INTRODUCTION
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. 1 Normally anal fissures heal spontaneously but some enter into a vicious cycle of anal pain, constipation, faecal trauma and sphincter spasm.

The pathogenesis of fissure in ano is not yet fully explained, however, increased tone of internal anal sphincter and poor perfusion of anterior and posterior ano-derm have been implicated. Among conservative modalities, glyceryl trinitrate (GTN) ointment is emerging as first line of treatment as it breaks the vicious cycle and relaxes the sphincter. 2–6 Moreover, it is considered economical in the era of minimal invasive and cost-effective approach in modern surgery. 7,8 Surgery was considered as first line of treatment if conservative measures such as bulk laxative, stool softeners and local anesthetics fail. 1,9,10 But this modality is invasive, expensive and the patients have pain in the postoperative period. 3,7,11 On the other hand, topical modality takes longer duration for the healing of fissure and causes headache. 5,12

Due to our social traditions and taboos, patients especially ladies do not readily accept the surgical treatment and ultimately suffer for a long time. The aim of this study was to compare the effectiveness and cost of treatments of chemical sphincterotomy versus surgical sphincterotomy for chronic anal fissure.

PATIENTS AND METHODS
Fifty-six patients were included in a trial of chemical vs. surgical sphincterotomy of the anus, after taking written informed consent from each patient for the study, which was conducted at DHQ/Allied Hospital, Faisalabad from November 2001 to October 2003. For each patient, a detailed history was taken and thorough physical examination was performed. The diagnosis of chronic fissure in ano was made on the basis of fore mentioned typical complaints for two months, the presence of an elongated ulcer/crack in the long axis, a sentinel pile, indurations at the edges of the fissure and exposure of horizontal fibers of internal anal sphincter by making the buttocks apart gently in the knee elbow position. Further evaluation/investigations were carried out in case of suspicion of secondary fissure. As per recommendations, equal numbers (28) chemical and lateral internal sphincterotomies of ano were performed. Chemical sphincterotomy was offered as first line of treatment. Follow-up was done at 1st, 2nd, 4th, 6th, 8th and 12th weeks. Surgical sphincterotomy was offered as first line of treatment.

Follow-up was done at 1st, 2nd, 4th, 6th, 8th and 12th weeks. Chemical sphincterotomy was done with the help of 0.2%
Sphincterotomy for chronic anal fissure


** p <0.077 {Insignificant pain relief with topical modality}
* p<0.000 {Highly significant pain relief with surgical modality}

Week 64.3% 35.7%
9

...completed glyceryl trinitrate ointment treatment, whereas
...therapy. After 6 (33.3%) patients (p<0.000) had recurrence of fissure after
...group but chemical sphincterotomy relieved
...completely only in 18 (64.3%) patient (p<0.077 Table I).

Highly significant (p<0.000) relief of pain and healing of fissures was achieved in 28 (100%) patients in lateral internal sphincterotomy group but chemical sphincterotomy relieved completely only in 18 (64.3%) patient (p<0.077 Table I).

Among 28 patients treated by chemical sphincterotomy, 6 (33.3%) patients (p<0.000) had recurrence of fissure after completion of glyceryl trinitrate ointment treatment, whereas none of the patients treated by lateral internal sphincterotomy suffered from persistence/ recurrence of anal fissure.

Table I: Pain associated with defecation follow-up.

<table>
<thead>
<tr>
<th>Duration</th>
<th>Modality</th>
<th>Absent</th>
<th>Present</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Week</td>
<td>Topical</td>
<td>0%</td>
<td>28</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>Surgical</td>
<td>28%</td>
<td>0%</td>
<td>28</td>
</tr>
<tr>
<td>2nd - 4th Weeks</td>
<td>Topical</td>
<td>8%</td>
<td>20</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>Surgical</td>
<td>28%</td>
<td>0%</td>
<td>28</td>
</tr>
<tr>
<td>6th - 8th Weeks</td>
<td>Topical</td>
<td>16%</td>
<td>57.1%</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>Surgical</td>
<td>28%</td>
<td>0%</td>
<td>28</td>
</tr>
<tr>
<td>9th - 12th Weeks</td>
<td>Topical</td>
<td>18%</td>
<td>64.3%</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>Surgical</td>
<td>28%</td>
<td>0%</td>
<td>28</td>
</tr>
</tbody>
</table>

Table II: Incontinence of flatus/ faeces.

Week 1: 100% 0% 0%
2: 100% 0% 0%
3: 92% 0% 7.1%

Duration: 1st 2nd 3rd 4th
Table: 28 28 28 28
Modality: Topical Surgical Topical Surgical
Absent: 28 0 28 0
Flatus: 0 0 0 0
Faeces: 0 2 0 2
Total: 28 28 28 28

*S p<0.00 (Highly significant transient incontinence with surgical modality)

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.1,2,4,6,10,11,13 Local application of nitroglycerine is being considered as an alternative to surgery for the treatment of fissure in ano.3,5,12,14-16 Eighty-three percent of anal fissure healed after two weeks of treatment with nitroglycerin ointment in a small pilot study. In another study, topical glyceryl trinitrate ointment applied twice-a-day cured 18 of 21 patients.18 Local application of GTN reduces anal pressure and improves anodermal blood flow. This dual effect resulted in a high healing rates.4,5,14 Zubairi showed fissure healing in 66.7% in about 8 weeks with 72.2% experiencing headache, flatus incontinence in 5.6% and a recurrence rate of 25% within six months of topical treatment. Haq in a regional study showed a significant fissure healing rate and regarded GTN as first line of treatment. Libeert in a similar comparative trial showed 98% healing of anal fissure with lateral internal sphincterotomy while GTN relieved 56% with 10% recurrence in the later group. Some other studies...
have shown healing rate upto 70% by GTN ointment.\textsuperscript{2-4,15} This study confirms the results of other similar studies. A healing rate of 64.3%, recurrence rate of 35.7% and persistence of fissure in 33.3% was noted with topical treatment while lateral internal sphincterotomy relieved 100% of cases. Surgery for anal fissure is associated with several complications, most of which can be prevented by the use of judicious surgical techniques and, of course, by familiarity with anorectal anatomy. In this study, permanent incontinence of faeces in 7.1% (p<0.045) and transient incontinence of flatus in 64.3% (p<0.000), which resolved by the end of two months was observed. However, the incidence of complications was relatively higher in other studies. Flatus control problems occurred in 35% and soiling in 22%. Abcarian\textsuperscript{11} found a flatus incontinence rate in 30% of patients after lateral sphincterotomy and in 40% of patients after the posterior procedure. In a retrospective study of 1313 patients, who underwent closed or open lateral sphincterotomy, Oh\textsuperscript{10}, observed 21 cases of flatus or liquid incontinence and 18 cases of recurrence of anal fissure as a late complication. Pernikoff\textsuperscript{19} reported 2% incidence of major complications and an 8% incidence of incontinence. However, Sultan\textsuperscript{20} in a prospective study of extent of internal anal sphincterotomy division, using anal endosonography suggested that more of the internal anal sphincter, than intended was divided. This is a major risk especially in multiparous women, who may already have an unrecognized obstetric related sphincter injury.\textsuperscript{20,21} So an anal canal ultrasound study is mandatory in multi-parous women without continence problems, in whom, internal sphincterotomy is planned because, in the presence of an already existing sphincter defect, this procedure may result in severe fecal incontinence.\textsuperscript{20-22} Corby showed that postpartum anal fissure is associated with reduced anal canal pressures.\textsuperscript{23} The extent of lateral internal sphincterotomy is still debatable.\textsuperscript{9}

Patients experienced transient headache while using topical nitrates preparations.\textsuperscript{2-4,6,12} In this study, all (p<0.000) patients experienced headache and 50% of them used analgesics for symptomatic relief. Headache was also reported as a complication of spinal anesthesia in surgical treatment. However, there has been no report of incontinence of faeces during topical treatment.\textsuperscript{2-4,12} Watson\textsuperscript{24} reported a fissure-healing rate of 33% with persistent or recurrent fissure in 44% of patients and failure to complete treatment in 23% at 6 weeks. In this study, out of 46 patients, whom topical modality was offered, 18 never reported for follow-up and 12 patients demanded surgery after 12 weeks of topical treatment. Khalid\textsuperscript{25} had excellent results as 100% healing and 0% recurrence with lateral internal sphincterotomy. In this study, comparable results in the local setup were achieved and a low incidence of side effects and lack of complications were observed. Topical modality has a higher recurrence/ persistent rate as compared to surgical modality. Still the use of GTN appears to be a promising approach for the treatment of anal fissure, particularly in patients at high risk of incontinence. It is highly significantly cost-effective (p<0.000) and easier to perform than surgical treatment and does not require anesthesia.\textsuperscript{7,8} Moreover, patient can continue their job without any hospital stay. No severe adverse effect or permanent sphincter damage results from GTN application. Patients who tend to avoid or are unfit for surgery, the topical modality is the treatment of choice but lateral internal sphincterotomy remains the "gold standard" treatment for fissure in ano.

**CONCLUSION**

In patients with chronic fissure in ano, chemical sphincterotomy is a non-invasive and effective modality that can be considered as first line of treatment, especially in patients who tend to avoid or are unfit for surgery, as it has no permanent side effects and is well tolerated, but in fissure, resistant to conservative measures, lateral internal sphincterotomy is the superior modality with least complications and recurrence rates in an expert surgeon’s hand. Moreover, topical treatment proved to be significantly cost-effective.

**REFERENCES**

16. Dorfman G, Levitt M, Platell C. Treatment of chronic anal fissure with...
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