

## Comparison of Surgical and Chemical Sphincterotomy in the Management of Acute Anal Fissures

UMER FAROOQ, SUMAIYA FAROOQ, SANA ZAHIR, ABDUL MAJEED CHAUDHRY

Department of Surgery, Sir Ganga Ram Hospital/Fatima Jinnah Medical College, Lahore

Correspondence to Dr. Umer Farooq, Email: roofi\_doc@hotmail.com cell: 0333-4424694

### ABSTRACT

**Objective:** To compare the results and outcome of chemical and surgical sphincterotomy in the management of acute anal fissure.

**Study design:** Quasi experimental study.

**Place and duration:** The study was carried out in the department of surgery, Sir Ganga Ram Hospital, Lahore, from 20-08-2007 to 19-08-2009.

**Sample size:** Total 100 patients of acute anal fissures

**Materials and methods:** Patients who gave informed consent were randomized into two groups. Fifty patients in group A underwent chemical sphincterotomy and 50 patients in group B underwent surgical sphincterotomy. They were followed up for a period of 3 months and results of two treatment modalities were compared.

**Results:** Surgical sphincterotomy showed early symptomatic relief within  $6.08 \pm 2.83$  days as compared to  $9.23 \pm 7.89$  days by chemical sphincterotomy. Hundred percent healing rates were observed with surgical sphincterotomy as compared to 54% with chemical sphincterotomy.

**Conclusion:** Surgical sphincterotomy is better than chemical sphincterotomy in the management of acute anal fissure in terms of early symptomatic relief and high healing rates. However, chemical sphincterotomy heals 54% of patients in out patient setting, associated with less work loss that is no hospital admission is required, so it has a definite role in the management of acute anal fissure.

**Keywords:** Acute anal fissure, chemical sphincterotomy, surgical sphincterotomy.

---

### INTRODUCTION

An anal fissure is one of the most common lesions to be considered in differential diagnosis of anal pain<sup>1</sup>. It is a painful linear tear or split in the long axis of the distal anal canal<sup>2</sup> below the level of the dentate line and extending to the anal verge<sup>3,4</sup>.

This common problem was first described by Reamer in 1824<sup>5</sup>. It is associated with increased tone of internal anal sphincter and poor perfusion of anterior and posterior anoderm. More than 90% of fissures are acute and resolve spontaneously. Acute anal fissures progress to chronic if not treated properly<sup>6</sup>. Atypical ulcer or fissures may be multiple or off the midline, or be large and irregular<sup>7</sup>.

Most anal fissures occur in the posterior midline, with the remainder occurring in the anterior midline (99% of men, 90% of women). Two percent of patients have anterior and posterior fissures. Fissures occurring off the midline should raise the possibility of other etiologies (eg, Crohn disease), an infectious etiology (e.g, sexually transmitted disease, acquired immunodeficiency syndrome [AIDS]<sup>8</sup>, or cancer.

In adults, fissures may be caused by constipation, the passing of large, hard stools, or by prolonged diarrhea as well as anal sex. In older adults, anal fissures may be caused by decreased

blood flow to the area. Anal fissures are also common in women after childbirth and persons with Crohn's disease<sup>9</sup>.

Local ischemia is due to elevated resting anal pressures commonly associated with fissures, acting on an area that has inherently poor vascular supply. Treatment thus aims to lower resting sphincter pressures increasing perfusion and promoting wound healing<sup>10</sup>. An acute anal fissure heals spontaneously or in response to medical treatment, while chronic fissure is a recurrent painful condition that needs a long term treatment<sup>11</sup>. A fissure is acute if it has been present for less than 6 weeks and chronic if present for more than 6 weeks<sup>12</sup>.

Surgery is invasive, expensive and<sup>13,14</sup> associated with postoperative pain but now considered the treatment of choice for anal fissure, as it addresses the pathologically raised pressure within the anal canal.

Acute anal fissure typically causes episodic pain that usually occurs during defecation and for one to two hours afterwards. Symptoms usually consist of painful defecation, post defecation pain and sparse bleeding<sup>15</sup>.

Diagnosis is based on history and clinical examination<sup>16</sup>. The most consistent finding in typical acute anal fissure is spasm of the internal anal

sphincters along with a split in anal mucosa as the buttocks are gently parted<sup>17</sup>. Digital rectal examination can be very painful so should be avoided. There are different modes of treatment of anal fissure e.g., surgical and medical one.

Medical treatment of acute and fissure implies use of stool softeners, high fibre diet<sup>18</sup> and bulk forming agents, warm sitz baths and local analgesics<sup>19</sup>. In the late 1990s newer medications were investigated, in each case a medication that was known to relax muscle spasm. These have included chemical sphincterotomy with 0.2% glyceryl trinitrate (GTN) ointment, Inj. Botulinum toxin and calcium channel blockers either given as tablets or applied locally.

Chemical sphincterotomy by GTN 0.2% ointment<sup>20</sup> applied locally leads to nitrous oxide mediated relaxation of internal anal sphincters and improves healing in 6-8 weeks.<sup>21</sup> Its effect is well recognized but is associated with headaches and recurrence<sup>22</sup>.

Historically, the most common approach for relieving pain associated with the spasm of anal fissure is surgical. Surgical approaches include anal dilatation, described by Recamier in 1838, with modification, fissurectomy<sup>23</sup> and lateral internal sphincterotomy.

Surgical Sphincterotomy is also called lateral internal sphincterotomy. It was described by Eisenhammer in 1951 and 1959. It is more popular in North America<sup>24</sup>. It is an operation in which the internal sphincter is divided away from fissure itself usually either in the right or left lateral position. This decreases the anal pressure and improves the healing of fissure.<sup>25</sup> Procedure can be done as an open or closed method. It can be done under local or general anaesthesia. Morbidity from operative procedure is mainly incontinence to flatus.<sup>26</sup> Although a number of studies have been conducted abroad and locoregionally comparing the efficacy of chemical and surgical sphincterotomy in management of chronic anal fissure but limited studies are there to compare the efficacy of two treatment modalities in the treatment of acute anal fissure. It has been the reason to conduct of two treatment modalities in management of acute anal fissure. So as to know that which modality is more effective and safe in management of acute anal fissure. The aim of this study is to compare the efficacy of Surgical versus chemical sphincterotomy for treatment of chronic anal fissure.

## PATIENTS AND METHODS

This Quasi experimental study was done in the department of surgery (unit-I), Sir Ganga Ram

Hospital, Lahore, from 20-08-2007 to 19-08-2009 on 100 patients with acute anal fissure. Patients who gave informed consent between 20 to 50 years of age were included in this study and having other anal pathology (i.e., inflammatory bowel diseases, hemorrhoids, anal fistula or anal abscess), cardiac patients, pregnant or planning to be pregnant patients were excluded. Full explanation of procedures and patient consent were assured before inclusion in the research. The study protocol was approved by the Sir Ganga Ram Hospital, Lahore.

All patients were subjected to routine investigations like Hb, TLC, DLC, ESR, X-ray, X-ray chest, ECG, etc. to rule out co-morbid conditions associated with acute anal fissure. Patients were randomly divided into two treatment groups A and B. Patients in group A were treated with chemical sphincterotomy on the basis of out door patients department. They were advised to apply 0.2% GTN ointment locally 3 to 4 times daily along with sitz bath and stool softeners for the period of six weeks. Patients were followed up at the end of first week, third week, sixth week, and after 3 months.

The patients who did not responded to chemical sphincterotomy or failed to comply as the disease progressed, were subjected to surgical sphincterotomy, but they were not included in group B. Patients in group B were admitted, fitness for anesthesia taken, anorectal preparation done with two glycerin suppositories at night and made nil per orum after mid night. They were subjected to lateral internal sphincterotomy (surgical sphincterotomy) under spinal or general anesthesia according to patients or anesthetist preference. Three doses of antibiotic [Ceftriaxone (Rocephan) 500mg BD diluted in 5ml of distal water into IV, and Metronidazole (Flagyl Rohne-tounene) 500mg TDS into IV in 100 ml solution form] were given during their hospital stay and 2 doses of injectable analgesia [Inj. Diclofenac sodium (Voren Yungshin) 75mg BD I/M in 3 ml solution] were given. They were advised hot sitz bath along with stool softener [syrup Lactulose (Duphalac Highnoon) 10 gm = 15 ml] twice daily. They were examined on second postoperative day during their hospital stay and followed up at the end of first week, third week, sixth week and after 3 months.

Pain severity, duration of symptomatology and symptoms were noted in both groups. Symptomatic relief, healing rate and complications associated with both treatments modalities were recorded. All the data was entered on a pre-designed proforma.

**Statistical analysis:** The data were evaluated in statistical program SPSS version 16.0. The qualitative data such as gender, constant pain, Pain on defecation, bleeding per rectum, symptomatic relief, healing time, healing rate, surgical and

chemical complications were presented as n(%) and chi-square test was applied to compare the proportion among the both groups A(chemical) and group B (surgical). Numerical parameters like symptomatic relief and healing time were expressed as Mean + Standard Deviation and student *t* test (2 tailed) was applied to compare the means between the groups. All the data were calculated on 95% confidence interval and *p* value  $\leq 0.05$  was considered as statistically significant level.

## RESULTS

All patients were studied in the range of (20-50) years, with mean age of 35.84±8.95years. The mean age in group A was 36.56±8.42 (range 20-50 years) while in Group B it is 35.14±9.48 (20.50 years). There was no difference statistically ( $P>0.05$ ). A total of 39 males and 61 females with acute anal fissure were included in the study. In Group A, 22 patients (44%) were male and 28 patients (56%) were females, while in Group B 17 patients (34%) were males and 33 patients (66%) were females (Table I).

In Group A, mean duration of symptoms of acute anal fissure was 4.60days ±1.46 (2-7 days), while in Group B, the mean duration of symptoms was 4.62±1.43 (2-7)days with *p* value  $> 0.05$  i.e. there was no statistical difference between the two groups. Ninety eight patients (98%) presented with constant pain. Patients (52%) had severe constant pain in 20 patients (40%) had moderate pain and 3 patients (6%) has mild pain and 1 patient (2%) had no constant pain. In Group B 25 patients (50%) experienced severe constant pain, 22 patients (44%) experienced moderately severe constant pain, 2 patients (4%) experienced mild pain and 1 patient (2%) had no constant pain. In all the patient pain was further aggravated on defecation. The *P* value  $> 0.05$ , no difference statistically as calculated by Pearson's method. (Table II)

All the patients presented with pain on defecation. In group A, 22 patients (46%) had severe pain, 19 patients (38%) had moderate while 9 patients (18%) had mild, whereas in group B, 23 patients (46%) had severe pain, 21 patients (42%) had moderate and 6 patients (12%) had mild pain on defecation. *P* value was  $> 0.05$  so difference was statistically insignificant. (Table III)

Eighty-two patients (82%) presented with bleeding per rectum. In Group A 41 patients (82%) had bleeding per-rectum. While 45 patients (90%) had bleeding per rectum in Group B and 5 patients (10%) had no bleeding per rectum. Difference between two groups was not statistically significant as *P* value  $> 0.05$  calculated through fisher's exact test.

Eighty six patients (86%) had fissure at posterior mid line 8 patients (8%) had it in the anterior midline and in 6 patients (6%) fissure were present at both anterior and posterior midline. In Group A, 45 patients (90%) fissures were present in the posterior midline, in 4 patients (8%)were present anteriorly and in 1 patient (2%), it was present at both anterior and posterior midline position. In Group B, 43 patient (86%) had fissures in posterior midline, 4 patients (8%) were present anterior midline and 3patients (6%) had both anterior and posterior fissure. *P* value  $> 0.05$  as calculated, so difference was statistically insignificant.

Mean duration of symptomatic relief was 9.23± 7.89 (7-21) days in Group A, whereas with chemical sphincterotomy (Group B) it was 6.08± 2.83 (2-10) days. Mean duration of symptomatic relief was significantly shorter with surgical sphincterotomy than with chemical sphincterotomy. Results were statistically significant as *P*-value was  $< 0.05$ .

Mean duration of healing in Group A was in the mean duration of 32.25± 10.67(21-42) days while in Group B it was 19.94±.51(10-20) days. *P* value  $< 0.05$  and was statistically significant.

In Group A, all the patients were treated on outdoor basis while in Group B patients were admitted and mean duration of hospital stay was not compared.

In Group A, 27 patients (54%) had healed fissure at the end of 42 days (6 weeks) while in 18 patients (36%) had no healing and they progressed into chronic anal fissure. They were then offered with surgical sphincterotomy but were not included in Group A. in 5 patients (10%) treatment was discontinued due to severe headache refractory to oral analgesics at the end of 28 days (4 weeks) but showed partial healing of fissure with partial symptomatic relief and they did not agree to any other treatment modality suggested to them In Group B, all the patients (100%) had healed fissure at the end of 42 days (6weeks).  $P<0.05$  and was statistically significant.

Patients in Group A, who underwent chemical sphincterotomy, 18 patients (36%) developed headache, it was of severe intensity in 5 patients (10%) sufficient to stop the treatment. Six patients (12%) developed dizziness initially but it improved with the passage of time and they continued with topical use of GTN patients (12%) developed dizziness initially but it improved with the passage of time and they continued topical use of GTN ointment. In Group B, 5 patients (10%) developed mild flatus incontinence with wound infection after surgical sphincterotomy. All of these patients then treated conservatively and became continent during the follow up period. No permanent flatus incontinence

was noted. Seven patients (14%) in Group A had recurrence of acute anal fissure within 3 months duration of the treatment with chemical sphincterotomy while there was no short term recurrence observed in Group B who were who were treated with surgical sphincterotomy.

Table I: Sex distribution of patients with acute anal fissure (n=100)

Gender	Group A (Chemical)	Group B(Surgical)
Male	22(44.0%)	17(34.0%)
Female	28(56.0%)	33(66.0%)

P value > 0.05

Table II: Distribution of patients with constant pain, defecation and bleeding per rectum in acute anal fissure (n=100)

Constant pain	Group A (Chemical)	Group B (Surgical)	P value
Severe constant pain	26(52.0%)	25(50.0%)	>0.05 (NS)*
Moderate	20(40.0%)	22(44.0%)	
Mild	3(6.0%)	2(4.0%)	
Nil	1(2.0%)	1(2.0%)	
Pain of defecation:			>0.05 (NS)*
Severe pain	22(44.0%)	23(46.0%)	
Mild	09(18.0%)	06(12.0%)	
Moderate	19(38.0%)	21(42.0%)	
Bleeding per rectum	41(82.0%)	45(90.0%)	>0.05 (NS)*

\*NS = not significant

Table III: Comparison of mean duration of symptomatic relief and healing time and rate in both groups (n = 100)

Parameters	Group A (Chemical)	Group B (Surgical)	P value
Symptomatic relief	6.08±2.83	9.23±7.89	<0.05*
Healing time	32.25±10.67	19.94±4.51	<0.05*
<b>Healing rate:</b>			<0.05*
Complete healing	27(54.0%)	50(100%)	
**Partial healing	5(10.0%)	0	
No healing	18(39.0%)	0	

\* P value is statistically significant, \*\*Treatment discontinued due to headache but had symptomatic relief and partial healing

Table IV: Complications with chemical and surgical sphincterotomy (n = 100)

Complications:	n=	%age
<b>Chemical (n = 50)</b>		
Headache	18	36.0
Dizziness	06	12.0
<b>Surgical:</b>		
Flatus incontinence with wound infection	05	10.0

## DISCUSSION

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.

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 out come of the two treatment modalities in the management of acute anal fissure.

This study was carried out at surgical unit 1 of Sir Ganga Ram Hospital, Lahore. One hundred patients, who gave informed consent, between 20-50 years of age, suffering from acute anal fissure, reported in the out patient and causality department of Sir Ganga Ram Hospital, Lahore were selected for the study. All the patients were subjected to complete history, clinical examination and randomized into two Groups A and B. Patient in Group A were treated on the basis of out patient department and offered chemical sphincterotomy i.e. topical use of 0.2% GTN ointment 3-4 times daily for a period of 6 weeks. While patient in Group B were admitted and operated on next available list for surgical sphincterotomy. Patients in both the groups were advised to take stool softeners and sitz bath along with their respective treatment. The two treatment modalities were than compared in terms of their symptomatic relief, healing rates and complications. As patients in Group A were treated on out patient basis, so duration of hospital stay was not compared.

Mean age of presentation is variable in different studies conducted internationally and regionally. In the study described by Jonas<sup>27</sup>, mean age of presentation of anal fissure was 42(22-83) years. In another study, conducted by Palazzo<sup>28</sup>, mean age was 44 (17-88). However a study conducted Ammari and Bani-Hani<sup>29</sup>, observed the mean age of

presentation of fissure as 33(16-68) years. Syed<sup>30</sup> described mean age of 39(12-95) in his study. Garcea G<sup>31</sup> mentioned a mean age of 40.3 years in her study. Hananel and Golden<sup>32</sup> described it as 39.9 (13.5-95) in his study. In this study, the mean age was found to be 35.84±8.95 (20-50) years which is comparable to above mentioned studies and to study conducted by Shafiq and Nadeem et al.<sup>33</sup> where mean age was 35 years. The mean age in this study is less as compared to studies conducted by Jonas<sup>27</sup> and Palazzo<sup>28</sup>, reason being the short range of age included in this study i.e. 20-50years.

The incidence of acute anal fissure is roughly equal in both sexes. Sex distribution is quite variable among the patients with acute anal fissures in different studies. Study conducted by Griffin et al<sup>34</sup> showed 29% males and 42 % females. Ammari and Bani-Hani<sup>29</sup>, in their study reported 44.9% males and 56% female with a male to female ratio of 0.8:1. Wiley<sup>35</sup> in his study had 48% of males and 52% females who presented with anal fissure. A study published by Hananel and Gorden<sup>32</sup> revealed 49.9% males and 51.1% females. Syed<sup>30</sup> described sex distribution as 41% males and 59% females but Garcea<sup>31</sup> had male to female ratio of 1:1 in their study. Whereas in study conducted by Shafiq and Nadeem<sup>33</sup>. 84% males and 16% females presented with anal fissure with a male to female ratio of 5:1.

However in this study, 39% males and 61% females presented with acute anal fissure comprising a ratio of (1:1.6). The result matched with the studies done abroad but did not match with the results of Shafiq<sup>33</sup>. The reason for slight female preponderance in this study was that the institution associated with Sir Gang Ram hospital, Lahore is considered to be a female institute so more number of females presented with acute anal fissure.

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. Results of the study conducted by Hananel and Gorden<sup>32</sup> concluded that 90.8% of patients having acute anal fissure presented with pain on defecation and 66% with bleeding per rectum. However, in this study about 98% patients presented with constant pain, 100% patients with pain on defecation and 82% with bleeding per rectum. However, in this study about 98% patients presented with constant pain, 100% patients with pain on defecation and 82% with bleeding per rectum, which are close to the findings in the studies mentioned above.

The exact cause of fissure is not known as described in literature whereas Ammari and Bani-Hani<sup>29</sup>, in their study, concluded constipation as cause of acute anal fissure in 100% of males and

17% of females, trauma due to child birth in 38% of females while a combination of constipation and of trauma of childbirth in 45% females. Whereas, in this study constipation was the cause of fissure in 100% of males and 85% females and childbirth in 15% of females.

The most usual site of anal fissure is posterior mid line like wise results of study conducted by Jonas<sup>27</sup>, showed anal fissure at posterior midline in 88% and on anterior mid line in 12% of cases. Hananel and Gorden<sup>32</sup> described the most common site as posterior mid line with frequency of 73.5%, 61.4% fissure were present anteriorly and in 2.6% cases fissure were present in both anterior and posterior midline. Similarly in this study 86% patients presented with fissure at posterior midline, 8% had it at anterior mid line and 6% had it at both anterior and posterior midlines, so the results matched with results of international studies.

Palazzo<sup>28</sup>, revealed in their study that the symptomatic relief occurred in 51% patient with acute anal fissure in 42 days (6weeks) with chemical sphincterotomy. Singh<sup>36</sup> observed that the mean duration of symptomatic relief was 28 days with acute anal fissure treated with chemical sphincterotomy. Whereas Mishra<sup>37</sup> reported mean duration of symptomatic relief in 14 days (2weeks) only in 40% of patient treated with GTN ointment i.e. chemical sphincterotomy. Whereas in this study the mean duration of symptomatic relief was 9.23±7.89 (7-21) days and it occurred in 64% of patients.

Mishra et al.<sup>37</sup> revealed in his study that pain relief occurred in mean duration of 14 days (2 weeks) in 70% of patients of acute anal fissure with surgical sphincterotomy. While in this study, mean duration of symptomatic relief was 6.08±2.83(2-10) days in almost 100% of cases. This duration was significantly shorter than the chemical sphincterotomy. So the result is comparable to international studies that the symptomatic relief occurs earlier with surgical sphincterotomy than with chemical surgical sphincterotomy.

Singh et al<sup>36</sup>, revealed that 8.75% patients on 0.2% GTN ointment showed healing by 28 days (4 weeks) and 91% patient by 42 days (6 weeks) Evans<sup>38</sup> described that 60% fissure heal by 56 days (8 weeks) when treated with topical 0.2% GTN ointment. Another study conducted by Bacher<sup>39</sup> revealed that 91.6% acute anal fissures healed within 14 days (2 weeks). Mishra<sup>37</sup> reported the healing rate of 55% in 14 days (2 weeks) with GTN. Parellada<sup>40</sup> concluded in the comparative study that 67% of the fissure healed by 35 days (5 weeks) and 89% at 70 days (10 weeks) with GTN ointment and 96% of the Fissure healed at 35 days (5 weeks). Garcea<sup>31</sup> et al described that 97% healing occurred at 42 days (6

weeds) with GTN ointment while Hananel<sup>32</sup> described 60% healing with GTN ointment in 56 days (8 weeks). Whereas in this study, mean duration of healing was  $32.25 \pm 10.67$  (21-40) days with chemical sphincterectomy in 54% of patients which is shorter than described in above mentioned in above mentioned studies. The main reason for this would be the topical GTN ointment applied more frequently i.e., 3-4 times daily in this study as compared to twice daily in above mentioned studies.

Even<sup>38</sup> revealed that 89% of anal fissure healed by 56 days (8 weeks) with surgical sphincterotomy. Parellada<sup>40</sup> concluded that 96% of the fissures healed at 35 days (5 weeks) and 100% at 70 days (10 weeks) with surgical sphincterotomy. Mentioned Massoud BW<sup>41</sup>, mentioned that rate of healing was better in operative group.

In this study mean duration of healing was  $19.94 \pm 4.51$  (10-20) days with surgical sphincterotomy. Although the duration of healing is shorter than observed in international studies, but the results were comparable to international data in the respect that the rate of healing is faster with surgical sphincterotomy than chemical sphincterotomy.

Jonas<sup>27</sup> observed that 0.2, GTN ointment caused healing of 60% of anal fissure in out patient setting. Kocher<sup>42</sup>, stated that chemical sphincterotomy had efficacy of 68% in healing of anal fissure. Zuberi<sup>43</sup> concluded that anal fissure healed completely in 66.7% patients with 0.2% GTN ointment. However in this study healing with 0.2% GTN ointment in patients with acute anal fissure was 54% which is quite comparable with the study conducted by Haq<sup>44</sup> which revealed healing with 0.2% GTN ointment as 56%.

Katsinelos et al<sup>45</sup> revealed that surgical sphincterotomy i.e. lateral internal sphincterotomy caused complete healing of fissure in 100% of cases and mentioned that healing is faster with surgical sphincterotomy.

Rotholtz et al<sup>46</sup>, in their study showed 100%; healing of anal fissure with lateral internal sphincterotomy. Study conducted by Rosa et al<sup>47</sup> and Arroyo-Sebastian et al.<sup>48</sup> showed healing of anal fissure by 97% and 90% respectively with surgical sphincterotomy. While in this study, healing occurred in 100% cases with lateral internal sphincterotomy. The results were quite excellent and were comparable to the above-mentioned studies.

Jonas et al<sup>27</sup> treated patient with anal fissure by chemical sphincterotomy on the basis of outpatient department. Similarly, in this study the patients in Group A, treated with chemical sphincterotomy as outpatient surgery. Wiley et al<sup>30</sup> performed closed and open lateral sphincterotomy as day care surgery in their study. However patients in Group B who

underwent surgical sphincterotomy were admitted and their mean duration of Hospital stay was  $3.46 \pm 0.99$  (2-5) days. The reasons for admission were low literacy rate in our society and non-availability of helpful attendants at home.

Most of the acute anal fissure resolves with the medical treatment i.e. chemical sphincterotomy but a significant percentage progress to chronicity. Cause of failure of treatment was defined as poor tolerance and bad compliance to topical application of 0.2% GTN ointment. Hananel<sup>32</sup> and Jonas<sup>27</sup> reported in their respective studies that 60% of fissure healed by 56 days (8 weeks) whereas 40% progress to chronic anal fissure. In this study, of the patients treated with chemical sphincterotomy, in 54% patients the fissure healed and they progressed to chronic anal fissures. They were then offered surgical sphincterotomy. The 10% patients who discontinued the treatment with 0.2% GTN ointment due to headache showed partial healing and symptomatic relief 28 days (4 weeks), they did not agree to any other treatment modality offered to them. Shafiq and Nadeem<sup>33</sup> concluded 10% treatment failure with lateral internal sphincterotomy in the long term whereas no treatment failure was observed with lateral sphincterotomy, comparable to study by Rotholtz et al<sup>46</sup>.

Treatment with 0.2% GTN ointment has strong association with headache dizziness and orthostatic hypotension. Palazzo<sup>28</sup> revealed that headaches were present in 84% patients who were treated with chemical sphincterotomy and it was severe intensity in 11% of cases, leading cause of discontinuation of therapy. Hayman<sup>49</sup> reported that headaches in 75% of cases treated with 0.2% GTN ointment. However in this study, headache developed in 18% of cases and it was of severe intensity in 10% of cases and was a major cause of discontinuation of treatment. Although headache developed in less number of patients treatment with chemical sphincterotomy in this study yet the percentage of severe headache sufficient for discontinuation of treatment matched strongly to the results of Palazzo<sup>28</sup>.

As with any surgical procedure, certain complications are associated with lateral internal sphincterotomy though rarely. There are no long term complications with surgical sphincterotomy concluded by Evan<sup>38</sup>. Roza et al<sup>47</sup> described that post operative complications in her study as abscess in 1% and pain in 1.5% another study conducted by Shafiq and Nadeem<sup>33</sup> described postoperative complications of close surgical sphincterotomy as pain in 4% of cases and incontinence 32%. In the study conducted by Nyam<sup>50</sup>, 45% patients had minor flatus incontinence. Syed<sup>30</sup> in his study described flatus incontinence 2.6% soiling of clothes in 1.7% of

cases treated with surgical sphincterotomy. While in this study, the temporary flatus incontinence and wound infection after surgical sphincterotomy occurred in 10% of cases, who were then treated with conservatively. As the infection resolved there was improvement in the flatus incontinence and by three months duration there was no incontinence so the results are comparable to the study conducted by Ammari and Bani-Hani<sup>31</sup> which revealed 10% self limiting incontinence.

There was no fecal incontinence observed in this study. Fecal incontinence was believed to occur due to violation of external sphincter fiber as described by Nariani<sup>51</sup>. The rate of incontinence in this study as low with the reason that there is better understanding of the basis of the procedure and meticulous surgical techniques by the senior surgeons.

Evans<sup>38</sup> described recurrence in 45% of cases after chemical sphincterotomy. Jonas<sup>27</sup> and 45% while Hananel<sup>32</sup> had 98.6% recurrence with 0.2 GTN ointment. Lysy<sup>52</sup> had recurrence of 37.4% after topical use of GTN ointment. In this study 14% of the 3 months duration, reason of low recurrence rate may be the shorter follow up time in this study as compared to above mentioned studies.

Recurrence after surgical sphincterotomy is negligible. Shafiq<sup>33</sup> showed 10% recurrence with lateral internal sphincterotomy. Nayam<sup>50</sup> described 8% of recurrence after surgery in the long follow up. Casillas<sup>53</sup> had recurrence is higher after surgical sphincterotomies done under local anesthesia or as office procedure. However no recurrence observed at the time of follow up in this study. The reason would be that all the operations were done under regional (spinal) or general anaesthesia with great care.

## CONCLUSION

Surgical sphincterotomy is better than chemical sphincterotomy in the management of acute anal fissure in terms of early symptomatic relief and high healing rates. However, chemical sphincterotomy heals 54% of patients in out patient setting, associated with less work loss that is no hospital admission is required and is not detrimental to continence so it has a definite role in the management of acute anal fissure.

## REFERENCES

1. Steele RJ Campbell K. Disorders of anal canal. In: cuscheiri A, Moosa AR. Essential practice of Surgery. 7th ed. London: Arnold Publishers 2002:642.
2. William N.S. The anus and anal canal. In: Russel R.C.G, Williams N.S, Bulstrode C.J.K (editors). Bailey and

- love's short practice of surgery. 25 ed. London: Chapman and Hall, 2008; 1251-53.
3. Murshed KM, Siddique M.I, Rahman M.A. Effectiveness and Complications of 0.2% Glyceritrinitrate in the treatment of chronic anal fissure. Journ Bang Coll Phy Surg 2007;25: 14-17.
4. El Tinay OE, Guraya Sy. The use of 0.2% glyceryltrinitrate ointment for anal fissures. Saudi J Gastroenterol 2005;1 1:40-44.
5. Konder IJ, Robert D, Fleshman JW. Rectum and Anus. In: Schwartz SI, Tomshire C. Principles of Surgery 7<sup>th</sup> ed. Newyork: McGraw Hill 1990:1298-9.
6. Khan HU, Shukr I, Munir S, Sheikh IA, Akhtar R. Effect of topical glyceryltrinitrate on the management of acute anal fissure. Rawal Med J 2006;3 1:70-72.
7. Nelson RL. Treatment of anal fissure. BMJ 2003; 327: 354-5.
8. Abramowitz L, Benabderrahmane D, Baron G, et al. Systematic evaluation and description of anal pathology in HIV-infected patients during the HAART era. *Dis Colon Rectum*. Jun 2009;52(6):1130-6.
9. Collins EE, Lund JN. "A Review of Chronic Anal Fissure Management". *Techniques in Coloproctology* 2007;11(3):209-223.
10. Tranqui P, Trottier DC, Charles Victor J, Freeman JB. Nonsurgical treatment of chronic anal fissure: nitroglycerin and dilatation versus nifedipine and botulinum toxin *Can J Surg*. 2006;49:41-5.
11. Russell RCG, Williams NS, Bulstrode CJK. Bailey & Love's Short Practice of Surgery. 24th ed, Arnold Publishers, 2004;1242-4.
12. Lindsay J, Jones OM, Cunningham C, Mortensen NJ. Chronic anal fissure. *Br J Surg* 2004;9:270-9.
13. 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.
14. Christie A, Guest JF. Modelling the economic impact of managing a chronic anal fissure with a proprietary formulation of nitroglycerin (rectogesic) compared to lateral internal sphincterotomy in the United State. *Int J Colorectal Dis* 2002; 17:259-67.
15. Lubowski DZ. Anal fissure. *Aust Fam Phys* 2001;29:839-44.
16. Madoff RD, Fleshman JW. AGA technical review on the diagnosis and care of patients with anal fissure. *Gastroenterology* 2003;124:235-45.
17. Sharp FR. Patient selection and treatment modalities for chronic anal fissure. *Am J Surg* 1996;171:521-5.
18. Jensen SL. Diet and other risk factors for fissure in ano. *Dis Colon Rectum* 1998;31:770-3.
19. Jensen SL. Treatment of first episode of acute anal fissure- a prospective randomized study of lignocain Vs hydrocortisone ointment Vs warm sitz bath plus bran. *Br Med J* 1986;292:1167.
20. Loder DB, Kamm MA, Nicholas RJ, Phillips RKS. Reversible chemical sphincterotomy by local application of glycerol trinitrat. *Br J Surg* 1994;81:1386-9.
21. Zuberi BF, Bloch Q, Abro H. Glycerol trinitrate ointment in treatment of anal fissure. *J Coll Physician Surg Pak* 1999;9:410-2.

22. Hesegana H, Radley DG, Dorricot NJ, Campbell DJ. Audit of topical glycerol trinitrate for treatment of fissure in ano. *Ann R Coll surg Engl* 2001;83:220-21.
23. Hambe GF, Driner CP, Morton S, Turnock RR. Fissurectomy as a treatment of anal fissure in children. *Ann R Coll surg Engl* 2000; 82:254-7.
24. Samaul S. Anal fissure. In: Mazier WB, Loren DH, Luchfeld M, Senagore AS. *Surgery of colon, rectum and Anus*. 5<sup>th</sup> ed. Philadelphia: WB Saunders 1995:225-68.
25. Siddique MT, Khan SA, Rehman M, Islam R, Ahmad W. Lateral internal sphincterotomy for chronic anal fissure under local anaesthesia as day case surgery. *Ann KEMC* 2003;9:52-3.
26. Nyam DC, Pemberton JH. Long term results of lateral internal sphincterotomy for chronic anal fissure with particular reference to incidence of fecal incontinence. *Dis colon rectum* 1999;42:1306-10.
27. Jonas M, Lund JN, sholefield JH. Topical 0.2% glycerol trinitrate ointment for anal fissures: long term efficacy in routine clinical practice. *Colorectal Dis* 2002;4:317-20.
28. Palazzo FF, Kapur s, Steward M, Cullen PT. Glycerol trinitrate treatment of chronic fissure in ano: one year's experience with 0.5% GTN paste. *J R coll surg Edin* 2000;45:168-70.
29. Ammari FT, Bani-Hani KE, Faecal incontinence in patients with anal fissure: A consequence of internal sphincterotomy or a fearute of the condition. *J R Coll Surg Edin Irel* 2004;3:225-9.
30. Sayed SA, Waris S, Ahmed E. Lateral internal anal sphincterotomy for anal fissure: with or without associated anorectal procedures. *J Coll Phy Sur Pak* 2003;13:436-9.
31. Garcea G, Sutton C, Mansoori s. Lateral sphincterotomy for the treatment of chronic anal fissure. *Colorectal Dis* 2003;5:311-4.
32. Hananel N, Gordon PH. Re-examination of clinical manifestations and response to therapy of fissure in ano. *Dis Colon Rectum*. 1997;40:229-33.
33. Shafiq-ullah A, Nadeem M. closed versus open lateral internal sphincterotomy in chronic anal fissure: a comparative study of post operative complications and rates. *Pak J Med Res* 2004;43:24-9.
34. Griffin N, Acheson AG, Tung P, Sheard C, Glazebrook c, Sholefield JH et al. Quality of life in patients with chronic anal fissure. *Colorectal Dis* 2004; 6:39-44.
35. Wiley M, Day P, Rieger N, stephens J, Moore J. Open Vs closed lateral internal sphincterotomy for idiopathic fissure in ano: a prospective randomized controlled trail. *Dis colon Rectum* 2004; 47:847-52.
36. Sing MM, Rajnesh M, Shaji T. Randomized, double blind trial comparing topical nitroglycerine with xylocain and proctosedyl in idiopathic chronic anal fissure. *Ind J Gastroenterol* 2004;23:91-3.
37. Mishra R, Thomas S, Maan MS, Haadke NS. Topical nitroglycerine versus lateral sphincterotomy for chronic anal fissure: prospective randomized trial. *ANZ J Surg* 2005;75:1032-5.
38. Evans J, Luck A, Hewett P. Glycerol trinitrate versus lateral sphincterotomy for chronic anal fissure: prospective randomized trail. *Dis Colon Rectum* 2001;44:93-7.
39. Bacher H, Mischinger HJ, wekgartner G, Gerwenka H, El-shabrawi. Local nitroglycerine for treatment of anal fissures an alternative to lateral sphincterotomy? *Dis Colon Rectum* 1997;40:840-5.
40. Parellada C. Randomized, prospective trial comparing 0/2 percent isosorbide dinitrate ointment with sphincterotomy in the treatment of chronic anal fissure: or two year follow up. *Dis Colon Rectum* 2004;47:437.
41. Massoud BW, Mehrdad V, Baharak T, Aliraza Z. Botulinium toxin injection versus internal anal sphincterotomy for treatment of chronic anal fissure. *Ann Saudi Med* 2005;25:140-2.
42. Kocher HM, Steward M, Leather AJ, colleen PJ. Randomized clinical trial assessing the side effects of GTN and diltiazem hydrochloride in treatment of chronic anal fissure. *Br J Surg* 2003; 89:413-7.
43. Zuberi BF, Rajput MR, Abro H, Shaikh LSA. A randomized trial of glycerol trinitrate ointment and nitroglycerine patch in healing of anal fissure. *Int J Colorectal Dis* 2000;15:246-7.
44. Haq Z, Rahman M, choudhry RA, Baten MA, Khatun M. Chemical sphincterotomy – first line treatment for chronic anal fissure. *Mymensingh Med j* 2005;14:88.
45. Katsinelos P, Papziogas, Koutlidakis, Parastoglou G, Dimirooulos S, souparis A et al. Topical 0.5% Nifedipine versus lateral internal sphincterotomy for the treatment of chronic anal fissure: long term follow-up. *Int J Colorectal Dis* 2006;21:179-83.
46. Rotholtz MA, Bun M, Mauri MV, Bosio R, Peczan CE, Mezzadi NA. Longterm assessment of fecal incontinence after lateral internal sphincterotomy. *Tech Coloproctol* 2005;9:115-8.
47. Rosa G, Lolli P, Piceinelli D, Mazzola F et al. Calibrated lateral internal sphincterotomy for chronic anal fissure. *Tech Coloproctol* 2005;9:127-3.
48. Arroyo-Sebastian A, Perez-Vicente F, Miranda-Tauler E, Sanchez-Romero A, Serranopaz P. surgical 9close lateral internal sphincterotomy versus chemical (botulinum toxin) sphincterotomy as treatment of chronic anal fissure. *Med Clin (Barc)* 2005;124:573-5.
49. Hayman NH, Cataldo PA. Nitroglycerine ointment for anal fissures: effective treatment or just a eadache? *Dis Colon Rectum* 199;42:83-5.
50. Nyam DC, Pemberton JH. Long term result of lateral internal sphincterotomy for chronic anal fissure with particular reference to incidence of fecal incontinence. *Dis Colon Rectum* 1999;42:1306-10.
51. Nariani MG, chaturvedi R, Jatania J. Anal fissure: a comparison of conservative treatment versus surgical methods. *Bomb Hosp J* 2002;4:25-8.
52. Lys J, Isralli E, Levy S, Rzentzmeig G, Struss-liviatan N. Long-term results of chemical sphincterotomy for chronic anal fissure: a prospective study. *Dis Colon Rectum* 2006;49:858-64.
53. Casillas S, Hull TL, zutshi M, Trzcinski R, Bast JF, Xu M. Incontinence after a lateral internal sphincterotomy: are we underestimating it. *Dis Colon Rectum* 2005;48:1193-9.

