$  days in Group B. The incidence of postoperative complications was lower in Group A, with anal discharge occurring in 16% of patients compared to 44% in Group B. These above differences were statistically significant. The study demonstrates that LIS with fissurectomy may offer better outcomes in the treatment of chronic anal fissures than LIS alone, including faster pain relief, improved healing rates and fewer postoperative complications. Given the limitations of a small sample size and single-center design, larger multi-center trials are recommended to confirm these findings and potentially adjust clinical practice guidelines.

**Keywords:** Chronic Anal Fissure, Lateral Internal Sphincterotomy, Fissurectomy, Postoperative complications, Surgical Outcomes.

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## INTRODUCTION

An anal fissure is a minor tear in the thin, moist tissue (anoderm) lining the lower part of the anal canal, typically located in the posterior midline [1].

The first study to investigate its prevalence was in New Mexico, revealing an annual incidence rate of 0.11% among the general population. Symptoms of an anal fissure include intense, sharp pain during bowel movements, which may be accompanied by bleeding. The pain can be prolonged and extremely distressing for the patient, significantly affecting their quality of life. Anal fissures are categorized as either acute, which heal naturally within six weeks, or chronic, which last longer and may necessitate medical or surgical treatment referred as chronic anal fissures [1].

Chronic fissure, lasts more than 8 to 12 weeks and is characterized by edema and fibrosis. In chronic fissures at the distal fissure there is a sentinel pile and a hypertrophied anal papilla in the anal canal that is proximal to the fissure and a non-healing ulcer by sphincter spasm and consequent ischemia [2]. Surgical options are lateral sphincterotomy, fissurectomy and advancement in flap procedures, anal dilatation and fissurectomy associated with anoplasty [1-3]. However, the outcome of the surgery varies with each.

Lateral internal sphincterotomy (LIS) is the surgical treatment of choice with chronic anal fissure since the last 3-4 decades [3]. In LIS sphincter tone is reduced by cutting parts of the internal sphincter muscle and the fissure itself is left mostly intact [4]. By decreasing the pressure in the anal canal LIS reduces hypertonia and improves local vascularization and

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allowing the fissure to resolve. LIS is gold standard because healing rates high as 95% with recurrence rate below 10%. However, complications such as anal incontinence upto 30%. These incontinences are usually transient in majority of cases. Additionally, in around 3% of the patients, there are wound-related complications such as bleeding, abscess or non-healing wound, and fistula. Major complications with LIS are recurrence of anal fissure and incontinence [5].

However, in most cases, incontinence is transient, and after postoperative management most of the patients recover. LIS is considered safe surgical treatment for chronic anal fissure due to reduction in recurrence, incontinence rate and improves symptoms, especially pain. Another alternative to LIS is the sphincter sparing technique known as fissurectomy. This technique resects the fissure with adherent sentinel pile and anal papillae. It is facilitated only to the internal sphincter fascicles and thus no damage is exercised to sphincter muscle. It has reported with a healing rate of upto 99% [4]. Symptoms such pain, bleeding and constipation has been shown to reduce with fissurectomy. However, local infection, urinary incontinence and recurrence is also common with this technique. While considering surgical management for treating chronic anal fissure, fissurectomy is comparable to LIS in terms of symptomatic pain relief, healing rates with minimal side effects and low recurrence. Patient with prior history of diarrhea, cholecystectomy, multiparity and perineal laceration the risk of anal incontinence is higher. Patient satisfaction was 91% [6]. The effectiveness of fissurectomy persist in the long-term with recurrence rate 11.6% after a mean follow up of 8.2 years (5.5 to 12.2) and a minimal impact on fecal continence. In a prospective trial (mean follow-up of 22 months) fissurectomy compared to LIS that showed sphincterotomy to be superior with 3.1% recurrence rate and a 6.3% incidence of incontinence of flatus after fissurectomy versus 0% after sphincterotomy. The combination of anoplasty with fissurectomy reduce sphincter spasm without taking risks on continence. Healing rate was higher in the fissurectomy group compared to the LIS group (96% versus 88%).

Lateral internal sphincterotomy (LIS) is considered the gold standard of surgery for chronic cases but limitations such as incontinence interferes to provide a good outcome. On sphincter sparing technique; fissurectomy can reduce the incontinence but has a higher recurrence rate. Hence, it can be hypothesized that LIS with fissurectomy may provide better outcome than LIS without fissurectomy and so improve the quality of life these patients. For chronic anal fissure initial outcome of LIS has been widely seen but comparative study between LIS and LIS with fissurectomy has not been properly evaluated. Given the high incontinence rate but low recurrence with LIS and low incontinence rate high recurrence with fissurectomy, combined approach of LIS and fissurectomy will balance the

drawbacks of the techniques and provide better outcome for patients with chronic anal fissure. Hence, this study aimed to find the initial outcome of lateral internal sphincterotomy with or without fissurectomy in the surgical management of chronic anal fissure.

## MATERIALS AND METHODS

This prospective cohort study was conducted among 50 patients with chronic anal fissure in the Department of Colorectal Surgery, Combined Military Hospital (CMH) Dhaka during the period of April to October, 2019. Patients with symptomatic midline anal fissure (>2 months) were included purposively and patients with non-midline anal fissure, anal manifestation of systemic disease associated with malignancy, anal sphincter dysfunction were excluded. After giving informed written consent detailed history was taken from each patient, thorough general and systemic examination, routine investigations were done. Then patients were distributed between two equal groups: 1) group A- included 25 patients who underwent lateral internal sphincterotomy (LIS) with fissurectomy and 2) group B- included 25 patients who underwent LIS without fissurectomy. Data was collected through face to face interview by a pre-tested, observation based, peer-reviewed semi-structured questionnaire. Question regarding clinical symptoms of disease had multiple response. Data regarding socio-demographic, clinical and surgical profile were recorded. After operation both groups were followed up for 3 months and evaluated for persistence of symptoms (pain and bleeding), postoperative fissure healing, postoperative complications and recurrence. Expert opinion was taken from specialists of the Department of colorectal surgery. Anal fissure defined as longitudinal split in the anoderm of the distal anal canal which extends from the anal verge proximally towards but not beyond the dentate line. Operational definition of lateral internal sphincterotomy the internal anal sphincter was partially divided, away laterally from fissure mostly on left by making a small radial incision in the inter-sphincteric groove, and dividing the internal sphincter under direct vision up to the height of fissure. Fissurectomy was defined as the excision of fissure with margin of healthy mucosa down to the level of internal sphincter.

### Statistical Analysis

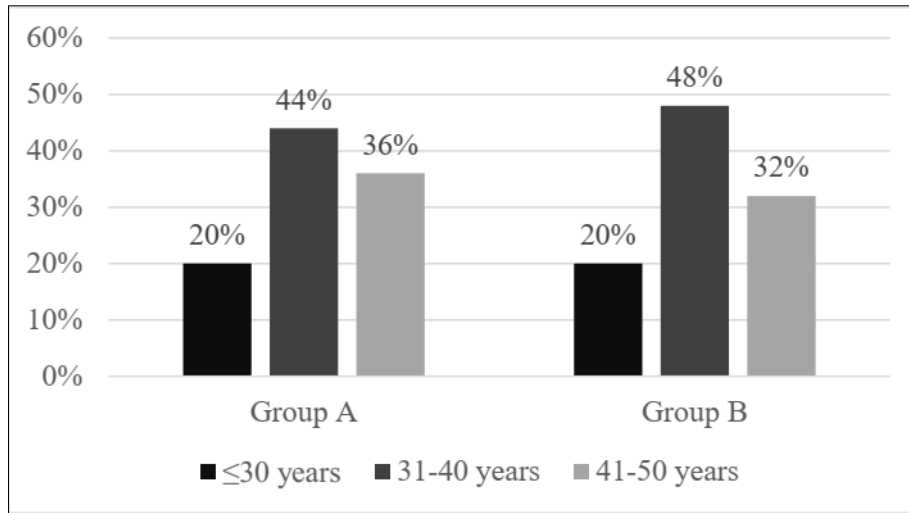
After collection of all the required data, data was checked thoroughly for any inconsistency, tabulated and analyzed using the SPSS software version 25. Descriptive statistics were presented by frequency, percentage, mean and standard deviation (SD). Chi-square test and independent samples T test was performed for comparison of categorical and continuous variable respectively. Statistical significance was set as 95% confidence level. A *p*-value of 0.05 or less than 0.05 was considered statistically significant and *p*-value <0.01 was considered as highly significant.

**Ethical Implication**

The procedure was explained to the sample unit and they were informed that if they do not wish to be included in the study it will in no way hamper the treatment of their patient and at any point of the study, if they wish, they can withdraw themselves from the study at any moment. Informed written consent of the patient was taken. Written permission has also been taken from concerned department where study was undertaken. Ethical clearance was taken from the ethical Review committee (ERC) of CMH, Dhaka.

**RESULTS**

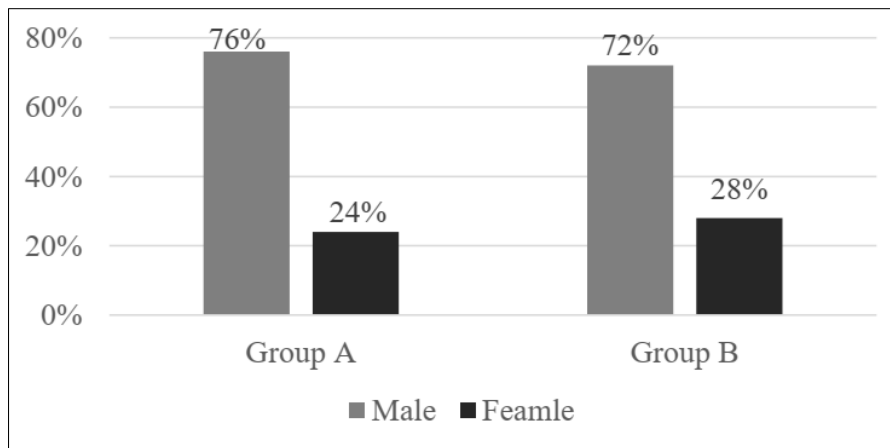
This prospective type of study was conducted among 50 patients in the Department of Colorectal Surgery in CMH, Dhaka. The patients were distributed between two equal groups: group A underwent lateral internal sphincterotomy (LIS) with fissurectomy, and group B underwent LIS without fissurectomy and followed up for 3 months. Details of the study results are described below.



**Figure 1: Comparison of age between respondents (n=50)**

Regarding age, in group A majority 11 (44%) of respondents were in 31-40 years followed by 9 (36%) and 5 (20%) were in 41-50 years and ≤ 30 years respectively. In group B majority 12 (48%) of

respondents were in 31-40 years followed by 8 (32%) and 5 (20%) were in 41-50 years and ≤ 30 years respectively shown in figure-1.



**Figure 2: Comparison between respondents by Gender (n=50)**

Among respondents of both group A and group B majority were male in gender (76% and 72% respectively) shown in figure-2.

constipation was complained by 16 (64%) and 11 (46%) of patients in group A. In group B, per-rectal bleeding and constipation was complained by 17 (68%) and 12 (48%) of patients. These differences were not statistically significant (p >0.05) shown in Table-I.

All of the study patients in both group had anal pain (100%). Besides, per-rectal bleeding and

**Table 1: Comparison between both groups by clinical symptoms (n=50)**

Symptoms	Group A (n=25) f (%)	Group B (n=25) f (%)	Significance
Anal pain	25 (100)	25 (100)	-
Per-rectal bleeding	16 (64)	17 (68)	0.765
Constipation	11 (44)	12 (48)	0.777

\*Multiple response

\*Pearson's chi-squared ( $\chi^2$ ) test was performed

Among the patients of group, A, all patients got relief from postoperative anal pain within 8 days and majority 15 (60%) of patients within 3 days or less than 3 days. While in group B, all patients got relief from postoperative anal pain within 14 days and majority 8

(32%) of patients within 6-8 days. This differences of duration for postoperative anal pain relief between both groups were statistically significant ( $p < 0.01$ ) shown in Table-II.

**Table 2: Comparison between both groups by duration for postoperative anal pain relief (n=50)**

Duration (Days)	Group A (n=25) f (%)	Group B (n=25) f (%)	Significance
≤3	15 (60)	3 (12)	0.000**
3-5	7 (28)	5 (20)	
6-8	3 (12)	8 (32)	
9-12	0 (0)	5 (20)	
13-14	0 (0)	4 (16)	

\*Fisher's exact test was performed

\*p value &lt;0.01 is highly\*\* significant

Majority 20 (80%) of patients got postoperative fissure healing within 2 weeks and the rest 5 (20%) within 3-5 weeks in group A. On the other hand among patients in group B, majority 13 (52%) got postoperative fissure healing within 3-5 weeks followed by 7 (28%)

and 5 (20%) of patients within 2 weeks and 6-8 weeks respectively. This differences of duration for postoperative fissure healing between both groups were statistically significant ( $p < 0.01$ ) shown in Table-III.

**Table 3: Comparison between both groups by duration for postoperative fissure healing (n=50)**

Duration (weeks)	Group A (n=25) No. (%)	Group B (n=25) No. (%)	Significance
0-2	20 (80)	7 (28)	0.000**
3-5	5 (20)	13 (52)	
6-8	0 (0)	5 (20)	

\*Fisher's exact test was performed

\*\*p value &lt;0.001 is highly\*\* significant

Regarding postoperative complications, anal discharge was noted in 4 (16%) patients in group A and 11 (44%) patients in group B, this differences between both groups were statistically significant ( $p < 0.05$ ).

Pruritus was noted in 1 (4%) patients in group A and 7 (28%) patients in group B, this differences between both groups were statistically significant ( $p < 0.01$ ) shown in Table-IV

**Table 4: Comparison between both groups by postoperative complications (n=50)**

Complication	Group A (n=25) f (%)	Group B (n=25) f (%)	Significance
Discharge	4 (16)	11 (44)	0.031
Pruritus	1 (4)	7 (28)	0.049
Bleeding spot	1 (4)	2 (8)	1.00
Stool incontinence	1 (4)	2 (8)	1.00
Urine retention	1 (4)	1 (4)	1.00

Mean duration of total hospital staying was 5.12±1.616 days and 8.32±3.18 days in group A and

group B respectively. This difference was statistically significant ( $p < 0.05$ ) shown in Table-V.

**Table 5: Comparison between both groups by duration of total hospital staying (n=50)**

Duration(days)	Group A	Group B	Significance
Mean±SD	5.12±1.616	8.32±3.18	0.033*
Minimum	3	3	
Maximum	10	14	

\*Independent sample T-test was performed

There was one (4%) patient with anal fissure recurrence within 3 months in group B, but none in group

A. No patient in either group developed anal stenosis (Table-VI).

**Table 6: Comparison between both groups by assessment findings after 3 months (n=50)**

Findings	Group A (n=25) f (%)	Group B (n=25) f (%)	Significance
Recurrence	0 (0)	1 (4)	1.00
Stenosis	0 (0)	0 (0)	-

## DISCUSSION

The predominance of middle-aged participants in this study reflects the age-related prevalence of chronic anal fissures. As individuals age, changes in anorectal physiology, dietary habits, and lifestyle factors may increase the risk of developing CAF. Additionally, middle-aged individuals may be more proactive about seeking healthcare, possibly due to heightened health awareness or greater access to medical resources. Furthermore, most of the patients from both groups were male (76 and 72% respectively). Chronic anal fissures may be more prevalent in males due to physiological differences or lifestyle factors. However, this could be attributed to sociocultural norms. In Bangladesh, there is scarcity of female colorectal surgeons and the discomfort women may feel when being examined by a male surgeon might lead to a lower representation of women in the study. Previous studies also found male predominance with similar age distribution among chronic anal fissure patients [1-3]. However, one earlier study stated CAF as a common anorectal condition that affecting all age groups, but mostly seen in young and healthy adults with equal incidence across both the sexes [7].

The study explored a significantly faster alleviation of postoperative anal pain for patients in Group A, with all experiencing relief within 8 days—60% of them in 3 days or less. In contrast, Group B patients required up to 14 days for pain relief, with the majority within 6-8 days. The statistical significance ( $p < 0.01$ ) underscores the effectiveness of the treatment modality used in Group A, suggesting a more expedient recovery process and indicating a potentially more beneficial postoperative pain management protocol. Previous studies also observed faster pain recovery after LIS with fissurectomy compared to LIS only [8].

The LIS with fissurectomy group likely experienced a better healing rate than those in the LIS only group due to the more comprehensive removal of scar tissue and the direct treatment of the fissure itself. Fissurectomy may facilitate improved blood flow to the area and allow for the removal of fibrotic edges, which can promote more efficient healing. Additionally, the combination of both procedures might create a more favorable environment for tissue regeneration. These results aligned with the previous studies who found that patients treated with LIS with fissurectomy had better healing rate than LIS only group [9].

The notable difference in postoperative complications, with fewer cases of anal discharge and pruritus in Group A compared to Group B, could be attributed to the additional fissurectomy procedure performed in Group A. This procedure might result in a cleaner and more precise surgical site, which could reduce the potential for infection and subsequent discharge. Moreover, the meticulous removal of the fissure may minimize irritation and tissue inflammation, leading to less pruritus. These results are almost similar to previous studies where both LIS and fissurectomy groups had experienced minimal early post-operative complications [10].

The statistically significant difference in hospital stays durations between the two groups, with Group A having a shorter stay, suggests that the combined approach of LIS with fissurectomy may lead to more efficient recovery processes, thus reducing hospitalization time. This could be due to a more effective healing process initiated by the additional fissurectomy, resulting in quicker patient mobilization and discharge readiness. The shorter stay also implies potential cost savings and less hospital resource utilization, which are important considerations in healthcare management.

In this study, there was one (4%) patient with anal fissure recurrence within 3 months in the LIS only group, but none in the LIS with fissurectomy group. However, this finding is discordant with earlier study which reported more recurrence after LIS with fissurectomy [8].

The results suggest that combining LIS with fissurectomy may offer benefits over LIS alone, including reduced postoperative pain, fewer complications, and shorter hospital stays.

### Limitations

The study's limitations include its being conducted at a single center, a small sample size, and variability in disease duration among patients, which could contribute to heterogeneous healing responses of chronic anal fissures. Further research with a larger, double-blinded, multi-center design is recommended to confirm these findings.

## CONCLUSION

In conclusion, the study suggests that the combination of lateral internal sphincterotomy with

fissurectomy may offer improved outcomes for patients with chronic anal fissures compared to lateral internal sphincterotomy alone. This is evidenced by faster anal pain relief, better fissure healing rates, lower complication rates and shorter hospital stays with a statistically significant difference. These findings, despite the study's limitations, contribute to the understanding of effective treatments for chronic anal fissures. Further research is needed to substantiate these results and inform clinical practices.

#### List of abbreviations

LIS-Lateral Internal Sphincterotomy, CAF-Chronic Anal Fissure, ERC-Ethical Review Committee, CMH-Combined Military Hospital

#### Declarations

**Consent for publication:** All authors have approved this manuscript for publication.

#### Availability of Data and Materials

The datasets supporting the conclusions of this article are included within the article. Datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

**Competing Interests:** The authors declare that they have no competing interests.

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