

ORIGINAL ARTICLE

Comparative Study of Glyceryl Trinitrate (GTN) Ointment Versus Lateral Internal Sphincterotomy in Management of Chronic Anal FissureMAKIL SHAH¹, ZIA UL ISLAM², JAVED IQBAL³, MUHAMMAD JAFAR⁴, MANSOUR ULLAH⁵¹Associate Professor Bannu Medical College²General Surgeon, Medical Officer Lady Reading Hospital Peshawar DHQ Hospital Khar Bajaur³Medical Officer THQ Hospital Kakki Bannu⁴Training in MS Urology, (Urologist), Medical Officer. Pakistan Institute of Medical Sciences Islamabad, Tehsil Headquarter Hospital Tangi Charsadda.⁵Training Medical Officer, Combined Military Hospital PeshawarCorresponding author: Makil Shah, Email: shahmakil@gmail.com, Cell: 03339749182**ABSTRACT****Objectives:** To compare the effectiveness of 0.2% glyceryl trinitrate ointment versus lateral sphincterotomy in management of patients with chronic anal fissure.**Materials and Methods:** This Comparative study was done in Irfan general hospital THQ Charsadda, and the duration of this study were from April 2022 to September 2022. In this study 80 patients with anal fissure were enrolled. All the patients were divided into two group by lottery method. Group A patients were treated by lateral sphincterotomy while group B was treated by ointment of 0.2% glyceryl trinitrate. A predesign questionnaire were used to collect data.**Results:** Total 80 patients were enrolled equally divided in to two groups. Group A had 29 (72.5%) male and 11 (27.5%) female while group B had 23 (57.5%) male and 17 (42.5%) female with mean age of 40.47±10.94 years. Group A had 18 (45%) mild pain and 22 (55%) had severe pain while group B had 19 (47.5%) mild pain and 21 (52.5%) severe pain. 23 (57.5%) and 25 (62.5%) patients had bleeding before treatment. The final comparison after 6 weeks of treatment shows the 65% of patients healed with the lateral sphincterotomy and 52.5% of patients healed with ointment of glyceryl trinitrate. The healed proportion was measured high for the lateral sphincterotomy treatment as compared to the ointment of GTN.**Practical implication:** In our study we find that lateral sphincterotomy is more effective so this study will help the clinical practioner to select the better treatment option inorder to cure the anal fissure soon.**Conclusion:** It is concluded that for the treatment of anal fissure, the lateral sphincterotomy is considered an effective treatment as compared to ointment of GTN.**Keywords:** Chronic anal fissure; Glyceryl trinitrate ointment; Lateral internal sphincterotomy**INTRODUCTION**

The term anal fissure describe a painful condition due to linear mucosal tear⁽¹⁾. It is situated in distal anal canal extending from just below dentate line to the anal verge⁽²⁾. It is characterised by crack in the skin of the anal canal (3). Anal fissure can affect both gender at any stage of life but it is most commonly seen in the young ones^(4, 5). Anal fissures are mostly located in posterior midline however 15% occur in anterior midline and fissures in lateral locations constitute 1%⁽⁶⁾. A number of factors that are responsible to cause anal fissure include hard stool or recurrent episodes of diarrhea, Insertion of anima tip, rectal thermometer and ultrasonic probe^(7, 8). But the most common cause is trauma to anus of anal canal. Chronic Anal Fissure is common perineal condition and well-known painful entity⁽⁹⁾.

The clinical symptoms of anal fissure includes pain, bleeding per rectum, constipation and mucous discharge⁽¹⁰⁾. Mostly it is characterized by presence for > 6 weeks⁽¹¹⁾. It has been stated that anal fissure is associated with spasm and stenosis of internal anal sphincter⁽¹²⁾. In this condition the flow of blood reduces that results in late healing of the ulcer.

For the Medical management of anal fissure, Eisen hammer, (1951) introduced a procedure known as internal sphincterotomy and then in 1967 Parks described lateral open spenectotomy⁽¹³⁾. Nitric oxide is one of the important neurotransmitter mediating relaxation of the internal anal sphincter⁽¹⁴⁾. Nitroglycerine and glyceryl trinitrate serve as a Nitric oxide donor which help in the relaxation of internal anal sphincter. It can also increases the blood flow that will results in early healing⁽¹⁵⁾. Loder et al.⁽¹⁶⁾ stated that 0.2% glyceryl trinitrate is quite effective in get rid of symptoms and supporting healing process of the anal fissure. Anal fissure is a lineal tear in the anal canal distal to the dentate line. Chronic anal fissure (CAF) is associated with hypertonia of the internal sphincter resulting in mucosal ischaemia and failure to heal, which results in severe anal pain. Resolution of the symptoms can be achieved by lowering the resting anal tone, and increasing blood flow. Historically, this was achieved by division of the muscle fibers, in the form of a lateral sphincterotomy. This was the mainstay of treatment, however, lateral sphincterotomy causes significant morbidity with reported incontinence rates of up to 30%⁽¹⁷⁾.

Conventionally acute anal fissure is managed by chemical sphincterotomy. Majority of anal fissures especially acute anal fissure is treated by this method at onset of disease. It comprises of bulk forming laxatives, stool softeners, oral analgesics, local analgesia in form of xylocaine ointment 2% and glyceryl trinitrate 0.2% ointment local application along with warm sitz baths^(6, 18).

The aim of the present study was to compare the effectiveness of 0.2% glyceryl trinitrate ointment versus lateral internal sphincterotomy in management of patients with chronic anal fissure that will help the clinical practitioner to choose better treatment option in order to avoid further complication and reduce the time duration of healing process.

Objective: To compare the effectiveness of 0.2% glyceryl trinitrate ointment versus lateral sphincterotomy in management of patients with chronic anal fissure.

MATERIALS AND METHODS**Study Design and setting:** This Comparative study was done at Irfan General Hospital THQ Charsadda.**Duration of the study:** Duration of the study was 6 months (April 2022– September 2022).**Sample Size:** By using the online Open Epi Sample size, the sample size was 80 patients by keeping the following parameter:

Confidential interval= 95%

Margin of error= 5%

Prevalence of disease is 47%⁽¹⁹⁾**Inclusion Criteria**

- Patients with anal fissure of >6-week duration.
- Patients of 20-45 years of age.
- Both genders.

Exclusion Criteria

- Patients on medication containing nitrate compound for different medical condition such as anal fissures of bowel disease, Crohn's disease ulcerative colitis and tuberculosis etc.
- Patients suffering from ischemic heart disease, Diabetes, and chronic liver disease.
- Pregnant women.
- Anal fissure patients with fistula complications.

METHODS

After the approval of ethical committee and CPSP, totally 80 patients with anal fissure of more than 6-week duration were enrolled in this study. Informed consents were obtained from the patients. A pre-design questionnaire was used to collect data after clinical examination of the patients. Consecutive nonprobability sampling technique was done for the recruitment of affected individuals. Detailed history of the pain severity and other symptoms such as bleeding, constipation, and previous treatment were recorded. All the patients were divided into two groups by lottery method. Group A patients were treated by lateral sphincterotomy while group B was treated by ointment of 0.2% glyceryl trinitrate. Ointment of 0.2% glyceryl trinitrate was recommended to use around the anal margins for 6 seconds and continuously use 3 times in 24 hours for 6 weeks. All the enrolled patients were kept under observation for 7 days.

Statistical Analysis: SPSS (version 25.0) was used for the analysis of data. The data was presented in the form of table and graph.

RESULTS

Totally 80 affected individuals were enrolled, out of which 52 were male and 28 were female with mean age of 40.47 ± 10.94 years (Table 1, Fig 1-0). Group A found with 16 (40.0%) patients of age range 21-40 years and 26 (60.0%) of 41-60 years old, while Group B found with 20 (50.0%) patients of age range 21-40 years and 20 (50.0%) of 41-60 years old (Table 2, Fig 2-0).

Table 1: Frequency of Patients According to Gender (n=80)

Variable	Frequency	Percentage
Gender		
Male	52	65.0
Female	28	35.0
	Mean	SD
Age (Years)	40.47	10.94

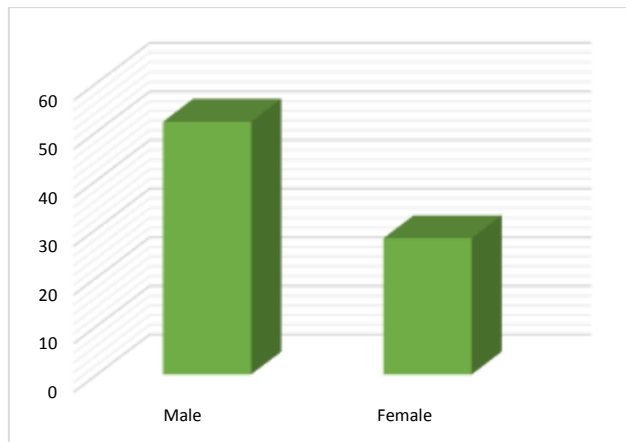


Figure 1: Graphical Representation of Patients on The Basis of Gender

Table 2: Different Variables of Patients Before Treatment (n=80)

Variables	Group A	Group B
Gender		
Male	29 (72.5%)	23 (57.5%)
Female	11 (27.5%)	17 (42.5%)
Age (Years)		
20-40	16 (40.0%)	20 (50.0%)
41-60	24 (60.0%)	20 (50.0%)
Pain		
Mild Pain	18 (45%)	19 (47.5%)
Severe Pain	22 (55%)	21 (52.5%)
Bleeding		
Yes	23 (57.5%)	25 (62.5%)
No	17 (42.5%)	15 (37.5%)

Group A had 18 (45%) mild pain and 22 (55%) had severe pain while group B had 19 (47.5%) mild pain and 21 (52.5%) severe pain. 23 (57.5%) and 25 (62.5%) patients had bleeding before treatment. The final comparison after 6 weeks of treatment shows the 65% of patients healed with the lateral sphincterotomy and 52.5% of patients healed with ointment of glyceryl trinitrate.

Table 3: Comparison of Outcomes of Lateral Sphincterotomy and Glyceryl Trinitrate (n=80)

Outcomes	Group A	Group B
2 nd week		
Wound healing	5 (12.5%)	4 (10.0%)
pain	32 (80.0%)	34 (85.0%)
Bleeding	22 (55.0%)	29 (72.5%)
6 th week		
Wound healing	25 (62.5%)	17 (42.5%)
Pain	16 (40.0%)	18 (45.0%)
Bleeding	9 (22.5%)	7 (17.5%)

Table 4: Frequency Distribution of Different Variables in Patients with Respect To Hyponatremia (n=179)

Treatment Group	Proportion Healed	P-Value
Lateral sphincterotomy	26 (65.0%)	0.25
glyceryl trinitrate	21 (52.5%)	

DISCUSSION

Anal fissure is a painful condition due to linear mucosal tear, mostly seen in young adults⁽²⁰⁾. Both genders were equally affected across the world. The present study was conducted in order to compare the effectiveness of 0.2% glyceryl trinitrate ointment versus lateral sphincterotomy in management of patients with chronic anal fissure.

In our study we found better healing in 65% of patients of lateral sphincterotomy group while 52.5% in patients of glyceryl trinitrate group. So glyceryl trinitrate ointment is considered as a best alternative of Lateral sphincterotomy⁽²¹⁾. In a study . demonstrated that use of 0.2% cream of glyceryl trinitrate (GTN) had healed the 19 patients and lateral sphincterotomy had healed 26 patients. Surgical sphincterotomy is best option and can heal fast with rapid relief of pain and symptoms but surgery is not a choice of priority for patients. Some surgeons also avoid the surgical procedure and can prefer the cream treatment. Therefore, we suggest that GTN is best alternative of Lateral sphincterotomy. Another study also describe good opinion in favor of surgical treatment that 100% symptomatic in affected individuals after the 6th weeks, fissure healing was seen in 84.85% during the 6th week and 100% healing was seen during the 10th week⁽²²⁾.

In another study it was stated that post treatment of 6th week of GTN cream, 18 patients were healed and after LIS 17 patients were healed⁽²³⁾. This study also supports that GTN is best alternative of surgical procedure. In a study of Leo et al.⁽⁹⁾ it has been stated that complete healing was seen in 53.6% in GTN group and 86.7% complete healing was seen in LIS group with P value 0.004, a significant value. While in our study complete healing was 52.5% and 65.0% in GTN group and Lateral sphincterotomy group respectively with P value was 0.25, a non-significant value. In our study the pain relief was seen in GTN group as compared to Lateral sphincterotomy group. Leo et al.⁽⁹⁾ in his study reported relief of pain in 86.6% of patients and 96.6% of patients respectively. Spasm of the internal anal sphincter has been noted in association with anal fissure. Surgical procedures and pharmacological preparations have generally been aimed at overcoming this spasm. Local application of nitroglycerine is being considered as an alternative to surgery for the treatment of fissure in ano. Anal fissure is a common condition causing severe pain during defecation. Until recently the "gold standard" treatment for chronic anal fissure was a surgical lateral internal sphincterotomy which, although effective at healing the fissure, has a definite risk of permanent faecal incontinence^(6, 24).

Topical application of 0.2% glyceryltrinitrate (GTN) ointment is emerging as first line treatment as it relaxes the sphincter. It is economical and cost-effective, but takes longer time for the healing and causes headache. Despite the high success rate in fissure healing after sphincterotomy, recurrence may occur between 1.6% and 6%⁽²⁵⁾. The most common cause of recurrence is inadequate sphincterotomy. Also, the localization of the fissure affects the recurrence. The recurrence rate is higher in anterior fissures⁽²⁶⁾.

Notaras described subcutaneous lateral internal sphincterotomy in 1971⁽²⁷⁾. The main goal of sphincterotomy is to increase the blood flow of the anoderm by decreasing the maximum anal sphincter pressure by 18–50%. This technique provides an improvement between 82% and 100%⁽²⁷⁾.

CONCLUSION

It is concluded that for the treatment of anal fissure, the lateral sphincterotomy is considered an effective treatment as compared to 0.2% ointment of glyceryl trinitrate. Glyceryl trinitrate ointment is a good alternative, so for those patients who fail to respond to glyceryl trinitrate therapy, lateral sphincterotomy is considered as a best option.

REFERENCES:

- Khan MS, Abar I, Zeb J, Ahmad S, Khan A. Outcome of 0.2% glyceryltrinitrate cream versus 2% diltiazem cream in the treatment of chronic anal fissure. *Journal of Ayub Medical College Abbottabad*. 2017;29(2):280-4.
- Cancer AJCo, Cancer AJCo. Anal Canal: The classification applies to carcinomas only; melanomas, carcinoid tumors, and sarcomas are not included. *AJCC cancer staging manual*. 2002:125-30.
- Jain M, Bajjal R, Srinivas M, Venkataraman J. Fecal evacuation disorders in anal fissure, hemorrhoids, and solitary rectal ulcer syndrome. *Indian Journal of Gastroenterology*. 2019;38(2):173-7.
- Abramowitz L, Bouchard D, Souffran M, Devulder F, Ganansia R, Castinel A, et al. Sphincter-sparing anal-fissure surgery: a 1-year prospective, observational, multicentre study of fissurectomy with anoplasty. *Colorectal Disease*. 2013;15(3):359-67.
- Jonas M, Scholefield JH. Anal fissure. *Gastroenterology Clinics of North America*. 2001;30(1):167-81.
- Bokhari ST, Zubair M, Rasheed S, Shaukat H, Munir MS. Outcome of chemical and surgical lateral internal sphincterotomy for acute anal fissure. *Pak J Med Health Sci*. 2020;14.
- Higuero T. Update on the management of anal fissure. *Journal of visceral surgery*. 2015;152(2):S37-S43.
- Schochet E, Khubchandani I. Pathophysiology of chronic anal fissure: current understanding and clinical applications. *Soc Ital Chir ColoRettale*. 2007;15:130-5.
- Tauro LF, Shindhe VV, Aithala PS, Martis JJ, Shenoy HD. Comparative study of glyceryl trinitrate ointment versus surgical management of chronic anal fissure. *Indian Journal of Surgery*. 2011;73(4):268-77.
- Felt-Bersma RJ, Bartelsman JF. Haemorrhoids, rectal prolapse, anal fissure, peri-anal fistulae and sexually transmitted diseases. *Best practice & Research Clinical Gastroenterology*. 2009;23(4):575-92.
- Scholefield J, Bock J, Marla B, Richter H, Athanasiadis S, Pröls M, et al. A dose finding study with 0.1%, 0.2%, and 0.4% glyceryl trinitrate ointment in patients with chronic anal fissures. *Gut*. 2003;52(2):264-9.
- Brisinda G, Maria G, Bentivoglio AR, Cassetta E, Gui D, Albanese A. A comparison of injections of botulinum toxin and topical nitroglycerin ointment for the treatment of chronic anal fissure. *New England Journal of Medicine*. 1999;341(2):65-9.
- Bansal A, Tripura R, Godara R. Comparative Study of Glyceryl Trinitrate Ointment versus Lateral Internal Sphincterotomy in Management of Chronic Anal Fissure. *Archives of Clinical Gastroenterology*. 2016;2(1):013-6.
- O'Kelly T, Brading A, Mortensen N. Nerve mediated relaxation of the human internal anal sphincter: the role of nitric oxide. *Gut*. 1993;34(5):689-93.
- Lund JN, Scholefield JH. A randomised, prospective, double-blind, placebo-controlled trial of glyceryl trinitrate ointment in treatment of anal fissure. *The Lancet*. 1997;349(9044):11-4.
- Loder P, Kamm M, Nicholls R, Phillips R. 'Reversible chemical sphincterotomy' by local application of glyceryl trinitrate. *British journal of surgery*. 1994;81(9):1386-9.
- Nevins EJ, Kanakala V. Topical diltiazem and glyceryl-trinitrate for chronic anal fissure: A meta-analysis of randomised controlled trials. *Turkish Journal of Surgery*. 2020;36(4):347.
- Jahnyy B, Ashurst JV. Anal fissures. *StatPearls [Internet]: StatPearls Publishing*; 2020.
- Ghaffar N, Ch SM, Ch WM, Ghufuran S, Hussain S, Jamil A. Comparison of efficacy of lateral sphincterotomy versus topical 0.2% Glyceryl Trinitrate Ointment in anal fissure treatment. *Pakistan Journal of Medical & Health Sciences*. 2022;16(02):154-.
- SADIQ I, SHAKIR MJ, KHAN RN, AHMED MA, ASHFAQ SS, IJAZ A. Comparison of Glyceryl Trinitrate Ointment versus Internal Lateral Sphincterotomy for Anal Fissure Pain Relief.
- Evans J, Luck A, Hewett P. Glyceryl trinitrate vs. lateral sphincterotomy for chronic anal fissure. *Diseases of the colon & rectum*. 2001;44(1):93-7.
- Sebastián AA, Vicente FP, Tauler EM, Romero AS, Paz PS, Rico RC. Surgical (close lateral internal sphincterotomy) versus chemical (botulinum toxin) sphincterotomy as treatment of chronic anal fissure. *Medicina clinica*. 2005;124(15):573-5.
- Mishra R, Thomas S, Maan MS, Hadke NS. Topical nitroglycerin versus lateral internal sphincterotomy for chronic anal fissure: prospective, randomized trial. *ANZ journal of surgery*. 2005;75(12):1032-5.
- McCallion K, Gardiner K. Progress in the understanding and treatment of chronic anal fissure. *Postgraduate medical journal*. 2001;77(914):753-8.
- Arroyo A, Pérez F, Serrano P, Candela F, Lacueva J, Calpena R. Surgical versus chemical (botulinum toxin) sphincterotomy for chronic anal fissure: long-term results of a prospective randomized clinical and manometric study. *The American journal of surgery*. 2005;189(4):429-34.
- Emile SH. Indications and technical aspects of internal anal sphincterotomy: highlighting the controversies. *Diseases of the Colon & Rectum*. 2017;60(1):128-32.
- Acar T, Acar N, Güngör F, Kamer E, Güngör H, Candan MS, et al. Treatment of chronic anal fissure: Is open lateral internal sphincterotomy (LIS) a safe and adequate option? *Asian journal of surgery*. 2019;42(5):628-33.