Basrah Journal of Surgery

Bas J Surg, March, 9, 2003

CHEMICAL SPHINCTEROTOMY FOR ANAL FISSURE

Nezar A. Al-Mahfooz[*], Nabeel A. J. Ali[@] & Kadhim H. Al-Temimy[#]

[*]Arab Board Certified Surgeon, Department of Surgery, Saddam Teaching Hospital, [@]Ph.D. Assistant Professor, Department of Pharmacology, University of Basrah College of Medicine, [#]M.B.Ch.B Registrar, Department of Surgery, Saddam Teaching Hospital, Basrah; IRAQ.

Summary

Six hundred and forty patients (65 of them were children) with acute and chronic anal fissure were randomized to receive topical 0.2%-0.8% Glyceryl trinitrate (G.T.N.) or Isosorbide dinitrate (ISDN) 1%-3% three times daily digitally applied ointment. Patients were followed for 6-26 months. A course of 2-6 weeks treatment was needed. Resting and maximum anal sphincter pressure (MARP) were measured by manometry for 40 patients and showed a very significant decrease in maximum anal sphincter pressure after application of ointment with progress of days of treatment ($p = 0.02$). After 1-2 weeks of treatment 90.4% of acute fissure patients were free of symptoms and 83.73% of them were later cured. Four to eight weeks of treatment were needed to abolish pain in 85.5% chronic fissure patients, and cure was clear in 80% of them ($p = 0.008$). Side effects of treatment were negligible. Recurrence rate was 4%, while 24 patients (3.8%) were sent for internal sphincterotomy and 81 patients (12.6%) requested revision of medical treatment. In this study we concluded that surgery can be avoided in most cases of anal fissure, and it kept for recurrent cases. Recurrent cases after surgery can also be treated medically.

Introduction

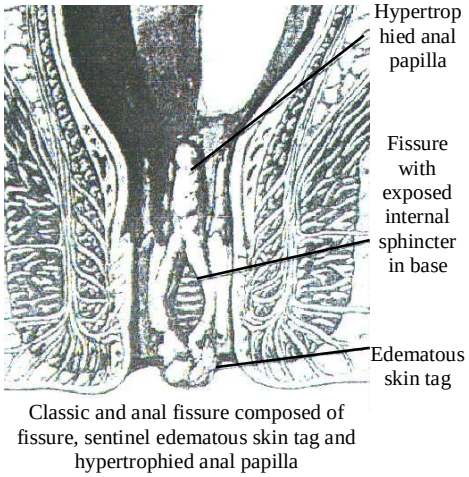
An anal fissure is a split in the anoderm, usually in either the posterior or anterior midline just distal to the dentate line. The majority (90%) of all fissures occur posteriorly and 10% anteriorly. Less than 1% of patients will be found to have a fissure in both the anterior and posterior position. The very common problem of anal fissure was first described in 1829 by Recamier[1].

Patients with chronic anal fissure make up about 10% of new attendants at colorectal outpatient clinics[2].

The cause of anal fissure, and particularly the reason why the mid-line posteriorly is so frequently affected, is not completely understood[3]. Traumatic or ischemic damage to the anal mucosa produces a superficial tear, usually posteriorly. Subsequent spasm of the internal sphincter causing the chronicity of the fissure. The clinical hallmarks are an external hypertrophic skin tag or

Correspondence to:
Dr. Nezar A. Al-Mahfooz
Department of Surgery, Saddam Teaching Hospital, Basrah; IRAQ.

"sentinel pile" and induration in the base[2] (Figure 1).



Classic and anal fissure composed of fissure, sentinel edematous skin tag and hypertrophied anal papilla

Figure 1. Anatomical details of anal fissure.

Chronic anal fissure is perpetuated by contraction of the internal sphincter, believed to reduce perfusion. Nitric oxide is a locally released transmitter mediating vasodilation and internal sphincter relaxation[4].

Until recently its treatment necessitated surgical intervention to lower the tension of the internal sphincter "lateral internal sphinctrotomy", or manual dilatation of the anus. A disadvantage of both methods is the risk of permanent sphincter injury resulting in reduced continence [5].

Several studies have recently examined the use of glyceryl trinitrate (G.T.N.) and / or isosorbide dinitrate (ISDN) in patients with anal lesions [2-15].

This study describes the recent medical treatment of anal fissure patients with nitrates group of drug in Basrah – Iraq.

The aim of this study is to test the effectiveness of nitrate group of drugs in the treatment of anal fissure.

Patients and Methods

To assess changing patterns of treatment for acute and chronic anal fissure, a randomized study was designed prospectively for 3 years from May 1999 to May 2002. A total of (640 consecutive patients – 65 were children constituting 10.15% of total) attending the outpatient surgical department of Saddam Teaching Hospital and author clinic in Basrah. Patients diagnosed by specialist surgeon at outpatients and clinic and then were randomly assigned to receive 0.2-0.8% G.T.N. ointment or 1-3% ISDN ointment in vaselline base prepared locally by the authors and administered digitally by the patient twice or trice a day over a period of 2-6 weeks. The patients were followed up thereafter for 6-26 months during which responses as well as recurrences, tachyphylaxis (tolerance to treatment) and side effects like headache, tingling sensation, tolerance to treatment, dizziness, gastrointestinal upset and hypotension were recorded.

Pre and post-application (of ointment), measurement of the maximum resting anal pressure (MARP) were recorded for 40 patients to check the effectiveness and effect of the treatment by a manometer designed locally by the authors.

After treatment, sequential readings were obtained in the first, second, fourth week and at the end of the therapy at the sixth week. Digital grip strength in the rectal examination was done and recorded as well for each patient.

The incidence parameters of investigations were as follows: medical history of the patient regarding the age, sex, main complaint and associated features. Examination of the fissure included its position, type (acute or chronic) and anal sphincter tone, digitally or by manometer, both pre and post therapy. Side effects of the treatment, follow up, re-treatment and failure of therapy were also observed in the study.

Results

From a total of 640 patients attending the Outpatient Surgical Department dia-

gnosed as fissure in ano over a period of one year, 343 patients (53.6%) had acute anal fissure (A.A.F.) and 297 patients (46.6%) had chronic anal fissure (C.A.F.) (Figure 2). Of those, only 65 patients (10.15%) were children, all of whom presented with acute fissure [their age was ≤ 14 years (Table I)].

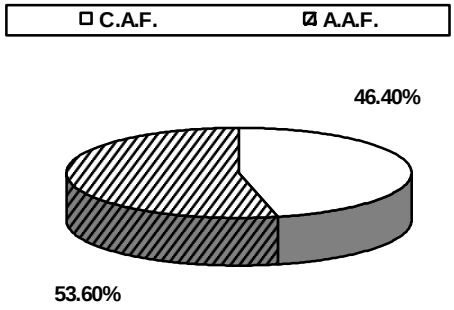


Figure 2. Distribution of anal fissure as acute and chronic

Twenty five patients (3.9%) were lost to follow up for various reasons. Most of the patients in our study were males (63.6%) and of young age as 57% were between the ages of 15-35 years (Table I).

Local anal pain was the main presenting feature both in A.A.F. and C.A.F. (68%), while the least common presenting feature was constipation (5.3%), bleeding was the presentation in 117, and itching in 54 (Table II).

Conversely "tolerance" occurred in 40 patients (6.25%); i.e. the need to increase the concentration of the drug in the ointment in order to reach the same effect of the previous application. Most of them were in the group of GTN ointment patients (33 patients) (Table III).

The disease whether acute or chronic, recurred in 26 patients (4%); 21 with C.A.F and 5 with A.A.F; i.e. recurrence of symptoms and signs after initial symptom free period (Table III).

Local anal pain was abolished within in 310 patients (90.4%) with A.A.F. and in 254 patients (85.5%) with C.A.F. respectively. Furthermore, two hundred eighty seven patients (83.72%) with A.A.F; and 239 patients (80%) with C.A.F. were cured from the disease, and followed for 6 months after stopping medical therapy.

Table I. Demographic features of patients with anal fissure.

Age in years (%)						**Sex**		**Total**
Type of fissure	**≤14 yr. (%)**	**15-25**	**26-35**	**36-45**	**>45**	**M**	**F**	**No (%)**
Acute fissure (A.A.F.)	60 (9.3%)	85 (13.3%)	115 (118%)	80 (12.5%)	3 (0.5%)	240 (37.5%)	103 (16%)	343 (53.6%)
Chronic fissure (C.A.F.)	5 (0.78%)	65 (10.15%)	100 (15.6%)	107 (16.7%)	20 (3.12%)	167 (26%)	130 (20.3%)	297 (46.4%)
Total	65 (10.15%)	150 (23.4%)	215 (33.6%)	187 (29.2%)	23 (3.6%)	407 (36.6%)	233 (36.4%)	640 (100%)

Table II. Main presenting features of anal fissure.

Presenting features	**Acute anal fissure**		**Chronic anal fissure**		**Total**	
	No.	**%**	**No.**	**%**	**No.**	**%**
Local pain	233	68	202	68	435	68
Bleeding per rectum	67	19.5	50	16.8	117	18.3
Itching	34	9.9	20	6.7	54	8.4
Constipation	9	2.6	25	8.5	34	5.3
Total	343	100	297	100	640	100

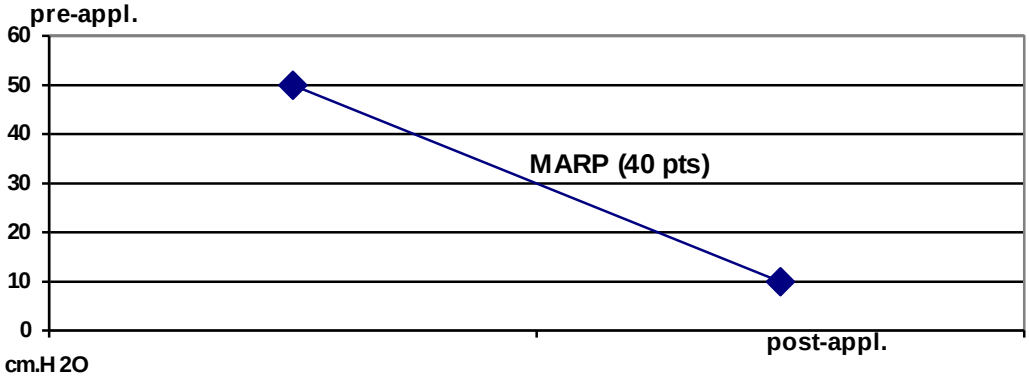


Figure 3. Maximum anal resting pressure (MARP) pre and post application of GTN or ISDN.

Table III. Patients response to treatment

Variables	A.A.F. No. (%)	C.A.F. No. (%)	Total No. (%)	ISDN No. (%)	G.T.N. No. (%)
Pain abolished	310 (90.4%)	254 (85.5%)	564 (88%)	378 (59%)	186 (29%)
Cured	287 (83.7%)	239 (80%)	526 (82%)	315 (49%)	211 (33%)
Re-treatment	10 (2.9%)	71 (24%)	81 (12.6%)	30 (4.7%)	51 (7.9%)
Tachphylaxis (Tolerance)	3(0.9%)	37 (12.4%)	40 (6.25%)	7 (1.1%)	33(5.25%)
Recurrence	5(1.4%)	21 (7%)	26 (4%)	9 (1.4%)	17 (2.6%)
Send for surgery	0(0%)	24 (8%)	24 (3.8%)	9 (1.4%)	15 (2.4%)
Lost to follow up	18 (5.2%)	7 (2.3%)	25 (3.9%)	10 (1.5%)	15 (2.4%)

No patient was sent for surgery among those with A.A.F.; while 24 patient (3.75%) were sent for surgery among those with C.A.F.; and this was regarded as "treatment failure" (Table III).

All 40 patients (6.60%) who underwent measurement for the maximum anal resting pressure "MARP" showed dramatic response to therapy given in terms of evident decriment of MARP from 50 to10 cm. H_2O after application (Figure 3 and 5). This relaxation of the anal sphincter was not associated with side effects. None of our patients experienced a major or grave drawback of therapy as severe hypotension, intractable headache, massive circulatory disturbance or local dermal burn apart from transient headache in five patients and self- limiting sensation in 15 patients (2.3%).

Discussion

The anal sphincter mechanism comprises the internal anal sphincter, the smooth-muscle termination of the rectal circular muscle layer that provides most of the anal canal resting tone, and the external anal sphincter, (a striated muscle under voluntary control). There is a relative deficiency of blood vessels in the posterior commissure of the anal canal of most people. Laser Doppler flow studies document a parallel hypoperfusion of this area normal subjects[1].

Patients with anal fissure typically have high resting anal sphincter, these high pressures can impede blood flow. Anodermal perfusion is particularly low at the base of fissures [1,2,3,.16].

For many years treatment of anal fissure has focused on alleviating sphincter hypertonia either conservatively by supportive therapy (sitz baths, topical anaesthetic and use of bulking supplements) or operatively by lateral internal sphincterotomy (historically by forceful dilation of the anoderm). Although this technique is a simple and effective outpatients surgical procedure

performed under local anaesthesia, its fundamental drawback is its potential to cause minor but sometimes permanent alterations in the control of gas, mucus and occasionally stool. This problem has motivated a quest for pharmacologic ways to create a temporary or reversible "sphincterotomy"[2].

There is now strong evidence that relaxation of internal anal sphincter is mediated by the locally released transmitter-nitric oxide[7]. Clearly; a new treatment was needed and anal fissure had proved to be a good example of basic laboratory research leading to worthwhile advances in treatment. Nitric oxide has been identified recently as the chemical messenger of the intrinsic non-adrenergic, non-cholinergic pathway mediating relaxation of the internal anal sphincter. The terminal branches of both inferior rectal arteries pass through the internal anal sphincter and blood flow to the skin of the anus is related to anal pressure. Applying G.T.N. ointment, which donates nitric oxide into the pathway that relax the anal sphincter, lowers the MARP in both normal people and is patients with various anal conditions[2].

Several studies have recently examined the use of G.T.N. and ISDN in patients with anal lesions[2].

Most, if not all these studies, proved that both GTN and ISDN decrease the MARP dramatically within days of commencing its topical use into the anoderm [4,6,8,11-15,17].

The St. Mark's Hospital group treated 19 patients with chronic anal fissures with ointment containing a range of concentrations of G.T.N. (0.2%-0.82%). They found that this reduced the MARP by at least 25%. The minimum effective concentration was 0.3%G.T.N. and 1.25% ISDN. Local application twice daily for six weeks produced healing in 9 out of 15 patients. Those results were very similar to our study, in which the manometric ranges of anal sphincter pressure were decreasing within days and weeks of applying ointment (from 50 to 10 cm. Water decrement). From Nottingham, improvement was reported in 8 or 21 patients treated with 0.2% G.T.N. ointment. From Netherlands, a report of local application of 1% ISDN administrated six times daily for six weeks lowered anal pressure in 30 or 34 patients. Sides effects that were recorded in some studies included headache in high doses and tolerance to treatment[2] . In our study, however, no significant side effects were recorded.

Conclusions & Recommendations

This study clearly shows that topical medical treatment of anal fissure by nitrate group of drugs can be considered as the first line therapy, and that surgery can be avoided in most of the cases. Keeping in mind the cost effectiveness, reliability, re- treatment, re- application, complications of incontinence, social factors, resources and applicability of drug therapy over the surgical management was proved.

We recommend the availability of a formal pharmaceutical nitrate ointment preparation to be conveniently applied for use to the patients with anal fissure disease.

References

1.Ira J. Koder, Robert D. Fry, James W. Fleshman, Elisa H. Birnbaum and Thomas E. Read. Anal fissure - anal ulcer / Colon Rectum and Anus. Ch. 26: 1298-1300. Schwartz Principles of Surgery, 7th Intern. Ed., Vol. 2, 1999. USA, McGraw Hill.

2.Anjan-K. Banerjee. Treating anal fissure by G.T.N. ointment may remove the need for surgery. B.M.J. 1997; 314: 1638-39.

3.Norman S. Williams. The

anus and anal canal. Ch.61. Bailey's and Love's short practice of surgery, 23rd ed., 2000, 1125-27.
4. Lysv J. Israelit-Yatzken Y, Sestiere Ittach M, Keret D, Goldin E. Treatment of chronic anal fissure with ISDN, long term results and dose determination, Dis Colon Rectum. 1998; 41(11):1406-10.
5. Stassen LP, Schouten WR. The treatment of chronic fissure in ano with nitrate ointment. Ned Tijdschr Geneeskd 1999;143(1): 13-6.
6. Lund JN, Scholefield JH. G.T.N. is an effective treatment for anal fissure, Dis Colon Rectum. 1997; 40(4): 468-70.
7. Kamm MA. Diagnostic, pharmacological, surgical and behavioural developments in benign ano rectal disease, Eur J Surg Supll. 1998; 582: 119-23.
8. Farouk R, Gunn J, Duthie GS. Changing patterns of treatment for chronic anal fissure, Ann R Coll Surg Engl 1998; 80(3): 164-6.
9. Jonas M, Lobo DN, Gudgeon A M. Lateral internal sphincterotomy is not redundant in the era of G.T.N. therapy for chronic anal fissure, J R Soc Med. 1999; 92(4): 186-8.
10. Brisinda G, Maria G, Bentivoglio AR, Cassetta E, Gui D, Albanese A. A comparison of injections of botulinum toxin and topical G.T.N ointment for the treatment of chronic anal fissure, N Engl J Med 1999; 341(2): 65-9.
11. Carapeti EA, Kamm MA, McDonald PJ, Chadwick SJ, Melville D, Philips RK. Randomised controlled trial shows that G.T.N. heals anal fissure, higher doses are not more effective, and there is a high recurrence rate. Gut. 1999; 44(5): 727-30.
12. Ward Dl, Miller BJ, Schache DJ, Cohen JR, Theile DE. Cut or paste? The use of G.T.N. paste in the treatment of acute and chronic anal fissure. Aust N Z J Surg 2000; 60(1): 19-21.
13. Tander B, Guven A, Demirbag S, Ozkan Y, Ozturk H, Cetinkursun S. A prospective, randomized, double-blind, placebo - controlled trial of G.T.N. ointment in the treatment of children with anal fissure. J Paediatr Surg. 1999; 34(12): 1819-12.
14. Bassotti G, Clementi M, Ceccorelli F, Pelli MA. Double-blind manometric assessment of two topical G.T.N. for mutations in patients with chronic anal flssures. Dig Liver Dts. 2000; 32(8): 699-702.
15. Zuberi BF, Rajput MB, Abro H, Shaihk SA. A randomized trial of G.T.N. ointment and G.T.N. patch in healing of anal fissures, Int J Colorectal Dis. 2000; 15(4): 243-5.
16. Robert D Madoff. USA. Pharmacologic therapy for anal fissure. N Eng J Med 1998; 338(4).
17. Carapeti EA, Kamm MA, Philips RK. Topical diltiazem and bethanichol decrease anal sphincter pressure & heal anal fissures without side effects. Dis Colon Rectum. 2001; 43(10):1359-62.