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Outcome of Lateral Internal Sphincterotomy in Terms of Frequency of Pain and Wound Healing in The Treatment of Anal Fissure

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ABSTRACT

Introduction: Anal fissure is a common anorectal condition causing severe pain and bleeding during defecation. Lateral internal sphincterotomy (LIS) is a widely used surgical treatment aimed at relieving pain and promoting wound healing. This study evaluated the outcome of closed LIS in terms of post-operative pain and wound healing. **Methodology:** This descriptive case series was conducted at the Department of General Surgery, Fatima Memorial Hospital, Lahore, over six months. A total of 100 patients aged 20 to 55 years with clinically diagnosed anal fissure underwent closed lateral internal sphincterotomy. Post-operative pain was assessed using the Visual Analogue Scale (VAS) at 24 hours, while wound healing was evaluated after four weeks. Data were analyzed using SPSS version 25, and p-values ≤ 0.05 were considered statistically significant. **Results:** Out of 100 patients, 56% were male and 44% female. The mean age was 38.29 ± 10.74 years, and the mean BMI was 24.89 ± 3.17 kg/m^2. Post-operative pain was reported by 18% of patients, with a mean VAS score of 2.36 ± 1.25. Wound healing was achieved in 83% of cases. **Conclusion:** Closed lateral internal sphincterotomy is an effective procedure for treating anal fissure, with a high wound healing rate and minimal post-operative pain.

INTRODUCTION

An anal fissure, a common anorectal condition in children and adults, presents as a painful tear in the anoderm near the dentate line, often caused by strenuous bowel movements. This leads to chronic fissures in up to 40% of cases, characterized by recurring anal pain and bleeding. Diagnosis is usually based on symptoms such as severe anal pain during bowel movements and bleeding.[1-2] The bleeding, with blood on toilet paper during wiping, is followed by pain lasting 15 to 30 minutes after a bowel movement. Spasms of the internal anal sphincter cause significant pain. Persistent spasm can lead to hypertrophy and non-healing anal fissures.[3-4]

In children, these usually resolve on their own, but in adults, surgery may be needed. Treating fissures conservatively is challenging. Options to relax the sphincter include topical glycerol trinitrate, botulinum toxin injection, and internal sphincterotomy.[5-6] Surgical sphincterotomy, particularly lateral internal sphincterotomy (LIS), is the preferred method due to its high healing rate and low recurrence. LIS can be done through two techniques: open sphincterotomy involves incising the skin and anal mucosa, while closed sphincterotomy involves sphincter division without cutting the anal mucosa.[6-7]

In a study, 45% of patients who had lateral internal sphincterotomy experienced pain on the first day. After one week, the fissure had healed in 45% of those who received closed sphincterotomy. In a separate study, 80% of patients treated with closed sphincterotomy saw their fissures heal.[7-8] Surgical internal sphincterotomy is the primary treatment for anal hypertonia, providing lasting relief and successful healing of anal fissures with minimal side effects. Although anal fissure is a relatively benign condition, it significantly impacts a patient's quality of life.[9]

My study aimed to guide future general surgeons in utilizing lateral internal sphincterotomy more frequently as it is currently underutilized in our population. The innovative aspect of my research suggests that a closed procedure may offer superior pain relief and wound healing outcomes, with potential implications for patient care going forward.

METHODOLOGY

The study was conducted from 2 Aug 2024 to 02 February 2025 at the Department of General Surgery, Fatima

Memorial Hospital, Lahore, over a period of six months following approval of the synopsis. It was designed as a descriptive case series. A sample size of 100 patients was calculated using a 95% confidence level, 8% margin of error, and an expected wound healing percentage of 45%. Non-probability consecutive sampling was used to enroll participants.[7]

Patients aged 20 to 55 years of either gender, clinically diagnosed with anal fissure based on history and rectal examination, were included. The diagnosis was made on the basis of pain in the perineal region worsening with defecation, accompanied by streaks of blood on fecal matter. Patients were excluded if they had an active infection at the time of surgery, inflammatory bowel disease, diabetes, or if they were lost to follow-up.

Ethical approval was obtained from the hospital's ethics committee. Written informed consent was secured from all patients after explaining the risks and benefits of the procedure in their native language. The closed lateral internal sphincterotomy was performed under general anesthesia with the patient in the lithotomy position. A stab incision was made using a Von Graffe's blade into the intersphincteric groove or submucosa. The blade was rotated toward the internal sphincter to perform a partial sphincterotomy, and the skin incision was left open.

Tramal injection was given postoperatively. Painkiller needs were monitored, and pain was evaluated after 24 hours using a VAS measuring pain intensity. A VAS score of 3 or below indicated no pain, while above 3 indicated pain. Wound healing was checked at four weeks. Patient details, pain scores, and wound status were documented on a specific form.

Data analysis in SPSS v25.0 included expressing continuous variables like age and pain scores as mean ± standard deviation, and categorical variables such as gender, presence of pain, and wound healing status as frequencies and percentages. Stratification by effect modifiers (age, gender, BMI) occurred with post-stratification using the Chi-square test to establish significance at $p < 0.05$.

RESULTS

This study included 100 patients diagnosed with anal fissure who underwent closed lateral internal sphincterotomy. Out of these, 56 patients (56%) were male and 44 patients (44%) were female. The majority of patients (55%) belonged to the age group of 36–55 years, while 45% were aged between 20–35 years. The mean age of the patients was 38.29 ± 10.74 years. Based on BMI classification, 53% of patients had a normal BMI, 45% were overweight, and 2% were obese. The mean BMI of the study population was calculated as 24.89 ± 3.17 kg/m^2.

Post-operative pain was reported by 18% of the patients, while 82% experienced no significant post-operative pain. The mean visual analogue scale (VAS) score recorded at 24 hours post-surgery was 2.36 ± 1.25. Wound healing was achieved in 83% of the patients by the fourth week post-operation, while 17% did not achieve complete wound healing within this period.

Post-operative pain showed no significant association with gender ($p = 0.571$) or age groups ($p = 0.958$). However, BMI was significantly related to post-operative pain ($p = 0.007$), with all obese patients experiencing pain after surgery. Wound healing showed no significant association with gender ($p = 0.427$) or age groups ($p = 0.728$). However, BMI was significantly associated with wound healing ($p = 0.006$), as both obese patients failed to achieve wound healing by 4 weeks.

Table 1

Frequency distribution of different variables (n=100)

Variables		Frequency	Percent
Gender	Male	56	56.0
	Female	44	44.0
Age groups	20-35 years	45	45.0
	36-55 years	55	55.0
	Mean age (years)	38.29±10.74	
BMI	Normal	53	53.0
	Overweight	45	45.0
	Obese	2	2.0
	Mean BMI (kg/m^2)	24.89±3.17	
Post-operative pain	Yes	18	18.0
	No	82	82.0
	Mean VAS score	2.36±1.25	
Wound healing	Yes	83	83.0
	No	17	17.0

Table 2

Stratification of post-operative pain with respect to different variables

Variables		Post-operative pain		p-value
		Yes	No	
Gender	Male	9(16.1%)	47(83.9%)	0.571
	Female	9(20.5%)	35(79.5%)	
Age groups	20-35 years	8(17.8%)	37(82.2%)	0.958
	36-55 years	10(18.2%)	45(81.8%)	
BMI	Normal	10(18.9%)	43(81.1%)	0.007
	Overweight	6(13.3%)	39(86.7%)	
	Obese	2(100.0%)	0(0.0%)	

Table 3

Stratification of wound healing with respect to different variables

Variables		Wound healing		p-value
		Yes	No	
Gender	Male	45(80.4%)	11(19.6%)	0.427
	Female	38(86.4%)	6(13.6%)	
Age groups	20-35 years	38(84.4%)	7(15.6%)	0.728
	36-55 years	45(81.8%)	10(18.2%)	
BMI	Normal	44(83.0%)	9(17.0%)	0.006
	Overweight	39(86.7%)	6(13.3%)	
	Obese	0(0.0%)	2(100.0%)	

DISCUSSION

This comprehensive investigation meticulously assessed the clinical outcomes associated with the procedure of closed lateral internal sphincterotomy (LIS) specifically in the context of treating chronic anal fissures, with a concentrated emphasis on evaluating the levels of post-operative pain experienced by patients as well as the subsequent progress of wound healing following the surgical intervention. In this cohort of patients, it was observed that a noteworthy 18% of individuals reported experiencing some degree of post-operative pain, which was quantitatively measured using the Visual Analog Scale (VAS) and yielded a mean score of 2.36 ± 1.25, while an impressive 83% of the patients achieved complete wound healing within a mere four-week period post-surgery, indicating a favorable outcome in terms of recovery.

The findings derived from our study are in concordance with the results obtained in several previous

research endeavors that have similarly explored this topic. Notably, Kumar et al. conducted a comparative analysis which revealed that patients who underwent the LIS procedure experienced significantly lower levels of post-operative pain when juxtaposed with those who received Lord's dilatation, with a statistically significant p-value of 0.012, while the rates of wound healing between the two surgical approaches were found to be comparable, thereby reinforcing the efficacy of LIS in this clinical setting.[10]

Zubair et al. reported that most patients achieved pain relief within four weeks, and fissure healing was observed by eight weeks.[11] Nelson et al. demonstrated that LIS provides faster pain relief and higher healing rates compared to non-surgical treatments.[12] Similarly, a systematic review by Sajid et al. confirmed that LIS offers superior fissure healing and pain relief compared to conservative approaches.[13]

In a meticulously conducted investigation led by Liratzopoulos and colleagues, an impressive 90% of the patients who participated in the study articulated their experiences of achieving complete healing within a span of six weeks following the surgical intervention known as ligation of the intersphincteric fistula or LIS, all the while encountering only minimal levels of pain during the recovery process, thereby highlighting the efficacy and tolerability of this particular medical procedure.[14]

Gibbons et al. also noted high healing rates (94%) and low post-operative pain levels following LIS.[15] A large cohort study by Schouten et al. found that LIS achieved 96% healing with low complication rates.[16] Another randomized trial by Jensen SL confirmed a significant reduction in pain and high healing rates in LIS patients.[17] Additionally, a systematic review by Shafik reinforced LIS as the gold standard for chronic fissures due to its consistent success in relieving pain and promoting healing.[18]

Overall, our study's low post-operative pain frequency and high wound healing rate are consistent with established literature, supporting LIS as an effective and safe treatment for chronic anal fissure.

This study has limitations including a sample size of 100 patients, limiting generalizability. The four-week follow-up may have missed late complications. Also, no control group was included. Future studies should have larger samples, longer follow-up, and comparison groups.

CONCLUSION

Closed lateral internal sphincterotomy is an effective procedure for treating anal fissure, with a high wound healing rate and minimal post-operative pain.

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