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Case Report

Newer method of segmental lateral internal sphincterotomy in chronic fissure-in-ano: a case report

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ABSTRACT

Fissure-in-ano is a common anorectal condition characterized by a linear tear distal to the dentate line, presenting with severe burning pain during defecation, constipation, and bleeding per rectum. Lateral internal sphincterotomy (LIS) remains the gold standard surgical intervention for chronic fissure-in-ano refractory to conservative management; however, it carries a well-recognized risk of postoperative anal incontinence, which has prompted investigation into technically modified approaches. Segmental lateral internal sphincterotomy (S-LIS), in which the internal anal sphincter is divided in two parts at different planes rather than as a single continuous cut, has been proposed as a continence-preserving alternative. In the present case report, a novel single-incision technique of segmental lateral internal sphincterotomy was employed, wherein both segments of the internal anal sphincter were sequentially elevated and divided through a single stab incision. The patient experienced an uneventful postoperative recovery, was discharged on postoperative day three, and demonstrated complete fissure healing with no recurrence on long-term follow-up. A systematic review of the literature identified four published studies, of which three clinical trials met eligibility criteria for inclusion. The single-incision segmental lateral internal sphincterotomy technique described herein may effectively eliminate the risk of postoperative anal incontinence while offering the additional advantages of a single wound, reduced procedural morbidity, and a minimally invasive operative approach.

Keywords: Anal fissure, Chronic fissure, Fissure in ano, Segmental sphincterotomy, Lateral internal sphincterotomy

INTRODUCTION

A linear ulcer distal to the dentate line in the midline of the anal canal is called a fissure in ano. Severe burning pain with defecation, hard stool, severe constipation and blood per rectum, presenting as a streak of fresh blood, are the clinical features of a fissure in ano.[1] A digital rectal examination is sufficient to diagnose a fissure in ano and assess anal sphincter spasm. The buttocks are spread apart to visualize the anal verge; longitudinal tears are diagnosed as fissures; and hypertrophied, thickened skin may be seen near the lower end of the fissure, called a skin tag or sentinel pile.[2] The exact cause of a fissure in ano is not known, meanwhile increased resting pressure, hypertonia, and spasm of the internal anal sphincter are thought to be the causes behind the pathology. Surgery for fissure in ano is planned when first-line medical therapy has failed. Lateral internal sphincterotomy is the gold standard procedure for fissure in ano.[3] Lateral internal sphincterotomy is a surgical procedure performed on the internal anal sphincter muscle to treat chronic fissure in ano.[4] There are two types of sphincters, i.e., external and internal. External anal sphincters are voluntary, while the internal sphincters are involuntary controls the passage of faeces.[5] This operation reduces the resting pressure of the internal anal sphincter, which

improves blood supply, resulting in the faster healing of fissures.[6] This case report discussed a newer method of segmental lateral internal sphincterotomy.

CASE REPORT

A 45-year-old male presented to the surgery department with a complaint of a mass felt at the anal region associated with pain after defecation, intermittent bleeding per rectum, itching at anal region, hard stools and constipation for the one year. The condition had begun as a bleeding per rectum, severe anal spasm and pain, which had gradually progressed to the present state. Digital rectal examination revealed an approximately 1 cm × 0.5 cm sentinel tag at 6 o'clock and fissure at 6 and 12 o'clock (Figure 1).



Figure 1: Pre-operative view with sentinel tag at 6 o'clock.

On palpation mild tenderness and mild spasm were present. No fecal impaction, no bleeding, no discharge; perianal skin was also normal. There was no abnormal growth present. There was no evidence of any lymphadenopathy. There was no history of weight loss, anemia, or thyroid disorder. Other medical history was not significant. There was no history of previous surgery. There was no family history of similar complaints. Vital signs were stable on examination. Routine surgical investigations were done; all reports were within normal limits. Surgery was planned under spinal anesthesia. Under all aseptic conditions, in lithotomy position, a small stab incision with surgical scalpel no. 11 was taken at 3 o'clock. Internal anal sphincters lifted and identified as circular fibers with a bright red appearance on Kelly forceps (Figure 2). From the same incision, another chunk of internal anal sphincters was lifted (Figure 3). Segmental sphincterotomy was performed, leaving some fibers intact (Figure 4). The sentinel tag was excised. Incision wound closed with vicryl (Figure 5). Dressing done and anal pack kept. Postoperatively, the patient received intravenous ceftriaxone, metronidazole and analgesics, along with a hot sitz bath, 2% lignocaine jelly for local application and lactulose syrup as a laxative. He was discharged after three days, asymptomatic, and attended assessment follow-up on 7 and 14th day, which revealed an uneventful recovery with no recurrence.



Figure 2: Identification of internal anal sphincter at 3 o'clock position on Kelly's forceps.

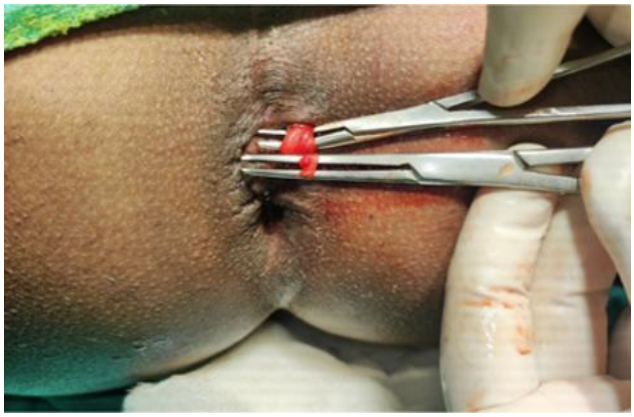


Figure 3: Elevation of second segment of internal anal sphincter fibers through the same incision at 3 o'clock position.



Figure 4: Segmental division of internal anal sphincter fibers with selective preservation of residual fibers.



Figure 5: Wound closure with absorbable vicryl suture following sentinel tag excision and sphincterotomy.

DISCUSSION

Lateral internal sphincterotomy (LIS) remains the most widely accepted surgical intervention for chronic fissure-in-ano, demonstrating consistently high rates of fissure healing. Nevertheless, its association with postoperative anal incontinence ranging from minor soiling to frank fecal leakage constitutes a significant clinical concern that has prompted the exploration of technically modified approaches.[7]

Segmental lateral internal sphincterotomy (S-LIS) has emerged as a promising alternative, predicated on the principle of partial sphincteric division performed in two segments at different planes, thereby preserving the structural continuity of the internal anal sphincter at any single point and theoretically minimizing the risk of incontinence.[8-10]

A systematic review of the literature pertaining to segmental lateral internal sphincterotomy was conducted through combined PubMed/PMC and Google Scholar database searches up to May 2026. This identified four published studies spanning the period from 2011 to 2021, of which three clinical trials were eligible for inclusion. One study was excluded on the basis of being a case report unavailable in the English language (Table 1).

In the present case report, segmental lateral internal sphincterotomy was performed through a single stab incision, representing a noteworthy technical modification relative to previously described bilateral and segmental approaches. While the underlying principle of staged sphincteric division to reduce postoperative incontinence is shared with earlier techniques, the defining characteristic of the present case is the execution of both sphincterotomy segments through a solitary access incision, in contradistinction to the dual-incision approaches reported in the existing literature.

Table 1: Preoperative and postoperative assessment of clinical parameters following single-incision segmental lateral internal sphincterotomy (S-LIS)

S. no.	Assessment parameter	Assessment scales	Before S-LIS	After S-LIS Day 1	After S-LIS Day 7	After S-LIS Day 14	Mean±SD	% Improvement
1.	Spasm	0: normal (one finger can pass) 1: finger can pass with severe pain 2: no finger can pass	1	0	0	0	0.25±0.50	100%
2.	Per rectal bleeding	0: no bleeding 1: mild (<5 drops) 2: moderate (5-10 drops) 3: severe (>10 drops)	2	0	1	0	0.75±0.74	100%
3.	Pain (Visual Analogue Scale)	0: no pain 1 - 3: mild 4 - 6: moderate 7 - 9: severe 10: unbearable	7	3	1	0	2.50±4.33	100%
4.	Itching (Numerical Rating Scale)	0: no itch 10: worst imaginable itch	10	0	0	0	2.50±4.33	100%

Continued.

S. no.	Assessment parameter	Assessment scales	Before S-LIS	After S-LIS Day 1	After S-LIS Day 7	After S-LIS Day 14	Mean±SD	% Improvement
5.	Wound healing	0: completely healed with healthy scar 1: partially healed with granulation tissue 2: clean wound without slough/discharge 3: wound with discharge	3	2	1	0	1.50±1.12	100%
7.	Overall		4.60 ±3.36	1.00± 1.22	0.60± 0.55	0.00±0.00		100%

Table 2: Characteristics and outcomes of included studies in systematic review of segmental lateral internal sphincterotomy for chronic fissure-in-ano.

Sr. No.	Author (Year)	Study Design (n=Sample Size)	Title	Outcome
1.	Lasheen et al (2011)[8]	Prospective interventional study (n=50)	Segmental internal sphincterotomy- a new technique for treatment of chronic anal fissure.	Fissure and anal wounds healed within 4 weeks in all patients. Pain was significantly reduced from postoperative day 1. Early complications included mild hematoma and urinary retention in one patient. No transient or persistent incontinence was recorded. Mean follow-up was 18.5 months. Concluded segmental LIS is safe, easy, effective, and not associated with risk of incontinence
2.	Kad et al (2017)[9]	Comparative non-randomized trial (n=54)	A comparison of segmental internal sphincterotomy versus lateral internal sphincterotomy in management of chronic fissure in ano.	VAS pain score on first postoperative defecation was 4.5 (LIS) vs 3.91 (segmental LIS), a statistically significant difference ($p < 0.010$). Duration of healing was 27.94 days (LIS) vs 28.09 days (segmental LIS). Postoperative incontinence assessed by Wexner score at 30 days showed no statistically significant difference between groups. Concluded segmental LIS is a comparable modality with similar healing and complication profile to standard LIS.
3.	Marzogi (2021)[10]	Prospective comparative study	Outcome of Bilateral Segmental Internal Anal Sphincterotomy for Treatment of Chronic Anal Fissure.	Bilateral segmental LIS was found to take slightly more operative time but was significantly effective in terms of early pain relief, reduction of resting anal pressure, and complete healing rate at 5 weeks. Concluded it is a good procedure with no increase in incontinence risk.

Intraoperative identification of the internal anal sphincter was facilitated by its characteristic circular fiber arrangement and bright red appearance upon elevation with Kelly's forceps a reliable anatomical landmark well-recognized in open sphincterotomy techniques, which lends precision to segmental division even through a restricted operative field. Wound closure with absorbable Vicryl suture and placement of an anal pack at the conclusion of the procedure represent standard hemostatic measures, aimed at minimizing early postoperative complications including hematoma formation and sepsis. Patient was assessed with assessment parameters anal spasm, per rectal bleeding, pain (VAS), itching (NRS), and wound healing preoperatively and on postoperative Days 1, 7, and 14. Preoperatively, the overall mean composite symptom score was 4.60±3.36, reduced to 1.00±1.22 after intervention by postoperative Day 1.

On postoperative Day 7, the overall mean further decreased to 0.60±0.55, with only mild residual pain (VAS: 1) and a transient recurrence of minimal bleeding (grade 1) noted, while wound healing advanced to grade 1 (partial healing with granulation tissue). By postoperative Day 14, complete and total resolution of all assessed parameters was achieved, with an overall

composite mean score of 0.00±0.00, representing 100% improvement across all assessment characters (Table 2).

Lasheen et al described a technique in which lateral internal sphincterotomy was performed in two segments under direct visualization through two separate incisions. A distinguishing strength of this study is the incorporation of objective anorectal manometry for outcome assessment.

Complete healing of the fissure and anal wounds was achieved within four weeks, with significant postoperative pain reduction. Neither transient nor persistent anal incontinence was reported; however, mild hematoma formation and urinary retention were identified as procedural complications.[8] Kad et al conducted a comparative, non-randomized trial evaluating conventional lateral internal sphincterotomy against segmental lateral internal sphincterotomy across two patient cohorts. Outcomes were assessed using subjective parameters, including postoperative pain relief on defecation, perianal sepsis, duration of fissure healing, and incontinence.

In this technique, sphincteric division was achieved at two distinct anatomical sites through dual incisions. Postoperative anal incontinence was observed exclusively in the conventional lateral internal sphincterotomy group, whereas perianal sepsis emerged as a complication specific to the segmental lateral internal sphincterotomy cohort, highlighting the differential complication profiles associated with each approach.[9]

Marzogi et al introduced bilateral segmental internal sphincterotomy as a novel technique designed to synergize the benefits of both bilateral and segmental sphincterotomy approaches. The procedure was executed at the 3 o'clock position bilaterally, necessitating operative access at multiple anatomical sites. Although the bilateral segmental approach demonstrated favorable outcomes including marked early pain relief and complete fissure healing at approximately five weeks it inherently entails greater operative time and a larger number of access incisions compared to the single-incision technique described in the present case.[10]

The limitations of the present case report include a single-patient design and clinical outcomes based on subjective parameters. While the results are clinically encouraging, prospective randomized controlled trials with larger sample sizes, objective manometric assessment, and long-term follow-up are warranted to validate the efficacy, safety, and reproducibility of the single-incision segmental lateral internal sphincterotomy technique.

CONCLUSION

In nutshell, the technique described in the present case represents a refinement of the segmental lateral internal sphincterotomy concept, achieving segmental sphincter division through a single minimally invasive stab incision, thereby potentially combining the continence-preserving benefits of the segmental approach with the reduced morbidity with single-access technique.

To the best of our knowledge, this specific modification performing both segments of sphincterotomy through a single incision has not been previously described in the published literature, and may represent a novel contribution to the evolving surgical technique of segmental lateral internal sphincterotomy.

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