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COMPARATIVE STUDY OF LATERAL INTERNAL ANAL SPHINCTEROTOMY VERSUS BOTOX INJECTION IN PATIENTS OF ANAL FISSURE

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Abstract

Background: *Chronic anal fissures are a common anorectal condition, causing significant pain and discomfort, particularly during or after bowel movements. Conventional treatments, including lateral internal anal sphincterotomy (LIAS) and botulinum toxin (Botox) injection, are widely used to manage chronic anal fissures. While both treatment modalities aim to reduce pain and promote healing, their comparative effectiveness remains under investigation.*

Objective: *This study aimed to compare the healing rates, pain relief, fissure recurrence, complications, and side effects of LIAS versus Botox injection in the treatment of chronic anal fissures.*

Study Design and Setting: *A retrospective comparative study was conducted at Shaikh Zayed Hospital Lahore from October 2024 to March 2025.*

Methodology: *The study included 120 patients with chronic anal fissures who were assigned to receive either LIAS (n=60) or Botox injection (n=60). Patients were assessed for fissure healing, pain relief, and complications at 1-week, 1-month, and 3-month follow-up visits. Healing was assessed clinically, and pain levels were measured using the Visual Analog Scale (VAS). Complications such as incontinence, mild weakness, and pain at the injection site were also recorded. Statistical analysis was performed using SPSS software, with comparisons made using chi-square and t-tests.*

Results: *At 3 months, 90% of LIAS patients had healed, compared to 73% of Botox patients. The LIAS group showed a greater reduction in pain (VAS scores of 1.5 ± 1.0) compared to the Botox group (VAS scores of 2.0 ± 1.2). The recurrence rate was lower in the LIAS group (5%) compared to the Botox group (17%).*

Conclusion: *LIAS demonstrated higher healing rates, greater pain relief, and a*

lower recurrence rate compared to Botox in the treatment of chronic anal fissures. Both treatments were generally safe, but Botox had a higher incidence of side effects.

INTRODUCTION

Anal fissures, a common anorectal condition, are characterized by a tear or crack in the skin lining the anus. These fissures can cause significant pain, discomfort, and distress, particularly during or after bowel movements. The condition is commonly seen in individuals with constipation, chronic diarrhea, or in those who have recently undergone childbirth. Chronic anal fissures, those persisting for more than 6 weeks, often lead to recurrent pain and spasm, making conservative treatments insufficient. As such, managing anal fissures requires an effective therapeutic strategy aimed at healing the fissure, reducing pain, and preventing recurrence.

Over the years, various treatment options have been proposed for chronic anal fissures, ranging from conservative medical management to surgical interventions. The traditional approach for treating chronic anal fissures involves lateral internal anal sphincterotomy (LIAS), a surgical procedure that involves the incision of the internal anal sphincter muscle to reduce spasm and promote healing of the fissure. This procedure has been shown to be highly effective in promoting healing and relieving pain, but it is not without its complications, such as incontinence or bleeding.

In recent years, non-surgical treatments such as botulinum toxin (Botox) injection have emerged as alternative or adjunctive options for managing chronic anal fissures. Botox works by temporarily paralyzing the anal sphincter, thus reducing muscle spasm and allowing for the fissure to heal. This approach is minimally invasive, with a lower risk of complications compared to surgery, and is particularly appealing for patients who are not candidates for surgery or prefer non-surgical options.

The comparative effectiveness of LIAS versus Botox injection in the treatment of anal fissures remains an area of active research. While both treatments aim to alleviate the pain associated with fissures and promote healing, they do so through different mechanisms. LIAS directly addresses the underlying muscle spasm by surgically cutting the internal anal sphincter, while Botox acts by temporarily weakening the muscle, offering a less invasive solution. Both methods have shown promising results, but differences in outcomes such as healing rates, pain relief, recurrence of fissures, and complication rates warrant further investigation.

This article presents a comparative study of lateral internal anal sphincterotomy versus Botox injection in the treatment of chronic anal fissures. It will examine the efficacy, safety, and long-term outcomes of both treatment modalities, providing insight into their relative advantages and disadvantages. Through this comparison, we aim to guide clinicians in making informed decisions regarding the best treatment options for their patients with anal fissures, optimizing both patient outcomes and quality of life.

MATERIALS AND METHODS

This study was conducted at Shaikh Zayed Hospital Lahore from October 2024 to March 2025. The study included a total of 120 patients who were diagnosed with chronic anal fissures and had failed conservative management. The patients were divided into two groups of 60 individuals each, with one group receiving lateral internal anal sphincterotomy and the other group receiving Botox injection. The inclusion criteria for the study were patients aged 18-60 years with chronic anal fissures lasting more than 6 weeks, confirmed by clinical examination. Patients with any history of anorectal surgery, inflammatory bowel disease, or other severe medical conditions were excluded from the study. Additionally, individuals with pregnancy or lactation, as well as those with contraindications to Botox, were excluded.

The sample size of 120 patients was calculated based on the expected difference in treatment outcomes between the two groups. A power analysis was performed using a standard formula, with a significance level set at 0.05 and a power of 80%. Based on previous studies, the anticipated effect size was 0.5, leading to the calculation of a minimum

sample size of 60 patients per group to achieve reliable results.

For the first group, the patients underwent lateral internal anal sphincterotomy under local anesthesia. The procedure was performed by making a small incision in the internal anal sphincter muscle, thereby reducing the sphincter spasm and facilitating fissure healing. The second group received an intramuscular injection of botulinum toxin in the anal sphincter, under sterile conditions, to alleviate muscle spasm. Follow-up assessments were carried out at 1 week, 1 month, and 3 months post-treatment to evaluate fissure healing, pain relief, and recurrence rates. The primary outcome measures were the healing rate of the fissure, the level of pain experienced by patients, and the recurrence of the fissure. Secondary outcomes included the incidence of complications, such as incontinence in the LIAS group and side effects like mild weakness in the Botox group.

Statistical analysis was performed using SPSS software, with comparisons made between the two groups using the chi-square test for categorical variables and the t-test for continuous variables. A p-value of less than 0.05 was considered statistically significant. The study was conducted in accordance with ethical standards, and informed consent was obtained from all participants prior to inclusion.

STUDY RESULTS

Table 1 presents the demographic details of the patients in both treatment groups. The total number of patients in each group was 60, with a mean age of 38.5 years in the LIAS (surgical) group and 37.8 years in the Botox (non-surgical) group. In the LIAS group, 58% of the patients were male, while 42% were female. In the Botox group, 53% of the patients were male, and 47% were female. The gender distribution was relatively similar between the two groups.

Table 2 shows the healing outcomes of chronic anal fissures at the 3-month follow-up for the LIAS and Botox treatment groups. In the LIAS (surgical) group, 90% of the patients had healed by the end of the study, while 10% did not heal. In contrast, the Botox (non-surgical) group had a healing rate of 73%, with 27% of patients not showing healing after 3 months. This indicates a higher healing rate in the LIAS group compared to the Botox group.

Table 3 presents the mean pain scores, measured using the Visual Analog Scale (VAS), before and after treatment for both the LIAS and Botox groups. In the LIAS (surgical) group, the mean pain score before treatment was 8.1 ± 1.2, which reduced to 3.2 ± 1.5 after 1 month and further decreased to 1.5 ± 1.0 after 3 months. In the Botox (non-surgical) group, the mean pain score before treatment was 8.3 ± 1.3, which decreased to 4.5 ± 1.4 after 1 month and 2.0 ± 1.2 after 3 months. Both groups showed significant pain reduction, with the LIAS group demonstrating greater improvement in pain relief at 1 month and 3 months compared to the Botox group.

Table 4 shows the recurrence rates of anal fissures after 3 months of treatment in both the LIAS and Botox groups. In the LIAS (surgical) group, 5% of patients experienced a recurrence of the fissure, while 95% had no recurrence. In the Botox (non-surgical) group, 17% of patients experienced recurrence, and 83% did not. These results indicate a lower recurrence rate in the LIAS group compared to the Botox group.

Table 5 presents the incidence of complications and side effects following LIAS and Botox treatments. In the LIAS (surgical) group, 5% of patients experienced incontinence, while no patients reported mild weakness or pain at the injection site. The majority, 95%, had no complications. In the Botox (non-surgical) group, no patients experienced incontinence, but 8% had mild weakness and 13% reported pain at the injection site. Additionally, 78% of patients in the Botox group had no complications. These findings highlight a higher rate of side effects in the Botox group compared to the LIAS group.

Table 1: Demographic Details of Patients in Both Treatment Groups: Lateral Internal Anal Sphincterotomy (LIAS) and Botulinum Toxin (Botox) Injection

Group	Total Patients	Mean Age (Years)	Male (%)	Female (%)
LIAS (Surgical)	60	38.5	35 (58%)	25 (42%)

Botox (Non-Surgical)	60	37.8	32 (53%)	28 (47%)

Table 3: Reduction in Pain Scores Measured by Visual Analog Scale (VAS): Pre-Treatment and Post-Treatment Comparison in LIAS and Botox Groups

Group	Mean Pain Score Before Treatment (VAS) ± SD	Mean Pain Score After 1 Month (VAS) ± SD	Mean Pain Score After 3 Months (VAS) ± SD
LIAS (Surgical)	8.1 ± 1.2	3.2 ± 1.5	1.5 ± 1.0
Botox (Non-Surgical)	8.3 ± 1.3	4.5 ± 1.4	2.0 ± 1.2

Table 4: Fissure Recurrence Rate After 3 Months of Treatment: Comparative Data for Patients Receiving LIAS Versus Botox Injections

Group	Recurrence (%)	No Recurrence (%)
LIAS (Surgical)	3 (5%)	57 (95%)
Botox (Non-Surgical)	10 (17%)	50 (83%)

Table 5: Incidence of Complications and Side Effects Following LIAS and Botox Treatments: Analysis of Incontinence, Muscle Weakness, and Injection Site Pain

Group	Incontinence (%)	Mild Weakness (%)	Pain at Injection Site (%)	No Complications (%)
LIAS (Surgical)	3 (5%)	0 (0%)	0 (0%)	57 (95%)
Botox (Non-Surgical)	0 (0%)	5 (8%)	8 (13%)	47 (78%)

DISCUSSION

Chronic anal fissures are a painful condition affecting the anorectal region, often resulting in discomfort during bowel movements. These fissures can cause significant distress and impair quality of life, particularly when conservative treatments fail. Traditional management options, such as lateral internal anal sphincterotomy (LIAS), have been effective in treating chronic fissures but carry surgical risks. Botulinum toxin (Botox) injection is a newer, non-surgical alternative, offering potential benefits with fewer complications. Despite their widespread use, a direct comparison between these two treatment modalities is necessary to determine the most effective treatment option for patients with chronic anal fissures.

In this study, we compared the effectiveness of lateral internal anal sphincterotomy (LIAS) and botulinum toxin (Botox) injection in the treatment of chronic anal fissures. The findings from our study are consistent with and provide further insights into the findings from previous studies. Our results showed that the healing rate for the LIAS group was significantly higher (90%) compared to the Botox group (73%), which is in line with the findings of Rashid et al. (2023), where 90.3% of patients in the LIAS group experienced treatment efficacy, whereas only 65.1% of patients in the Botox group showed similar results (p-value < 0.001).[16] This supports the conclusion that LIAS may be a more effective treatment option in terms of healing rates for chronic anal fissures.

Regarding pain relief, our study found a significant reduction in pain scores for both groups, with the LIAS group showing a greater reduction in pain (VAS scores of 1.5 ± 1.0 at 3 months) compared to the Botox group (VAS scores of 2.0 ± 1.2). This result aligns with the findings of Naqvi et al. (2024), who reported that 95.12% of patients in the LIAS group achieved healing and pain relief, compared to 85.37% in the Botox group.[17] The higher pain relief observed in the LIAS group further emphasizes the potential superiority of LIAS over Botox in providing long-term comfort and symptom relief.

When comparing recurrence rates, our study found a recurrence rate of 5% in the LIAS group and 17% in the Botox group, which is consistent with the findings of Naqvi et al. (2024), where the recurrence

rate in the Botox group was 4.63%, higher than the 2% recurrence observed in the LIAS group. The lower recurrence rate in the LIAS group in our study further supports its efficacy in providing sustained healing for chronic anal fissures.[17]

In terms of complications, our study showed a higher rate of complications in the Botox group, including mild weakness and pain at the injection site (13%). This result aligns with Hussain et al. (2024), who reported a higher incidence of side effects in the Botox group, such as mild weakness.[18] However, our study also found that the LIAS group had a relatively lower complication rate, with only 5% of patients experiencing incontinence, which corroborates findings from Khan et al. (2024), where the lateral sphincterotomy group had fewer complications compared to the Botox group.[19] Furthermore, our study observed a significantly higher rate of pain relief in the LIAS group (VAS scores of 1.5 ± 1.0 at 3 months) compared to the Botox group (VAS scores of 2.0 ± 1.2), which contrasts with Mohamed et al.'s conclusion that there was no significant variance in pain recovery between the two treatments. This discrepancy could be due to differences in patient demographics, duration of symptoms, or the methods used to assess pain relief.[20]

Overall, the findings from our study are consistent with the existing literature, showing that while Botox offers a minimally invasive approach with fewer complications, LIAS tends to provide better long-term outcomes, higher healing rates, greater pain relief, and a lower recurrence rate. Despite the higher effectiveness of LIAS, the decision between the two treatments may depend on patient preferences, risk profiles, and the potential for complications. Further studies with longer follow-up periods are necessary to evaluate the long-term outcomes and to assess the cost-effectiveness of both treatments.

The study's large sample size (120 patients) enhances the reliability of the results. However, one limitation is the relatively short follow-up period of three months, which may not fully capture long-term recurrence or complications. Additionally, patient variability and subjective pain reporting may introduce bias, despite efforts to standardize assessment methods. The study also did not include an assessment of cost-effectiveness between the two treatments.

CONCLUSION

Both LIAS and Botox treatments were effective in managing chronic anal fissures, with LIAS showing superior healing rates and pain relief. While Botox offered a minimally invasive option, LIAS demonstrated better long-term outcomes in terms of fissure healing and recurrence prevention. Further studies with longer follow-up are needed to confirm these findings.

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