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Original Article

Short-term and Long-term Complications Following Surgical Lateral Internal Sphincterotomy for Chronic Anal Fissure

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ABSTRACT

Background: *Chronic anal fissure, a painful tear in the anal lining, often requires intervention when conservative treatment fails. This study compares the short-term outcomes and complications of lateral internal sphincterotomy (LIS), the gold standard, with Botox injection to inform optimal treatment choices.* ***Methods & Materials:*** *This descriptive longitudinal study was conducted in the Department of Surgery, Bangladesh Medical College Hospital, Dhaka, from July 2015 to December 2015. Patients with chronic anal fissures, attending the surgical outpatient department were considered as the study population. 50 adult patients; 25 in two groups. Data; analysis was done by SPSS version 22.* ***Result:*** *In this study of 50 patients (25 in each group), the mean maximal squeeze pressure was significantly higher in the LIS group (117.41 ± 32.31 mmHg) than in the Botox group (70.52 ± 27.52 mmHg; p < 0.001). However, LIS was associated with higher complication rates, including itching in 9 patients (36.0%) vs. 2 (8.0%) in the Botox group (p = 0.016), flatus incontinence in 4 patients (16.0%) vs. none (p = 0.037), and fecal incontinence in 3 (12.0%) vs. 1 (4.0%) patient (p = 0.297).* ***Conclusion:*** *Lateral internal sphincterotomy (LIS) is more effective than Botox for short-term pain relief and healing of chronic anal fissures but carries a higher risk of complications, including incontinence. Botox is safer with fewer side effects but may be less effective and require repeat treatments.*

Keywords: *Complications, Lateral Internal Sphincterotomy, Chronic Anal Fissure, Botox Injection*

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INTRODUCTION

Chronic anal fissure is a prevalent and distressing condition, typically characterized by a longitudinal tear in the anoderm distal to the dentate line, most commonly located posteriorly. The chronicity of the fissure is associated with persistent internal anal sphincter hypertonia, impaired anodermal blood flow, and cycles of pain and sphincter spasms that hinder healing [1]. Conservative treatments—including stool softeners, dietary fiber, sitz baths, and topical agents like glyceryl trinitrate or calcium channel blockers—are often first-line management options [2]. However, when these fail, surgical intervention becomes necessary. Lateral internal sphincterotomy (LIS) has been regarded as the gold standard for chronic anal fissures resistant to medical therapy, with reported healing rates exceeding 90% [3]. The procedure involves the division of the internal anal sphincter to reduce resting anal pressure, thus alleviating pain and promoting healing [4]. While the efficacy of LIS is well-documented, concern remains over the risk of both short-term and long-term complications, most notably fecal or flatus incontinence [5]. Short-term complications of LIS include perianal hematoma, urinary retention, wound infection, and mild postoperative bleeding [6,7]. These complications are generally transient and manageable, yet they contribute to early postoperative morbidity. Long-term concerns primarily involve varying degrees of incontinence, fissure recurrence, and, in rare cases, chronic wound non-healing or fistula formation [8]. Although major incontinence is rare, minor incontinence such as occasional soiling or gas leakage is reported in up to 35% of cases in some series [9]. These outcomes, while often temporary, can significantly impact a patient's quality of life and willingness to undergo surgery [10]. Several studies have investigated risk factors contributing to postoperative incontinence, including female gender, age, multiparity, and pre-existing pelvic floor dysfunction [11]. Additionally, the surgical technique—whether open or closed LIS—may influence complication rates, with some reports suggesting higher infection risk in the open approach but

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similar continence outcomes overall [9]. To minimize risks, modifications to standard LIS have been explored. Techniques such as tailored sphincterotomy (limiting the division to the length of the fissure) or combining LIS with adjunctive therapies like botulinum toxin injections have been employed, aiming to preserve continence without compromising healing [12]. However, the success of these alternatives varies, and long-term data remains limited compared to conventional LIS. Another key aspect is the recurrence rate following LIS. While recurrence is relatively low (2–10%), it may be attributed to incomplete sphincter division, ongoing constipation, or underlying proctologic disorders [13]. Importantly, recurrence often requires repeat surgery or prolonged medical therapy, which further underscores the need to balance surgical efficacy with the potential for complications. This study aims to evaluate the short-term and long-term complications associated with surgical lateral internal sphincterotomy in patients with chronic anal fissure.

METHODS & MATERIALS

This descriptive longitudinal study was conducted in the Department of Surgery, Bangladesh Medical College Hospital, Dhaka, from July 2015 to December 2015. Patients with chronic anal fissures, attending the surgical outpatient department were considered as the study population. 50 adult patients; 25 in two groups; both male and female, were selected for this study by purposive sampling technique. The patients were divided into two groups of 25 patients Group A and Group B in each group. One group used Botox A and the other group underwent lateral internal sphincterotomy. In the Botox group, 20 U of Botox A was injected into the intersphincteric groove. Sphincterotomy was performed under spinal anesthesia using the open method. All filled-up questionnaires were checked for any inconsistency and after the compilation of data; analysis was done by SPSS version 22. Recruitment of an average of 25 patients to each group gives an 80% chance of detecting a significant result at $p< 0.05$. Ethical clearance for this study was taken from the Ethical Committee of BMC.

Inclusion criteria (men or women):

- Patients presenting with features of chronic anal fissure for more than 8 weeks that had failed to resolve with simple measures (stool softeners, high fiber diet).
- Patients have decided to be treated application of botox A or surgical sphincterotomy.
- Patients willingly give informed consent to take part in the study.

Exclusion criteria:

- Patient/attendant unwilling to give informed consent to take part in the study.
- Pregnant women.
- Patient presenting with acute anal fissures.
- Diabetic patients.
- Co-existing anal disease.

RESULTS

Table – I: Age distribution of the study patients in two groups

Age group	Group A (LIS) No. (%) (n=25)	Group B (Botox) No. (%) (n=25)	P value
20-30	11(44.0%)	14(56.0%)	
31-40	3(12.0%)	9(30.0%)	
41-50	5(20.0%)	0(0.0%)	-
> 50	6(24.0%)	2(8.0%)	
Total	25(100.0%)	25(100.0%)	
Mean± SD	33.84±12.93	31.20±7.69	0.384^{ns}

Data were expressed as frequency, percentage, and mean±SD; An unpaired t-test was performed to compare between two groups S=significant

Table I shows the age distribution of the study subjects, it was observed that 11(44.0%) patients belonged to age 20-30 years in group A and 14(56.0%) in group B. The mean age was found 33.84±12.93 years in group A and 31.2±7.69 years in group B. The age difference was statistically not significant ($p>0.05$) between the two groups.

Table – II: Sex distribution of the study patients in two groups

Sex	Group A (LIS) No. (%) (n=25)	Group B (Botox) No. (%) (n=25)	P value
Male	13(52.0%)	3(12.0%)	0.002^{s}
Female	12(48.0%)	22(88.0%)	
Total	25(100.0%)	25(100.0%)	-

Data were expressed as frequency and percentage. A chi-square test was performed to see the association between the two groups. S=significant

Table II shows the sex distribution of the study subjects, it was observed that 13(52.0%) patients were male 48% were female in Group A 12.0% were male, and 88% were female in Group B. Female patients were more predominant in the

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Botox group. The association was statistically significant (p<0.05) between the two groups.

Table – III: Distribution of the study patients in two groups by anal pain (*n*=50)

Anal pain	Group A (LIS) No. (%) (n=25)	Group B (Botox) No. (%) (n=25)	P value
Yes	1(4.0%)	14(56.0%)	<0.001*
No	24(96.0%)	11(44.0%)	
Total	25(100.0%)	25(100.0%)	-

Data were expressed as frequency and percentage. A chi-square test was performed to see the association between the two groups. S=significant

Table III shows the anal pain distribution of the study subjects, it was observed that 4.0% of patients had pain in Group A and a higher percentage 56% of pain in Group B. Which were statistically significant (p<0.05) between the two groups.

Table – IV: Clinical characteristics of the study patients in two groups (*n*=50)

Clinical characteristics	Group A (LIS) (n=25) Mean± SD	Group B (Botox) (n=25) Mean± SD	P value
Symptoms duration (months)	11.12±6.1	10.31±5.81	0.632
Maximal resting pressure (mmHg)	105.11±22.14	101.21±23.32	0.547
Maximal Squeeze pressure (mmHg)	117.41±32.31	70.52±27.52	<0.001^{S}

Data were expressed as mean± SD. An unpaired t-test was performed to compare between two groups. S=significant

Table IV shows the clinical characteristics of the study subjects, it was observed that mean symptoms of duration (months) were 11.12±6.1 in Group A and 10.31±5.81 in Group B. Maximal resting pressure in Group A and Group B were 105.11±22.14 and 101.21±23.32 respectively. Maximal squeeze pressure in Group A 117.41±32.31 and in Group B 70.52±27.52 which statistically significant difference between the two groups. Symptoms of duration and maximal resting pressure were not significantly different between groups.

Table – V: Compare complications between two groups of the study patients (*n*=50)

Complications	Group A (LIS) (n=25) No. (%)	Group B (Botox) (n=25) No. (%)	P value
Early complications			
Haematoma	2(8.0%)	0	0.148
Perianal abscess	1(4.0%)	0	0.312
Itching	9(36.0%)	2(8.0%)	0.016*
Late complication			
Flatus incontinence	4(16.0%)	0	0.037*
Fecal incontinence	3(12.0%)	1(4.0%)	0.297

Data were expressed as frequency and percentage. A chi-square test was performed to see the association of complications between the two groups. S=significant

Table V shows the complications of the patients, hematoma 2(8.0%) and perianal abscess 1(4.0%) were early complications in the LIS group. Itching was found in 36% of the LIS group and 8% in the Botox group (p <0.05). Late complications were observed in flatus incontinence 4(16.0%) in the LIS group and none in the Botox group, flatus incontinence is significantly higher in the LIS group (p =0.037). Another outcome i.e., fecal incontinence of anal fissure in both groups was compared and it shows 3(12%) in Group-A and 1(4%) in Group B (p=0.297).

DISCUSSION

This study evaluated and compared the clinical profiles and postoperative outcomes of patients undergoing lateral internal sphincterotomy (LIS) and botulinum toxin (Botox) injection for chronic anal fissure. The analysis focused on age, sex, symptomatology, anal manometry, and complication rates, providing insight into the effectiveness and safety of these two widely used treatment modalities. In the present study, both groups primarily included younger adults, with a mean age of 33.84 ± 12.93 years in the LIS group and 31.20 ± 7.69 years in the Botox group. The difference was not statistically significant, which aligns with findings by Brisinda et al., who reported that chronic anal fissures commonly affect adults aged 30–50, irrespective of treatment choice [14]. A significant difference was observed in sex distribution, with females comprising 88% of the Botox group versus 48% in the LIS group. Although sex is not typically a determinant in treatment selection, some studies suggest that women, especially those concerned about sphincter-related complications such as incontinence, may prefer less invasive options like Botox [4]. Postoperative pain outcomes significantly favored the LIS group, where only 4% of patients

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reported anal pain, compared to 56% in the Botox group. This mirrors the results of studies such as Nasr et al., which found LIS to be more effective in immediate symptom relief due to prompt sphincter pressure reduction [15]. Botox, although effective, takes longer to exert its muscle-relaxing effects, explaining the higher short-term pain incidence. Manometric findings in our study showed comparable maximal resting pressures between the two groups, but the LIS group demonstrated significantly higher maximal squeeze pressures. These findings suggest better preservation of voluntary sphincter control in the LIS group, although a similar study has cautioned that Botox may cause a temporary reduction in external sphincter strength due to diffusion of the toxin [9]. Regarding complications, early postoperative issues such as hematoma and perianal abscess were observed only in the LIS group, though not statistically significant. Itching was significantly more common in LIS patients (36%) compared to those receiving Botox (8%). These findings are consistent with those of Arroyo et al., who noted higher early postoperative discomfort and minor wound complications in LIS patients [16]. Late complications were more frequent in the LIS group, including flatus incontinence (16%) and fecal incontinence (12%), compared to none and 4% respectively in the Botox group. The increased rate of incontinence in the LIS group aligns with reports by Garcia-Aguilar et al. and Brisinda et al., who emphasized that while LIS is highly effective, it is associated with a measurable risk of minor continence disturbances, particularly flatus leakage [3,17]. Conversely, Botox is associated with a significantly lower risk of incontinence, making it a safer option for patients at higher risk, such as elderly individuals or multiparous women [10]. Despite the better safety profile of Botox, its lower effectiveness in pain relief and the need for repeat injections remain key limitations. A randomized controlled trial by Brisinda et al. showed that while Botox achieves fissure healing in a significant proportion of patients, its recurrence rates were higher than LIS over long-term follow-up [17]. Similar conclusions were drawn in the systematic review by Nelson et al., which reported higher healing rates but also a greater risk of incontinence with LIS [18]. The results of our study reaffirm that while LIS remains the most effective treatment for chronic anal fissures in terms of pain relief and healing, it comes with a higher incidence of early and late complications, especially related to continence. Botox, on the other hand, offers a safer alternative, particularly for patients who prioritize continence preservation over rapid symptom resolution [19].

Limitations of The Study

The study was conducted in a single hospital with a small sample size. So, the results may not represent the whole community.

CONCLUSION

Lateral internal sphincterotomy (LIS) remains the more effective treatment for chronic anal fissure in terms of pain relief and fissure healing, with significantly better short-term symptomatic improvement compared to botulinum toxin (Botox) injection. However, LIS is associated with a higher incidence of both early complications such as itching and hematoma, and late complications like flatus and fecal incontinence. In contrast, Botox offers a safer profile with fewer complications, though it is less effective in immediate pain control and may require repeat treatments.

RECOMMENDATION

Based on the study findings, lateral internal sphincterotomy (LIS) should be recommended as the first-line treatment for chronic anal fissure in patients who are suitable surgical candidates due to its superior efficacy in symptom resolution. However, botulinum toxin injection may be considered a safer, less invasive alternative for patients at higher risk of incontinence or those unwilling to undergo surgery. Individualized treatment decisions should be guided by patient preference, risk factors, and clinical presentation.

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