

OUTCOME OF CLOSE INTERNAL SPHINCTEROTOMY IN THE MANAGEMENT OF CHRONIC ANAL FISSURE

ULLAH I*, HAQ AU

Department of General Surgery, Saidu Group of Teaching Hospitals, Swat, Pakistan

*Corresponding author email address: drirfan949@gmail.com



(Received, 15th March 2025, Revised 28th June 2025, Accepted 09th July, Published 17th July 2025)

ABSTRACT

Background: Chronic anal fissure is a common benign anorectal condition characterized by severe pain and bleeding during defecation. It often results from hypertonicity of the internal anal sphincter. Lateral internal sphincterotomy (LIS) remains the gold standard surgical treatment, though postoperative complications such as incontinence and infection may occur. **Objective:** To determine the outcomes of closed lateral internal sphincterotomy (CLIS) in the management of chronic anal fissures. **Study Design:** Descriptive study. **Setting:** Department of General Surgery, Saidu Group of Teaching Hospital, Swat, Pakistan. **Duration of Study:** From 26-August-2024 to 26-February-2025. **Methods:** A total of 149 patients aged 18–60 years diagnosed with chronic anal fissure were included. Patients presented with symptoms lasting more than six weeks, including pain (VAS >4), bleeding, and clinical findings of sentinel piles or hypertrophied anal papillae. All underwent closed LIS under regional anesthesia using a von-Greaves knife, ensuring preservation of sphincter tone. Postoperative outcomes were monitored over four weeks and included bleeding (visible blood), wound infection (erythema, edema, purulent discharge), and flatus incontinence (involuntary passage of gas). Data were analyzed using SPSS version 25. **Results:** The mean patient age was 37.85 ± 12.36 years, with a slight male predominance (55.7%). Postoperative complications included bleeding in 7.4%, wound infection in 11.4%, and flatus incontinence in 22.8% of cases. **Conclusion:** Closed lateral internal sphincterotomy is a safe and effective surgical option for chronic anal fissures, demonstrating low rates of bleeding and wound infection, with transient flatus incontinence observed in a minority of cases.

Keywords: Chronic Anal Fissure, Closed Lateral Internal Sphincterotomy, Postoperative Complications, Flatus Incontinence

INTRODUCTION

Anal fissure is a typical anal condition defined by severe pain after and during defecation, in addition to bleeding and itching, leading to a significant reduction in overall quality of life (1, 2). Chronic anal fissure (CAF) is marked by fibrotic alterations in fissure margins, the existence of a sentinel tag, and expanded anal papilla. This condition is frequently linked to spasm within the internal anal sphincter (IAS), which can result in local ischemia as well as impede the natural healing process (3). Relieving IAS spasm is crucial for pain relief as well as remission, achievable via surgical as well as chemical sphincterotomy (4).

Surgical intervention is often needed for these fissures. Based on the principle of reducing internal anal sphincter tone while minimizing the risk of fecal incontinence, multiple surgical treatment methods have been developed over the past two decades. Close Lateral Internal sphincterotomy (CLIS) is an extensively utilized intervention for chronic anal fissure management. However, it poses complications such as anal incontinence in approximately 30% of instances (5). CLIS has been accepted as the primary intervention for CAF, involving division of the internal anal sphincter (IAS) from the distal end into either the proximal margin of the fissure or the dentate line. The general healing rates following CLIS are reported at 94%. However, the rate of anal incontinence is 3.4%, which could impact patient wellbeing significantly (4, 6, 7). The procedure involves making a small incision near the anal opening and then cutting a portion of the internal sphincter muscle, which reduces the sphincter pressure and allows the fissure to heal (8, 9). A study reported the outcome (Bleeding in 5%, Wound infection in 10%, and Flatus incontinence in 20%) of CLIS in the management of CAF (10).

CAF is a minimally invasive procedure that aims to reduce sphincter pressure and promote fissure healing by partially dividing the internal anal sphincter; however, complications are associated with this

procedure. Due to paucity of literature on this subject, the purpose of this study is to determine the outcome of CLIS in the management of chronic anal fissure at our hospital. Understanding potential complications is critical for our medical professionals in optimizing patient selection, refining surgical techniques, and improving overall treatment protocols. The results of this study will also provide robust data to support clinical decision-making, enhance patient education, and ultimately contribute to the development of best practice guidelines for the surgical management of chronic anal fissures.

METHODOLOGY

The descriptive study was conducted within the General Surgery Department at Saidu Group of Teaching Hospital, Swat, after taking ethical approval from our hospital. The study time frame was 26-August-2024 to 26-February-2025. One hundred forty-nine patients were selected, a sample which was determined using the World Health Organization sample size calculator, using an anticipated bleeding outcome of 5% (10) post-procedure, a margin of error of 3.5% and a 95% confidence level. Participants were selected through consecutive non-probability sampling. Eligible patients were adults aged 18 to 60 years, both male and female diagnosed with chronic anal fissure which was defined as persistent symptoms for over six weeks such as pain during and after bowel movements (Visual Analog Scale score >4), bleeding and itching, alongside physical examination findings of at least two of the following, sentinel pile, hypertrophied anal papilla or exposed internal sphincter muscle fibers. Patients with fissures associated with inflammatory bowel disease, a history of prior sphincterotomy or anal dilatation, or end-stage renal disease were not enrolled. Each participant was informed and gave their consent. Demographic information, including age, gender, body mass index (BMI), socioeconomic status, residence area, employment status, and occupation, was recorded along with any history of diabetes or

hypertension. The surgical procedure involved close lateral internal sphincterotomy, which was performed under regional anesthesia in the lithotomy position utilizing a von-Greaves (cataract) knife. To preserve sphincter tone, light general anesthesia was administered by an anesthetist, allowing clear differentiation between the internal sphincter and anorectal ring during per-rectal examination. A 2cc injection of 2% lignocaine was administered 1 cm above the anal verge at the 7 o'clock position before knife insertion. Sentinel piles were not excised. Post-operative outcomes, specifically bleeding, wound infections, and flatus incontinence, were assessed within four weeks following the procedure. Bleeding was identified through visual inspection of the anal region or patient-reported blood in the stool within four weeks after the procedure. Wound infections were diagnosed based on the presence of erythema, edema, pain (Visual Analog Scale score >3), warmth, and purulent discharge within four weeks of the procedure. Flatus incontinence was determined by patient-reported involuntary loss of intestinal gas during physical activity, positional changes, or at rest within four weeks of the procedure. All evaluations were conducted under the supervision of a consultant with at least five years of post-fellowship experience, and patient data were recorded using a structured proforma.

Data analysis was performed using SPSS version 21. Age, height, weight, and BMI were assessed using mean and standard deviation. Gender, outcomes (bleeding, wound infections, flatus incontinence), diabetes, hypertension, and other demographic variables were evaluated as frequencies and percentages. Outcomes were stratified with demographics, hypertension, and diabetes using the chi-square test, with a level of significance set at $P \leq 0.05$.

RESULTS

The mean age of our 149 patients was 37.85 ± 12.36 years, and the mean BMI was 24.73 ± 1.45 kg/m². The demographic profile revealed a slight male majority with 83 (55.7%) males and 66 (44.3%) females. Comorbidities such as diabetes were present in 28 (18.8%) patients, while hypertension was noted in 46 (30.9%) (Table 1).

Postoperative outcomes were assessed, revealing complications in some cases. Bleeding occurred in 11 (7.4%) patients, while 138 (92.6%) experienced no such issue. Wound infection was reported in 17 (11.4%) individuals, with 132 (88.6%) remaining unaffected. Flatus incontinence affected 34 (22.8%) patients, whereas 115 (77.2%) did not exhibit this symptom (Table 2). Stratification of outcomes with demographics and comorbidities can be seen from table no 3 to table no 11.

Table 1: Demographic profile and comorbidities

Demographic profile and comorbidities		n	%
Gender	Male	83	55.7%
	Female	66	44.3%
Education	Literate	78	52.3%
	Illiterate	71	47.7%
Occupation status	Employed	70	47.0%
	Unemployed	79	53.0%
Residence	Urban	73	49.0%
	Rural	76	51.0%
Socioeconomic status	Lower class	45	30.2%
	Middle class	74	49.7%
	Upper class	30	20.1%
Diabetes	Yes	28	18.8%
	No	121	81.2%
Hypertension	Yes	46	30.9%
	No	103	69.1%

Table 2: Outcomes

Outcomes		n	%
Bleeding	Yes	11	7.4%
	No	138	92.6%
Wound infection	Yes	17	11.4%
	No	132	88.6%
Flatus incontinence	Yes	34	22.8%
	No	115	77.2%

Table 3: Stratification of outcomes with age

Outcomes		Age distribution (Years)						P value
		18 to 35		36 to 50		51 to 60		
		n	%	n	%	n	%	
Bleeding	Yes	4	36.4%	4	36.4%	3	27.3%	P > 0.05
	No	64	46.4%	46	33.3%	28	20.3%	
Wound infection	Yes	10	58.8%	3	17.6%	4	23.5%	P > 0.05
	No	58	43.9%	47	35.6%	27	20.5%	
Flatus incontinence	Yes	15	44.1%	12	35.3%	7	20.6%	P > 0.05
	No	53	46.1%	38	33.0%	24	20.9%	

Table 4: Stratification of outcomes by gender

Outcomes		Gender				P value
		Male		Female		
		n	%	n	%	
Bleeding	Yes	7	63.6%	4	36.4%	P > 0.05
	No	76	55.1%	62	44.9%	
Wound infection	Yes	4	23.5%	13	76.5%	P < 0.05
	No	79	59.8%	53	40.2%	
Flatus incontinence	Yes	20	58.8%	14	41.2%	P > 0.05
	No	63	54.8%	52	45.2%	

Table 5: Stratification of outcomes with diabetes

Outcomes		Diabetes				P value
		Yes		No		
		n	%	n	%	
Bleeding	Yes	4	36.4%	7	63.6%	P > 0.05

Wound infection	No	24	17.4%	114	82.6%	P > 0.05
	Yes	1	5.9%	16	94.1%	
Flatus incontinence	No	27	20.5%	105	79.5%	P > 0.05
	Yes	6	17.6%	28	82.4%	
	No	22	19.1%	93	80.9%	

Table 6: Stratification of outcomes with hypertension

Outcomes		Hypertension				P value
		Yes		No		
		n	%	n	%	
Bleeding	Yes	5	45.5%	6	54.5%	P > 0.05
	No	41	29.7%	97	70.3%	
Wound infection	Yes	3	17.6%	14	82.4%	P > 0.05
	No	43	32.6%	89	67.4%	
Flatus incontinence	Yes	9	26.5%	25	73.5%	P > 0.05
	No	37	32.2%	78	67.8%	

Table 7: Stratification of outcomes with Education

Outcomes		Education				P value
		Literate		Illiterate		
		n	%	n	%	
Bleeding	Yes	7	63.6%	4	36.4%	P > 0.05
	No	71	51.4%	67	48.6%	
Wound infection	Yes	11	64.7%	6	35.3%	P > 0.05
	No	67	50.8%	65	49.2%	
Flatus incontinence	Yes	19	55.9%	15	44.1%	P > 0.05
	No	59	51.3%	56	48.7%	

Table 8: Stratification of outcomes with occupation status

Outcomes		Occupation status				P value
		Employed		Unemployed		
		n	%	n	%	
Bleeding	Yes	0	0.0%	11	100.0%	P < 0.05
	No	70	50.7%	68	49.3%	
Wound infection	Yes	9	52.9%	8	47.1%	P > 0.05
	No	61	46.2%	71	53.8%	
Flatus incontinence	Yes	15	44.1%	19	55.9%	P > 0.05
	No	55	47.8%	60	52.2%	

Table 9: Stratification of outcomes with residence

Outcomes		Residence				P value
		Urban		Rural		
		n	%	n	%	
Bleeding	Yes	3	27.3%	8	72.7%	P > 0.05
	No	70	50.7%	68	49.3%	
Wound infection	Yes	11	64.7%	6	35.3%	P > 0.05
	No	62	47.0%	70	53.0%	
Flatus incontinence	Yes	14	41.2%	20	58.8%	P > 0.05
	No	59	51.3%	56	48.7%	

Table 10: Stratification of outcomes with socioeconomic status

		Socioeconomic status						P value
		Lower class		Middle class		Upper class		
		n	%	n	%	n	%	
Bleeding	Yes	1	9.1%	6	54.5%	4	36.4%	P > 0.05
	No	44	31.9%	68	49.3%	26	18.8%	
Wound infection	Yes	4	23.5%	6	35.3%	7	41.2%	P > 0.05
	No	41	31.1%	68	51.5%	23	17.4%	
Flatus incontinence	Yes	10	29.4%	12	35.3%	12	35.3%	P < 0.05
	No	35	30.4%	62	53.9%	18	15.7%	

Table 11: Stratification of outcomes with BMI

Outcomes		BMI				P value
		18 to 24.9		> 24.9		
		n	%	n	%	
Bleeding	Yes	8	72.7%	3	27.3%	P > 0.05
	No	79	57.2%	59	42.8%	
Wound infection	Yes	9	52.9%	8	47.1%	P > 0.05
	No	78	59.1%	54	40.9%	
Flatus incontinence	Yes	21	61.8%	13	38.2%	P > 0.05
	No	66	57.4%	49	42.6%	

DISCUSSION

Chronic anal fissure (CAF) is a common and debilitating condition characterized by severe pain and reduced quality of life. Surgical intervention, particularly lateral internal sphincterotomy (LIS), remains the Gold standard for treatment when conservative measures fail. The two primary techniques used are open and closed LIS.

Our study, which analyzed 149 patients, found a mean age of 37.85±12.36 years and a slight male predominance (55.7%). Postoperative complications in terms of outcomes included bleeding (7.4%), wound infection (11.4%), and flatus incontinence (22.8%). These results align with several studies, such as Nasir et al, which documented similar outcomes; they reported flatus incontinence in around 20% cases (10). The meta-analysis by Asefa et al reported an overall healing rate of 90.2% for LIS, with closed LIS showing lower incontinence rates (6.6%) compared to open LIS (11.0%) (8). However, our higher flatus incontinence rate contrasts with their pooled analysis, which favored closed LIS for lower incontinence risks.

The study by Al-Ubaide et al. also noted flatus incontinence in 3% of their 165 patients, primarily in women and those over 35, suggesting that age and gender may influence outcomes (12). The study by Sabuncuoglu et al. further highlighted that open LIS had no incontinence cases while closed LIS had a 5.15% rate (12).

When comparing our results with other studies, similarities and discrepancies emerge. For instance, our infection rate (11.4%) was similar to that of Nasir et al, who documented wound infections in 10% cases (10). However, our infection rate was higher than the 1.2% reported by Al-Ubaide et al (11). Our infection rate was lower than the 15.6% observed by Zafar et al. in closed LIS cases (13).

Bleeding occurred in 7.4% cases in our study, which is similar to Nasir et al, as they documented bleeding in 5% cases (10). Al-Ubaide in their cohort of close LIS patients reported a 2.4% bleeding rate, which was lower than our study (11). Sabuncuoglu et al demonstrated a higher rate of bleeding in their comparative study of open and closed LIS. They reported that 17.4% cases had an incidence of bleeding in the closed LIS group (12). Zafar et al also documented a lower incidence of bleeding in patients receiving closed LIS compared to open LIS (8% vs 12%) (13). Shanmugaiah A et al reported that closed LIS exhibited notably lower incidence of bleeding, which was only 4% when compared to open LIS, which was 16% (14).

Literature supports the notion that closed LIS has superiority over open LIS. Asefa et al concluded in their study that closed LIS has lower postoperative pain and infection rates as compared to open LIS, reinforcing its preference in clinical practice (8). Zafar et al also support the notion of closed LIS being superior; they also concluded that postop complications were lower in the closed LIS group and it had a minimal hospital stay (13).

CONCLUSION

In conclusion, the outcome of close lateral internal sphincterotomy in the management of chronic anal fissure was bleeding, which was found in 7.5% cases, wound infection in 11.4% cases, and flatus incontinence

in 22.8% patients. It is a safe and effective surgical procedure for the management of chronic anal fissure.

DECLARATIONS

Data Availability Statement

All data generated or analysed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department Concerned. (IRB-127-ERB/024)

Consent for publication

Approved

Funding

Not applicable

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTION

IRFAN ULLAH (Postgraduate Residence)

Data acquisition, Manuscript drafting, Manuscript revisions and final approval of manuscript.

ANWAR UL HAQ (Professor)

Supervision, Study Design, Review of manuscript, Conception of Study, Critical input, Final approval of manuscript.

REFERENCES

- Salati SA. Anal fissure—an extensive update. *Pol Przegl Chir.* 2021;93(4):46–56. <https://doi.org/10.5604/01.3001.0014.7879>
- Gilani A, Tierney G. Chronic anal fissure in adults. *BMJ.* 2022;376:e066834. <https://doi.org/10.1136/bmj-2021-066834>
- Roelandt P, Bislenghi G, Coremans G, De Looze D, Denis MA, De Schepper H, et al. Belgian consensus guideline on the management of anal fissures. *Acta Gastroenterol Belg.* 2024;87(2):304–321. <https://doi.org/10.51821/87.2.11787>
- Nelson RL, Manuel D, Gumienny C, et al. A systematic review and meta-analysis of the treatment of anal fissure. *Tech Coloproctol.* 2017;21(8):605–625. <https://doi.org/10.1007/s10151-017-1664-2>
- Garg P, Garg M, Menon GR. Long-term continence disturbance after lateral internal sphincterotomy for chronic anal fissure: a systematic review and meta-analysis. *Colorectal Dis.* 2013;15(3):e104–e117. <https://doi.org/10.1111/codi.12108>
- Casillas S, Hull TL, Zutshi M, et al. Incontinence after a lateral internal sphincterotomy: are we underestimating it? *Dis Colon Rectum.* 2005;48(6):1193–1199. <https://doi.org/10.1007/s10350-004-0914-3>
- Garcia-Aguilar J, Belmonte C, Wong WD, et al. Open vs. closed sphincterotomy for chronic anal fissure: long-term results. *Dis*

Colon Rectum. 1996;39(4):440–443.

<https://doi.org/10.1007/BF02054061>

8. 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(1):20957. <https://doi.org/10.1038/s41598-023-48286-z>

9. Tanveer A, Arshad S, Fakhri N, Farooq DA, Afyouni A, Kamran A, et al. 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>

10. Nasir GM, Sadaqat G. Comparison of open and closed lateral sphincterotomy in patients with chronic anal fissure. *J Pharm Res Int.* 2022;34(30):1–6. <https://doi.org/10.9734/jpri/2022/v34i30B36071>

11. Al-Ubaide AF, Al-Rubaye SM, Al-Ani RM. Lateral internal anal sphincterotomy of chronic anal fissure: an experience of 165 cases. *Cureus.* 2022;14(10):e30530. <https://doi.org/10.7759/cureus.30530>

12. Sabuncuoglu MZ, Sozen I, Zihni I, 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. Zafar J, Hashmi F, Talpur AA, Katyar IR, Khanzada I, Akhtar R. Early complications of open versus closed internal anal sphincterotomy in the management of chronic anal fissure. *Med Forum.* 2021;32(1):156–158. DOI not available.

14. Shanmugaiah A, Pandian S. Prospective randomized study between open vs closed lateral anal internal sphincterotomy in patients with chronic fissure in ano. *Acad J Surg.* 2020;3(1):167–171. <https://doi.org/10.47008/ajs/2020.3.1.36>



Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution, and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third-party material in this article are included in the article's Creative Commons licence unless indicated otherwise in a credit line to the material. Suppose material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use. In that case, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>. © The Author(s) 2025