

Original Research Article

A PROSPECTIVE OBSERVATIONAL STUDY ON CLINICAL PRESENTATION, TREATMENT MODALITIES AND THEIR OUTCOMES IN ANAL FISSURE

Navdeep¹, Damini Kumari¹, Prafull Kumar Arya², Gouthami Devi S. L³

¹Junior Resident, Department of General Surgery, Satguru Partap Singh Hospital, Ludhiana, Punjab, India.

²Senior Consultant and Head, Department of General Surgery, Satguru Partap Singh Hospital, Ludhiana, Punjab, India.

³Junior Resident, Department of Family Medicine, Satguru Partap Singh Hospital, Ludhiana, Punjab, India.

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Corresponding Author:

Dr. Navdeep,
Doctors Hostel, Satguru Partap Singh
Hospital, Sherpur Chowk, Grand Trunk
Road, Ludhiana, Punjab 141003, India
Email: drnavdeepshokeen@gmail.com

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ABSTRACT

Background: Anal fissure is a common anorectal disorder causing severe pain during defecation and bleeding per rectum, with a major impact on quality of life. Most primary fissures occur in the posterior midline and are linked to constipation, internal anal sphincter spasm, reduced anodermal blood flow, and delayed healing.

Materials and Methods: This prospective observational study was conducted in the Department of General Surgery, Satguru Partap Singh Hospital, Ludhiana, Punjab, from April 2024 to October 2025. Adults aged >18 years with clinically diagnosed anal fissure were enrolled (n = 104; Cochran formula), while patients with prior anorectal surgery or other painful perianal conditions were excluded. Demographic, clinical, lifestyle, obstetric history, and comorbidity data were recorded along with fissure type and site. Management included lifestyle measures and topical therapy, mainly fixed-dose combinations of topical calcium channel blockers (diltiazem 2% plus lignocaine 2% or nifedipine 0.3% plus lignocaine 1.5%). Follow-up was at 2, 4, 6 weeks, and 3 months.

Results: Of 104 patients, 72 had an acute fissure, and 32 had a chronic fissure. Constipation and low fiber intake were common. Baseline pain was higher in acute fissure (VAS 7.57 vs 6.53; p = 0.04), while chronic fissure had more pruritus, burning, sentinel tag, and discharge. Most patients responded to medical therapy. Pain reduction was similar with both regimens; bleeding improved more with nifedipine (p = 0.04).

Conclusion: Constipation control and fiber optimization are key targets; topical nifedipine-lignocaine and diltiazem-lignocaine are safe and effective, and LAS should be reserved for refractory cases.

Keywords: Anal fissure, constipation, low fiber intake, topical calcium channel blockers, lateral internal sphincterotomy.

INTRODUCTION

Anal fissure was a common anorectal condition defined as a longitudinal tear in the anoderm of the distal anal canal.^[1,2] Despite its small size, it caused severe pain during defecation and bleeding per rectum, leading to significant discomfort and reduced quality of life.^[3]

Based on duration and clinical features, anal fissures were classified as acute or chronic. Acute fissures lasted less than 6 weeks, while chronic fissures persisted beyond 6 weeks and were often associated

with exposed internal anal sphincter fibres, sentinel pile, or hypertrophied anal papilla.^[3,4] Most fissures occurred in the posterior midline due to relatively poor blood supply, whereas anterior fissures were less common and were more frequently seen in females.^[3,5,6]

The condition affected both genders and was common in young adults. Pregnancy was recognized as a risk factor, and a high prevalence of perianal diseases was reported during gestation.^[7] Secondary fissures at atypical locations could have indicated underlying conditions such as tuberculosis,

inflammatory bowel disease, HIV infection, or malignancy.^[6,8] Common contributing factors included constipation, low fiber intake, inadequate hydration, diarrhea, and prolonged sitting.^[8-10]

The pathophysiology involved a cycle of anodermal injury, pain, internal anal sphincter spasm, reduced blood flow, and delayed healing.^[3,8] Initial management focused on breaking this cycle through conservative measures such as dietary fiber, stool softeners, sitz baths, and topical pharmacological agents.^[4,11] Control of local infection and the use of healing agents such as zinc could have further aided recovery.^[12-14]

Lateral internal anal sphincterotomy remained the standard surgical treatment for chronic fissures refractory to medical therapy, although the risk of anal incontinence necessitated cautious use.^[2,5,9,11] In view of the high prevalence and morbidity associated with anal fissure, the present study aimed to evaluate its clinical profile, risk factors, and treatment outcomes.

MATERIALS AND METHODS

Study setting and ethics: The present study was conducted at the Department of General Surgery, Satguru Partap Singh Hospital, Ludhiana, Punjab, with prior approval from the Institutional Ethics Committee [DMS/SPS-I/2024/94]. All eligible patients were informed of the study's purpose in their vernacular language, and written informed consent was obtained before enrolment.

Study design: This was a prospective observational study evaluating the clinical presentation, risk factors, treatment modalities, and outcomes in patients with fissure in ano.

Duration and place of study: The study was conducted over 18 months, from April 2024 to October 2025, at a tertiary care referral centre serving a large urban and rural population.

A total of 104 patients with a fissure in ano were included in the study.

Patient selection:

Inclusion criteria

- Patients aged more than 18 years
- Outpatients and inpatients clinically diagnosed with anal fissure
- Patients who provided written informed consent

Exclusion criteria

- Patients with a previous history of anorectal surgery.
- Patients with perianal abscess or other painful perianal conditions such as fistula, thrombosed piles, or malignancy

Methodology: All patients fulfilling the eligibility criteria were enrolled. A detailed clinical history was recorded using a predesigned proforma. The following information was collected:

- Demographic details, including age, gender, and body mass index.

- Presenting complaints such as pain during defecation, constipation, bleeding per rectum, discharge, perianal burning sensation, and pruritus.
- Duration of symptoms
- Past medical and surgical history, including previous anorectal disease.

Personal history with reference to diet type, dietary fiber intake, bowel habits, laxative use, prolonged sitting, physical activity, water intake, childbirth history, and performance status.

Associated comorbidities include diabetes mellitus, hypertension, chronic kidney disease, gastrointestinal tuberculosis, thyroid disorders, and inflammatory bowel disease.

Clinical examination: All patients underwent general and systemic examination. Local perianal examination was performed in the left lateral Sims position under adequate illumination.

Inspection included assessment of the anal verge and perianal skin for erythema, induration, discharge, fecal soiling, sentinel pile, thrombosed piles, or skin tags. The location of the fissure was noted. The presence of a perianal abscess was ruled out clinically and, when required, radiologically.

A gentle digital rectal examination was performed, and sphincter tone, tenderness, and presence of sentinel pile or induration were assessed. If the examination was not tolerated due to pain, it was deferred to a later visit. Proctoscopy was performed in selected cases after adequate analgesia to assess the anal canal and exclude associated anorectal pathology.

Treatment modalities: Patients were managed according to standard institutional protocols. The choice of treatment depended on the type of fissure, severity of symptoms, associated comorbidities, and patient preference.

Conservative management: Patients were advised to make lifestyle modifications, including a high-fiber diet, adequate hydration, and avoidance of prolonged sitting or straining. A warm water sitz bath was advised three times daily. Stool softeners or bulk-forming agents were prescribed as required. Topical agents such as lignocaine, diltiazem, or nifedipine were used at the clinician's discretion.

Medical management: Selected patients received fixed-dose topical calcium channel blocker combinations, either diltiazem 2% with lignocaine 2% w/w or nifedipine 0.3% with lignocaine 1.5% w/w.

Surgical management: Patients with chronic fissure who did not respond to medical therapy were offered surgical treatment. Lateral internal anal sphincterotomy was performed under spinal anesthesia. Intraoperative findings and postoperative complications were documented.

Follow up: Patients were followed up at 2, 4, and 6 weeks, and at 3 months after treatment initiation. At each visit, symptom relief, pain score on the Visual Analogue Scale, clinical healing on inspection or

digital examination, adverse effects, recurrence, and persistence of the fissure were assessed. Patients lost to follow-up were contacted telephonically whenever possible.

Outcome measures: The primary outcome measure was complete healing of the fissure. Secondary outcome measures included symptomatic relief, time to healing, recurrence rate, complications, adverse effects, and requirement for surgical intervention.

Statistical analysis: Data were entered and analyzed using the Statistical Package for the Social Sciences (SPSS). Continuous variables such as age, body mass index, symptom duration, and Visual Analogue Scale pain scores were expressed as mean $\pm$ standard deviation and compared using the Student t test or the Mann-Whitney U test, depending on the data distribution. Categorical variables were presented as frequencies and percentages and compared using the chi-square test or Fisher's exact test, where appropriate. Repeated measures analysis was used to assess changes in pain scores over follow-up. A p-value less than 0.05 was considered statistically significant.

RESULTS

A total of 104 patients with a fissure in ano were included in the analysis. Of these, 72 patients had an acute fissure, and 32 had a chronic fissure.

Demographic profile and baseline characteristics: Baseline demographic and clinical features were largely comparable between acute and chronic groups, with significant differences only for age distribution and haemorrhoid prevalence. Bedridden status was uncommon in both groups, with no significant difference ($\chi^2 = 0.83$, $p = 0.72$). Laxative use was higher in chronic patients (59.38%) than in acute patients (25%), but this difference was not significant ($\chi^2 = 0.75$, $p = 0.73$) and did not differ continuously across chronic cases. Mean symptom duration was 15.8 days in the acute group versus 186.2 days in the chronic group. Among women, multiparity was common in both groups (acute: 67.9%; chronic: 71.4%), without a significant difference; intrapartum constipation was reported in 7 acute and 2 chronic cases; postpartum constipation was rare; and mode of delivery was similar between groups [Table 1].

Table 1: Demographic characteristics and baseline clinical history of patients

Parameter	Acute		Chronic		p-value
	n	%	n	%	
Age					
10–19	0	0	1	3.12	<0.05
20–29	12	16.67	3	9.38	
30–39	26	36.11	7	21.88	
40–49	19	26.39	7	21.88	
50–59	6	8.33	4	12.5	
60–69	8	11.11	6	18.74	
70–79	1	1.39	3	9.38	
80–89	0	0	1	3.12	
Gender					
Male	44	61.11	18	56.25	0.66
Female	28	38.89	14	43.75	0.53
BMI					
Underweight (<18.5)	1	1.39	0	0	0.35
Normal (18.5–24.9)	44	61.11	18	56.25	
Overweight (25–29.9)	25	34.72	14	43.75	
Obese (≥ 30)	2	2.78	0	0	
ECOG					
0	48	66.67	16	50	0.09
1	16	22.22	12	37.5	0.12
2	3	4.17	1	3.125	0.82
3	5	6.94	2	6.25	
4	0	0	1	3.125	
Comorbidities					
Diabetes Mellitus Type-2	13	18.06	8	25	0.44
Chronic kidney disease	7	9.72	7	21.88	0.11
Hypertension	12	16.67	6	18.75	0.82
Haemorrhoids	10	13.89	10	31.25	0.04
Hypothyroidism	7	9.72	6	18.75	0.21
GI-Tuberculosis	1	1.39	0	0	-
Inflammatory bowel diseases	3	4.17	0	0	-
Parity in female patients					
Nulliparous	4	14.29	2	14.29	0.87
Primigravida	5	17.86	2	14.29	0.76
Multiparous	19	67.86	10	71.43	0.07
Bedridden status	5	6.94	3	9.38	0.07
Laxative use	18	25	19	59.38	<0.05

Pain and symptom profile: Pain during defecation was present in all patients at presentation. The mean baseline VAS pain score was significantly higher in the acute fissure group compared to the chronic fissure group (7.57 vs 6.53, $p = 0.04$), indicating greater pain intensity in the acute fissure group. [Figure 1]

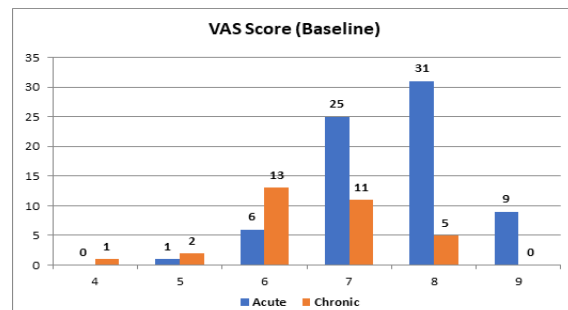


Figure 1: VAS pain score at initial assessment of patients

Peri-anal burning and peri-anal pruritus were significantly more common in chronic fissures (50% and 65.62%) than acute fissures (6.94% and 12.5%). In contrast, bleeding per rectum was significantly higher in acute fissures (58.33%) than in chronic fissures (31.25%). Constipation and diarrhea were similar in both groups, with no significant difference.

Overall, chi-square analysis showed significant differences for peri-anal burning, peri-anal pruritus, and bleeding PR between groups ($p = 0.009$).

Lifestyle factors: Daily sitting time and physical activity were similar in acute and chronic fissure groups. Sitting for more than 5 hours per day was reported by 59.7% of acute and 62.5% of chronic patients, with no significant difference ($p = 0.79$ and 0.22 , respectively). Regular exercise was reported by 37.5% in both groups, while 62.5% in each group were inactive. Mean daily water intake was 1.88 L, and diet type was comparable, with a similar proportion of vegetarians (acute 43.06% vs chronic 43.75%) and non-vegetarians (acute 56.94% vs chronic 56.25%). In contrast, low fiber intake was very common and significantly higher in chronic fissures (96.88%) than acute fissures (80.56%) ($p = 0.01$).

Clinical examination findings: Anal skin tags were rarely observed in acute fissures (2.78%) but were highly prevalent in chronic fissures (75%), a difference that was statistically significant. Discharge per anum was also significantly more common in chronic fissure patients. In contrast, blood spotting on the examining finger and increased anal tone were significantly more frequent in patients with acute fissures. Perianal skin excoriation did not differ significantly between groups. [Table 2]

Table 2: Comparison of clinical examination findings in acute and chronic fissure patients

Clinical findings	Acute		Chronic		p-value
	n	%	n	%	
Anal skin tag	2	2.78	24	75	<0.05
Peri-anal skin excoriation	7	9.72	1	3.12	0.21
Discharge per anum	3	4.17	21	65.62	<0.05
Spotting on the finger	34	47.22	6	18.75	<0.05
Increased Anal tone	65	90.28	20	62.5	<0.05

Fissure location differed significantly between acute and chronic cases (acute: $\chi^2 = 12.4$, $p < 0.05$; chronic: $\chi^2 = 4.9$, $p < 0.05$), with posterior midline overall predominance (70%, 28 patients) compared with anterior (30%, 12 patients). Across parity groups, posterior fissures consistently remained more common than anterior (nulliparous 66.7%, primigravida 71.4%, multiparous 70.4%), and parity showed a significant association with fissure location (anterior $\chi^2 = 7.6$; posterior $\chi^2 = 6.3$; $p < 0.05$).

Treatment and outcomes: Most patients were managed with medical therapy alone. Diltiazem with lignocaine was used in 35 patients, and nifedipine with lignocaine in 69 patients. Only 6 patients required surgical intervention in the form of lateral

internal anal sphincterotomy after failure of medical management. [Table 3]

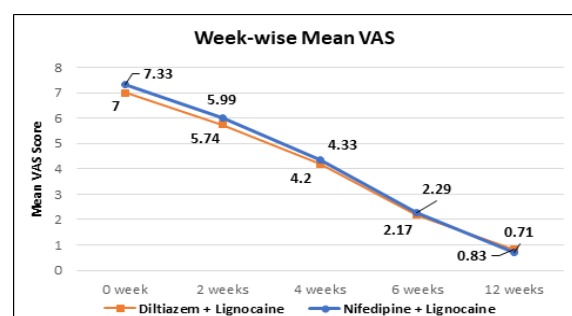


Figure 2: Week-wise mean VAS score in diltiazem lignocaine, and nifedipine lignocaine.

Table 3: Pattern of medical and surgical management in study patients

Group	Medical management alone (n)	Medical management followed by surgery (LAS) (n)	Total
Diltiazem + Lignocaine	32	3	35
Nifedipine + Lignocaine	66	3	69
Total	88	6	104

Mean VAS pain scores declined steadily and comparably over time in both treatment groups. By 12 weeks, pain scores were close to 1 in both groups,

indicating marked pain relief with both regimens. [Figure 4]

Constipation, bleeding per rectum, and perianal pruritus improved significantly in both treatment groups over 12 weeks. Improvement in bleeding per rectum was significantly greater in the nifedipine

lignocaine group compared to the diltiazem lignocaine group ($p = 0.04$), while improvement in constipation and pruritus was comparable between groups. [Table 4]

Table 4: Comparison of symptom improvement from baseline to 12 weeks between diltiazem lignocaine and nifedipine lignocaine groups

Symptom	Diltiazem + Lignocaine (Baseline → 12w)	Nifedipine + Lignocaine (Baseline → 12w)	p-value
Constipation (n)	31 → 3	58 → 2	0.52
Bleeding per rectum (n)	11 → 1	37 → 0	0.04
Peri-anal pruritus (n)	8 → 0	12 → 1	0.43

Adverse events and recurrence: Adverse events were low and comparable between diltiazem plus lignocaine ($n = 32$) and nifedipine plus lignocaine ($n = 66$), with no significant differences (all $p > 0.05$). Diltiazem most commonly caused dizziness (21.88%) and headache (12.50%), while nifedipine most commonly caused flushing (9.09%) and pruritus or palpitations (7.58% each). At 12 weeks, recurrence was 20.0% with diltiazem vs 11.59% with nifedipine, not significant ($p = 0.26$). After lateral internal anal sphincterotomy, pain occurred in all patients, but major complications, recurrence, and flatus or fecal incontinence was not seen; only 1 patient reported liquid incontinence.

DISCUSSION

This prospective observational study of 104 patients with fissure in ano over 18 months describes clinical features, risk factors, and outcomes of commonly used topical medical therapies, mainly topical calcium channel blockers with lignocaine. The findings reflect routine tertiary care practice and emphasize the central role of bowel habits and lifestyle factors in the chronicity of fissures. Symptom control was broadly comparable between nifedipine-based and diltiazem-based regimens. Acute fissure was most frequent in the 30 to 39 years age group, while chronic fissure showed a shift toward older age groups, especially beyond 60 years. This pattern is consistent with disease progression related to persistent constipation, recurrent injury, delayed care, and reduced tissue healing with age.^[15–17] Males predominated in both acute and chronic groups, similar to other Indian hospital-based studies, likely reflecting health-seeking behavior rather than true sex difference.^[2,18] Although fissure incidence is generally similar in both sexes, pregnancy and multiparity are recognized background factors in women due to constipation, pelvic floor stretch, and sphincter vulnerability.^[7,16,17,19,20] In this study, the posterior fissure remained predominant irrespective of obstetric status.

Body mass index and ECOG performance status did not significantly differ between acute and chronic fissures, suggesting limited influence on chronicity in this cohort. Most medical comorbidities were comparable between groups, though haemorrhoids were significantly more common in chronic fissure,

reflecting shared etiologic factors such as constipation and straining.^[10,16,21]

Symptom patterns clearly distinguished acute from chronic fissure. Acute fissures were characterized by higher pain scores and more frequent bleeding, while chronic fissures showed more discharge, pruritus, and burning.^[16,17,20,21] Constipation was highly prevalent in both groups, reinforcing its central role. Low fiber intake was significantly more common in chronic fissure, supporting the evidence that inadequate fiber intake contributes to hard stools, recurrent anodermal injury, and progression to chronic disease.^[16,20–22] Water intake was modest, which may further reduce the effectiveness of fiber. Clinical examination findings reliably marked chronicity. Sentinel skin tags and discharge per anum were strongly associated with chronic fissure, while spotting and higher anal tone were more typical of acute disease.^[16,17,20,21] Posterior midline fissures predominated in both groups, consistent with the anatomical vulnerability of this region.^[5,6,12,16,21]

Most patients responded to conservative and medical therapy, with only,^[6] requiring lateral internal sphincterotomy, supporting a stepwise management approach.^[4,11] Both nifedipine lignocaine and diltiazem lignocaine produced substantial symptom improvement with minimal adverse effects. Pain reduction was similar, while bleeding improvement favored nifedipine.^[4] Perianal pruritus improved in both groups. Recurrence at 12 weeks was numerically higher with diltiazem but not statistically significant, and likely influenced by persistent constipation and lifestyle factors.^[16,20–22] Surgical outcomes were favorable, with no major complications and minimal continence issues, consistent with existing literature.^[11,16,17,21]

Overall, the study highlights constipation and low fiber intake as key modifiable factors. Both topical calcium channel blocker regimens were effective and well tolerated, with nifedipine showing some advantage in bleeding control. Surgery was required in a small proportion, supporting conservative first-line management. Limitations include single-center design, non-random treatment allocation, and unequal group sizes. Future randomized studies with standardized protocols and objective measures of healing are needed to better define comparative efficacy in acute and chronic fissures.

Limitations and future directions: The study was single-center and non-randomized, limiting

generalizability and introducing potential selection bias. Outcomes were primarily symptom-based. Future randomized studies comparing nifedipine and diltiazem with standardized protocols and objective healing assessment are needed to further define optimal medical therapy.

CONCLUSION

Fissure-in-ano is common in young and middle-aged adults, and constipation with low dietary fiber intake is the key modifiable risk factor. Acute fissures usually present with severe pain and bleeding, while chronic fissures more often have discharge, pruritus, and sentinel pile. The posterior midline is the most common site in both acute and chronic fissures. Most patients respond to conservative care and topical calcium channel blockers with lignocaine. Both nifedipine and diltiazem regimens are safe and effective, with nifedipine showing a trend toward better bleeding control and lower recurrence. Surgery is needed only for patients who do not respond to medical therapy. Early diagnosis, bowel habit correction, adequate fiber and fluids, and patient education help prevent chronicity and recurrence, supporting a stepwise approach with surgery reserved for refractory cases.

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