

Comparative Study of 0.2% Nifedipine versus Lateral Internal Sphincterotomy for Treatment of Anal Fissure

Kamlesh Yadav¹, Mridul Shahi², Tanay Chanda Tiwari³

¹Postgraduate Trainee, Department of General Surgery, People's College of Medical Sciences & Research Centre, Bhopal, Madhya Pradesh, India

² Associate professor. Department of General Surgery, People's College of Medical Sciences & Research Centre, Bhopal, Madhya Pradesh, India

³Postgraduate Trainee Department of General Surgery, People's College of Medical Sciences & Research Centre, Bhopal, Madhya Pradesh, India

Received: 01-03-2026 / Revised: 15-04-2026 / Accepted: 21-05-2026

Corresponding author: Dr. Tanay Chanda Tiwari

Conflict of interest: Nil

Abstract

Background: Chronic anal fissure is a painful anorectal condition commonly affecting young and middle-aged adults. Lateral internal sphincterotomy (LIS) is considered the standard treatment, while topical nifedipine provides a non-surgical alternative. This study compared the efficacy and outcomes of topical 0.2% nifedipine with LIS in chronic anal fissure patients.

Methods: A prospective comparative study was conducted on 200 patients divided equally into medical (topical nifedipine) and surgical (LIS) groups. Baseline demographic characteristics, duration of symptoms, pain scores, fissure healing, complications, patient satisfaction, and hospital stay, and return to normal activity were assessed and compared.

Results: Most patients were young to middle-aged males with comparable baseline characteristics between groups. Posterior fissure was the most common clinical presentation. Both treatments significantly reduced pain; however, the LIS group showed faster and greater pain relief. At 6 weeks, healing was achieved in 95% of surgical patients compared to 73% in the nifedipine group. Persistent fissure and recurrence were lower in the surgical group. Headache and hypotension were noted mainly with nifedipine, whereas bleeding, urinary retention, and temporary flatus incontinence occurred after LIS. Patient satisfaction was significantly higher following LIS.

Conclusion: LIS provides superior pain relief and healing outcomes, while topical nifedipine remains an effective non-invasive alternative with quicker return to daily activities.

Keywords: Chronic Anal Fissure; Lateral Internal Sphincterotomy; Topical 0.2% Nifedipine; Pain Relief; Fissure Healing; Recurrence; Patient Satisfaction; Conservative Treatment.

DOI: 10.25258/ijcpr.18.6.224

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

Anal fissure is one of the most common and painful benign anorectal disorders encountered in surgical practice. Anal fissure It is defined as a linear tear in the anoderm below the dentate line and typically presents with severe pain during or after defecation, bleeding per rectum, and sphincter spasm.[1,2] Although small in size, the condition significantly impairs quality of life because of persistent pain and fear of defecation. The pathophysiology involves a vicious cycle of pain, internal anal sphincter spasm, reduced blood flow, and delayed healing. [3,4]

Globally, anal fissure is one of the most prevalent anorectal conditions, second only to hemorrhoids in outpatient clinics. The lifetime incidence ranges

from 7% to 11%, commonly affecting young and middle-aged adults.[5,6] In India, its prevalence among anorectal disorders has been reported between 17.8% and 24.8%.[8,9] Low-fiber diet, constipation, spicy food intake, inadequate hydration, and irregular bowel habits are important contributing factors.[8–10] Delayed medical consultation due to social embarrassment and self-treatment often results in chronicity.

Lateral internal sphincterotomy (LIS) has long been considered the gold standard treatment for chronic anal fissure.[11] By partially dividing the internal anal sphincter, LIS reduces resting anal pressure and improves blood supply, resulting in healing rates exceeding 90%.[11] However, postoperative

complications such as pain, bleeding, and especially fecal or flatus incontinence remain concerns. Recent advances in medical therapy have introduced topical calcium channel blockers such as 0.2% nifedipine as effective non-surgical alternatives. Nifedipine reduces sphincter spasm, improves anodermal perfusion, relieves pain, and promotes healing.[12] Studies have shown healing rates comparable to surgery with fewer complications, although recurrence may be slightly higher.[13–15]

Therefore, the present study was undertaken to compare the efficacy of topical 0.2% nifedipine and lateral internal sphincterotomy in the management of anal fissure with respect to pain relief, healing, recurrence, complications, and patient satisfaction.

Material & Methodology

This prospective randomized comparative study was conducted in the Department of General Surgery at People's Hospital associated with People's College of Medical Sciences and Research Centre. The study included patients diagnosed with chronic anal fissure who fulfilled the inclusion criteria and were willing to participate. Ethical clearance was obtained from the Institutional Ethics Committee before commencement of the study, and informed written consent was obtained from all participants. Patients with chronic anal fissure associated with hypertonic anal sphincter were included in the study. Patients with fissures associated with hemorrhoids, fistula, malignancy, secondary fissures due to Tuberculosis or Crohn's disease, pregnant women, patients with cardiac disorders, and immunocompromised individuals were excluded.

After detailed clinical history and examination, eligible patients were randomly allocated into two groups. Group A received topical 0.2% nifedipine ointment applied locally twice daily along with conservative measures including high-fiber diet, adequate fluid intake, stool softeners, and sitz baths. Group B underwent lateral internal sphincterotomy under appropriate anesthesia

following standard surgical procedures and aseptic precautions. Baseline demographic data, primary diagnosis, and fissure position were recorded in a structured proforma. Postoperative outcomes including pain relief, postoperative bleeding, wound healing, recurrence, duration of hospital stay, complications, and return to normal activities were assessed. Pain severity was evaluated using the Visual Analogue Scale (VAS), and patients were followed up regularly to assess symptomatic improvement and recurrence. The collected data were compiled and statistically analyzed using SPSS version 20. Categorical variables were compared using Pearson's Chi-square test, while continuous variables were analyzed using the independent t-test. A p-value of less than 0.05 was considered statistically significant.

Results

Baseline demographic and clinical characteristics were comparable between the groups, with most patients belonging to the 18–40 years age group and males predominating. Posterior fissure was the most common presentation in both groups. Baseline VAS pain scores were also similar ($p>0.05$). At 1 week and 6 weeks follow-up, the LIS group demonstrated significantly greater pain reduction compared to the nifedipine group ($p<0.001$). Complete pain relief at 6 weeks was achieved in 93% of patients in the surgical group compared to 70% in the medical group. Healing rates were significantly higher with LIS (95%) than nifedipine (73%), while recurrence was lower in the surgical group (1% vs. 8%). Drug-related side effects such as headache and hypotension were more common with nifedipine, whereas postoperative bleeding, temporary flatus incontinence, and urinary retention were observed after LIS. However, hospital stay and return to normal activities were significantly shorter in the medical group. Patient satisfaction was significantly higher in the LIS group (94%) compared to the nifedipine group (72%), indicating superior overall treatment outcomes with surgical management.

Table 1: Base line Characteristics of study groups

Variable	Medical (Nifedipine)	Surgical (LIS)	p- Value
Mean Age (Years)	37.12 ± 9.84	38.20 ± 10.35	0.45
Male (%)	64 %	67 %	0.65
Symptoms > 6 months	60 %	63 %	0.65
Posterior Fissure	80 %	82 %	0.87
Severe Baseline pain	56 %	60 %	0.84

Table 2: Comparison of pain relief and healing outcomes

Outcome	Medical (Nifedipine)	Surgical (LIS)	p- Value
Mild pain at 1 week	20%	46 %	0.004
Mild pain at 6 weeks	73%	95%	0.0001
Complete pain relief at 6 Weeks	70%	93%	0.0001
Healed fissure at 6 weeks	73%	95%	0.0001
Recurrence	8%	1%	--

Table 3: Complications and recovery Outcomes

Variable	Medical (Nifedipine)	Surgical (LIS)	p- Value
Headache	15%	0%	<0.001
Hypotension	7%	0%	<0.001
Postoperative bleeding	1%	7%	<0.001
Temporary flatus incontinence	0%	6%	<0.001
Mean Hospital stay (days)	1.32 ± 0.63	3.91 ± 4.67	<0.001
Return to normal activity (Days)	9.81 ± 3.45	14.53 ± 4.67	<0.001
Patient Satisfaction	72 %	94%	0.00003

Discussion

The present study compared topical 0.2% nifedipine therapy with lateral internal sphincterotomy (LIS) in the management of chronic anal fissure and demonstrated that both modalities were effective in reducing pain and promoting healing; however, surgical treatment produced faster symptomatic relief and superior healing outcomes. Chronic anal fissure commonly affects young and middle-aged adults, which was consistent with the demographic profile observed in the present study and supported by previous epidemiological reports (Kanojiya R et al.,[16]; Chauhan A et al.,[17]; Asghar U et al.,[18], Malik MR et al.,[19]). Male predominance was also noted, similar to earlier studies reporting higher incidence among males (Kanojiya R et al.,[16]; Chauhan A et al.,[17], Malik MR et al.,[19]).

Posterior fissure was the most common clinical presentation in both groups, followed by anterior fissure, which agrees with previous anatomical and clinical observations that most fissures occur in the posterior midline because of relatively poor perfusion and increased sphincter pressure in this region (Jonas M et al.,[2]; Villalba H et al.,[3]; Schlichtemeier S et al.,[4]; Altomare DF et al.,[5]; Beaty JS et al.,[6]). Hypertonicity of the internal anal sphincter was observed in all patients, supporting the accepted pathophysiological mechanism of chronic anal fissure (Jonas M et al.,[2]; Altomare DF et al.,[5]). Pain relief was achieved in both groups, but the reduction in VAS score was significantly greater and faster in the LIS group. Similar findings were reported by Katsinelos P et al. [13], Ho KS et al. [20], and de Rosa M et al. [21], who demonstrated superior early pain relief and faster symptom resolution following LIS compared with conservative therapy. Although topical nifedipine produced comparatively slower improvement, it still achieved satisfactory healing and pain reduction, consistent with studies by Shahi P et al. [22], Kujur AD et al. [23], and Perrotti P et al. [24], showing good efficacy of nifedipine-based therapy.

The healing rate at 6 weeks was significantly higher in the LIS group, while recurrence and persistent fissure were more common in the medical group. Comparable outcomes were

reported in previous comparative studies evaluating LIS and medical management (Kumar KV et al.,[14]; Kanojiya R et al.,[16]; Malik MR et al.,[19]; Ho KS et al.,[20]). However, medical therapy was associated with shorter hospital stay and earlier return to normal activity because it avoided surgical trauma and postoperative recovery (Katsinelos P et al.,[13]; Kumar KV et al.,[14]). Complications differed between groups, with headache and hypotension occurring mainly in the nifedipine group, whereas transient flatus incontinence and postoperative bleeding were more frequent after LIS (Chauhan A et al.,[17]; Shahi P et al.,[22]; Kujur AD et al.,[23]).

Overall, the present study confirms that LIS remains the gold standard for rapid pain relief and definitive healing, while topical nifedipine provides an effective non-invasive alternative with fewer postoperative limitations.

Conclusion

Both topical 0.2% nifedipine and lateral internal sphincterotomy (LIS) were effective in the management of chronic anal fissure.

However, LIS demonstrated superior outcomes with faster pain relief, higher healing rates, lower recurrence, and greater patient satisfaction. Topical nifedipine was associated with fewer serious complications, shorter hospital stay, and earlier return to normal activities.

Therefore, LIS remains the gold standard treatment, while topical nifedipine serves as an effective non-invasive alternative for selected patients.

Acknowledgement: The authors sincerely thank the Department of General Surgery, People's College of Medical Sciences & Research Centre, Bhopal, for their guidance and support throughout the study. We are also grateful to all the patients who participated in this research.

References

1. Golfam F, Golfam P, Golfam B, Pahlevani P. Comparison of topical nifedipine with oral nifedipine for treatment of anal fissure: a randomized controlled trial. *Iran Red Crescent Med J.* 2014 Aug;16(8):e13592.
2. Jonas M, Scholefield JH. Anal fissure. In: Holzheimer RG, Mannick JA, editors. *Surgical*

- treatment: evidence-based and problem-oriented. Munich: Zuckschwerdt; 2001.
3. Villalba H, Villalba S, Abbas MA. Anal fissure: a common cause of anal pain. *Perm J*. 2007 Fall;11(4):62-65.
 4. Schlichtemeier S, Engel A. Anal fissure. *Aust Prescr*. 2016 Feb;39(1):14-17.
 5. Altomare DF, Binda GA, Canuti S, Landolfi V, Trompetto M, Villani RD. The management of patients with primary chronic anal fissure: a position paper. *Tech Coloproctol*. 2011;15(2):135-141.
 6. Beaty JS, Shashidharan M. Anal fissure. *Clin Colon Rectal Surg*. 2016 Mar;29(1):30-37.
 7. Meleine M, Matricon J. Gender-related differences in irritable bowel syndrome: potential mechanisms of sex hormones. *World J Gastroenterol*. 2014;20(22):6725-6743.
 8. Chaudhary R, Dausage CS. Prevalence of anal fissure in patients with anorectal disorders: a single-centre experience. *J Clin Diagn Res*. 2019;13(2):PC05-PC07.
 9. Jumaa MKJ, Kadhim AA, Al Badri AH. Prevalence rate and clinical features of fissure-in-ano in a private surgical clinic in Al-Diwaniyah Province, Iraq. *Med Leg Update*. 2021;21(2).
 10. Nautiyal S. Piles, fistula and fissures on the rise in adults aged between 25 and 55: experts. 2024.
 11. Lee KH, Hyun K, Yoon SG, Lee JK. Minimal lateral internal sphincterotomy: is it enough to cut less than the conventional tailored LIS? *Ann Coloproctol*. 2021;37(5):275-280.
 12. Siboe MW. A double-blind randomized controlled trial comparing effectiveness of 0.2% topical nifedipine versus 0.2% topical glyceryl trinitrate in the treatment of chronic anal fissure [dissertation]. East Africa: Aga Khan University; 2014.
 13. Katsinelos P, Papaziogas B, Koutelidakis I, Paroutoglou G, Dimiropoulos S, Souparis A, et al. Topical 0.5% nifedipine vs lateral internal sphincterotomy for the treatment of chronic anal fissure: long-term follow-up. *Int J Colorectal Dis*. 2006;21:179-183.
 14. Kumar KV, Sarada B, Jyothi JP, Rani BS, Akhila P, Priyanka M. A comparative study between efficacy of topical nifedipine application and lateral sphincterotomy in chronic fissure in ano. *J Popul Ther Clin Pharmacol*. 2024;31(2):2800-2808.
 15. Rashad AM, Nafady HA, El-Gaabary TM. Comparative study between surgical lateral internal sphincterotomy and botulinum toxin injection in the treatment of chronic anal fissure. *Egypt J Surg*. 2020;39(4):1242-1249.
 16. Kanojiya R, Patel E, Goyal R, Trivedi R. A comparative study of lateral internal sphincterotomy and 2% nifedipine and lignocaine gel local application in the treatment of chronic fissure in ano. *Int J Pharm Clin Res*. 2024;16(9):1096-1099.
 17. Chauhan A, Shrivastava PK, Lahariya CP. A comparative study of 0.2% nifedipine versus lateral sphincterotomy in the management of anal fissure. *Int J Sci Res*. 2021 Apr;10(4):32-35.
 18. Asghar U, Khan R, Nigar Z, Shukr I, Gul I. Comparison of healing rate of anal fissure with 0.2% glyceryl trinitrate ointment versus 2% nifedipine ointment. *Pak Armed Forces Med J*. 2020;70(Suppl 1):S91-S94.
 19. Malik MR, Rizwan K, Khaliq A. Comparative study of 0.2% glyceryl trinitrate ointment versus lateral internal sphincterotomy for chronic anal fissure. *Pak J Med Health Sci*. 2021;15(3):855-858.
 20. Ho KS, Ho YH. Randomized clinical trial comparing oral nifedipine with lateral anal sphincterotomy and tailored sphincterotomy in the treatment of chronic anal fissure. *Br J Surg*. 2005 Apr;92(4):403-408.
 21. de Rosa M, Cestaro G, Vitiello C, Massa S, Gentile M. Conservative versus surgical treatment for chronic anal idiopathic fissure: a prospective randomized trial. *Updates Surg*. 2013 Sep;65(3):197-200.
 22. Shahi P, Sharma B, Solanki M. A comparison of 0.3% topical nifedipine ointment vs lateral sphincterotomy in the treatment of chronic anal fissure. *J Mahatma Gandhi Univ Med Sci Tech*. 2020;5(3):77-82.
 23. Kujur AD, Ekka NMP, Chandra S, Lal S, Malua S. Comparative study to assess the effectiveness of topical nifedipine and diltiazem in the treatment of chronic anal fissure. *J Family Med Prim Care*. 2020;9:5652-5657.
 24. Perrotti P, Bove A, Antropoli C, Molino D, Antropoli M, Balzano A, et al. Topical nifedipine with lidocaine ointment vs active control for treatment of chronic anal fissure: results of a prospective, randomized, double-blind study. *Dis Colon Rectum*. 2002 Nov;45(11):1468-1475.