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Comparative Study of Post-Operative Pain Score in Open Sphincterotomy and Closed Sphincterotomy For Anal Fissure

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Abstract

Anal fissure was thought to be due to severe constipation or straining during defecation. The diagnosis is made by the typical history of pain during defecation associated with prior constipation. Chronic anal fissure is accompanied by an external skin tag and hypertrophied anal papilla. Lateral sphincterotomy is regarded as the gold standard treatment. This study aimed to compare the open and closed techniques of lateral internal sphincterotomy in terms of post-operative pain.

Keywords: Anal fissure, Lateral anal sphincterotomy, pain score

Introduction

Anal fissure was thought to be due to severe constipation or straining during defecation. Various studies have suggested that both anorectal mechanics and blood supply play a role in anal fissure development. Initial reports from the 1970s and 1980s have implicated internal sphincter hypertonia (ISH) in anal fissure pathogenesis. The posterior commissure is not as well-perfused as other regions of the anal canal; here the inferior rectal artery has a perpendicular course through the septa of the internal anal sphincter. Hence, increased intramuscular pressure compromises the blood flow, which is further aggravated by increased intraluminal pressure. This endodermal ischaemia prevents small mechanical tears from healing in a timely fashion. The diagnosis is made by the typical history of pain during defecation associated with prior constipation. Chronic anal fissure is accompanied by an external skin tag and hypertrophied anal papilla. Anal fissure is very painful, because it affects the multilayer squamous epithelium of the anoderm, which is richly innervated with pain fibres. The basal tone of the IAS is affected by various substances, including Nitric Oxide (NO). In patients with anal fissures, the synthesis of NO in the IAS is reduced in comparison

with the controls. Surgical treatment includes anal dilatation and posterior or lateral internal sphincterotomy. Lateral sphincterotomy has been regarded as the gold standard for the treatment. Surgical internal sphincterotomy is recommended as the first-line treatment in patients with anal hypertonia. This study aimed to compare the open and closed techniques of lateral internal sphincterotomy in terms of post-operative pain.

Materials and Methods

A comparative study was conducted in the Department of General Surgery, Government General Hospital, Vizianagaram, Andhra Pradesh from January 2024 to June 2024. The study included 100 patients who underwent elective surgical procedure after being explained regarding the procedure and the study and their need for follow-up and proper perioperative care; of which 50 patients underwent open sphincterotomy and 50 patients underwent closed sphincterotomy for chronic anal fissure.

Post-operative pain score, wound healing, and wound care were observed in both groups of patients.

Study Type:

- Hospital-based prospective comparative study

Inclusion Criteria:

- All patients of both sexes between the ages of 15–70 years presenting to our outpatient clinic.

Exclusion Criteria:

- Patients who underwent any other anorectal procedure at the time of anal sphincterotomy or had a history of previous sphincterotomy or anal dilatation.
- Fissures associated with inflammatory bowel disease or malignancy.

Statistical Analysis: All continuous variables were expressed as mean and number of percentages were used for categorical variables. Chi-square test, Student's t-test, and multivariate logistic analysis were used. A p-value < 0.05 was considered statistically significant.

Surgical Procedure: Both surgical procedures were carried out in the lithotomy position under regional or local anesthesia.

In *open sphincterotomy*, the anal canal is visualized with an anoscope, a longitudinal incision is made in the anoderm, and the distal half of the internal anal sphincter is divided under direct vision followed by closure of the mucosa.

In *closed sphincterotomy*, a radial stab incision is given at the anoderm at either the 3 o'clock or 9 o'clock position with sharp-pointed curved artery forceps laterally in the intersphincteric groove, exposing the internal sphincter muscle fibres. The internal sphincter is then lifted using vas hooks and brought out through the wound. Under direct vision, the distal 4/5th of the internal sphincter muscle (up to the length of the fissure) is divided using monopolar cautery. Haemostasis is secured with bipolar forceps, and the wound is dressed. The wound is then left open to heal.

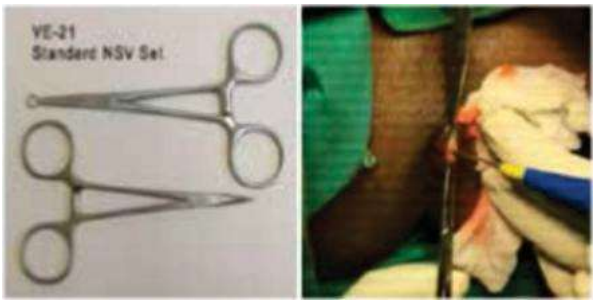

Figure 1: Instruments used in closed sphincterotomy

Figure 2: The closed technique

Post-Operative Management: The wound and perianal area were inspected for bruising or hematoma within 12 hours after the surgery. Prophylactic antibiotics in the form of metronidazole and a second-generation cephalosporin were administered orally to all patients for 1 week post-operatively. Patients presented most often with pain during defecation, followed by associated bleeding from the rectum. A few patients with constipation associated with bleeding from the rectum were also noted in this series. Eisenhammer in 1951, this procedure has been used with increasing frequency and is

now considered the treatment of choice for chronic anal fissures (CAFs). The patients resumed eating a high-fibre diet on the day of the surgery. Laxatives or stool softeners were given for 2–3 weeks. Patients were followed to assess any complications of these procedures (pain, infection or abscess formation, incontinence, soiling, and recurrence) and to determine the mean duration of stay in hospital in the groups with open or closed sphincterotomy.

Pain was measured using a visual analog scale representing an intensity of pain from 0 (no pain) to 10 (worst imaginable pain) and was assessed at 12 and 24 hours after the operation. Patients were followed up once a week for 2 weeks and then every 2 weeks for another 6 weeks to monitor fissure healing.

Results

In 100 patients, 50 underwent open anal sphincterotomy and 50 underwent closed/no scalpel sphincterotomy. In the open group, 22 were males and 28 were females; in the closed group, 24 were males and 26 were females. The difference was not significant according to the Chi-square test ($p = 0.0016$).

The maximum number of patients was in the 56–70 year age group. The mean age of patients was comparable in the two groups ($p = 0.482$). The ages of patients who underwent open and closed sphincterotomies were 39.38 ± 12.96 years and 40.88 ± 11.80 years, respectively.

Pain during defecation was the predominant symptom seen in 27 (54%) patients in the closed sphincterotomy group and 20 (40%) patients in the open sphincterotomy group. Induration was present in one (2%) patient in each of the closed sphincterotomy and open sphincterotomy groups.

The mean score on the visual analog scale for the measurement of pain 12 hours after the operation was 5.62 ± 0.81 in the closed sphincterotomy group and 6.13 ± 0.75 in the open sphincterotomy group ($p < 0.001$).

The mean score on the visual analog scale 24 hours after the operation was 2.10 ± 0.35 in the closed sphincterotomy group and 2.35 ± 0.59 in the open sphincterotomy group ($p = 0.003$).

Postoperative incontinence or soiling was not seen in any patient. Most of the patients underwent rapid healing and resolution of their symptoms, with no recurrence noted in either group.

Delayed healing was seen in 4.4% ($p = 0.08$) of the open sphincterotomy patients; none of the patients in the closed sphincterotomy group had either delayed wound healing or an absence of wound healing post-operatively.

	Closed sphincterotomy	Open sphincterotomy	*p*
Visual analog scale score 12 h after operation	5.62 ± 0.81	6.13 ± 0.75	<0.001
Visual analog scale score 24 h after operation	2.10 ± 0.35	2.35 ± 0.59	0.003

Figure 3: Post-operative pain scores

Discussion

Surgical lateral internal sphincterotomy remains the gold standard. The treatment of anal fissures by sphincterotomy was first suggested in 1818 by Boyer. Since the introduction of lateral internal sphincterotomy by Eisenhammer in 1951, this procedure has been used with increasing frequency and is now considered the treatment of choice for chronic anal fissures.

Most of the patients (89%) presented with posterior midline anal fissures. Other positions seen were anterior midline (8%), i.e., at the 12 o'clock position, and at multiple positions in two patients.

On comparison of the complication rates of the open and closed sphincterotomy techniques, we found both methods to be effective in the treatment of fissure. No case of delayed or absent healing was noted in the closed group, whereas three cases of non-healing were noted in the open group.

In a long-term study, Garcia-Aguilar et al. concluded that closed lateral sphincterotomy is preferable to open lateral sphincterotomy as it carries a similar rate of cure with less impairment of control. Nelson concluded that both techniques are equally effective. Cohen and Dehn are in favour of closed lateral sphincterotomy. Arroyo et al. also reported that closed lateral sphincterotomy is effective in the management of chronic anal fissure, with fewer post-operative complications.

The mean pain score on the visual analog scale 24 hours after the operation was significantly lower in the closed sphincterotomy group than in the open sphincterotomy group. There was a statistically significant difference between the duration of hospital stay in the two groups.

Conclusions

The open and closed sphincterotomy techniques are not significantly different in terms of the occurrence of post-operative complications such as incontinence or soiling, recurrence, and healing rates in patients with chronic anal fissure.

Post-operative pain was less in the closed sphincterotomy technique than in the open sphincterotomy technique. Healing was better with a shorter mean duration of stay in the closed sphincterotomy group than in the open sphincterotomy group, along with a reduced overall cost burden.

There was a statistically significant difference between the mean pain score on the visual analog scale at 12 hours and 24 hours after the operation and the duration of hospital stay in the two groups.

Closed sphincterotomy is the treatment of choice for chronic anal fissure, and it can be performed effectively and safely with a low rate of complications and a reduced cost burden for the patient.

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