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Comparative Study between Closed versus Open Lateral Internal Sphincterotomy in the Treatment of Chronic Anal Fissure

Dr. Gayathri V.¹, Dr. Vinayaka N.S.², Dr. Murali S.V.,³ Dr. Praveen S. Mali⁴,
Dr. Harindranath H.R.⁵

¹ Assistant Professor, Department of General Surgery, PES University Institute of Medical Sciences and Research, Bangalore, Karnataka, India.

² Professor, Department of General Surgery, PES University Institute of Medical Sciences and Research, Bangalore, Karnataka, India.

³ Assistant Professor, Department of General Surgery, PES University Institute of Medical Sciences and Research, Bangalore, Karnataka, India.

⁴ Post graduate resident, Department of General Surgery, Bangalore Medical College and Research Institute, Bangalore, Karnataka, India.

⁵ Professor, Department of General Surgery, Bangalore Medical College and Research Institute, Bangalore, Karnataka, India.

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ABSTRACT

BACKGROUND

Chronic anal fissure is a common benign anorectal condition associated with severe pain, bleeding, and significant impairment in quality of life. When conservative management fails, LIS (Lateral Internal Sphincterotomy) is considered the gold standard surgical treatment. Two techniques- OLIS (Open Lateral Internal Sphincterotomy) and CLIS (Closed Lateral Internal Sphincterotomy)-are widely practiced, yet debate continues regarding their relative efficacy and postoperative outcomes. This study was undertaken to compare early and short-term outcomes of open versus closed LIS in patients with chronic anal fissure.

MATERIALS AND METHODS

This prospective comparative study was conducted at Bowring and Lady Curzon Hospital and Victoria Hospital, attached to Bangalore Medical College and Research Institute, from May 2015 to May 2018. Sixty adult patients with chronic anal fissure refractory to conservative treatment were enrolled. Patients were randomly allocated into two equal groups: CLIS (n = 30) and OLIS (n = 30). Postoperative outcomes, including pain (assessed using the Visual Analog Scale at predefined intervals), bleeding, hematoma, seroma, abscess formation, flatus and stool incontinence, duration of hospital stay, and fissure healing, were evaluated and statistically analyzed.

RESULTS

The majority of patients were aged between 30 and 40 years, with a female predominance. Posterior midline fissures were most common. Both techniques were effective in relieving symptoms and achieving fissure healing, with no recurrence noted during follow-up. However, CLIS demonstrated significantly lower postoperative pain scores at 48, 60, 72, and 96 hours compared to OLIS. Postoperative bleeding, hematoma, seroma, and local abscess formation were more frequent in the open technique. Transient flatus incontinence was minimal and comparable in both groups, with no cases of stool incontinence. The mean hospital stay was significantly shorter in the closed sphincterotomy group.

CONCLUSION

Both open and closed lateral internal sphincterotomy are effective surgical options for chronic anal fissure. However, closed lateral internal sphincterotomy is associated with less postoperative pain, fewer complications, shorter hospital stays, and reduced overall morbidity, making it the preferred technique for the surgical management of chronic anal fissure.

KEYWORDS

Chronic Anal Fissure, Lateral Internal Sphincterotomy, Closed Sphincterotomy, Open Sphincterotomy, Postoperative Pain, Surgical Outcomes.

INTRODUCTION

Anal fissure is a common benign anorectal condition and a significant cause of morbidity encountered in surgical practice. It is characterized by severe pain during and after defecation, often accompanied by bleeding, which markedly affects the quality of life of affected individuals. While acute anal fissures may respond to conservative measures, chronic anal fissures frequently show a poor response to medical management and therefore often require surgical intervention.

LIS (Lateral Internal Sphincterotomy) has been established as the gold standard surgical treatment for chronic anal fissure due to its high healing rates and effective reduction of internal anal sphincter hypertonicity.^[1] By decreasing resting anal pressure, LIS improves anodermal blood flow, thereby promoting fissure healing and providing symptomatic relief. Over the years, two principal techniques of lateral internal sphincterotomy have been described and widely practiced: the open and the closed methods.^[2]

Advocates of the closed lateral internal sphincterotomy technique suggest that it is associated with a lower incidence of postoperative complications, particularly incontinence to stool, although transient incontinence to flatus has been reported with both techniques.^[2] The closed method is considered minimally invasive, involves less tissue dissection, and is believed to result in reduced postoperative pain and shorter hospital stays. On the other hand, proponents of the open technique argue that direct visualization of the internal anal sphincter fibers allows a more controlled and precise division of the sphincter muscle. This approach is also considered advantageous for surgical training, as it provides clear anatomical exposure and is therefore commonly recommended in teaching hospitals.

Despite widespread use of both techniques, controversy persists regarding their comparative safety and efficacy, particularly with respect to early postoperative outcomes such as pain, bleeding, wound-related complications, and continence status. In this context, the present study was undertaken to evaluate and compare the early surgical outcomes of open versus closed lateral internal sphincterotomy in the management of chronic anal fissure.

Aims and Objectives

The study aimed to compare the early surgical outcomes of open and closed lateral internal sphincterotomy in the management of chronic anal fissure. The objectives are to evaluate and compare postoperative pain, bleeding, wound-related complications, continence status, and duration of hospital stay between the two techniques and to determine whether either approach offers a clinical advantage in terms of safety, efficacy, and patient recovery.

MATERIALS AND METHODS

Study Design

This study was designed as a prospective comparative study conducted among patients admitted to Bowring and Lady Curzon Hospital and Victoria Hospital, both attached to BMCRI (Bangalore Medical College and Research Institute). The study was carried out over a defined period from May 2015 to May 2018. Eligible patients diagnosed with chronic anal fissure were prospectively enrolled and evaluated, with data systematically collected to compare outcomes between the study groups during the study period.

Inclusion and Exclusion Criteria

The study included patients aged 18 years and above who were diagnosed with chronic anal fissure of more than three months' duration, particularly those exhibiting features of chronicity such as sentinel pile, hypertrophied anal papillae, and exposure of internal anal sphincter fibers, and who had failed to respond to conservative management. Patients were excluded if they were younger than 18 years, pregnant women, those with anal fissures associated with inflammatory bowel disease or Crohn's disease, and patients with an immunocompromised state.

Sample Size Calculation

60

Data Collection Tools

Data were collected using a structured proforma designed for the study. This included detailed documentation of patient demographics, clinical history, presenting symptoms, duration of disease, findings on physical examination, diagnostic evaluation, and relevant laboratory investigations. Operative details such as the type of lateral internal sphincterotomy performed (open or closed), anesthesia used, and intraoperative findings were recorded. Postoperative assessment tools included the VAS (Visual Analog Scale) for pain evaluation, clinical assessment for bleeding, hematoma, seroma, abscess formation, and continence status, along with follow-up records to document fissure healing and postoperative complications.

Data Collection Procedure

After admission, patients fulfilling the inclusion and exclusion criteria were enrolled in the study following written informed consent. Baseline clinical data were collected preoperatively, and all patients received standard preoperative preparation, including antibiotic prophylaxis and bowel preparation with enema. Lateral internal sphincterotomy was performed using either the open or closed technique under appropriate anesthesia, with the internal sphincter divided away from the fissure. Patients were monitored postoperatively for immediate complications. Follow-up assessments were conducted weekly for the first two weeks, followed by biweekly reviews for the next six weeks to evaluate pain, bleeding, and fissure healing. Thereafter, patients were followed up monthly either through outpatient visits or telephonic interviews for

a minimum period of six months. Any patient developing postoperative complications during follow-up was recalled for detailed clinical evaluation and management.

RESULTS

Variable	Category	Number (%)
Age (in years)	<30	20 (33.3%)
	30–40	22 (36.7%)
	>40	18 (30.0%)
Sex	Female	35 (58.3%)
	Male	25 (41.7%)
Table 1: Demographic Profile of Study Participants (n = 60)		

Table 1 shows that the majority of patients were aged between 30 and 40 years, with a female predominance in the study population.

Symptom	Present n (%)
Anal pain	60 (100%)
Blood in stools	44 (73.3%)
Anal skin tag	45 (75.0%)
Mucoid discharge	30 (50.0%)
Perianal swelling	3 (5.0%)
Table 2: Clinical Presentation of Patients (Overall Symptoms)	

Table 2 illustrates that anal pain was universal among all patients, followed by anal skin tags and bleeding per rectum, confirming classical features of chronic anal fissure.

Location	Total n (%)	Male	Female
Posterior	51 (85.0%)	33	18
Anterior	7 (11.7%)	2	5
Both	2 (3.3%)	0	2
Table 3: Location of Anal Fissure			

Table 3 demonstrates that posterior midline fissures were most common, while anterior and combined fissures were predominantly seen in female patients.

Time Interval	Patients with No Pain (VAS-0) n (%)
6 hours	57 (95.0%)
12 hours	50 (83.3%)
24 hours	32 (53.3%)
36 hours	16 (26.6%)
48 hours	10 (16.7%)
60 hours	14 (23.3%)
72 hours	16 (26.7%)
96 hours	33 (55.0%)
Table 4: Overall Post-operative Pain Assessment (VAS Score, n = 60)	

Table 4 shows a marked reduction in postoperative pain immediately after surgery, with gradual pain resolution noted by 96 hours postoperatively.

Time Interval	Significance
6–24 hours	Not significant
48 hours	Significant (p < 0.05)
60 hours	Significant (p = 0.04)
72 hours	Significant (p = 0.014)
96 hours	Highly significant (p = 0.0002)
Table 5: Comparison of Post-operative Pain between CLIS and OLIS	

Table 5 illustrates that postoperative pain scores were significantly lower in the closed sphincterotomy group during the later postoperative period (48–96 hours).

Complication	Number (%)
Bleeding	11 (18.3%)
Hematoma	12 (20.0%)
Seroma (2 weeks)	9 (15.0%)
Abscess (2 weeks)	3 (5.0%)
Flatus incontinence (6 weeks)	3 (5.0%)
Stool incontinence	0 (0%)
Table 6: Post-operative Complications (Overall, n = 60)	

Table 6 shows that postoperative complications were generally infrequent, with no cases of stool incontinence reported during follow-up.

Outcome	CLIS n (%)	OLIS n (%)
Bleeding	2 (7%)	9 (30%)
Hematoma	2 (7%)	10 (33%)
Seroma	2 (7%)	7 (23%)
Abscess	1 (3%)	2 (7%)
Mean hospital stay (days)	2.38 ± 1.33	3.38 ± 2.45
Table 7: Comparison of Surgical Outcomes between CLIS and OLIS		

Table 7 demonstrates that closed lateral internal sphincterotomy was associated with fewer postoperative complications and a significantly shorter hospital stay compared to the open technique.

DISCUSSION

Characteristics of the Study Population

In the present study, sixty patients with chronic anal fissure underwent lateral internal sphincterotomy, with equal allocation to CLIS (Closed Lateral Internal Sphincterotomy) and OLIS (Open Lateral Internal Sphincterotomy). The median age at presentation was 34 years, which is consistent with previous studies reporting chronic anal fissure predominantly in young and middle-aged adults.^[3] A female predominance was observed, aligning with reported epidemiological patterns in the literature.^[4]

Anal pain during and after defecation was the universal presenting symptom (100%), followed by anal skin tag (75%) and bleeding per rectum (73%). This classical symptom triad has been described as highly predictive of chronic anal fissure and allows clinical diagnosis with minimal examination, thereby avoiding the severe pain associated with digital rectal examination in awake patients.^[5]

The majority of fissures were located in the posterior midline (85%), with anterior fissures seen predominantly in female patients. This predilection for posterior fissures is explained by anatomical and physiological factors, particularly reduced blood supply to the posterior commissure of the anoderm. Branches of the inferior rectal artery traverse the internal anal sphincter before reaching the anoderm, and increased resting sphincter pressure compromises perfusion, leading to ischemia and impaired healing.^[4,6,7]

Chronicity-related features such as sentinel pile, hypertrophied anal papillae, and exposed internal sphincter fibers were frequently observed, reflecting long-standing inflammation and fibrosis. Similar findings have been reported by Hiller and Aguilar et al., who emphasized the association of chronic fissures with fibrotic changes and persistent sphincter hypertonicity.^[8,9,10]

Postoperative Outcomes

All patients received spinal saddle block anesthesia, which contributed to minimal pain in the immediate postoperative period. Nearly all patients reported no pain during the first 6 hours, and satisfactory pain control persisted up to 24 hours postoperatively. Lateral internal sphincterotomy effectively relieved sphincter spasm, resulting in significant improvement in patient comfort and quality of life.

Postoperative bleeding occurred in a minority of patients and was successfully managed conservatively with local pressure. Hematoma and seroma formation were infrequent and did not require surgical intervention. The incidence of perianal sepsis was low, which can be attributed to meticulous surgical technique, prophylactic antibiotic administration, and strict postoperative hygiene measures.

Flatus incontinence was transient and rare, with no cases of stool incontinence reported. Arroyo et al. reported higher rates of transient flatus incontinence (up to 15%); however, the significantly lower incidence observed in the present study may reflect careful patient selection and limited sphincter division.^[11]

Comparison between Closed and Open Sphincterotomy

Comparison of postoperative pain between CLIS and OLIS revealed no statistically significant difference during the early postoperative period (up to 24 hours). However, at later time intervals (48, 60, 72, and 96 hours), pain scores were significantly lower in the CLIS group, indicating faster recovery and reduced tissue trauma. These findings are in agreement with reports by Ram et al. and Metcalfe et al., who demonstrated reduced postoperative discomfort following closed sphincterotomy.^[7,12]

Postoperative bleeding and hematoma formation were significantly higher in the OLIS group, likely due to greater tissue dissection and wound exposure. Although seroma and abscess formation were more frequent in the open group, these differences were not statistically significant. Flatus incontinence rates were low and comparable between the groups, with no long-term continence impairment observed.

The mean duration of hospital stay was significantly shorter in patients undergoing CLIS, reflecting reduced postoperative morbidity and faster return to normal activity.

The findings of the present study are consistent with multiple published reports. Pernkoff et al. found both techniques effective, with comparable healing rates and minimal incontinence.^[13] Kortbeek et al. reported similar complication rates but significantly less postoperative pain and shorter hospital stays with the closed technique.^[12] Arroyo et al. and

Garcia-Aguilar et al. also favored closed sphincterotomy due to reduced postoperative discomfort and lower impairment of continence.^[14,11]

Altomare et al. and Nelson concluded that while both techniques are effective, closed sphincterotomy offers advantages in terms of patient comfort and recovery.^[15,16] These findings further support the results of the present study.

The present study demonstrates that both open and closed lateral internal sphincterotomy are effective surgical options for chronic anal fissure. However, closed lateral internal sphincterotomy is associated with significantly less postoperative pain in the later recovery period, fewer complications, shorter hospital stays, and comparable healing rates, making it the preferred surgical technique for the management of chronic anal fissure.

CONCLUSION

Both open and closed lateral internal sphincterotomy are effective surgical techniques for the management of chronic anal fissure, with no significant difference observed in terms of recurrence, healing rates, or major complications such as incontinence or soiling. However, closed lateral internal sphincterotomy demonstrated clear advantages, including significantly lower postoperative pain, reduced incidence of seroma, hematoma, and local abscess formation, as well as a shorter mean duration of hospital stay, thereby lowering the overall cost burden. A statistically significant reduction in pain scores at 48, 60, 72, and 96 hours postoperatively further supports the superiority of the closed technique. Based on these findings, closed lateral internal sphincterotomy can be considered the treatment of choice for chronic anal fissure, as it is safe, effective, and associated with lower morbidity compared to the open technique.

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