



Postoperative Complications of Closed Lateral Sphincterotomy in Patients with Chronic Anal Fissure

Gulfam Ullah¹, Gulsharif¹, Muhammad Danial¹, Abdullah Khan², Murtaza Ayaz¹, Maira Ilyas¹

¹Department of General Surgery, Lady Reading Hospital, Peshawar, Pakistan

²Department of General Surgery, Peshawar Institute of Medical Sciences, Peshawar, Pakistan

ARTICLE INFO

Keywords: Anal fissure, Fecal incontinence, Pain, Postoperative complications, Sphincterotomy

Correspondence to: Gulfam Ullah, Department of General Surgery, Lady Reading Hospital, Peshawar, Pakistan. Email: gulfamm753@gmail.com

Declaration

Authors' Contribution: All authors equally contributed to the study and approved the final manuscript.

Conflict of Interest: No conflict of interest.

Funding: No funding received by the authors.

Article History

Received: 10-02-2025 Revised: 02-05-2025
Accepted: 17-05-2025 Published: 30-05-2025

ABSTRACT

Background: A chronic fissure of the anal canal is a painful condition of the anal canal that causes discomfort both during and after the defecation process. If the condition does not respond to medical treatment, closed lateral sphincterotomy is normally used. However, this procedure is associated with the risk of developing different postoperative complications. **Objective:** To determine the frequency of postoperative complications after closed lateral sphincterotomy in patients with chronic anal fissure. **Study Design:** Descriptive cross sectional study. **Duration and Place of Study:** This study was conducted from July 2024 to January 2025 in the Department of General Surgery, Lady Reading Hospital, Peshawar. **Methodology:** A total of 122 patients aged 18 to 70 years with chronic anal fissure were included. All patients underwent closed lateral sphincterotomy under regional anesthesia. Postoperative complications including pain, gas incontinence and fecal incontinence were assessed after surgery and during follow up. Data was analyzed using Statistical Package for Social Sciences version 26. Chi square test and Fisher exact test were applied, and p value less than 0.05 was considered significant. **Results:** The mean age of patients was 39.49 years. Postoperative pain was observed in 34.40% patients, gas incontinence in 9.00% and fecal incontinence in 5.70%. Age showed significant association with gas incontinence and fecal incontinence. **Conclusion:** Closed lateral sphincterotomy is an effective treatment for chronic anal fissure but postoperative complications are common especially pain and incontinence particularly in older patients.

INTRODUCTION

Chronic fissure of the anal region refers to a painful condition that involves a tear or crack in the tissues that make up the anal canal.¹ The tear in the tissues causes a lot of pain, especially after a bowel movement.¹ The major symptom exhibited by a patient with a chronic fissure in the anal region is pain around the rectal area, which can last for several hours after a bowel movement.² Over the years, the fissure may become chronic, causing thickening of the tissue and contraction of the muscle surrounding the rectal area, hence causing pain and discomfort to the patient.³ Left untreated, chronic fissures in the anal region may cause difficulties in carrying out daily tasks due to the pain associated with the medical condition.⁴

Closed lateral sphincterotomy represents a very common surgical technique utilized in the management of chronic anal fissures, especially when the results derived from the use of pharmacologic therapies and lifestyle changes are inadequate.⁵ This surgical technique involves the meticulous incision of a part of the external sphincter muscle of the anal structure.⁶ This significantly increases the chances of the fissure healing by creating a more ideal

environment that is conducive to the healing effects.⁷ This surgical technique also represents a preferred choice owing to the relatively minimal invasive nature of this technique and the good outcomes related to the decrease in pain and the healing rate as well.⁸ There are, however, risks and complications associated with this surgical technique.

Regarding post-operative complications, these can include a range of problems such as pain, incontinence of flatus, as well as incontinence of fecal material post-operatively in cases involving closed lateral sphincterotomy.⁹ Pain is perhaps one of the most complained-about post-operative concerns, especially in relation to the first few days post-surgery. While it is expected that there be some degree of pain, it can also be considered an indication of a problem with healing if it is chronic in nature.¹⁰ A loss of bowel continence in relation to the passage of gas is another possible post-operative problem, which is especially frustrating due to the accompanying embarrassment that can be associated with this problem.¹¹ This particular problem is due to the weakened, modified muscle tone within the sphincter, which is no longer capable of

controlling the passage of gas.¹² Occasionally, it can become so severe as to involve problems associated with the incontinence of fecal material, which is obviously even more challenging in terms of needing further treatment, such as rehabilitation programs or further surgical intervention.¹³

According to a study, postoperative complications of closed lateral Sphincterotomy in patients with chronic anal fissure were Pain by 26.66%, Gas Incontinence 10% and Fecal Incontinence by 5.33%.¹⁴

The need for doing this study in Peshawar is crucial because many people in this region suffering from chronic anal fissures and there was not enough research in this area. The healthcare system not have enough data to understand the common complications that patient face after surgeries like closed lateral sphincterotomy. Understanding this issues is important because the complications like pain, gas incontinence and fecal incontinence can have a big effect on daily lives. By doing this study we can get more information that can help doctor in Peshawar treat patient better and also improve the healthcare facilities for these patient.

METHODOLOGY

The study was carried out in the Department of General Surgery Lady Reading Hospital Peshawar and it was descriptive in nature. The duration of the study extended from 10th July 2024 to 10th January 2025. Approval for the study was obtained from the ethical committee board of the hospital (Ref: No. 160/LRH/MTI) as well as the research department of CPSP Karachi before initiation of data collection, and all procedures were conducted in accordance with institutional guidelines. The sample size was calculated as 122 using the WHO sample size calculator. The calculation was based on an anticipated frequency of fecal incontinence of 5.33%,¹⁴ a margin of error of 4% and a confidence level of 95%. Patients were enrolled using consecutive non-probability sampling technique until the required sample size was achieved. Patients aged between 18 and 70 years of both male and female gender and diagnosed with chronic anal fissure were included in the study. Chronic anal fissure was considered in patients having history of painful defecation with bleeding per rectum for more than 4 weeks along with clinical evidence of tear in the anal mucosa associated with sentinel pile. Patients having other anorectal disease, hemorrhoids, or chronic liver disease were excluded from the study.

Before initiation of data collection, the purpose and benefits of the study were explained to all eligible patients. They were informed that participation carried no additional risk and informed written consent was obtained from each patient prior to enrollment. Demographic information including age, gender, BMI, socio economic status and residence was recorded on a pre-designed structured proforma for all enrolled patients. A detailed history was taken focusing on symptoms related to anal fissure and relevant clinical examination was performed to confirm the diagnosis. All patients diagnosed with chronic anal fissure underwent closed lateral sphincterotomy in lithotomy position under regional anesthesia. The procedure was performed using a scalpel by dividing the

lower half of the anal sphincter followed by application of pressure on the wound site for 3 minutes to minimize bleeding and hematoma formation. All patients were discharged approximately 10 hours after surgery and were followed for postoperative assessment. Postoperative complications were evaluated after completion of the procedure and during follow-up period. Pain was considered as discomfort or unpleasant sensation experienced by the patient after 48 hours of the surgical procedure and was assessed using Visual Analog Score ranging from 0 to 10 where score more than 3 was taken as presence of pain. Gas Incontinence was taken as involuntary passage of gas from the anus for a duration of at least 5 days leading to inability to control timing or frequency. Fecal Incontinence was considered when there was uncontrolled passage of feces for at least 5 days in patients who previously had bowel control on history. All collected data were entered and analyzed using IBM SPSS version 26. Numerical variables such as age, height, weight and BMI were analyzed by calculating mean \pm SD. Categorical variables including gender, Pain, Gas Incontinence, Fecal Incontinence, socio economic status and residence were expressed as frequencies and percentages. Effect modifiers including age, BMI, gender, socio economic status and residence were controlled through stratification and post-stratification Chi-square test or Fisher's exact test was applied at 5% level of significance.

RESULTS

The mean age of patients was found 39.49 ± 13.08 years with average height measuring 1.65 ± 0.07 meters and weight being 72.66 ± 9.85 kilograms. The body mass index was calculated as 26.74 ± 2.78 kg/m². Regarding gender distribution, males were comprising 71 patients (58.2%) while females were 51 patients (41.8%). When analyzing socioeconomic status, lower class patients were maximum with 60 cases (49.2%), followed by middle class having 49 patients (40.2%) and upper class was least represented with only 13 patients (10.7%). The residential distribution showed that rural patients were more common accounting 69 cases (56.6%) compared to urban patients who were 53 (43.4%) (as shown in Table 1).

Table 1
Patient Demographics and Characteristics

Demographics	Mean \pm SD / n (%)
Age (years)	39.49 \pm 13.08
Height (m)	1.65 \pm 0.07
Weight (kg)	72.66 \pm 9.85
BMI (kg/m ²)	26.74 \pm 2.78
Gender	Male n (%)
	Female n (%)
Socioeconomic Status	Lower Class n (%)
	Middle Class n (%)
	Upper Class n (%)
Residence	Urban n (%)
	Rural n (%)

The postoperative complications assessment revealed that pain was experienced by 42 patients representing 34.40% of total cases while remaining 80 patients (65.60%) did not reported pain. Gas incontinence was observed in 11

patients which is 9.00% whereas 111 patients (91.00%) were not having this complication. Fecal incontinence was least common complication occurring in only 7 patients (5.70%) with 115 patients (94.30%) being free from this complication (as shown in Table 2).

Table 2
Frequency of Postoperative Complications Following Closed Lateral Sphincterotomy in Patients with Chronic Anal Fissure

Postoperative Complications		Frequency	%age
Pain	Yes	42	34.40%
	No	80	65.60%
Gas Incontinence	Yes	11	9.00%
	No	111	91.00%
Fecal Incontinence	Yes	7	5.70%
	No	115	94.30%

The association analysis between demographic factors and postoperative complications demonstrated several findings. For pain, patients aged ≤50 years showed 30 cases (30.6%) with pain versus 68 cases (69.4%) without pain, while patients >50 years had 12 cases (50.0%) with pain and 12 cases (50.0%) without pain, but this difference

was not statistically significant (p=0.073). Gender wise, males had 24 cases (33.8%) with pain compared to females having 18 cases (35.3%) with pain, showing no significant association (p=0.864). BMI categories showed 15 patients (36.6%) with pain in ≤25 group and 27 patients (33.3%) in >25 group without significant difference (p=0.721). Socioeconomic status and residential status also showed no significant associations with pain having p-values of 0.927 and 0.290 respectively. For gas incontinence, age showed significant association where patients ≤50 years had 6 cases (6.1%) compared to >50 years having 5 cases (20.8%) with p-value of 0.039. However, gender (p=0.760), BMI (p=0.097), socioeconomic status (p=0.509), and residential status (p=0.755) did not showed significant associations. Regarding fecal incontinence, age was significantly associated with patients ≤50 years showing 3 cases (3.1%) versus >50 years having 4 cases (16.7%) with p-value of 0.027. Other demographic factors including gender (p=1.000), BMI (p=1.000), socioeconomic status (p=0.559), and residential status (p=0.469) were not significantly associated with fecal incontinence (as shown in Table 3).

Table 3
Association of Postoperative Complications with Demographic Factors

Demographic Factors		Pain		p-value	Gas Incontinence		p-value	Fecal Incontinence		p-value
		Yes n(%)	No n(%)		Yes n(%)	No n(%)		Yes n(%)	No n(%)	
Age (years)	≤50	30 (30.6%)	68 (69.4%)	0.073	6 (6.1%)	92 (93.9%)	0.039*	3 (3.1%)	95 (96.9%)	0.027*
	>50	12 (50.0%)	12 (50.0%)		5 (20.8%)	19 (79.2%)		4 (16.7%)	20 (83.3%)	
Gender	Male	24 (33.8%)	47 (66.2%)	0.864	7 (9.9%)	64 (90.1%)	0.760*	4 (5.6%)	67 (94.4%)	1.000*
	Female	18 (35.3%)	33 (64.7%)		4 (7.8%)	47 (92.2%)		3 (5.9%)	48 (94.1%)	
BMI (Kg/m ²)	≤25	15 (36.6%)	26 (63.4%)	0.721	1 (2.4%)	40 (97.6%)	0.097*	2 (4.9%)	39 (95.1%)	1.000*
	>25	27 (33.3%)	54 (66.7%)		10 (12.3%)	71 (87.7%)		5 (6.2%)	76 (93.8%)	
Socioeconomic Status	Lower Class	21 (35.0%)	39 (65.0%)	0.927	6 (10.0%)	54 (90.0%)	0.509*	3 (5.0%)	57 (95.0%)	0.559*
	Middle Class	16 (32.7%)	33 (67.3%)		5 (10.2%)	44 (89.8%)		4 (8.2%)	45 (91.8%)	
	Upper Class	5 (38.5%)	8 (61.5%)		0 (0.0%)	13 (100.0%)		0 (0.0%)	13 (100.0%)	
Residential Status	Urban	21 (39.6%)	32 (60.4%)	0.290	4 (7.5%)	49 (92.5%)	0.755*	2 (3.8%)	51 (96.2%)	0.469*
	Rural	21 (30.4%)	48 (69.6%)		7 (10.1%)	62 (89.9%)		5 (7.2%)	64 (92.8%)	

*Fischer Exact Test

DISCUSSION

In present study, postoperative pain was experienced by 42 patients (34.40%) which is considerable complication rate. This high frequency of pain can be attributed to the surgical trauma to anal sphincter muscle and surrounding tissues which leads to inflammatory response and nerve irritation in highly sensitive anal region. The anal canal is having dense nerve supply which makes it more prone to postoperative pain sensations. Gas incontinence was observed in 11 patients (9%) in this study. This complication occurs because of partial damage to internal anal sphincter during sphincterotomy procedure which disrupts the normal continence mechanism. The internal sphincter is responsible for maintaining resting anal tone and its division can lead to temporary or permanent weakness resulting in inability to control gas passage. Fecal incontinence was least common complication found in 7 patients (5.70%). This serious complication happens when sphincter division is too extensive or when external sphincter is inadvertently damaged during procedure. The sphincter complex is crucial for maintaining fecal

continence and any significant disruption can compromise this function. Age showed significant association with both gas incontinence (p=0.039) and fecal incontinence (p=0.027), with higher rates in patients >50 years. This finding can be explained by age-related degeneration of sphincter muscles and reduced tissue elasticity in older patients. The healing capacity and muscle regeneration also decreases with advancing age which makes elderly patients more vulnerable to develop incontinence complications after sphincter surgery. The present study findings regarding postoperative complications can be compared with existing literature which shows both similarities and differences. The pain frequency of 34.40% (42 patients) in current study is considerably lower than what was reported by Khan ZA *et al.*¹⁴ where 89.4% patients experienced pain preoperatively but 81.7% became pain-free at follow-up. However, Baig AA *et al.*¹⁵ reported that 68.3% obtained adequate pain relief within 24 hours which suggests early resolution of pain after procedure. The variation in pain reporting can be attributed to different assessment timing

and pain measurement criteria used across studies, as some studies measured immediate postoperative pain while others assessed it at different follow-up intervals.

Gas incontinence rate of 9.00% (11 patients) in present study shows similarity with several studies. Ullah I and Haq AU¹⁶ reported 22.8% transient flatus incontinence which is higher than current findings, while Baig AA *et al.*¹⁵ documented only 3.3% flatus incontinence which is considerably lower. Zubair M *et al.*¹⁷ observed transient flatus incontinence peaked at 64% in first week but reduced to 0% by fourth week, indicating temporary nature of this complication. Ahmed FA *et al.*¹⁸ found 6% flatus incontinence in closed sphincterotomy group at day-5. The differences in gas incontinence rates can be explained by variations in surgical technique precision, extent of sphincter division and timing of assessment as many studies shows that flatus incontinence is transient condition which improves with time as sphincter heals.

Fecal incontinence of 5.70% (7 patients) in present study is consistent with reported literature. Memon AS *et al.*¹⁹ reported 2.2% transient faecal incontinence while Singh S *et al.*²⁰ documented 6% anal incontinence which is very close to current findings. However, Ullah I and Haq AU [16], Zubair M *et al.*¹⁷ Ali M *et al.*²¹ and Baig AA *et al.*¹⁵ reported no solid or liquid stool incontinence in their studies. The presence of fecal incontinence in some studies including present one may be related to more extensive sphincter division or individual patient factors like pre-existing weak sphincter tone which was not assessed properly before surgery.

The significant association of age with gas incontinence ($p=0.039$) and fecal incontinence ($p=0.027$) found in current study with higher rates in patients >50 years is important finding. However, Ullah I and Haq AU¹⁶ reported that flatus incontinence was evenly distributed across age groups showing no significant association. This discrepancy can be explained by different age cutoff points used and smaller sample size in age subgroups. The physiological basis for age-related incontinence is well established as older patients having weaker sphincter muscles and reduced healing capacity makes them more susceptible to continence problems after sphincter surgery.

Gender showed no significant association with any complication in present study ($p=0.864$ for pain, $p=0.760$ for gas incontinence, $p=1.000$ for fecal incontinence). This

finding is partially supported by Ullah I and Haq AU¹⁶ who found flatus incontinence evenly distributed across sex, however they reported wound infection was significantly higher in females. The lack of gender association with complications in current study suggests that surgical technique and sphincter anatomy are more important determinants of outcomes rather than patient gender.

The current study has several limitations that need to be taken into account. The study lacks external validity because it was conducted at a single institution. This could potentially hamper the study ability to apply to a wider population. The study has a relatively small sample size of 122 patients. This could potentially be insufficient to fully represent the population that undergoes closed lateral sphincterotomy. The study lacks long-term follow-up after the treatment to assess the long-term resolution or persistence of complication. Additionally, there was no preoperative sphincter function and manometry that could have provided important data about the state of the sphincter.

CONCLUSION

The present study has concluded that closed lateral sphincterotomy is effective surgical procedure for management of chronic anal fissure but it is associated with some postoperative complications. In which pain was most common complication followed by gas incontinence and fecal incontinence in decreasing frequency.

Acknowledgment

The author would like to thank the medical staff of the department. Their help in keeping patients records and managing data properly played an important role in completing this study.

Ethical Approval

This research was approved by the ethical committee. All procedures of the study were carried out by following committee guideline and rule mentioned in the Helsinki Declaration.

Patient Consent

Written consent was taken from all patient before the study started. Patients were informed that their personal data will be kept confidential and they were free to withdraw from the study at any time.

REFERENCES

- Kutluk F, Ergün S, Mihmanli İ, Demiryas S, Hamid R, Perek A. The effect of sphincter pressure and anal length on surgical decision in chronic anal fissure. *J Clin Med.* 2025;14(11):3805. <https://doi.org/10.3390/jcm14113805>
- Shankar KMP, Puthan Purayil I, Binitha P, Rai AK, Jameela S, Ahmad A, *et al.* Efficacy and safety of murivenna anal infiltration compared to diltiazem topical application in chronic anal fissure: protocol for a prospective, randomized, open-label clinical trial. *JMIR Res Protoc.* 2025;14:e63063. <https://doi.org/10.2196/63063>
- Madalinski MH. Identifying the best therapy for chronic anal fissure. *World J Gastrointest Pharmacol Ther.* 2011;2(2):9-16. <https://doi.org/10.4292/wjgpt.v2.i2.9>
- Alfathi A, Ibrahim B, Abu A, Hamza M, Hassan I. Botox in below knee amputation for the management of post-operative contracture: a systematic review. *Pan Afr Med J.* 2024;47:26. <https://doi.org/10.11604/pamj.2024.47.26.42249>
- Asefa Z, Awedew AF. Comparing closed versus open lateral internal sphincterotomy for management of chronic anal fissure: systematic review and meta-analysis of randomised control trials. *Sci Rep.* 2023;13:20957. <https://doi.org/10.1038/s41598-023-48286-z>
- Riboni C, Selvaggi L, Cantarella F, Podda M, Bracchitta S, Mosca V, *et al.* Anal fissure and its treatments: a historical review. *J Clin Med.* 2024;13(13):3930. <https://doi.org/10.3390/jcm13133930>
- Sussman G. An update on wound management. *Aust Prescr.* 2023;46(2):29-35. <https://doi.org/10.18773/austprescr.2023.006>

8. Lee KH, Hyun K, Yoon SG, Lee JK. Minimal lateral internal sphincterotomy (LIS): is it enough to cut less than the conventional tailored LIS? *Ann Coloproctol.* 2021;37(5):275-280.
<https://doi.org/10.3393/ac.2020.00976.0139>
9. Manoharan R, Jacob T, Benjamin S, Krishnan S. Lateral anal sphincterotomy for chronic anal fissures: a comparison of outcomes and complications under local anaesthesia versus spinal anaesthesia. *J Clin Diagn Res.* 2017;11(1):PC08-PC12.
<https://doi.org/10.7860/JCDR/2017/21779.9299>
10. Tanveer A, Arshad S, Fakhri N, Farooq DA, Afyouni A, Kamran A, Imran M. Close lateral internal sphincterotomy versus open lateral internal sphincterotomy for chronic anal fissure: a systematic review and meta-analysis. *Ann Med Surg (Lond).* 2023;86(2):975-985.
<https://doi.org/10.1097/MS9.0000000000001593>
11. Liu R, Li J, Geng R, Xu H, Zhong S. Comment on long-term incontinence rates after traditional lateral internal sphincterotomy: a 5-year retrospective analysis from a high-volume tertiary referral center for proctologic disorders. *Tech Coloproctol.* 2025;29(1):189.
<https://doi.org/10.1007/s10151-025-03233-0>
12. Sabuncuoglu MZ, Sozen I, Zihni İ, Celik G, Turan B, Acar S, et al. Comparative analysis of open and closed sphincterotomy for the treatment of chronic anal fissure: safety and efficacy evaluation. *Med Sci Monit.* 2024;30:e944127.
<https://doi.org/10.12659/MSM.944127>
13. Realis Luc A, Di Vittori A, Salvatore A, Gravante G, De Simone V, Micarelli A, et al. Long-term incontinence rates after traditional lateral internal sphincterotomy: a 5-year retrospective analysis from a high-volume tertiary referral center for proctologic disorders. *Tech Coloproctol.* 2025;29(1):149.
<https://doi.org/10.1007/s10151-025-03189-1>
14. Khan ZA, Hassan M, Asnath L, Khan S, Shahid M, Zaman M, et al. Outcomes of lateral internal sphincterotomy for management of chronic anal fissures in a tertiary care hospital of Peshawar. *J Rehman Med Inst.* 2019;5(3):7-10.
15. Baig AA, Mehmood MS, Ahmad A. Close lateral internal sphincterotomy, an effective treatment for chronic anal fissure. *Pak J Med Health Sci.* 2019;13(2):276-278.
16. Ullah I, Haq AU. Outcome of close internal sphincterotomy in the management of chronic anal fissure. *Pak J Inten Care Med.* 2025;5(2):176.
<https://doi.org/10.54112/pjicm.v5i02.176>
17. Zubair M, Saaiq M, Shah SA. Efficacy and safety of subcutaneous lateral internal sphincterotomy for chronic anal fissure. *J Ayub Med Coll Abbottabad.* 2014;26(2):141-144.
18. Ahmed FA, Mengal MA, Ahmed M, Akbar S, Elahi B, Khan A. Comparison of complications of open versus closed lateral internal sphincterotomy in chronic anal fissures. *Pak J Med Health Sci.* 2018;12(3):1072-1074.
19. Memon AS, Siddiqui FG, Hamad A. Fissurectomy with posterior midline sphincterotomy for management of chronic anal fissure. *J Coll Physicians Surg Pak.* 2010;20(4):229-231.
20. Singh S, Sidhu V, Kumar A, Singh B, Walia BS. A prospective study on the outcomes of lateral internal sphincterotomy for chronic anal fissure. *Int Surg J.* 2025;12(10):1712-1716.
<https://doi.org/10.18203/2349-2902.isj20253020>
21. Ali M, Gul H, Hussain M, Shuja MI, Khan A, Mukhtar S. A prospective study on closed lateral internal sphincterotomy in chronic anal fissures. *J Bacha Khan Med Coll.* 2021;2(1):1-4.
<https://doi.org/10.69830/jbkmc.v2i01.44>