ORIGINAL ARTICLE

CHEMICAL VERSUS SURGICAL SPHINCTEROTOMY FOR CHRONIC FISSURE IN ANO

Azeem Hashmat and Tahira Ishfaq

ABSTRACT

Objective: To evaluate the efficacy and costs of chemical (topical glyceryl trinitrate ointment) versus lateral internal sphincterotomy for the treatment of chronic anal fissure.

Design: A quasi-experimental study.

Place and Duration of Study: This study was conducted at D.H.Q. /Allied Hospital, Faisalabad from November 2001 to October 2003.

Patients and Methods: Out of 74 patients, topical treatment was applied to 46. Eighteen patients never followed this modality of treatment so were excluded from the study. The remaining 28 patients applied 0.2% glyceryl trinitrate ointment on their anal verge thrice-a-day for two months. The patients in urgency due to pain or refused topical modality were treated by surgical sphincterotomy. Twenty-eight patients were allocated to undergo surgical sphincterotomy. The patients were followed-up and the extent of improvement in presenting symptoms, side effects, complications and costs of these modalities were noted on the questionnaires.

Results: Chemical sphincterotomy relieved symptoms only in 18 (64.3%) patients while surgical sphincterotomy relieved 28 (100%) patients. In the former, recurrence occurred in 6 (33.3%) patients, but in the later group incontinence of flatus/ faeces was present in 18 (64.3%) at first week which resolved by eighth weeks. Wound related complications in 4 (14.2%) cases were noted. Average costs of treatments excluding hospital expenditures were Rs. 164 and Rs. 1244 respectively.

Conclusion: Topical modality proved to be cost-effective and non-invasive than the surgical modality, but later was superior regarding healing of anal fissures.

KEY WORDS: *Fissure in ano. Surgical sphincterotomy. Recurrence. Chemical sphincterotomy.*

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] Usually 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 2001 to 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 anus were performed. Chemical 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%

Department of Surgery, DHQ /Allied Hospital (PMC), Faisalabad.

Correspondence: Dr. Azeem Hashmat, 71-Yasrib Colony, Faisalabad. E-mail: azeem_surgeon@hotmail.com

Received May 15 2006; accepted November 24, 2006.

glyceryl trinitrate ointment prepared in soft liquid paraffin. A pea sized amount (0.5ml) was applied at the anal verge thrice a day for two months. Method of application was demonstrated to the patients on their first visit. Tablet Paracetamol for symptomatic relief of headache was advised.

Patients for surgical sphincterotomy were admitted in the ward. Under anesthesia, a small incision was made lateral to the lower edge of internal anal sphincter, which was located by the finger. Sharp-Mayo's scissor was introduced and passed up between the internal sphincter and the mucous membrane with the left index finger inserted into the anus, and the inter-sphincter groove was identified and inter-sphincter plane separated, with the help of scissor. The internal anal sphincter upto the level of dentate line was cut with the help of scissor. The skin incision was closed with a single chromic catgut 2/0 suture. Postoperative care/ analgesia was advised. The average stay of patients in the ward was 3 $\pm$ 1 days.

At follow-up, symptoms were assessed on a prescribed questionnaire and anus was examined for healing/ recurrence of fissures. Statistical evaluation was done by chi-square and t-tests and $p < 0.05$ was considerer as significant.

Result

In this study, mean age of patients was 30 years (range 16 to 58 years). Majority (20) of patients were falling in age group of 31-35 years. Male to female ratio in this study was 3:1. Fissure in ano was present at posterior midline in 50 (89.3%) and anterior midline in 6 (10.7%) of patients. Pain on defecation was present in 56 (100%), constipation in 54 (96.4%), bleeding per rectum in 44 (88.6%), discharge per rectum in 12 (21.4%), pruritus ani in 12 (21.4%) and the sentinel pile was present in 48 (85.7%) of the patients.

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.

Transient incontinence (p<0.000) of faeces and flatus was reported in 2 (7.1%) and 18(64.3%) patients respectively, which resolved by the end of two months, while permanent incontinence (p<0.245) of faeces was present in 2(7.1%) patients treated by surgical as compared to none of the patients in topical group (table II).

Four (14.2%) patients treated by lateral internal sphincterotomy developed wound related complications during 1st week of operation. Symptomatic treatment was done and the wounds healed satisfactorily. All patients (p<0.000) treated by chemical sphincterotomy experienced headache and 14 (50%) patients used tablet paracetamol for symptomatic relief.

Topical modality proved to be highly significantly (p<0.000) cost-effective as compared to the surgical modality. Average costs of treatments were Rs.164 (ranging from 100-355) and Rs.1244 (ranging from 900-1500) respectively. This describes only the costs of medicines. Surgical treatment also includes patient's expenditures on stay and burden on the public hospital.

Table I: Pain associated with defecation follow-up.

Duration	Modality	Absent	Present	Total
1st Week	Topical	0 0%	28 100%	28
	Surgical	28* 100%	0 0%	28
2nd - 4th Weeks	Topical	8 28.6%	20 71.4%	28
	Surgical	28 100%	0 0%	28
6th -8th Weeks	Topical	16 57.1%	12 42.9%	28
	Surgical	28 100%	0 0%	28
9th -12th Weeks	Topical	18** 64.3%	10 35.7%	28
	Surgical	28 100%	0 0%	28

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

Discussion

Table II: Incontinence of flatus/ faeces.

Duration	Modality	Absent	Flatus	Faeces	Total
1st Week	Topical	28 100%	0 0%	0 0%	28
	Surgical	8 28.6%	18* 64.3%	2* 7.1%	28
2nd Weeks	Topical	28 100%	0 0%	0 0%	28
	Surgical	18 64.3%	8* 28.6%	2* 7.1%	28
8th- 12th weeks	Topical	28 100%	0 0%	0 0%	28
	Surgical	26 92%	0 0%	2 7.1%	28

* 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.[17] 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[6] 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[3] in a regional study showed a significant fissure healing rate and regarded GTN as first line of treatment. Liberting[14] 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.[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[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[10], observed 21 cases of flatus or liquid incontinence and 18 cases of recurrence of anal fissure as a late complication. Pernikoff [19] reported 2% incidence of major complications and an 8% incidence of incontinence. However, Sultan [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.[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.[20-22] Corby showed that postpartum anal fissure is associated with reduced anal canal pressures.[23] The extent of lateral internal sphincterotomy is still debatable.[9]

Patients experienced transient headache while using topical nitrates preparations.[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.[2,4,12] Watson[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[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.[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

1. Lindsey I, Jones OM, Hellmich G, Petersen S. Chronic anal fissure. Br J Surg 2004; **91**: 270-9.
2. Simpson J, Lund JN, Thompson RJ, Kapila L, Schlefield JH. The use of GTN in the treatment of chronic anal fissure in children. Med Sci Monit 2003; **9** (Pt 1):123-6.
3. Haq Z, Rahman M, Chowdhury RA, Baten MA, Khatun M. Chemical sphincterotomy- first line of treatment for chronic anal fissure. Mymesingh Med J 2005; **14**: 88-90.
4. 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.
5. Scholefied 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.
6. Zubaeri BF, Baloch Q, Abro H. Glyceryl trinitrate ointment in the treatment of anal fissures. J Coll Physicians Surg Pak 1999; **9**: 410-12.
7. 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.
8. Essani R, Sarkisyan G, Beart RW, Ault G, Vukasin P, Kaiser AM. Cost saving effect of treatment algorithm for chronic anal fissure: a prospective analysis. J Gastrointest Surg 2005; **9**: 1237-43.
9. Mentes BB, Ege B, Leventoglu S, Oguz M, Karadag A. Extent of lateral internal sphincterotomy: upto the dentate line or upto the fissure apex. Dis Colon Rectum 2005; **48**: 365-70.
10. Oh C, Divino CM, Steinhagen RM. Anal fissure 20 years experience. Dis Colon Rectum 1995; **38**: 378-82.
11. Abcarian H, Lakshmanan S, Read DR, Roccaforte P. The role of internal sphincter in chronic anal fissures. Dis Colon Rectum 1982; **25**: 525-8.
12. Kocher HM, Steward M, Leather AJ, Cullen PT. Randomized clinical trial assessing the side effects of glyceryl trinitrate and diltiazem hydrochlnide in the treatment of chronic anal fissure. Br J Surg 2002; **89**: 413-7.
13. Mishra R, Thomas S, Maan MS, Hadke NS. Topical nitroglycerin versus lateral internal sphincterotomy for chronic anal fissure: prospective, randomized trail. ANZ J Surg 2005; **75**: 1032-5.
14. Libertiny G, Knight JS, Farour R. Randomised trial of tropical 0.2% glyceryltrinitrate and lateral internal sphincterotomy for the treatment of patients with chronic and fissure: long-term follow-up Eur J Surg 2002; **168**: 418-21.
15. Novell F, Novell-Costa F, Novell J. Topical glyceryl trinitrate in the treatment of anal fissure. Rev Esp Enterm Dig 2004; **96**: 255-8.
16. Dorfman G, Levitt M, Platell C. Treatment of chronic anal fissure with

topical glyceryl trinitrate Dis Colon Rectum 1999; **42**:1007-10.

17. Gorfine SR. Topical nitroglycerin therapy for anal fissures and ulcers. N Engl J Med 1995; **333**:1156-7.
18. Lund JN, Armitage NC, Scholefield JH. Use of glycerl trinitrate ointment in the treatment of anal fissure. Br J Surg 1996; **83**: 776-7.
19. Pernikoff BJ, Eisenstat TE, Rubin RJ, Oliver GC, Salvati EP. Reappraisal of partial lateral internal sphincterotomy. Dis Colon Rectum 1994; **37**:1291-5.
20. Sultan AH, Kamm MA, Nicholls RJ, Bartram CI. Prospective study of the extent of internal anal sphincter division during lateral sphincterotomy. Dis Colon Rectum 1994; **37**:1031-3.
21. Speakman CT, Burnet SJ, Kamm MA, Bartram CI. Sphincter injury and anal dilatation demonstrated by anal endosonography. Br J Surg 1991; **78** : 1429-30.
22. Martin JD. Postpartum anal fissure. Lancet 1953; **1**: 271-3.
23. Corby H, Donnelly VS, O`Herlihy C, O`Connell PR. Anal canal pressures are low in woman with postpartum anal fissure. Br J Surg 1997; **84**: 86-8.
24. Watson SJ, Kamm MA, Nicholls RJ, Phillips RK. Topical glyceryl trinitrate in the treatment of chronic anal fissure. Br J Surg 1996; **83**: 771-5.
25. Khalid M. Comparative study of manual dilation of anal versus lateral sphincterotomy as a procedure of choice in the treatment of chronic fissure in ano (Dissertation General Surgery). Karachi: College of Physicians and Surgeons Pakistan 2001.