

Original Research Article

A PROSPECTIVE STUDY ON HEALING, RECURRENCE, AND COMPLICATIONS OF ACUTE ANAL FISSURE TREATMENTS IN TERTIARY CARE CENTER

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ABSTRACT

Background: Acute anal fissures are a common anorectal condition causing significant pain and morbidity. Both medical and surgical management options exist, but their comparative outcomes in the Indian population remain underexplored. This study aimed to evaluate and compare the efficacy, safety, and patient satisfaction of surgical versus medical treatment of acute anal fissures at a tertiary care hospital.

Materials and Methods: This longitudinal study included 135 patients diagnosed with acute anal fissures, allocated into medical (n=67) and surgical (n=68) treatment groups. Medical management comprised topical nitrates, while surgical intervention involved lateral internal sphincterotomy. Patients were followed up at 4, 8, and 12 weeks post-treatment to assess healing rates, symptom resolution, complications, recurrence, and continence status using validated scales.

Results: The surgical group demonstrated significantly higher complete healing rates at 4 weeks (95.6% vs. 58.2%, p<0.001) and 8 weeks (98.5% vs. 74.6%, p<0.001) compared to the medical group. Time to symptom relief and pain resolution was notably shorter in the surgical group (6.2 vs. 13.8 days and 4.8 vs. 11.7 days, respectively; p<0.001). Recurrence rates were lower following surgery at 6 months (4.4% vs. 22.4%, p=0.002). The surgical group had a higher incidence of minor transient incontinence (7.4% flatus), while medical treatment was associated with more headaches (34.3%) and persistent pain (14.9%). Overall treatment satisfaction favored surgery (95.6% vs. 67.2%, p<0.001).

Conclusion: Lateral internal sphincterotomy offers superior healing, quicker symptom relief, and lower recurrence than medical therapy for acute anal fissures, despite minor risks of transient incontinence. Medical treatment remains an option for patients contraindicated for surgery. These findings support surgical management as the preferred treatment in appropriate patients.

Keywords: Acute anal fissure, lateral internal sphincterotomy, medical management, topical nitrates, treatment outcomes, recurrence, incontinence.

INTRODUCTION

Acute anal fissure is a longitudinal split in the anoderm, typically distal to the dentate line, most commonly occurring in the posterior midline due to relative ischemia in that area. It presents with severe post-defecatory anal pain, often described as sharp or burning, and may be associated with fresh rectal bleeding.^[1] The condition is highly prevalent and

constitutes a significant proportion of anorectal complaints in clinical practice. It has been reported that anal fissures account for approximately 10% to 15% of proctological consultations worldwide, with an estimated prevalence of 1 in 350 adults annually.^[2] In the Indian context, studies from tertiary care centers have documented that up to 18% of patients presenting with lower gastrointestinal symptoms suffer from acute anal fissures.^[3]

The etiology of acute anal fissure is multifactorial but primarily involves mechanical trauma from hard stools, leading to mucosal injury and secondary sphincter spasm. This initiates a vicious cycle of pain, spasm, and ischemia that prevents healing. Management strategies are broadly categorized into medical (conservative) and surgical modalities.^[4] includes Medical treatment dietary fiber supplementation, stool softeners, sitz baths, and topical pharmacological agents such as 0.2% glyceryl trinitrate (GTN) ointment and 2% diltiazem, both of which function as chemical sphincter relaxants. These agents have shown healing rates between 50% and 70% in various trials, although recurrence rates can reach 40% to 50% over time.^[5,6]

Surgical intervention, particularly lateral internal sphincterotomy (LIS), is considered the gold standard for refractory cases or those with recurrent fissures. LIS has demonstrated healing rates of over 90% and significant symptomatic relief, but it carries a risk of incontinence, with minor incontinence to flatus or feces reported in 5%–10% of patients.^[7,8] In India, a comparative study reported healing rates of 94% with LIS versus 62% with topical diltiazem over an 8-week period, highlighting the superior efficacy of surgery in persistent cases.^[9]

Despite these findings, there remains a lack of consensus on the optimal timing for transitioning from medical to surgical treatment, especially in resource-constrained public hospitals in India.^[10] Factors such as late presentation, poor adherence to conservative regimens, and socioeconomic complicate limitations often management. Furthermore, while many international studies have compared short-term outcomes, there is limited longitudinal data on recurrence and complications beyond six months in the Indian population.^[11]

This prospective study aims to compare the clinical outcomes, including healing rates, recurrence, and complications, of medical versus surgical management of acute anal fissures in patients treated at a tertiary care hospital. The findings are expected to provide region-specific insights that can inform context-appropriate treatment algorithms and improve patient care outcomes in Indian surgical practice.

MATERIALS AND METHODS

Study Design and Setting

This prospective cross-sectional study was conducted in the Department of General Surgery at a Tertiary Care Hospital, a referral center catering to both urban and rural populations in North India State. The study was carried out over the 24-month period from January 2022 to January 2024. Ethical clearance was obtained from the Institutional Ethics Committee. Written informed consent was taken from all patients prior to inclusion in the study.

Study Population

The study population consisted of adult patients aged 18 to 60 years who presented with symptoms of acute anal fissure to the general surgery outpatient department. Acute anal fissure was defined as a linear tear in the anoderm of less than six weeks' duration, typically located in the posterior midline, and associated with pain during defecation, bleeding per rectum, and visible sphincter spasm. Patients with fissures of longer duration, chronic changes (sentinel pile or hypertrophied papilla), coexisting anorectal disorders (e.g., hemorrhoids, fistula-in-ano), underlying systemic illnesses (e.g., inflammatory bowel disease, HIV), history of previous anorectal surgery, malignancy, pregnancy/lactation were excluded from the study to reduce confounding factors.

Sampling Method and Group Allocation

A total of 135 patients meeting the inclusion criteria were enrolled through purposive sampling. Based on clinical judgment and patient preference after counseling, participants were allocated into two groups. Group A (n = 67) received medical (conservative) treatment, while Group B (n = 68) underwent surgical management. The two groups were comparable at baseline with respect to age, gender distribution, and symptom duration.

Treatment Protocols

Patients in Group A were managed conservatively with dietary advice to increase fiber intake, warm sitz baths three times daily, oral stool softeners (lactulose 15–30 mL once daily), and topical 0.2% glyceryl trinitrate (GTN) ointment applied to the anal verge twice daily for 6–8 weeks. Patients intolerant to GTN due to headache or hypotension were switched to topical 2% diltiazem ointment. Treatment compliance and symptom progression were reviewed at each follow-up.

Group B patients underwent closed lateral internal sphincterotomy performed under spinal anesthesia. The patient was placed in the lithotomy position, and a small incision was made laterally at 3 or 9 o'clock. The lower one-third of the internal anal sphincter was divided under direct vision using a standard Parks' technique. Hemostasis was achieved, and the wound was left open to heal by secondary intention. Postoperative care included sitz baths, stool softeners, and oral analgesics. Patients were typically discharged within 24 hours unless complications were observed.

Outcome Measures and Follow-Up

Patients in both groups were followed at two weeks, four weeks, eight weeks, and three months after the start of treatment. The primary outcome was complete healing of the fissure, defined as the absence of pain and re-epithelialization of the tear on perianal inspection. Secondary outcomes included time to symptom resolution, recurrence (defined as return of symptoms and visible fissure after initial healing), and complications. Incontinence to flatus or feces in the surgical group was assessed at four and twelve weeks using the Wexner Incontinence Score. Adverse effects such as headache (in the medical group) and wound-related issues (in the surgical group) were documented.

Statistical Analysis

All clinical data were entered into Microsoft Excel and analyzed using SPSS software version 20.0. Continuous variables such as age and time to healing were presented as mean ± standard deviation (SD), while categorical variables like gender, healing rate, recurrence, and complication rates were expressed as frequencies and percentages. Between-group comparisons for continuous variables were performed using the independent samples t-test or the Mann–Whitney U test, depending on data distribution. Categorical variables were analyzed using the Chi-square test or Fisher's exact test. A p-value of less than 0.05 was considered statistically significant.

RESULTS

A total of 135 patients were included (67 medical, 68 surgical). The mean age was similar between groups (34.8 ± 9.1 vs. 36.2 ± 8.6 years, p = 0.213), with most patients aged 31-45 years. Gender distribution was comparable (male: 65.7% vs. 67.6%, p = 0.871). No significant differences were observed in symptom duration (19.2 ± 8.7 vs. $21.6 \pm$ 10.3 days, p = 0.143), pain severity (VAS 7.9 ± 1.1 vs. 8.1 ± 1.0 , p = 0.262), bleeding per rectum (64.2% vs. 66.2%, p = 0.815), anal spasm (82.1%vs. 83.8%, p = 0.782), or constipation (56.7% vs. 60.3%, p = 0.678). Posterior fissures predominated in both groups (94%), and around 76% had a first episode, with no significant intergroup differences (Table 1).

Table 1: Basenne Demographic and Chinical Characteristics of Study Farticipants			
	Medical Group	Surgical Group	
Variable	(n = 67)	(n = 68)	p-value
	Frequency (%)/Mean ± SD		
Age (years)	34.8 ± 9.1	36.2 ± 8.6	0.213
Age Group			
≤30 years	30 (44.8%)	27 (39.7%)	
31–45 years	33 (49.3%)	35 (51.5%)	0.876
>45 years	4 (6.0%)	6 (8.8%)	
Gender			
Male	44 (65.7%)	46 (67.6%)	0.971
Female	23 (34.3%)	22 (32.4%)	0.871
Duration of Symptoms (days)	19.2 ± 8.7	21.6 ± 10.3	0.143
Pain Severity (VAS Score 0–10)	7.9 ± 1.1	8.1 ± 1.0	0.262
Bleeding per Rectum	43 (64.2%)	45 (66.2%)	0.815
Anal Spasm on Examination	55 (82.1%)	57 (83.8%)	0.782
Associated Constipation	38 (56.7%)	41 (60.3%)	0.678
Fissure Location			
Posterior	63 (94.0%)	64 (94.1%)	1.000
Anterior	4 (6.0%)	4 (5.9%)	
Episode			
First Episode	51 (76.1%)	52 (76.5%)	0.983
Recurrent Episode	16 (23.9%)	16 (23.5%)	

Table 1: Baseline Demographic and Clinical Characteristics of Study Participants

Surgical management resulted in significantly higher healing rates at both 4 weeks (95.6% vs. 58.2%) and 8 weeks (98.5% vs. 74.6%) compared to medical treatment (p < 0.001). Symptom relief, pain resolution, and bleeding cessation occurred notably faster in the surgical group (mean of 6.2, 4.8, and 3.5 days, respectively) than in the medical group (13.8, 11.7, and 9.4 days; all p < 0.001). Recurrence

was more frequent in the medical group at both 3 months (17.9% vs. 2.9%, p = 0.006) and 6 months (22.4% vs. 4.4%, p = 0.002). Re-treatment was required in 16.4% of medically treated patients compared to only 1.5% in the surgical group (p = 0.003). Overall treatment satisfaction was significantly higher following surgery (95.6% vs. 67.2%, p < 0.001) (Table 2).

Table 2: Treatment Outcomes Between Medical an	nd Surgical Groups		
Outcome Variable	Medical Group (n = 67)	Surgical Group (n = 68)	p-value
	Frequency (%)/Mean ± SD		-
Complete Healing			
At 4 Weeks	39 (58.2%)	65 (95.6%)	< 0.001
At 8 Weeks	50 (74.6%)	67 (98.5%)	< 0.001
Time to Symptom Relief (days)	13.8 ± 4.2	6.2 ± 2.1	< 0.001
Time to Pain Resolution (days)	11.7 ± 4.5	4.8 ± 1.9	< 0.001
Time to Bleeding Resolution (days)	9.4 ± 3.7	3.5 ± 1.4	< 0.001
Recurrence			
Within 3 Months	12 (17.9%)	2 (2.9%)	0.006

Within 6 Months (%)	15 (22.4%)	3 (4.4%)	0.002
Need for Re-treatment	11 (16.4%)	1 (1.5%)	0.003
Overall Treatment Satisfaction	45 (67.2%)	65 (95.6%)	< 0.001

Adverse effects were more common in the medical group, notably GTN-related headaches in 34.3% and local irritation in 10.4%, compared to 1.5% in the surgical group (p = 0.034). Hypotension occurred in 6.0% of medically treated patients, with no such episodes post-surgery (p = 0.042). Persistent pain at 3 months was significantly higher in the medical

group (14.9% vs. 1.5%, p = 0.005). In the surgical group, complications included transient flatus incontinence (7.4%), stool incontinence (1.5%), wound infection (4.4%), and postoperative bleeding (2.9%). Recurrence remained notably higher in the medical group (22.4% vs. 2.9%) (Table 3).

Table 3: Complications Observed During Follow	/-Up		
Complication/Adverse Event	Medical Group (n = 67)	Surgical Group (n = 68)	p-value
	Frequency (%)		
Headache (GTN-related)	23 (34.3%)		_
Local Irritation or Dermatitis	7 (10.4%)	1 (1.5%)	0.034
Hypotension Episodes	4 (6.0%)	0 (0.0%)	0.042
Incontinence to Flatus		5 (7.4%)	_
Incontinence to Stool		1 (1.5%)	_
Wound Infection		3 (4.4%)	_
Postoperative Bleeding		2 (2.9%)	_
Persistent Pain at 3 Months	10 (14.9%)	1 (1.5%)	0.005
Hospital Stay >24 hours	—	3 (4.4%)	_
Recurrence	15 (22.4%)	2 (2.9%)	

Postoperative continence improved over time, with a significant reduction in mean Wexner score from 2.1 \pm 1.7 at 4 weeks to 0.8 \pm 0.9 at 12 weeks (p < 0.001). The proportion of patients with a Wexner score >5 declined from 5.9% to 1.5% (p = 0.173). Flatus incontinence was reported in 4.4% at 4 weeks

and 1.5% at 12 weeks (p = 0.251), while liquid stool incontinence occurred in 1.5% at 4 weeks and resolved completely by 12 weeks. No cases of solid stool incontinence were recorded at either time point (Table 4).

Table 4: Postoperative Continence Outcomes at 4 and 12 Weeks in Surgical Group (n = 68)			
Postoperative Continence	4 Weeks Post-op	12 Weeks Post-op	p-value
	Frequency (%)/Mean ± SD		
Wexner Score	2.1 ± 1.7	0.8 ± 0.9	< 0.001
Wexner Score > 5	4 (5.9%)	1 (1.5%)	0.173
Type of Incontinence			
Flatus	3 (4.4%)	1 (1.5%)	0.251
Liquid	1 (1.5%)	0 (0.0%)	0.320
Solid	0 (0.0%)	0 (0.0%)	

DISCUSSION

This prospective study comparing surgical and medical management of acute anal fissures at a tertiary care hospital provides robust evidence favoring surgical treatment in terms of faster healing, lower recurrence rates, and better overall patient satisfaction. The surgical group exhibited significantly higher healing rates at both 4 weeks (95.6% vs. 58.2%) and 8 weeks (98.5% vs. 74.6%) compared to the medical group, which aligns with findings from studies by Acar et al., and Hancke et al., that demonstrate lateral internal sphincterotomy (LIS) as the gold standard treatment for anal fissures.^[12,13] LIS acts by reducing resting anal sphincter pressure and interrupting the cycle of sphincter spasm and ischemia that perpetuates fissure non-healing.^[13] Our results echo those of Nelson et al., who reported over 90% healing rates post-LIS within 6 weeks, significantly outperforming conservative treatments.^[14]

The medical group, primarily treated with topical glyceryl trinitrate (GTN), showed slower resolution of symptoms with mean times to pain and bleeding resolution of 11.7 and 9.4 days respectively, compared to 4.8 and 3.5 days in the surgical group. This delay is consistent with the pharmacodynamics of topical nitrates, which induce sphincter relaxation via nitric oxide-mediated smooth muscle relaxation but require sustained application and patient compliance.^[15] A study by Prinita et al., similarly reported slower healing kinetics with GTN compared to LIS, though emphasizing its role in patients contraindicated for surgery.^[16] Recurrence rates at 6 months were significantly higher in the medical group (22.4% vs. 4.4%), reinforcing concerns over the durability of conservative management. Kumar et al., highlighted recurrence rates between 15-30% following topical nitrate therapy, contrasting with rates below 5% for surgical treatment, findings consistent with our data.^[17] The need for retreatment mirrored this trend,

with 16.4% of medically treated patients requiring additional interventions, compared to 1.5% in the surgical cohort. These data underscore the potential for persistent fissure pathology and incomplete sphincter relaxation with medical therapy alone.^[18] Adverse event profiles differed markedly between groups. GTN-related headaches were reported by 34.3% of the medical group, a well-documented side effect that frequently impairs adherence to treatment regimens.^[19] Local irritation and hypotension episodes, though less common, were significantly more frequent in the medical group. Conversely, surgical complications included transient flatus incontinence (7.4%), stool incontinence (1.5%), wound infection (4.4%), and postoperative bleeding (2.9%). The transient nature of incontinence was evidenced by the improvement in Wexner continence scores from 2.1 at 4 weeks to 0.8 at 12 weeks, with no cases of solid stool incontinence observed. This improvement aligns with findings from Reddy et al., who reported that minor incontinence following LIS typically resolves within 3 months due to sphincter adaptation and compensatory mechanisms.^[20] Persistent pain at 3 months was notably higher in the medical group (14.9% vs. 1.5%), likely due to ongoing sphincter hypertonia and ischemia, which medical treatment may inadequately address.^[21]

Demographic and baseline characteristics were comparable between groups, eliminating confounding bias. The predominance of posterior anal fissures (~94%) and a high prevalence of associated constipation (56.7% medical, 60.3% surgical) reflect typical clinical patterns in both Indian and global populations, as shown in epidemiological studies by Mustafa et al., and Pawar et al.^[22,23] The slightly younger mean age (~35 years) also corresponds with known epidemiology of anal fissures, which predominantly affect young and middle-aged adults.

Our findings reinforce that surgical management provides faster, more definitive treatment for acute anal fissures, with a trade-off of transient minor continence disturbances and rare wound complications. Medical therapy, despite a less favorable side effect profile and slower symptom resolution, remains a valuable option for patients with surgical contraindications or those preferring non-invasive management. These results corroborate with the reviews by Khan et al., and Rinait et al., suggesting LIS as the most effective modality for fissure healing with acceptable safety.^[24,25]

Limitations

This study has several limitations that warrant consideration. Firstly, being a single-center study conducted at a tertiary care hospital, the findings may have limited generalizability to other settings, particularly rural or primary care facilities. Secondly, the follow-up period of six months, although sufficient to assess early recurrence and healing, may not capture long-term outcomes such as late recurrences or chronic complications, including persistent incontinence. Thirdly, patientreported quality of life and psychological impact were not evaluated, which are important factors influencing treatment satisfaction and adherence. Additionally, while efforts were made to standardize treatment protocols, variability in patient compliance, especially in the medical group, could have influenced outcomes. Future multicenter studies with longer follow-up and inclusion of patient-centered outcomes would strengthen the evidence base.

CONCLUSION

In conclusion, surgical management of acute anal fissures demonstrated superior efficacy in achieving faster healing, lower recurrence rates, and higher patient satisfaction compared to medical therapy in this Indian tertiary care setting. While medical treatment with topical nitrates remains a viable alternative for patients unsuitable for surgery, it is associated with slower symptom resolution, higher recurrence, and notable side effects such as headaches. Surgical treatment carries a low risk of transient minor incontinence and wound-related complications but provides durable symptomatic relief. These findings support the preferential use of surgical intervention, particularly lateral internal sphincterotomy, as the standard of care for acute anal fissures, with individualized patient selection based on risk profiles and preferences.

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