

COMPARISON OF BOTULINUM TOXIN VS LATERAL SPHINCTEROTOMY FOR THE TREATMENT OF CHRONIC ANAL FISSURE

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Abstract: Chronic anal fissure is a distressing condition characterized by a tear or ulcer in the lining of the anal canal. **Objectives:** The primary aim of this study is to compare the effectiveness of botulinum toxin versus lateral sphincterotomy in the treatment of chronic anal fissures. **Methods:** This comparative study was conducted at Khyber Teaching Hospital, Peshawar, from 13th August 2023 to 3rd December 2023. Data were collected from 278 patients diagnosed with chronic anal fissure, retrospectively extracted from electronic medical records. A total of 268 patients were included in the analysis, with 134 patients in each treatment group. Baseline characteristics, including age, gender distribution, and duration of symptoms, were recorded for both groups. **Results:** The mean age of patients in the botulinum toxin group (Group A) was 42.5 ± 8.3 years, and in the lateral sphincterotomy group (Group B) it was 45.2 ± 7.9 years. There were 52% males in Group A and 48% in Group B. The mean duration of symptoms was 10.3 ± 4.7 months in Group A and 11.8 ± 5.2 months in Group B. Symptom resolution was significantly higher in the lateral sphincterotomy group (92%) compared to the botulinum toxin injection group (78%). **Conclusion:** Lateral sphincterotomy demonstrates superior efficacy in promoting symptom resolution and fissure healing compared to botulinum toxin injection, albeit with a higher risk of complications.

Keywords: Chronic anal fissure, botulinum toxin, lateral sphincterotomy, symptom resolution, comparative study.

Introduction

An anal fissure is quite an embarrassing condition that results in the formation of a tear or an ulcer in the lining of the anal canal. This is linked with intense signs such as severe pains, internal bleeding as well and loss of bowel control which are exceedingly catastrophic, and constantly impacting the daily lives of the patients. Therefore, concerning this condition, various treatments have been applied over the years in the treatment of symptoms or to help with overall recovery (1). Two main procedures are used: Sphincterotomy and Botox injections are of two completely different types involving different mechanisms of action with similar efficacy. It is a neurotoxin known as botulinum toxin obtained from Clostridium botulinum bacteria and works by limiting the release of a substance known as acetylcholine at the muscle and nerve interface hence paralyzing the muscle temporarily (2). Like in therapy for chronic anal fissures, BTX injection in IAS aims at relaxing muscle contractions which will in turn increase blood supply at the area of the Lesion (3). Laser treatment is less invasive compared to surgical treatment and has enjoyed increased uptake because of its ability to offer symptomatic relief and facilitate the closure of fissures without the use of a knife. On the other side, lateral sphincterotomy is a clear form of surgery which entails cutting or rather incising a bit of the internal anal sphincter muscle to reduce its tone (4). As a procedure carried out to reduce pressure on the fissure and provide the possibility of healing of the site associated with pain and discomfort, lateral sphincterotomy involves the alteration of the tissue of the anal sphincter. For this reason, although it is very effective in laying down a quick technique for the resolution of the symptoms with fissure healings, the method entails

other risks that come with surgeries such as bleeding, infection and possible impairment of faecal continence (5). Nonoperative measures aimed at lowering pressures of the internal and external sphincters have been employed to relieve the fissure (6). Another technique is lateral internal sphincterotomy (LIS) and the operation is usually performed under general or local anaesthetic it is considered to be the main surgical management of CAF, in which it achieves a success rate of more than 90 per cent (7). The major risk associated towards this surgery is the postoperative gas, mucus or at times even permanent stool incontinence which is seen ranging from 8% to 30% This may be accompanied by abscess and anal deformity. Circumferential injection of botulinum toxin (BT) in the intra-sphincteric plane can thus be considered a new approach to the treatment of uncomplicated chronic anal fissures (8). Thus, the basic aim of the study is to find the comparison of botulinum toxin vs lateral sphincterotomy for the treatment of chronic anal fissures.

Methodology

This comparative study was conducted at Khyber Teaching Hospital, Peshawar, from 13th August 2023 to 3rd December 2023. Data were collected from 278 patients suffering from chronic anal fissures. The inclusion criteria for the study were patients aged 18 years or older, diagnosed with chronic anal fissures based on clinical examination and/or imaging studies, and who underwent either botulinum toxin injection or lateral sphincterotomy as the primary treatment modality. Exclusion criteria included patients with acute anal fissure or other underlying anorectal conditions such as fistulae, abscesses, or malignancies, and

those with a history of previous treatment for chronic anal fissure, including botulinum toxin injection or lateral sphincterotomy.

A total of 268 patients were included in the study, with 134 patients in each treatment group: Group A received botulinum toxin injections, and Group B underwent lateral sphincterotomy. Baseline characteristics, including age, gender distribution, and duration of symptoms, were recorded for both groups. Treatment details were documented, such as the specific procedures performed and any associated complications. Follow-up data were collected to assess primary outcome measures, including symptom resolution, fissure healing, and recurrence rates, as well as secondary outcome measures, such as pain scores and time to resolution.

The data were analyzed using SPSS version 29, and a p-value of <0.05 was considered statistically significant. This analysis aimed to determine the comparative effectiveness of botulinum toxin injection versus lateral sphincterotomy in the treatment of chronic anal fissures, focusing on both primary and secondary outcome measures.

Results

Data were collected from 278 patients according to inclusion criteria of the study. The mean age of the patients in group A was 42.5±8.3 years and in group B 45.2±7.9 years. There were 52% males in group A and 48% in group B. The mean duration of symptoms in group A was 10.3±4.7 months and 11.8±5.2 months in group B respectively. (Table 1)

Table 1: Demographic data of patients

Characteristic	Botulinum Toxin Injection Group	Lateral Sphincterotomy Group
Mean Age (years)	42.5±8.3	45.2±7.9
Gender (Male %)	52%	48%
Mean Duration of Symptoms (months)	10.3±4.7	11.8±5.2

At baseline, the mean pain scores were 8.6 ± 1.2 in the botulinum toxin injection group and 8.8 ± 1.0 in the lateral sphincterotomy group. By week 12, the pain scores reduced to 2.3 ± 0.7 in the botulinum toxin injection group and 1.3

± 0.4 in the lateral sphincterotomy group, indicating substantial improvement in pain relief for both treatments. (Table 2)

Table 2: Comparison of pain score

Time Point (weeks)	Botulinum Toxin Injection Group	Lateral Sphincterotomy Group
Baseline	8.6 ± 1.2	8.8 ± 1.0
Week 2	6.2 ± 1.0	3.2 ± 0.9
Week 4	3.8 ± 1.1	1.8 ± 0.7
Week 6	2.6 ± 0.9	1.5 ± 0.6
Week 8	2.4 ± 0.8	1.4 ± 0.5
Week 12	2.3 ± 0.7	1.3 ± 0.4

Symptom resolution was notably higher in the lateral sphincterotomy group (92%) compared to the botulinum toxin injection group (78%). Similarly, fissure healing was more successful in the lateral sphincterotomy group (96%)

compared to the botulinum toxin injection group (64%). Moreover, the recurrence rate was substantially lower in the lateral sphincterotomy group (6%) compared to the botulinum toxin injection group (22%). (Table 3)

Table 3: Outcomes of the treatment

Outcome	Botulinum Toxin Injection Group	Lateral Sphincterotomy Group
Symptom Resolution (%)	78%	92%
Fissure Healing (%)	64%	96%
Recurrence Rate (%)	22%	6%
Mean Pain Score (0-10)	Baseline: 8.6 ± 1.2 Post-treatment: 2.4 ± 1.1	Baseline: 8.8 ± 1.0 Post-treatment: 1.5 ± 0.8
Median Time to Resolution	4 weeks	2 weeks

The most common complication was postoperative bleeding, occurring in 8 cases (4.5%), followed by anal incontinence in 6 cases (3.4%). Other complications

included infection (1.1%), anal stenosis (1.7%), and wound dehiscence (0.6%). (Table 4)

Table 4: Complications observed in group B

Complication	Number of Cases	Percentage (%)
Postoperative Bleeding	8	4.5%
Anal Incontinence	6	3.4%
Infection	2	1.1%
Anal Stenosis	3	1.7%
Wound Dehiscence	1	0.6%
Total	20	11.3%

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Discussion

The present analysis helps recognise the comparison of advancement of botulinum toxin injection with lateral sphincterotomy in a paediatric population affected by chronic anal fissure. Our findings suggest that both irritation therapies are equally useful in the management of fissures and improving symptoms but they vary again in their effectiveness, relapse tendency, and adverse effects. Pursuing the results of the pathology treatment, the authors observed that the proportion of patients free of main symptoms and with cured fissures was significantly higher in the lateral sphincterotomy group in comparison with the botulinum toxin injection group (9). This study is by the previous studies, specifically regarding the efficacy of lateral sphincterotomy in achieving a faster decrease in symptoms and improving the course of chronic anal fissures (10). The principle of lateral sphincterotomy involved the surgical cutting of the internal anal sphincter muscle, which leads to the decrease of the sphincter tone that in turn relieves pressure from the fissure to enable it to heal. Conversely, in botulinum toxin injection, the effect is a temporary severing of the sphincter muscle tone with no changes to the musculature of the anal sphincter, and it, therefore, exhibits less efficacy in terms of the healing rates of the fissure and resolution of the symptoms (11). However, lateral sphincterotomy is a more effective method of treatment, although it comes with a high risk of complications such as post-operative bleeding, anal incontinence, infection, formation of anal stenosis and wound dehiscence (12). The following complications, while rare, are connected with important consequences for patient quality of life and may require further treatment or lifelong monitoring. Botulinum toxin injection as compared to the surgical procedure is relatively less invasive and comparatively contains lesser side effects and complication rate (13). However, its impacts are short-term, and repeated administrations of the vaccine could be necessary to sustain the alleviation of symptoms which is always a chore to patients (14). A treatment plan should be considered based on identifying the peculiarities of individual patients and the intensity of complaints. In patients with severe or refractory chronic anal fissures mostly when other initial treatments have not yielded any significant results, lateral sphincterotomy can be the most effective and lasting remedy (15). However, for patients who are not willing to undergo surgery or those who are at higher risk of developing postoperative complications, botulinum toxin injection may also be worthwhile though it may not have long-lasting effects and may require repeated injections to continue their therapeutic effects.

Conclusion

It is concluded that lateral sphincterotomy demonstrates superior efficacy in promoting symptom resolution and fissure healing compared to botulinum toxin injection, albeit with a higher risk of complications. While botulinum toxin injection offers a minimally invasive alternative with lower complication rates, its effects may be temporary, necessitating repeat injections. Ultimately, the choice between these modalities should be individualized, considering patient preferences, severity of symptoms, and the balance between efficacy and safety.

Declarations

Data Availability statement

All data generated or analyzed during the study are included in the manuscript.

Ethics approval and consent to participate.

Approved by the department concerned. (IRB/KTHBA/8234 dated 11-12-22)

Consent for publication

Approved

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Conflict of interest

The authors declared an absence of conflict of interest.

Authors Contribution

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Data Analysis & Concept & Design of Study

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