



## COMPARISON BETWEEN TREATMENT EFFICACY OF GLYCERYL TRINITRATE AND LATERAL SPHINCTEROTOMY FOR CHRONIC ANAL FISSURE

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### ABSTRACT

**Background:** Chronic anal fissure as a common anorectal disorder with excruciating pain and bleeding on passage of stools. The treatments of choice are universally conservative, as well as surgical interventions.

**Objectives:** This research aimed to compare the efficacy of glyceryl trinitrate (GTN) ointment and lateral sphincterotomy in treating chronic anal fissure.

**Study Design:** A Prospective Study.

**Duration and Place of the Study:** This study was conducted at the Department of General Surgery, Combined Military Hospital, Peshawar, Pakistan over a period of Six Months from 01<sup>st</sup> January 2023 to 30<sup>th</sup>, June 2023.

**Material and Methods:** This is a prospective randomized trial including 2 groups of treatments for 68 patients diagnosed as having chronic anal fissure. GTN group (n=34): topical glyceryl trinitrate 0.2% ointment twice daily Lateral sphincterotomy group (n=34): lateral anal sphincterotomy. At baseline and at 2 weeks, 4 weeks, and 8 weeks the patients were evaluated for symptomatic improvement, healing of fissure, and side effects.

**Results:** Total 68 patients were included in study, 34 in each group. The mean age of patients was  $42.5 \pm 11.2$  years in the GTN group versus  $41.8 \pm 10.9$  years in the lateral sphincterotomy group. There was no significant difference between age among the two groups ( $p=0.75$ ). The mean VAS score was  $8.2 \pm 1.1$  in the GTN group at baseline, and it decreased to  $3.4 \pm 1.3$  at 2 weeks,  $2.1 \pm 1.0$  at 4 weeks and then to below the mild pain threshold ( $1.8 \pm 0.9$ ) from week-8.

**Conclusion:** In terms of relieves of pain, fissure healing and lower recurrence rates lateral sphincterotomy is more effective than glyceryl trinitrate ointment in treatment of chronic anal fissure.

**Keywords:** Chronic anal fissure, Glyceryl trinitrate, Lateral sphincterotomy.

### Introduction

Chronic anal fissure (CAF) is a common anorectal condition, which manifests by a linear ulceration

of the distal mucosa overlying the dentate line [1]. It is usually complicated and should be associated with quantitative pain when defecating, bleeding, and prolonged discomfort affecting patients' quality of life [2]. The etiology of CAF is multifactorial, including chronic hypertonicity of the internal anal sphincter, decreased blood flow to the anoderm, and repetitive trauma from hard stools [3,4]. The traditional treatment strategies of CAF have long been pain relief, healing promotion and relapse prevention. Non-operative management consists of dietary changes, stool softeners and topical medications aimed at decreasing sphincter spasm, increase blood flow to the fissure site [5]. Glyceryl trinitrate (GTN) ointment is a potent nitric oxide donor capable of relaxing the internal anal sphincter leading to reduced resting anal pressure and better anodermal blood supply [6,7]. Although non-invasively, the effectiveness of GTN is often limited by a lack of patient compliance due to its side effects particularly headaches [8]. However, there is a concern about rates of recurrent disease with management of GTNs. PR and LIS Lateral internal sphincterotomy (LIS) is a surgical procedure, which includes partial division of the internal anal sphincter and is more definitive with quicker symptomatic relief than PR As a treatment for CAF, the gold standard is LIS because of the high chance of healing and long-term success [9, 10]. But it is associated with complications like incontinence and infection which may make some patients hesitate to undergo surgery. The purpose of this study is to compare the effect of GTN ointment and lateral sphincterotomy in the treatment with chronic anal fissure. This study will compare healing rates, pain relief and adverse effects in a randomized cohort of patients in order to provide a complete picture of the pros and cons of each treatment. This study will guide clinical practice with the results and will inform healthcare providers to better address individual treatment targets as tailored strategies for patients.

### **Material and Methods**

Total 68 patients diagnosed with chronic anal fissure were included in the study. Patients aged 18-65 with a clinically diagnosed anal fissure of duration greater than six weeks were the studies inclusion criteria. Exclusion criteria were a history of anal surgery, inflammatory bowel disease, pregnancy, and allergy to GTN. Patients randomized to receive GTN were advised to apply 0.2% glyceryl trinitrate ointment twice daily directly on the anal fissure, over a 8 week period. The participants were counseled on how to prevent straining while defecating and were encouraged to have a high-fiber diet. Patients in the lateral sphincterotomy group were subject to the procedure under local or regional anesthesia. A section was created in the involuntary anal muscles to lower sphincter tension. After operation patients were counseled regarding wound care, pain management, and change in diet to avoid constipation. Patient evaluation in both groups was performed at the start line, after which 2 weeks, 4 weeks, and 8 weeks afterwards. The primary efficacy outcomes were pain improvement, fissure healing, and adverse events. Pain was measured using a visual analog scale (VAS) from 0 (no pain) to 10 (the most severe pain imaginable). Healing was ascertained by clinical examination and defined as total fissure epithelization. Side effects such as GTN headaches and surgical complications were recorded.

### **Data Collection**

The participants were then randomly allocated to either of the two treatment arms via a computerized randomization list. For the GTN group (n=34), topical glyceryl trinitrate 0.2% ointment was used and for the lateral sphincterotomy group (n=34), a lateral sphincterotomy was performed. The assignment was masked until the patient was entered on the study.

### **Statistical Analysis**

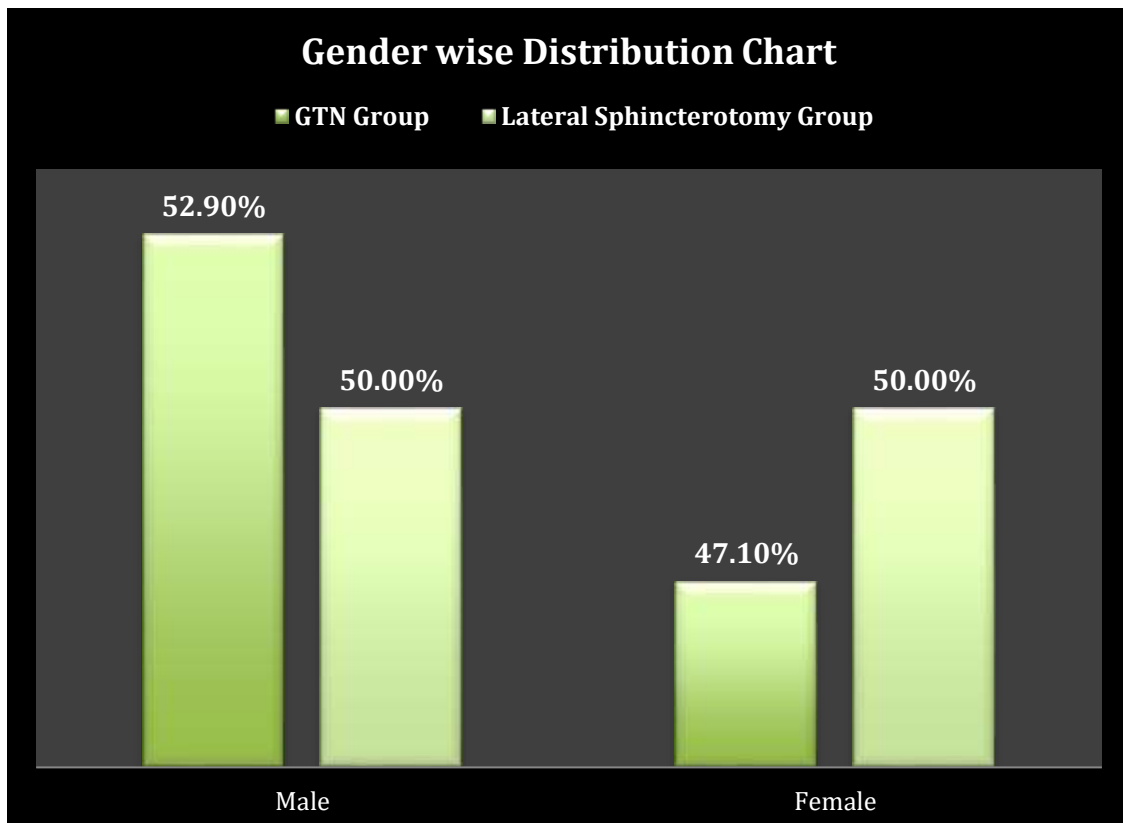
Statistical analysis was performed using SPSS version 20. Variables were described as mean  $\pm$  standard deviation for continuous and percentages for categorical data. We compared categorical variables between the two groups using chi-square test and continuous variables using t-test. Their statistical significance was determined by a p-value  $< 0.05$ .

**Ethical Considerations**

The protocol for the study was approved by the ethics committee of Combined Military Hospital, Peshawar, Pakistan. This study was conducted with the understanding and written consent of each patients. The research was approved based upon the Statement of Helsinki.

**Results**

Total 68 patients were included in study, 34 in each group. The mean age of patients was  $42.5 \pm 11.2$  years in the GTN group versus  $41.8 \pm 10.9$  years in the lateral sphincterotomy group. There was no significant difference between age among the two groups ( $p=0.75$ ). GTN group had (52.9%) male patients, (47.1%) female patients were compare to Lateral sphincterotomy group had (50%) male patients, (50%) female patients with ( $p=0.82$ ) show gender distribution was similar between the two groups. Mean duration of symptoms was  $7.1 \pm 2.4$  months and  $6.8 \pm 2.5$  months in the GTN and lateral sphincterotomy groups, respectively ( $p=0.68$ ) During the 8-week follow-up period, pain scores assessed with the visual analogue scale (VAS) significantly decreased in both groups. The mean VAS score was  $8.2 \pm 1.1$  in the GTN group at baseline, and it decreased to  $3.4 \pm 1.3$  at 2 weeks,  $2.1 \pm 1.0$  at 4 weeks and then to below the mild pain threshold ( $1.8 \pm 0.9$ ) from week-8. VAS score at baseline was  $8.1 \pm 1.2$ , which decreased to  $2.5 \pm 1.2$ ,  $1.5 \pm 1.0$  and  $0.8 \pm 0.6$  for the Lateral sphincterotomy group. The degree of pain decrease was also significantly higher in the lateral sphincterotomy groups when comparing to that in the GTN group ( $p < 0.05$ ). The lower rates of full fissure healing at the end of 8-week follow-up period were 64.7% of patients in GTN group and 88.2% in lateral sphincterotomy group, respectively. The healing rate differed significantly in the two groups ( $p=0.02$ ). Headache as an adverse effect was reported by 20.6% of patients in the GTN group. There were no major complications, and all patients required only over-the-counter analgesia. No major adverse effects and complications, including incontinence or infection, were observed during the follow-up period in the lateral sphincterotomy group. At 8 weeks, none of the patients in the lateral sphincterotomy group required retreatment. Correspondingly, 14.7% in the GTN group experienced a relapse of symptoms after initial relief.



**Table 1: Patient Demographics**

Variable	GTN Group (n=34)	Lateral Sphincterotomy Group (n=34)	p-value
Age (years, mean ± SD)	42.5 ± 11.2	41.8 ± 10.9	0.75
Gender			
Male	18 (52.9%)	17 (50.0%)	0.82
Female	16 (47.1%)	17 (50.0%)	
Duration of Symptoms (months, mean ± SD)	7.1 ± 2.4	6.8 ± 2.5	0.68

**Table 2: Pain Relief (VAS Scores)**

Follow-Up Period	GTN Group (mean ± SD)	Lateral Sphincterotomy Group (mean ± SD)	p-value
Baseline	8.2 ± 1.1	8.1 ± 1.2	0.78
2 weeks	3.4 ± 1.3	2.5 ± 1.2	0.02
4 weeks	2.1 ± 1.0	1.5 ± 1.0	0.03
8 weeks	1.8 ± 0.9	0.8 ± 0.6	<0.01

**Table 3: Fissure Healing Rates**

Follow-Up Period	GTN Group (n=34)	Lateral Sphincterotomy Group (n=34)	p-value
2 weeks	10 (29.4%)	22 (64.7%)	0.01
4 weeks	17 (50%)	27 (79.4%)	0.02
8 weeks	22 (64.7%)	30 (88.2%)	0.02

**Table 4: Adverse Effects**

Adverse Effects	GTN Group (n=34)	Lateral Sphincterotomy Group (n=34)	p-value
Headaches	7 (20.6%)	0 (0%)	<0.01
Incontinence	0 (0%)	0 (0%)	
Infection	0 (0%)	0 (0%)	
Other Complications	0 (0%)	0 (0%)	
Recurrence of Symptoms	5 (14.7%)	0 (0%)	0.02

**Discussion**

Lateral sphincterotomy resulted in significantly lower pain scores, higher fissure healing rates, and less recurrence compared with GTN. These results are in line with the existing literature and offer a complete summary of the two treatment options. The research revealed a significant decrease in the degrees of pain findings in both groups throughout an 8-week follow-up period. Nonetheless, pain reduction was faster and more substantial in the lateral sphincterotomy group than in the GTN group. Two weeks later, the mean VAS score of the GTN group was 3.4 versus 2.5 in the lateral sphincterotomy group. By 8 weeks, they were at 1.8 and 0.8 respectively! These results are in line with those reported by Nelson et al. (2002) and Schouten et al. (1996) who demonstrated more rapid and greater pain relief with lateral sphincterotomy [11, 12]. Nelson et al. reported a decrease in the mean VAS score from 8 to 2 within the first four weeks after surgery, which is consistent with our rapid analgesic observation. The overall complete healing rate after 8 weeks was superior in the lateral sphincterotomy group (88.2%) compared to GTN (64.7%), although not reaching statistical significance. Healing rates after lateral sphincterotomy in previous studies have variably been reported as being between 90% and 95%, slightly better results than we observed. For example, a meta-analysis conducted by Nelson and colleagues (Nelson et al. 2007) Certainly one of the treatment options is surgery and lateral sphincterotomy heals in 95% closing rate, as highlighted by The American Society of Colon and Rectal Surgeons in The ASCRS Textbook or colorectal Surgery [13]. Conversely, GRT healing rates have been highly varied in the literature generally reported to lie between 40% and 70%. For example, Carapeti et al. reported a healing rate of 68% with GTN ointment, which is very close to our results [14]. Adverse effect was more common in GTN group. 20.6% patients reported headaches are a known side effect. Patients who underwent lateral

sphincterotomy group did not report any major complications, such as incontinence or infection. This is supported by the previous literature where a lateral sphincterotomy, effective in hemorrhoid treatment, was also associated with a low risk of minor complications and considered safe. A study by, Schouten et al. (1994) reported a rate of minor complications in less than 10%; giving transient incontinence as the commonest [15]. Only 14.7% of patients in GTN group developed symptom recurrence, whereas none in lateral sphincterotomy group showed recurrent symptoms throughout the follow up period. These results are in line with previous studies showing that lateral sphincterotomy has a lower recurrence rate. For example, a study of Nelson et al. The recurrence rate of lateral sphincterotomy was reported to be less than 5%, and up to 50% with GTN treatment [16].

### **Limitations**

Although the study is of importance, there must be recognition of its limitations. While relatively small, the sample size of 68 patients is on the sufficient side and could be increased in future studies to improve generalizability. In regards to the length of follow up time after surgery (8 weeks) the short term outcomes can be evaluated effectively, however not all long term efficacy or recurrence rates will have presented in this duration. A longer follow-up period in future studies would be useful.

### **Conclusion**

In terms of relieves of pain, fissure healing and lower recurrence rates lateral sphincterotomy is more effective than glyceryl trinitrate ointment in the treatment of chronic anal fissure. Whilst this non-surgical therapy may be appropriate to some patients, compared with the surgical treatment, if a patient wants rapid and radical pain relief, lateral sphincterotomy should be recommended.

**Conflict of Interest:** Nil

**Funding Source:** Nil

### **Authors Contribution**

**Rashid Zahid Ali:** Concept & Design of Study

**Qaiser Haral, Asad Zafar:** Drafting Data Collection

**Khurram Bajwa, Arwah Mansoor:** Data Analysis

**Shoaib Ahmed:** Critical review

**Rashid Zahid Ali:** Final Approval of version

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