

## Outcome of Chemical and Surgical Lateral Internal Sphincterotomy for Acute Anal Fissure

SABA TAHIR BOKHARI<sup>1</sup>, MUHAMMAD ZUBAIR<sup>2</sup>, SAIMA RASHEED<sup>3</sup>, HASSAN SHAUKAT<sup>4</sup>, MUHAMMAD SAJID MUNIR<sup>5</sup>, ARUJALAM<sup>6</sup>

<sup>1</sup>Registrar General Surgery Fatima Memorial Hospital Shadman Lahore.

<sup>2</sup>Associate Professor Surgery, Niazi Medical and Dental College Sargodha

<sup>3</sup>Dept of Biochemistry Assistant Prof Biochemistry, Niazi Medical And Dental College Sargodha

<sup>4</sup>Senior Registrar Surgery Niazi Medical And Dental College Sargodha

<sup>5</sup>Assistant Professor Ophthalmology, Niazi Medical And Dental College Sargodha.

<sup>6</sup>Associate Professor of Surgery, Continental Medical College, Lahore

Correspondence to Dr. Saba Tahir Bokhari, Email: saba.bokhari@yahoo.com Cell: 03219451120,

### ABSTRACT

Anal fissures are common causes of morbidity in the surgical units. The severe pain during and after defecation greatly impacts on the quality of life of many patients. Acute anal fissures responds poorly to medical treatment and are therefore best managed using surgical methods. Lateral internal sphincterotomy is the gold standard in the treatment of anal fissures.

**Aim:** To compare the efficacy of chemical and surgical lateral internal sphincterotomy in patients of acute anal fissure.

**Methods:** A Randomized controlled trial conducted at Department of Surgery, Unit-II, Fatima Memorial Hospital, Lahore. The duration of the Study was over a period of six months from 10-09-2018 to 09-03-2019. A total of 100 patients (50 in each group) were included in the study. Group-A was treated with chemical sphincterotomy local application of glyceryl trinitrate 0.2 percent ointment and Group-B was treated with surgical lateral internal sphincterotomy.

**Results:** Patients were ranged between 15-60 years of age. Mean age of the patients was 36.64±10.05 and 33.42±11.47 in group-A and B, respectively. In group-A 13 patients (26%) and in group-B 15 patients (30%) were male and 37 patients (74%) in group A and 35 patients (70%) were female. Efficacy was observed in 16 patients (32.0%) of group-A and 50 patients (100%) of group B. There was a statistically significant difference between two groups ( $p < 0.001$ ).

**Conclusion:** In conclusion, surgical sphincterotomy was significantly more effective in providing postoperative pain relief ( $p < 0.001$ ). However, chemical sphincterotomy is a non-invasive, cost-effective, easier to apply, well-tolerated and effective therapy for anal fissure and is a first line treatment especially in patients who are unwilling or unfit for surgery.

**Key words:** Chemical sphincterotomy, lateral internal sphincterotomy, Acute anal fissure

---

### INTRODUCTION

Anal fissure is the condition in which there is a tear in the anal mucosa below the dentate line<sup>1</sup>. The cause of this tear is either mostly due to chronic constipation, trauma due to vaginal delivery or diarrhea. Most fissures are located in posterior midline position, however 15% occur in anterior midline<sup>2</sup>. Multiple anal fissures or lateral anal fissure may be due to underlying Crohn's disease, tuberculosis, malignancy or STDs<sup>3</sup>. Regardless of the cause leading to this pathology the tear in the lower anal mucosa causes spasm of the internal sphincter of anal canal and thereby decreases the blood supply to the mucosa of anal canal<sup>3</sup>. This causes pain which is moderate to severe in intensity. Pain may last for a couple of hours or more. Ischaemia does not allow the tear to heal and the patient develops a vicious circle of spasm, painful defecation and bleeding per rectum. This disease affects both sexes. Females are usually more often affected than men, the ratio being approximately 58% to 40%, respectively. Acute anal fissure

may become chronic if left untreated or poor compliance of the patient with the prescribed therapy. In such cases the fissure has a pale appearance of the ulcer base, edges may be thickened and there is a sentinel skin tag<sup>4</sup>.

Anal fissures are mostly located in posterior midline however 15% occur in anterior midline and fissures in lateral locations constitute 1%<sup>5</sup>.

The treatment goal is to lower the internal anal sphincter tone and enhance vascular supply of the area locally to promote healing of the ulcer. Methods used to achieve this goal are broadly divided into medical therapeutic measures and surgical therapy. Conventionally acute anal fissure is managed by chemical sphincterotomy<sup>6</sup>. 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. However patients have to follow this regime for 4 to 6 weeks. This period is associated with bearing side effects of medications, the availability and cost of medicines prescribed. Return to normal routine activity is delayed. These factors affect

Received on 09-08-2019

Accepted on 19-01-2020

patient compliance leading to failure of medical therapy and relapses<sup>7</sup>.

The other modality of treating anal fissure is surgery under local, regional, spinal or general anaesthesia<sup>8</sup>. This gives prompt relief of symptoms and early return to normal routine activity. In literature the cure rate for acute anal fissure is 70% for chemical and 100% for surgical sphincterotomy<sup>9</sup>. Although this method of treatment is reserved for recurrent acute anal fissure and chronic anal fissure, its value in treating acute anal fissure maintains ground that patients do not have to suffer relapse<sup>10</sup> and progress to chronic anal fissure is avoided. This various surgical techniques include manual dilatation of anal canal<sup>11</sup>, lateral internal anal sphincterotomy (closed/open). Lateral internal anal sphincterotomy is however more controlled method than manual dilatation<sup>12,13</sup>

In addition to increasing dietary fiber, patients should begin fiber supplementation once a day (i.e., 6 g psyllium), and if that is tolerated, their dosage should be increased to twice a day within a week. Stool softeners such as docusate can also be added to the fiber regimen. A sitz bath in warm water once or twice a day for ten minutes may offer some relief<sup>14</sup>. Lidocaine 2% jelly is prescribed to reduce pain as needed before and after bowel movements. Steroid-based creams and hemorrhoidal ointments are usually not effective. Ointments such as nitroglycerin 0.2% to 0.3%, diltiazem 2%, and nifedipine 0.03% can heal symptomatic fissures; their reported success rate is between 30% and 70%<sup>15</sup>.

Most of these medications must be compounded as an ointment preparation by a pharmacy. Gel or liquid preparations are not as effective because of a shorter duration of action. Furthermore, they are cumbersome to use and do not adhere to the anal area as well as ointments do<sup>16</sup>. Nitric oxide is now recognized as the principal inhibitory neurotransmitter in the internal anal sphincter<sup>17</sup>. Hyman N also demonstrated superior reductions in anal pressure and healing in patients treated with GTN compared with patients treated with anaesthetic gel<sup>18</sup>.

Another study they achieved a rate of 83% of patients healed in 2 weeks and 100% healed in one month, with 0.2% GTN in a study<sup>19</sup>.

In 2014, a randomized controlled trial took place in St. Mark's Hospital to determine the long term results of GTN. They concluded that GTN heals anal fissure, higher doses of GTN are not more effective and there is a high recurrence rate<sup>20</sup>. In one of the large reported series to date a healing rate of 69% in acute and 54% in chronic fissures was reported with 0.2% GTN<sup>21</sup>. Until now, very few comparative studies has been done between the role of topical glyceryl trinitrate and lateral internal sphincterotomy. One such randomized, controlled trial comparing GTN versus sphincterotomy was carried out by Oettle et al. on 24 patients. They were followed up for 22 months. All 12 with sphincterotomy showed fissure healing while 2 out of 12 failed on GTN treatment. No recurrence was seen in either group establishing the safety and efficacy of non-surgical GTN therapy<sup>22</sup>.

But the results of very latest comparative studies are not so supportive as for GTN therapy is concerned. A prospective, randomized trial was done in Australia. Sixty

five patients were enrolled in the trial. Five patients were excluded. 20 of 33 (60.6%) glyceryl trinitrate patients had healed fissures in eight weeks compared with 26 of 27(97%) in the sphincterotomy group. 12 patients in GTN group had little improvement in their symptoms and underwent lateral sphincterotomy. Fissure healed significantly faster after sphincterotomy compared with GTN treatment. 9 of 20 patients whose fissures healed with glyceryl trinitrate paste subsequently had a recurrence of their fissure. There were no long term complications from lateral sphincterotomy. This proves lateral sphincterotomy still the best option especially for chronic anal fissures<sup>23</sup>.

The objective of this study was to compare the efficacy of chemical and surgical lateral internal sphincterotomy in patients of acute anal fissure.

## MATERIAL AND METHODS

It was a Randomized controlled trial carried out at Department of Surgery, Unit-II, Fatima Memorial Hospital, Lahore. The duration of this Study was over a period of six months from 10-09-2018 to 09-03-2019. Sample size was estimated as 100 cases (50 each) using 5% level of significance, 90% power of test with an expected percentage of efficacy as 95% in internal sphincterotomy group and 70% in glyceryl trinitrate group. Sampling technique was Non-probability purposive.

**Inclusion Criteria:** All the patients between 15-60 years both male and female diagnosed as having acute anal fissure as per operational definitions.

### Exclusion Criteria

1. Patients with sentinel skin tag on clinical examination.
2. Patients who have medical record of chronic liver disease, diabetes mellitus, collagen disorders (systemic lupus erythematosus).
3. Pregnant women

**Data collection procedure:** After approval from IRB, 100 patients were selected on basis of inclusion and exclusion criteria admitted through OPD and asked to sign informed consent for surgery.

Demographic profile was recorded which included name, age, sex. They were asked detailed history of illness, in terms of types of symptoms, their duration and severity.

Patients were divided in two groups randomly through lottery methods.

**Group-A** chemical sphincterotomy local application of glyceryl trinitrate 0.2 percent ointment three times a day.

**Group-B** surgical lateral internal sphincterotomy. Division of lower one third of fibers of internal anal sphincter below the dentate line by open technique under regional anesthesia.

Isphaghol husk two tablespoon in glass of water, syrup lactulose two tablespoon thrice a day, hot sitz bath and high fibre diet was advised daily to both groups.

**Data analysis procedure:** All the information was entered in a computer programme SPSS version 20.0 and analyzed. The variables to be analyzed were included demographic information (name, age, sex) and efficacy (Yes/No) were recorded. Quantitative data like age was presented as mean and standard deviation. Qualitative data like gender and efficacy presented as frequency distribution table. Comparison was made regarding

outcome (efficacy) by using Chi square test as the variable was qualitative in nature. A P value of  $\leq 0.05$  was considered significant.

**RESULTS**

A total of 100 patients were included in this study during the study period of six months from 10-09-2018 to 09-03-2019. Group-A chemical sphincterotomy local application of glyceryl trinitrate 0.2 percent ointment . Group-B surgical lateral internal sphincterotomy. Patients were ranged between 15-60 years of age. Mean age of the patients was  $36.64 \pm 10.05$  and  $33.42 \pm 11.47$  in group-A and B, respectively (Table 1).

In group-A 13 patients (26%) and in group-B 15 patients (30.0%) were male and 37 patients (74%) in group-A and 35 patients (70%) were female (Table 2).

Efficacy was observed in 16 patients (32%) of group-A and 50 patients (100%) of group-B. There was a statistically significant difference between two groups ( $p < 0.001$ ) (Table 3). Stratification with regard to age and gender presented in Tables 4 & 5.

Table 1: Distribution of cases by age

Age (year)	Group A	Group B
15-45	40(80%)	43(86%)
46-60	10(20%)	7(14%)
Total	50(100%)	50(100%)
Mean±SD	$36.64 \pm 10.05$	$33.42 \pm 11.47$

Tble-2: Distribution of cases by gender

Gender	Group A	Group B
Male	13(26%)	15(30%)
Female	37(74%)	35(70%)
Total	50(100%)	50(100%)

Table 3 : Distribution of cases by efficacy

Efficacy	Group A	Group B
Yes	16(32%)	50(100%)
No	34(68%)	50(100%)
Total	50(100%)	50(100%)

Chi Square = 51.515  
P value =  $p < 0.001$

Table-4: Stratification of age with regard to efficacy

Group	Age 15-45 (Year)		Age 46-60 (Year)	
	Efficacy		Efficacy	
	Yes	No	Yes	No
Group-A Chemical sphincterotomy	14	26	2	8
Group-B Surgical lateral internal sphincterotomy	43	0	7	0
P value	$p < 0.001$		$p < 0.001$	

Table-5: Stratification of gender with regard to efficacy

Group	Male		Female	
	Efficacy		Efficacy	
	Yes	No	Yes	No
Group-A	4	9	12	25
Group-B	15	0	35	0
P value	$p < 0.001$		$p < 0.001$	

Table 6: Comparison to other Studies

Study	n	Efficacy
<b>Chemical sphincterotomy</b>		
Libertiny G	35	56%
Zubaeri BF	21	66.7%
Our study	50	32%
<b>Lateral internal anal sphincterotomy</b>		
Memon et al	272	100%
Our study	52	100%

**DISCUSSION**

Anal fissure is a linear tear in the lining of the anal canal below the dentate line. It is a common proctologic problem affecting all age groups but seen particularly in the young and middle aged people with nearly equal incidence in either gender. The usual complaints are pain during/after defecation with most of the times bright red colored bleeding along the surface of stool. About 90% fissure in ano occur in posterior midline . Usually anal fissures heal spontaneously but some enter into a vicious cycle of anal pain, constipation, faecal trauma and sphincter spasm.

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<sup>13</sup>. Local application of nitroglycerine is being considered as an alternative to surgery for the treatment of fissure in ano<sup>24</sup>. 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<sup>25</sup>. Acute anal fissure has been identified as a distinct entity deserving increased recognition, treatment and research. It is one of the most common condition to be considered in the differential diagnosis of acute anal pain. Although different treatment modalities are available but the choice of modality in management of acute anal fissure is controversial. Chemical sphincterotomy of internal anal sphincters by topical application of 0.2% GTN ointment is a standard 1<sup>st</sup> line medical method in the treatment of acute anal fissure but associated with side effects such as severe headache, tachyphylaxis, dizziness and treatment failure. As the effects of chemical sphincterotomy are reversible, there are increased rates of recurrence of anal fissure<sup>26</sup>.

Surgical sphincterotomy i.e., lateral internal sphincterotomy is a well recognized and standard procedure for treatment of refractory acute and chronic anal fissures. It is associated with rare complications such as flatus incontinence, wound infection and hemorrhage. As it involves division of internal anal sphincters, recurrence rates are low. The main aim of this study is to compare the safety and outcome of the two treatment modalities in the management of acute anal fissure<sup>27</sup>.

Symptoms of acute anal fissure are pain on defecation, post defecation pain (constant) and bleeding per rectum in the form of streak on the side of stool . High anal resting pressure has previously been proposed as a cause of ischemia of the anal lining which contributes to the pain of anal fissures and failure to heal. Surgical

procedures and pharmacological preparation have generally been aimed to overcome anal spasm. In a study by Haq et al<sup>28</sup>, a significant fissure healing rate was observed with GTN. Libertiny in a similar comparative trial showed 98% healing of anal fissure with lateral internal sphincterotomy while GTN relieved 56%, with 10% recurrence<sup>29</sup>. In another study, fissure healing was found in 66.7% with side effect of headache and a recurrence rate of 25% within six months of topical GTN<sup>30</sup>. The present study showed efficacy 32% and 100% in chemical sphincterotomy and surgical lateral internal sphincterotomy, respectively. Our findings are comparable with finding of the study carried out by Memon et al<sup>9</sup>.

Chemical sphincterotomy (topical application of 0.2% glyceryltrinitrate (GTN) ointment) is emerging as first line treatment as it relaxes the sphincter<sup>31</sup>. It is economical and cost-effective, but takes longer time for the healing and causes headache. They demonstrated that relief of pain was found in 100% patients in surgical group, but chemical sphincterotomy cured fissure completely only in 30.04% patients.

## CONCLUSION

In conclusion, surgical sphincterotomy was significantly more effective in providing postoperative pain relief ( $p < 0.001$ ). However, chemical sphincterotomy is a non-invasive, cost-effective, easier to apply, well-tolerated and effective therapy for anal fissure and is a first line treatment especially in patients who are unwilling or unfit for surgery. For recurrent or persistent chronic fissure, the lateral internal sphincterotomy is superior, curative, easy and safe in the hands of an expert and skilled surgeon with less complications and recurrence.

## REFERENCES

- Williams NS. The anus and anal canal. In: Russel RCG, Williams NS, Bulstrode CJK, editors. *Bailey and love's short practice of surgery*. 25<sup>th</sup> ed. London: Chapman and Hall, 2008. P.1251-3.
- Klingensmith ME, Amos KD, Green DW, Halpin VJ, Hunt SR. *The Washington Manual of Surgery*. 5<sup>th</sup> ed. Philadelphia: Lippincott Williams and Wilkins; 2005.
- Cuschieri A, Steele RJC, Moossa AR. *Essential Surgical Practice*. 4<sup>th</sup> ed. New York: Oxford University Press; 2002.
- Murshed KM, Siddique MI, Rahman MA. Effectiveness and complications of 0.2% glyceryl trinitrate in the treatment of chronic anal fissure. *J Bangladesh CollPhysSurg* 2007;25:14-7.
- El TinayOE, GurayaSY. The use of 0.2% glyceryl trinitrate ointment for anal fissures. *Saudi J Gastroenterol* 2005;11:40-4.
- Khan HU, Shukr I, Munir S, Sheikh IA, Akhtar. Effect of topical glyceryl trinitrate on the management of acute anal fissure. *RMJ* 2006;31: 70-72.
- Hashmat A, Ishfaq T. Chemical versus surgical sphincterotomy for chronic fissure in ano. *J Coll Physicians Surg Pak* 2007;17:44-7.
- Rather SA, Dar TI, Malik AA, Rather AA, Khan A, Parray FQ, et al. Subcutaneous internal lateral sphincterotomy (SILS) versus nitroglycerine ointment in anal fissure: a prospective study. *Int J Surg* 2010;8:248-51.
- Manan F, Khan SM, Khattak EG, Jan WA, Naseer A. Chemical and surgical sphincterotomy in acute anal fissure. *J Med Sci (Peshawar, Print)* 2013;21:62-5.
- Novell F, Novell-Costa F, Novell J. Topical glyceryltrinitrate in the treatment of anal fissure. *Rev EspEnter Dig* 2004;96:255-8.
- Lysy J, Israeli E, Levy S, Rozentzweig G, Strauss- Liviatan N, Goldin E. Long-term results of chemical sphincterotomy for chronic anal fissure: a prospective study. *Dis Colon Rectum* 2006;49:858-64.
- Scholefield JH, Bock JU, Marla B, Richter HJ, Athanasiadis S, Prols M, et al. A dose finding study with 0.1%, 0.2%, and 0.4% glyceryltrinitrate ointment in patients with chronic anal fissures. *Gut* 2003;52:264-9.
- Mishra R, Thomas S, Maan MS, Hadke NS. Topical nitroglycerin versus lateral internal sphincterotomy for chronic anal fissure: prospective, randomized trial. *ANZ J Surg* 2005;75:1032-5.
- El-SebaiO, El-Sisy AA, Amar MS. A comparative study between internal sphincterotomy and sentinel pile flap in treatment of chronic anal fissure. *MenoufiaMed J* 2014;27:419-22.
- Brown CJ, Dubreuil D, Santoro I. Lateral internal sphincterotomy is superior to topical nitroglycerin for healing chronic anal fissure and does not compromise long-term fecal continence: six-year follow-up of a multicenter, randomized, controlled trial. *Dis Colon Rectum* 2007;50:442-8.
- Lindsey I, Cunningham C, Jones OM, Francis C, Mortensen NJ. Fissurectomy-botulinum toxin: a novel sphincter-sparing procedure for medically resistant chronic anal fissure. *Dis Colon Rectum* 2004;47:1947-52.
- Bailey HR, Beck DE, Billingham RP. A study to determine the nitroglycerin ointment dose and dosing interval that best promote the healing of chronic anal fissures. *Dis Colon Rectum* 2002;45: 1192-9.
- Hyman N. Incontinence after lateral internal sphincterotomy: a prospective study and quality of life assessment. *Dis Colon Rectum* 2004;47:35-8.
- Kumar D, Anil N, Neeraj K, Avinash P. A prospective, randomized study of comparison of lateral internal sphincterotomy versus Lord's anal dilatation in chronic anal fissure. *IntSurgJ*. 2018;5(3):1026-30.
- VivekG, Gabriel R, Raghunath P, Chandni P. Open versus closed lateral internal anal sphincterotomy in the management of chronic anal fissure: A prospective randomized study. *Asian J Surgery* 2014;37:178-83.
- Abdulwahid M.S. Chronic anal fissure. Open lateral internal sphincterotomy result; a case series study. *Annals Medicine and Surgery*. 2017;15:56-58.
- HerzigDO, Lu KC. Anal fissure. *SurgClin North Am*. 2010;90:33-44
- Evans J, Luck A, Hewett P. Glyceryl trinitrate vs. lateral sphincterotomy for chronic anal fissure: prospective, randomized trial. *Dis Colon Rectum* 2001;44:93-7.
- Dorfman G, Levitt M, Platell C. Treatment of chronic anal fissure with topical glyceryl trinitrate. *Dis Colon Rectum* 1999;42:1007-10.
- McCallionK, GardinerKR. Progress in the understanding and treatment of chronic anal fissure. *Postgrad Med J* 2001;77:753-8.
- Farooq U, Farooq S, Zahir S, Chaudhry AM. Comparison of surgical and chemical sphincterotomy in the management of acute anal fissures. *Pak J Med Health Sci* 2012;6:24-31.
- Ram E, Alper D, Stein GY, Bramnik Z, Dreznik Z. Internal anal sphincter function following lateral internal sphincterotomy for anal fissure- A long-term manometric study. *Ann Surg* 2005;242:208-11.
- Haq Z, Rahman M, Chowdhury RA, Baten MA, Khatun M. Chemical sphincterotomy- first line of treatment for chronic anal fissure. *Mymensingh Med J* 2005;14:88-90.
- Libertiny G, Knight JS, Farou R. Randomized trial of topical 0.2% glyceryltrinitrate and lateral internal sphincterotomy for the treatment of patients with chronic anal fissure: long-term follow-up. *Eur J Surg* 2002;168:418-21.
- Hashmat A, Ishfaq T. Chemical versus surgical sphincterotomy for chronic fissure in ano. *J CollPhysicians Surg Pak* 2007;17:44-7.
- Simpson J, Lund JN, Thompson RJ, Kapila L, Schleflefield JH. The use of GTN in the treatment of chronic anal fissure in children. *Med SciMonit* 2003;9:123-6