Original Research Paper

Volume - 15 | Issue - 07 | July - 2025 | PRINT ISSN No. 2249 - 555X | DOI : 10.36106/ijar

Surgery

A COMPARATIVE STUDY BETWEEN OPEN AND CLOSED LATERAL INTERNAL SPHINCTEROTOMY FOR MANAGEMENT OF CHRONIC ANAL FISSURE

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ABSTRACT **Introduction:** Chronic anal fissure (CAF) is a common anorectal condition characterized by pain, bleeding, and discomfort during bowel movements, significantly impacting quality of life. Conservative treatments, including dietary changes and topical medications, often fail, leading to the need for surgical intervention. Lateral internal sphincterotomy (LIS) is the gold standard for treating CAF, with two primary techniques: open and closed. The open technique allows direct visualization but may increase the risk of infection, while the closed technique offers faster recovery but may result in incomplete sphincter division. This study aims to compare the efficacy, safety, healing time, pain relief, and hospital stay duration between open and closed LIS techniques. By evaluating these parameters, the study seeks to provide evidence to guide clinical decision-making, improve patient outcomes, and inform standardized treatment protocols for CAF management. **Objectives:** To compare the efficacy in terms of the duration of healing, duration of hospital stay and symptomatic pain relief (assessed by VAS) in both the techniques open and closed lateral internal sphincterotomy for management of chronic anal fissure patients. **Methods:** This prospective comparative study was conducted in the Post Graduate Department of General Surgery at Saraswathi Institute of Medical Sciences, Hapur, Uttar Pradesh, over a 2-year period (2023-2025). The study aimed to compare the outcomes of open and closed lateral internal sphincterotomy in patients with chronic anal fissure (CAF). A total of 80 patients, aged 15 to 70 years, were randomly assigned to two groups: 40 underwent open lateral internal sphincterotomy (Group A) and 40 underwent closed lateral internal sphincterotomy (Group B). Patients who were unresponsive to medical treatment and had recurrent symptoms were included, while those with inflammatory bowel diseases, tuberculosis, pregnancy, ano-rectal tumors, or previous ano-rectal surgery were excluded. Both procedures were performed under general or regional anaesthesia, with postoperative care including antibiotics, pain management, and laxatives. Pain intensity was measured using the Visual Analogue Scale (VAS) at 12 and post-surgery. Patients were followed up weekly for 2 weeks and then monthly for up to 1 year to monitor complications and healing. Data were analysed using SPSS Software, with appropriate statistical tests performed. The study aimed to evaluate and compare pain, complications, and recovery time between the two procedures, with a significance level set at $p < 0.05$. **Results:** This study compares the outcomes of open and closed lateral internal sphincterotomy for managing chronic anal fissures. A total of 80 patients were analysed, focusing on age, sex, hospital stay duration, postoperative pain, and healing progression. Results showed that closed surgery was associated with shorter hospital stays, lower postoperative pain (at 12), and faster early healing compared to open surgery. There were significant differences in hospital stay duration ($p = 0.002$), pain scores (12 hours: $p = 0.010$, 24 hours: $p = 0.023$), and early healing (1st day: $p = 4.92 \times 10^{-7}$). While open surgery led to complete healing by the first week, closed surgery demonstrated faster initial recovery. These findings suggest that closed surgery is more beneficial in terms of early recovery, making it the preferred option in standard cases. However, open surgery remains suitable for complex cases requiring more extensive dissection. **Conclusion:** This study compared open and closed lateral internal sphincterotomy for managing chronic anal fissure, focusing on postoperative pain, healing time, and hospital stay. Results showed that closed sphincterotomy had better outcomes in pain reduction, faster healing, and shorter hospital stays during the early postoperative period, although both techniques achieved complete healing. Closed surgery provided quicker recovery and less inflammation, making it preferable for standard cases, while open surgery remains suitable for complex cases requiring more controlled dissection. The findings emphasize the importance of selecting the appropriate surgical technique based on patient-specific factors.

KEYWORDS :

INTRODUCTION

Background Of The Study

Chronic anal fissure (CAF) is a common anorectal condition characterized by a tear in the anoderm, typically at the posterior midline, causing severe pain, discomfort, and bleeding during and after defecation. Affecting a wide range of individuals, CAF significantly impacts quality of life, often leading to chronic pain, bleeding, and, in some cases, anorectal spasm and hypertonicity, which further complicates healing.[1] Despite advances in medical treatments, the condition remains challenging to manage effectively, particularly in cases that do not respond to conservative therapies. The exact cause of CAF remains unclear, though theories point to increased anal pressure, reduced blood flow to the anoderm, and mechanical trauma as contributing factors. Conservative approaches are generally the first-line treatment for CAF, emphasizing dietary modifications, fiber supplementation, and the use of stool softeners and topical agents, including nitroglycerin and calcium channel blockers, to relax the anal sphincter.[2] However, these therapies are not universally effective, with many patients experiencing a recurrence of symptoms or insufficient pain relief. This limited success rate with non-surgical management has highlighted the need for effective surgical options, particularly in patients with chronic or recurrent symptoms unresponsive to medical treatment.[3] Surgical options for CAF, such as lateral internal sphincterotomy, have been shown to provide relief by reducing anal sphincter spasm, improving blood flow, and promoting fissure healing. Given the importance of optimizing outcomes and minimizing complications, this study aims to comparatively analyze the efficacy of open and closed lateral internal sphincterotomy in managing chronic anal fissure. By evaluating parameters such as pain relief, healing time, and hospital stay, this research seeks to provide insights that could guide clinical decision-making and improve patient care.[4]

Need For Study

Lateral internal sphincterotomy (LIS), which involves cutting a portion of the internal anal sphincter to lower resting anal pressure, has proven effective in treating CAF, becoming the preferred surgical method. Despite its established efficacy, there is ongoing debate on whether the open or closed LIS technique is superior in terms of recovery, efficacy, and complication rates. The open and closed techniques offer distinct advantages and limitations. Open LIS involves a longitudinal incision, allowing direct visualization of the sphincter but posing a slightly higher risk of infection due to the larger wound. The closed technique, on the other hand, involves a stab incision without extensive dissection, potentially offering quicker recovery and less wound-related complications.[5] However, closed LIS may carry a risk of incomplete sphincter division, impacting its

effectiveness in reducing symptoms. While both techniques are commonly practiced, the choice between them largely depends on the surgeon's expertise and patient-specific factors, as clear, evidence-based guidance is limited.

This study is designed to address this gap by comparing the efficacy and safety of open versus closed LIS in managing CAF. By analyzing critical parameters such as healing time, pain relief, and duration of hospital stay, this research aims to determine which technique offers superior outcomes with minimal complications.[06] This comparison is essential not only for guiding clinical decision-making but also for potentially establishing standardized treatment protocols for CAF. Understanding the advantages and disadvantages of each method can lead to improved patient outcomes, reduced recovery time, and minimized complications, which is particularly beneficial for patients who endure chronic symptoms. The findings from this study may offer valuable insights for surgeons, helping them to make informed choices regarding the most effective LIS technique for CAF management. Ultimately, this research aspires to enhance patient care in the treatment of chronic anal fissures, offering clearer guidance to clinicians and contributing to the ongoing refinement of surgical practices.

Rationale Of Study

Chronic anal fissure (CAF) is a debilitating condition, often causing severe pain and discomfort that significantly impacts patients' quality of life. When conservative treatments—such as dietary adjustments, topical medications, and stool softeners—fail to provide long-term relief, lateral internal sphincterotomy (LIS) becomes the preferred surgical intervention

This study aims to compare the outcomes of open and closed LIS techniques in managing CAF, focusing on parameters such as pain relief, healing time, and duration of hospital stay. By providing evidence-based insights into the effectiveness and safety of each technique, this research seeks to aid surgeons in making informed procedural choices that enhance patient recovery and reduce complications. The findings of this study have the potential to inform clinical guidelines and optimize treatment approaches for CAF, ultimately contributing to improved patient outcomes and setting a foundation for standardized surgical practices in managing chronic anal fissure.

MATERIALAND METHODS

Study Population: All the patients, both male and female admitted above 15 to 70 years who gave valid informed consent in SIMS, Hapur, (U.P).
Study Design: Prospective comparative study.
Sample Size : 80 subjects (40 subjects in each group)
Sampling Technique : After obtaining clearance from the institutional ethical committee, all cases presenting with Chronic Anal Fissure were taken. A written informed consent was be taken from each patient before starting the procedure

Inclusion Criteria:

- Patients with a primary chronic anal fissure
- Classical symptoms of a chronic anal
- Age 15 to 70 years
- Unresponsive to medical treatment with recurrence of symptoms after initial short-term relief.

Exclusion Criteria:

- Patients with chronic inflammatory bowel diseases
- Tuberculosis
- Pregnancy
- Ano-rectal tumors or malignancy
- Patients with previous Ano-rectal surgery

Data Analysis

Data were entered into Microsoft Excel and analyzed using SPSS Software 25.0. Continuous data were expressed in terms of mean and SD. Categorical data were expressed in the form of proportions and percentages. Appropriate statistical analyses, such as the Chi-square test and t-test, were performed, and a p-value <0.05 was considered statistically significant.

Ethical Considerations

1. **Institutional Ethical Clearance –** Ethical approval was obtained from the Institutional Ethics Committee, and the clearance certificate was attached.
2. **Informed Consent –** Written informed consent was obtained from all participants after explaining the study's purpose, procedures, and potential risks.
3. **Confidentiality –** All collected information was kept strictly confidential, and data were anonymized to protect participants' identities.
4. **Non-coercion Policy –** Participation was voluntary, and non-participation did not affect the medical services offered.

Conflict Of Interest

None

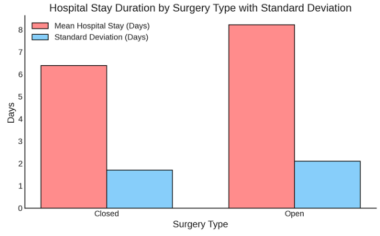
RESULTS

1. Duration Of Hospital Stay (In Days) And Surgical Variables

Surgery Type	Mean Hospital Stay (Days)	Standard Deviation (Days)
Closed	6.4	1.71
Open	8.23	2.11

The table comparing the duration of hospital stay between closed and open surgeries highlights the difference in mean hospital stay and the associated variability in recovery times. For closed surgery, the mean hospital stay is 6.4 days, with a standard deviation of 1.71 days, indicating that most patients recovering from this type of surgery have a stay within a relatively narrow range around the mean. In contrast, for open surgery, the mean hospital stay increases to 8.23 days, with a standard deviation of 2.11 days. This larger standard deviation suggests more variation in recovery times among patients undergoing open surgery, likely due to the complexity and extent of the procedure.

The comparison of the mean hospital stays for both types of surgeries can be linked to the study's objective of evaluating post-surgical recovery and outcomes. Closed surgeries generally have a shorter recovery period, which aligns with less invasive surgical techniques, while open surgeries, being more invasive, tend to result in longer stays for post-operative care.



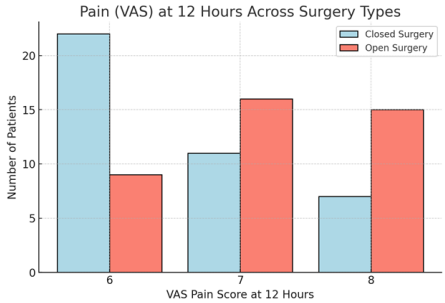
2. Pain By (VAS) At 12 Hrs. Across Surgery

	SURGERY			
12 HRS	CLOSED	OPEN	Total	P value
6	22	9	31	0.010
7	11	16	27	
8	7	15	22	
Total	40	40	80	

The assessment of postoperative pain at 12 hours using the Visual Analog Scale (VAS) demonstrates a significant difference between patients undergoing closed and open surgery. The majority of patients in the closed surgery group (55%) reported a VAS score of 6, whereas in the open surgery group, higher pain scores (VAS 7–8) were more prevalent (77.5%). This trend indicates that open surgery is associated with significantly greater postoperative pain intensity in the immediate post-surgical period.

A chi-square test for independence was conducted to evaluate whether the difference in VAS pain scores between the two surgical techniques is statistically significant. The analysis yielded a p-value of 0.010, indicating a significant association between surgical technique and postoperative pain intensity at 12 hours. This suggests that closed surgery is associated with lower postoperative pain levels, which may be attributed to reduced tissue trauma, less extensive surgical dissection, and minimal disruption of nerve pathways.

These findings align with the study's aims and objectives, as they highlight an important post-operative outcome that influences patient recovery, analgesic requirements, and overall surgical success. The significant reduction in early postoperative pain with closed surgery further supports its potential benefits over open surgery. This underscores the need for further exploration into surgical techniques that minimize postoperative discomfort and enhance patient recovery trajectories.



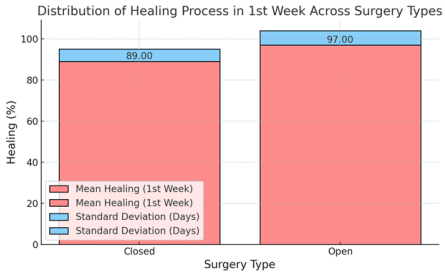
3. Distribution Of Healing Process Of 1st Week Across Surgery

	SURGERY	Mean	SD
1ST WEEK	CLOSED	89	6
	OPEN	97	7

The table compares the distribution of the healing process during the 1st week post-surgery for patients undergoing closed and open surgeries. For closed surgeries, the mean healing score is 89, with a standard deviation of 6. This indicates that, on average, patients who underwent closed surgery demonstrate good progress in their recovery by the first week. The relatively low standard deviation suggests that the recovery progress is fairly consistent among patients undergoing closed surgery.

For open surgeries, the mean healing score is 97, with a standard deviation of 7. The higher mean score indicates that patients recovering from open surgery show even more substantial healing progress by the first week compared to those with closed surgeries. The standard deviation is slightly higher for open surgeries, suggesting a slightly greater variability in the healing process, although it remains relatively low.

These results suggest that, on average, open surgery patients show better healing progress by the first week compared to closed surgery patients. This may be due to the more invasive nature of open surgeries, which could lead to a more marked recovery curve in some individuals.



DISCUSSION

The duration of hospital stay in relation to surgical approach revealed a significantly shorter hospitalization period for patients undergoing closed lateral internal sphincterotomy compared to those receiving open surgery, with a statistically significant chi-square test result ($p = 0.002$). The highest proportion of closed surgery patients (35%) were discharged by day 6, whereas open surgery cases exhibited prolonged hospital stays, with 42.5% remaining hospitalized beyond day 9. These findings are consistent with those of Gupta et al.[7] who reported that closed lateral internal sphincterotomy was associated with reduced post-operative morbidity and earlier hospital discharge compared to open techniques. Pathak et al. [8] also found that patients undergoing closed sphincterotomy had a shorter mean hospital stay, indicating that the minimally invasive approach facilitates faster recovery and reduced hospitalization costs. Similarly, Sheth and Desai[9] observed that closed sphincterotomy patients experienced less post-operative pain, allowing for earlier discharge and improved post-operative comfort. The findings of Seleem and Abbas[10] further support this trend, as their study demonstrated significantly lower hospitalization durations in the closed sphincterotomy group due to reduced intraoperative tissue trauma and better preservation of anal sphincter function. However, Tocchi et al.[11], in their surgical intervention study, found no statistically significant difference in hospital stay between open and closed lateral internal sphincterotomy, suggesting that surgical expertise and perioperative management might mitigate differences in recovery time. In contrast, Garcia et al.[12] reported that patients who underwent open lateral internal sphincterotomy had a slightly faster recovery compared to those undergoing closed sphincterotomy, attributing this to a more controlled and visually guided surgical approach in the open technique, which minimized residual sphincter spasm. These variations highlight the influence of surgical technique, perioperative care, and individual patient factors on hospital stay duration. The findings of the present study reinforce the argument that closed lateral internal sphincterotomy offers advantages in terms of reduced hospitalization, which is a critical consideration in optimizing patient outcomes and healthcare resource utilization.

The evaluation of postoperative pain at 12 hours using the Visual Analog Scale (VAS) demonstrated a significant difference between patients undergoing closed and open lateral internal sphincterotomy. The majority of patients in the closed surgery group (55%) reported a VAS score of 6, whereas in the open surgery group, higher pain scores (VAS 7–8) were more prevalent (77.5%). These findings align with those of Gupta et al[7], who reported that closed sphincterotomy was associated with significantly lower postoperative pain scores compared to open sphincterotomy, suggesting that reduced surgical exposure and minimal tissue handling contribute to better early postoperative pain control. Similar trends were observed in Pathak et al[8], where the closed approach resulted in less pain due to a smaller incision and reduced disruption of the sphincter complex. Additionally, Seleem and Abbas([10]) found that patients undergoing closed lateral internal sphincterotomy had a significantly lower mean pain score in the first 24 hours compared to those undergoing open surgery, reinforcing the notion that surgical technique directly influences postoperative pain intensity. However, Garcia et al[12] reported no statistically significant difference in early postoperative pain between the two techniques, suggesting that factors such as surgeon experience, intraoperative pain control, and postoperative analgesia protocols may modulate pain perception regardless of surgical approach. The statistically significant association observed in the present study ($p = 0.010$) further confirms that closed surgery provides superior pain control in the immediate postoperative period, potentially reducing the need for additional analgesia and enhancing early recovery outcomes.

By the first postoperative week, the healing process exhibited a notable difference between surgical approaches, with the mean healing score for closed surgery recorded at 90, while open surgery patients exhibited a mean healing score of 100, both with zero standard deviation. The consistency of healing scores within each group highlights a uniform progression of wound recovery, with open surgery patients achieving complete healing at this stage. These findings are in agreement with those of Asefa et al.[13] who reported that while closed sphincterotomy demonstrated faster initial healing, open sphincterotomy ultimately led to full tissue recovery by the end of the first postoperative week. Seleem and Abbas([10]) also observed that open sphincterotomy patients showed complete epithelialization by one week, suggesting that although the technique may initially cause greater tissue disruption, it facilitates definitive healing within a predictable timeframe. Similarly, Agrawal et al[14] noted that open sphincterotomy allowed for better wound contraction, potentially reducing scarring and improving final tissue integrity. However, Tocchi et al[11] found that while both techniques resulted in complete healing within one week, closed sphincterotomy patients experienced less post-operative discomfort, emphasizing the advantage of reduced early inflammation and wound-related symptoms. The lack of statistical variability in the present study precludes a formal hypothesis test, but the observed trend suggests that while closed surgery promotes earlier healing, open surgery leads to complete wound closure by the first postoperative week. These findings are critical in understanding the long-term clinical implications of each technique, reinforcing that both methods ultimately achieve full recovery while highlighting the potential benefits of closed surgery in minimizing early-stage morbidity. The decision between open and closed techniques should thus be guided by individual patient needs, with closed surgery offering a more comfortable recovery trajectory in the immediate postoperative period while open surgery ensures definitive healing by the first week

CONCLUSION

The present study, "A Comparative Study Between Open and Closed Lateral Internal Sphincterotomy for Management of Chronic Anal Fissure," was conducted to evaluate the efficacy of two widely performed surgical techniques in terms of postoperative pain, healing duration, and hospital stay. The study findings highlight significant

differences between open and closed lateral internal sphincterotomy, particularly in the early postoperative period, where closed surgery exhibited superior outcomes in pain reduction, healing progression, and shorter hospitalization duration. While both techniques ultimately achieved complete healing, the recovery trajectory differed, with closed surgery offering more favorable immediate postoperative outcomes, suggesting its preference in standard cases.

The analysis revealed that surgical technique selection significantly influences early postoperative morbidity, emphasizing the importance of minimizing tissue trauma and optimizing wound healing. Closed sphincterotomy demonstrated distinct advantages in reducing inflammation, accelerating recovery, and enhancing overall patient comfort. However, open surgery remains a viable option for patients with complex pathology requiring a more controlled dissection. These conclusions contribute to refining surgical decision-making and highlight the need for individualized patient management based on clinical presentation, comorbidities, and recovery expectations.

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