



## Chemical sphincterotomy with topical 2% diltiazem for chronic anal fissure: Our experience

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### Abstract:

**Background:** Chronic anal fissure is a common problem across the world treated largely by surgical methods. Studies have demonstrated the efficacy of topical agents like Glyceryl-trinitrate in anal fissure but it has been shown to have side effects like headache and dizziness. There is a need for a pharmacological therapy for fissure which has fewer side effects. Hence, this study was taken up to assess the efficacy and adverse effects of topical 2% Diltiazem gel. **Method:** 50 patients with chronic anal fissure were considered for this study and they were treated with regular topical application of 2% Diltiazem gel. Patients were followed up at regular intervals for symptomatic relief and healing of fissure. **Results:** Fissure healed completely in 42 (89.36%) patients by 8 weeks. Of the 47 patients who applied Diltiazem, 13 (27.7%) were pain-free at the end of 4 weeks, 39 (83%) by 8 weeks and 42 (89.4%) by 14 weeks, while 5 (10.6%) patients remained symptomatic at the end of 14 weeks. However, mild headache (6.4%) and local irritation (4.3%) were noted. **Conclusion:** Topical 2% diltiazem gel is an effective agent in the treatment of chronic anal fissure. The need for hospital stay is abolished; psychological and financial burden on the patient is reduced. With a healing rate close to 90%, topical Diltiazem can be easily advised as the first line of treatment of chronic anal fissure.

**Key words:** Chemical sphincterotomy; Chronic Anal Fissure; Diltiazem; Lateral internal sphincterotomy; Glyceryltrinitrate.

### Introduction

Various proctologic diseases have been affecting the mankind since times immemorial. They

encompass a diverse set of disorders which cause significant discomfort to the patients. Majority of the population (30-40%) suffers from these conditions at least once in a lifetime [1].

Anal fissure, a common disease under this category, first described by Recamier [2] in 1829, is a vertically oriented tear or ulceration in the squamous lining of the anal canal between the pectinate line and anal verge. This condition is associated with pain on defecation, bleeding per anum and anal sphincter spasm. It can affect all age groups particularly young and otherwise healthy adults but shows no sex preponderance. Most of the anal fissures are acute, resolving spontaneously or with increased dietary fibre intake and stool softeners where appropriate. Those lesions which fail to heal despite simple lifestyle modifications and persist beyond six weeks are designated as chronic anal fissures.

The most common location for fissure-in-ano in both men and women is posterior due to oval shaped sphincters that are best supported at their sides and weakest posteriorly. Anatomic and microscopic studies of cadaveric specimens have revealed poor blood supply to posterior part of anal canal in 85% cases. The posterior anal commisure is poorly perfused and hence in patients with hypertrophied internal sphincters this blood supply is further compromised rendering the area relatively ischemic [3,4]. In women, there is deficient support anteriorly due to presence of the vagina; therefore 10% of fissures in women are anterior unlike males where the incidence is only 1%. Perineal trauma during childbirth also causes a tear extending into the anoderm [5].

Early or acute fissures have the appearance of a simple tear in the anoderm. With the passage of time, chronic fissures develop thickened skin margins, and fibres of the internal anal sphincter become visible at the fissure's base. Many patients develop a sentinel skin tag at the distal aspect and a hypertrophied anal papilla proximally (Figure 1). It has been generally accepted that hypertonicity of the internal anal sphincter is involved in the pathogenesis of anal fissure. A vicious cycle ensues whereby the anal spasm exacerbates the ischemia and prevents the fissure from healing, which in turn sustains the anal spasm to prevent further tearing. Once this cycle sets in, the likelihood of spontaneous healing decreases.

Therapy focuses on breaking the cycle of pain, spasm, and ischemia thought to be responsible for development of fissure in ano. Surgical techniques like manual anal dilatation or lateral internal sphincterotomy, effectively heal most fissures within a few weeks, but may result in permanently impaired anal continence. This has led to the research for alternative non-surgical treatment,

and thus 'Chemical Sphincterotomy' is being investigated and used as the possible first line of treatment for chronic anal fissure.

Topical Glyceryltrinitrate (GTN) ointment has been shown to be effective but has reduced compliance due to headache as side effect. Topical 2% diltiazem gel has been reported to cause healing of chronic anal fissures in 60-75%, with less than 80% patients having no adverse effects in previous studies [6]. Calcium channel blockers like diltiazem and nifedipine offer a very attractive alternative to nitroglycerine for the treatment of anal fissures. They act by blocking L-type calcium channels in smooth muscle causing relaxation of the internal sphincter [7]. They also dilate the blood vessels of the anoderm and increase the flow of blood. Healing rates of chronic fissures has been reported in up to 73% [8].

The first clinical study of the role of calcium channel antagonists on the anal canal pressure was conducted by Chrysos and colleagues. An oral dose of Nifedipine 20 mg twice daily was used to treat 15 patients with chronic anal fissure [9]. Griffin N et al [10], in a study on 47 patients showed that topical 2% Diltiazem is an effective and safe treatment for chronic anal fissure in patients who have failed 0.2% GTN. The need for surgical sphincterotomy can be avoided in up to 70% of cases. In a study conducted by K. Bielecki et al [11], out of 43 outpatients with chronic anal fissure, 22 patients were randomized to topical Diltiazem (2%) ointment and 21 patients to GTN (0.5%) ointment twice daily for 8 weeks. During the course of treatment each patient was seen three times. Side-effects and healing were recorded. Healing occurred in 19 of 22 patients treated with Diltiazem and 18 of 21 patients were cured with GTN. Headache and dizziness developed after GTN in 33.3% of cases while no patient had any side-effects after Diltiazem. They concluded that Diltiazem and GTN were equally effective in healing anal fissure but the former resulted in fewer side-effects.

The present study comprises of 2% Diltiazem gel application in the treatment of chronic fissure in ano with respect to both efficacy and complications.

## Materials and Methods:

**Method of Collection of Data:** The cases attending the OPD of the Department of General Surgery, KVG Medical College & Hospital, Sullia, Karnataka who came with the complaints of painful defecation with or without bleeding per rectum of more than 6 weeks duration, between July 2010 and

June 2012 were considered for this study after taking due clearance from the ethical committee. With informed consent of the patient, detailed history was taken and per-rectal examination done to diagnose chronic anal fissure. Patients with haemorrhoids, anorectal abscess, anal malignancies and tuberculosis of anorectal region were excluded from this study. Patients with previous history of faecal incontinence or anal stenosis and those who had undergone previous anal surgeries were not included. Immunocompromised patients and those with history of bleeding diathesis were also not taken up. Systemic examination was done. Baseline clinical photographs were taken. 50 patients were randomly subjected to chemical sphincterotomy which involved local application of 2% Diltiazem gel thrice a day, for a period of 8 weeks. They were advised plenty of oral fluids, high fibre diet, laxatives and sitz bath. Follow-up of the patients was done by history and per-rectal examination to assess the efficacy of the treatment and its complications. **Method of application of 2% Diltiazem gel:** Patients were advised to apply 1.5 to 2 cm length of gel thrice daily at least 1.5 cm into the anus. They were instructed to wash their hands before and after use of gel. **Follow-up:** Patients were followed up at 2, 4, 6, 8, 14 weeks and 6 months. During each visit enquiries were made regarding the expected complications using a simple questionnaire. Patients were also examined to look for healing of the fissure. Digital examination was done to assess the relaxation of sphincter. Results were tabulated and analyzed using SPSS software (19<sup>th</sup> version).

## Results:

Data was obtained from the fifty patients attending the surgery OPD of our hospital, who came with features of chronic anal fissure. Patients were randomly subjected to chemical sphincterotomy. The data was later analysed from their proforma sheets.

It is observed (Figure 2) that 38% of the patients are in the age group of 31-40 years which includes 41.38% males along with 33.33% females. 28% of the patients belong to 21-30 years age group, 14% in the 11-20 years age group and 12% in 41-50 years and 8% in 51-60 years age groups. It can be noted that the mean year of occurrence of chronic anal fissure in males is 32.03 years and in females is 35.76 years with a standard deviation of 7.33 in males and 12.86 in females.

In our study of 50 patients, there are 29 male patients and 21 female patients with a male to female ratio of 1.38:1. All the patients included in the study

group (100%), both males and females had painful defecation which was the most common symptom (Figure 3). This was followed by constipation and bleeding per anum in 92% and 74% of the patients respectively. Local pruritus and discharge per anum was present in 10% of the study group.

The occurrence of posterior anal fissure is noted to be 93.1% (27 out of 29 patients) in males and 90.48% (19 out of 21 patients) in females. The overall occurrence of posterior anal fissure is 92% (46 out of 50 patients). Anterior anal fissure is noted in 3.45% of male and 9.52% of female patients. The presence of both anterior and posterior fissure-in-ano is seen in 3.45% of males. Sentinel pile is noticed in 88% (i.e 44 out of 50) of the patients.

Out of 50 patients, 3 patients were lost to follow-up at various stages during the course of this study. 42 (89.36%) out of 47 fissures healed completely between 4-8 weeks.. 13(27.7%) patients were pain-free at the end of 4 weeks. 26 (55.3%) patients were free of pain by 8 weeks and 3(6.4%) patients were pain free by 14 weeks. 5 patients (10.6%) were not relieved of pain at the end of 14 weeks (Figure 4).

Out of the 47 patients that were followed up, 3(6.4%) patients experienced mild headache (Table 1) and local irritation was present in 2(4.3%) patients. No patient had complaints of vertigo, flushing or palpitations. Recurrence was seen in 1(2.1%) patient.

## Discussion

Fissure-in-ano is a common problem across all parts of the world, causing considerable morbidity and affecting the quality of life of the patients. This necessitates the prompt treatment of the condition with suitable, cost-effective methods.

The rationale of treating this condition lies in reducing the internal anal sphincter tone, relieving the spasm and thereby improving the local circulation which is necessary for the healing of the ulcer (fissure). Lateral internal sphincterotomy (LIS) has been considered as the gold standard in the treatment of anal fissure, wherein, there is partial division of the internal anal sphincter away from the fissure site. Chemical sphincterotomy, a medical line of treatment, is now being accepted as the first line of treatment for chronic anal fissures at various centres. Previous studies have found that diltiazem is efficacious in the treatment of chronic anal fissure. Studies showed that oral intake and topical applications of diltiazem reduced the anal pressure significantly [12].

In the present study, analysis of 2% diltiazem gel for topical application was done with regards to efficacy and complications in patients with chronic anal fissure. The current study included a total of 50 patients of chronic anal fissure who presented to the surgical out-patient in our hospital between July 2010 and June 2012, and were randomly subjected to chemical sphincterotomy.

Patients with complaints of painful defecation with or without bleeding per rectum of more than 6 weeks duration were labelled as chronic fissure-in-ano and considered for this study. Patients were advised local application of 2% diltiazem gel thrice a day, for a period of 8 weeks. They were adequately followed up at regular intervals and the final data was analyzed according to the proforma sheets.

In the present study, the age group most affected was 31-40 years (38%) and least affected was 51-60 years (8%). According to J.C. Goligher [13] the disease is usually encountered in middle aged adults. In Udwardia T.E [14] series also maximum incidence was seen in 31-40 years age group. There was a slight male preponderance (58%) compared to females (42%) in our study with the male to female ratio of 1.38:1. The study from Goligher [13] which says anal fissure is equally common in the two sexes.

In our analysis, painful defecation was a universal and the most common symptom (100%). This was followed by constipation and bleeding per anum in 82% and 74% of the patients respectively. Local pruritus was present in 10% of the patients and so was discharge per anum.

The presence of posterior anal fissure was noted to be 93.1% (27 out of 29 patients) in males and 90.48% (19 out of 21 patients) in females. The overall incidence of posterior anal fissure was found to be 92% making it the most common site involved. Anterior anal fissure was noted in 3.45% of male and 9.52% of female patients. This is in conjunction with the study from Boulos [15] which says posterior fissure (85.7%) is more common than anterior fissure (14.2%).

In this study, fissure was completely healed in 42 (89.36%) out of 47 patients by 8 weeks. Study (Table 2) conducted by J. S. Knight [16] et al reported a healing rate of 75% after 8-12 weeks treatment with Diltiazem gel. U. K. Srivastava [17] reported a healing rate of 80% with Diltiazem gel in 12 weeks.

In our study, out of the 47 patients that were followed up in the Diltiazem group, 3(6.2%) patients

experienced mild headache and local irritation was present in 2(4.3%) patients. None of the patients reported to have features like dizziness, flushing or palpitations. Study conducted by U. K. Srivastava reports no side effects in patients treated with Diltiazem gel [17]. In a study conducted by G. F. Nash et al [19] 112 patients were treated with 2% Diltiazem gel for 6 weeks and were followed up over 2 years. The success rate and satisfaction of topical Diltiazem were each over two thirds. Nearly 80% of patients reported no adverse effects.

The follow up period available after successful treatment with Diltiazem gel was short and therefore no long term conclusions could be drawn. Long term follow up is needed to assess the risk of recurrence after initial healing with Diltiazem gel therapy.

## Conclusion

Chronic anal fissure is an evidently common condition which influences the quality of life of the patients to a certain extent. Considering today's busy world, it is, but, natural for the patients to opt for non-invasive ways of treatment which yield results that are comparable to their surgical counterparts. Topical Diltiazem achieves good success rate in the healing of anal fissures with negligible side effects compared to other topical agents and scores over surgical sphincterotomy by obviating the need for hospitalisation, anaesthesia, post-operative complications and also by being a cost-effective therapy. Hence Topical Diltiazem therapy can be rightly considered as the first choice of treatment in treating chronic anal fissures.

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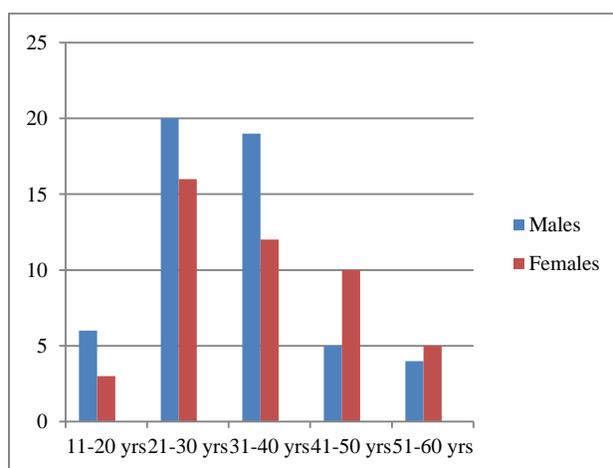
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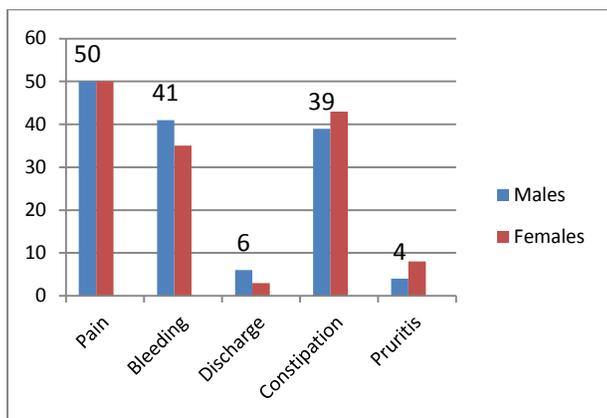
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**Figure 1: Chronic Anal Fissure**



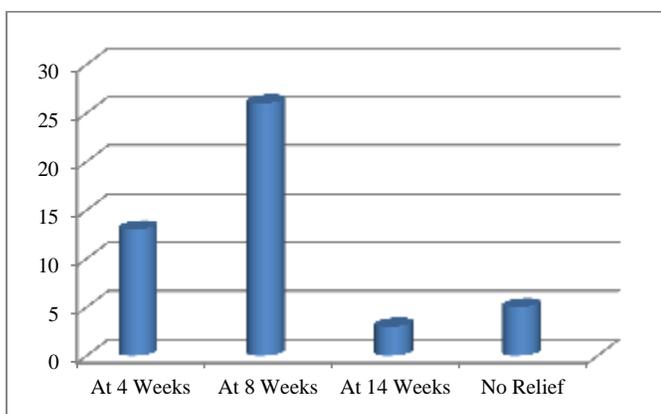
**Figure 2: Age and Sex distribution of the patients**



**Figure 3: Various symptoms according to sex (percentage)**

Studies	Number of patients	Healing rate (%)
Bharadwaj et al [8] (2000)	27	73
Knight et al [16] (2001)	66	89.4
Srivastava et al [17] (2007)	90	80
Kocher et al [18] (2002)	31	67
<b>Present study</b>	<b>47</b>	<b>89.3</b>

**Table 2: Comparison of Results with Diltiazem**



**Figure 4: Pain Relief**



**Figure 5: Healed Fissure**

	Number of patients	Percentage
<b>Headache</b>	03	6.4
<b>Local irritation</b>	02	4.3
<b>Vertigo</b>	--	--
<b>Flushing</b>	--	--

**Table 1: Complications of Diltiazem therapy**