

## Original Article

### EARLY OUTCOME OF OPEN VERSUS CLOSED LATERAL INTERNAL ANAL SPHINCTEROTOMY IN THE TREATMENT OF CHRONIC ANAL FISSURE

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#### Abstract

**Background:** Chronic anal fissure is a benign disorder that is associated with considerable discomfort. Surgical treatment in the form of lateral internal sphincterotomy has long been regarded as the gold standard of treatment. Two methods of sphincterotomy are currently practiced: open or closed technique.

**Objective:** The objective of this study was to compare the early outcome of closed versus open lateral internal anal sphincterotomy for the treatment of chronic anal fissure, based on the assessment of post-operative pain and complications.

**Methods:** A comparative study was conducted at the department of surgery in Dhaka Medical College & Hospital, over a period of 6 months from April 2015 to September 2015. A total of 80 patients were purposefully included in this study and were equally divided into two groups; Group A included 40 patients undergone closed lateral internal anal sphincterotomy and Group B included 40 patients undergone open lateral internal anal sphincterotomy. Patients were followed up postoperatively for 6 weeks to assess any complications. The outcomes were compared between the groups using the Chi-square ( $\chi^2$ ) test and Student's "t" test.

**Results:** Delayed postoperative healing was found in 7.5% patients of the open lateral internal anal sphincterotomy group. The mean pain score and duration of hospital stay were lower in closed lateral internal anal sphincterotomy group.

**Conclusion:** Closed lateral internal sphincterotomy is preferred to open technique in the treatment of chronic anal fissure, as it is effective, safe, less expensive, and is associated with low complication rate.

**Key words:** Chronic anal fissure (CAF), closed lateral internal sphincterotomy, open lateral internal sphincterotomy, Visual Analogue Score (VAS)

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## Introduction

An anal fissure is a longitudinal split in the anoderm of the distal anal canal, which extends from the anal verge proximally, towards but not beyond the dentate line<sup>1</sup>. Anal fissures occur equally in men and women and tend to occur in younger patients (mean age 40 years). 75% of anal fissure are located in the posterior midline. Among the patients of anal fissure, 25% of female & 8% of male will have it anteriorly and 3% of all cases will have it both anteriorly and posteriorly<sup>2</sup>.

Acute anal fissures present for less than 6 weeks with the appearance of a simple tear or ulcer in the anoderm, which starts at the dentate line. Chronic anal fissures, present for more than 6 to 8 weeks, can be further characterized by the presence of an anal tag or "sentinel pile" at the distal end of the fissure and a hypertrophied anal papilla at the proximal end near the dentate line<sup>3</sup>.

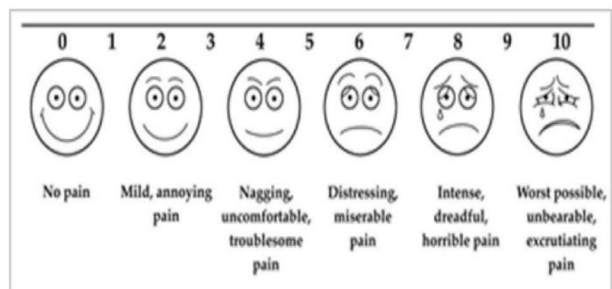
The main underlying pathology, however, appears to be a high resting anal pressure caused by increased internal sphincter tone. The blood supply to the anal canal has to pass through the internal sphincter and therefore spasm of this muscle reduces the blood flow and the oxygen tension in the skin of the anal canal. This, in addition to the exposure to faecal matter, accounts for the delays in the healing of fissures<sup>4</sup>. The underlying principle of treating anal fissures is to reduce the internal anal sphincter tone. It can be achieved by medical therapy or surgical interventions.

Conventional pharmacological treatment uses muscle relaxants; commonly topical drugs and occasionally drugs given by mouth. These drugs include nitrates (glyceryltrinitrate), calcium channel blockers, botulinum toxin, alpha-adrenoreceptor antagonists, beta-adrenoreceptor agonists, and muscarinic agonists. New pharmacological drugs being tested include gonyautoxin and a paralytic neurotoxin derived from shellfish<sup>5</sup>.

Surgical treatment includes anal dilatation, fissurectomy, anal advancement flap and lateral internal sphincterotomy<sup>2</sup>. Lateral internal sphincterotomy has been regarded as the gold standard for the treatment of chronic anal fissure. Various studies have shown the superiority of lateral sphincterotomy over posterior sphincterotomy<sup>5</sup>. The procedure can be performed with an open technique where an incision is made over the intersphincteric groove and the internal muscle is identified and divided under direct vision. Alternatively, the closed technique uses a small scalpel such as a beaver blade that is inserted through a very small incision into the intersphincteric groove and carefully divides the internal sphincter<sup>6-9</sup>.

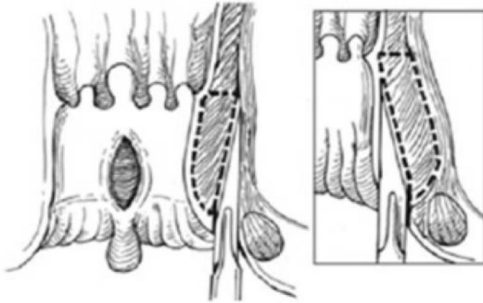
## Materials and Methods

The study was designed as an observational comparative study, conducted at the department of surgery of Dhaka Medical College & Hospital, over a period of 6 months from April 2015 to September 2015. Total 80 patients of chronic anal fissure, aged more than 18 years were purposefully selected for this study and equally divided into two groups, Group A included 40 patients undergone closed lateral internal anal sphincterotomy and Group B included 40 patients undergone open lateral internal anal sphincterotomy. Patients with history of previous ano-rectal surgery, quack treatment, co-morbid illnesses, and fissures complicated with fistula, anal stenosis, tuberculosis, taeniasis, crohn's disease, ulcerative colitis or anal warts were excluded from the study. Following approval of the study protocol by the institutional ethical committee, written informed consent was obtained from the patients. Data were collected by preformed data collection sheet. Postoperative outcome up to 6 weeks following surgery was considered as early outcome in this study. Pain relief was defined as a complete absence of pain during and after defecation and after proctoscopic examination. Visual analogue scale was used for the assessment of severity of pain. Healing was accepted when there was no visual lesion in anoderm with full epithelization.

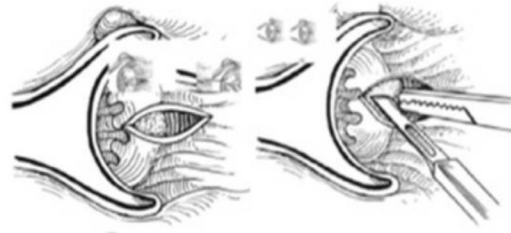


**Figure 1:** Visual Analogue Scale (VAS).

In closed technique, a surgical blade no. 11/ Von-Greaves (cataract) knife was introduced through the perianal skin at the left lateral aspect of the canal sandwiched parallel between the anoderm and internal sphincter. When tip of blade reached the dentate line guided by left index finger, blade was turned outwards to divide the sphincter. A "give" sensation was felt when fibres were divided defined adequate release. Blade was removed and gentle pressure applied for 5 minutes to control bleeding. Skin tag was then excised. In open technique radial incision was made lateral at the lower border of the internal sphincter across intersphincteric groove. Then the distal internal sphincter was grasped with Allis forceps and bluntly freed. The lower half of the fibres was divided.



**Figure II:** Closed lateral internal anal sphincterotomy



**Figure III:** Open lateral internal anal sphincterotomy

Patients were followed up 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 analogue scale, representing an intensity of pain from 0 (no pain) to 10 (worst imaginable pain) and was assessed at 12, 24 and 48 hours after the operation. Patients were followed up once after 2 weeks and then after 6 weeks to monitor fissure healing and assess complications.

Data processing and analysis were done using SPSS (statistical package for social sciences), version 17. Categorical data were expressed according to their corresponding frequency and percentage, whereas continuous data were expressed as mean and standard deviation of their respective range. The summarized data were presented in the form of tables with due statistical interpretation. Statistical significance was determined by Chi-square Test( $\chi^2$ ) for categorical data and by student's 't' Test for quantitative data.

### Results:

**Table 1:** Demographic and clinical profiles of patients at presentation.

		Group A (n=40) No. (%)	Group B (n=40) No. (%)	p value
Sex	Male	14 (35.0%)	13 (32.5%)	0.83
	Female	26 (65.0%)	27 (67.5%)	
Age	Mean $\pm$ SD	34.73 $\pm$ 8.88	38.18 $\pm$ 12.05	0.334
Site of fissure	Anterior	6(15.0%)	4(10.0%)	0.688
	Posterior	33(82.5.0%)	34(85.0%)	
	Others	1(2.5%)	2(5.0%)	
Symptoms	Constipation	24(60.0%)	29(72.5%)	0.237
	Pain in anal area	38(95.0%)	39(97.5%)	0.556
	Blood in stool	29(72.5%)	25(62.5%)	0.340
	Mucoid discharge	1(2.5%)	2(5.0%)	0.556
Sentinel tag	Yes	39(97.5%)	38(95.0%)	0.556
	No	1(2.5%)	2(5%)	
Hypertrophied anal papilla	Yes	20(50.0%)	23(57.5%)	0.501
	No	20(50.0%)	17(42.5%)	

**Table 2.:** Duration of operation and per-operative Complication

	Group A (n=40) No. (%)	Group B (n=40) No. (%)	p values
Duration of surgery (min)	14.60±3.11	17.10±3.26	0.001
Excessive Bleeding	5(12.5%)	9(22.5%)	0.239
Mucosal Tearing	6(15.0%)	20(50.0%)	0.001

**Table 3:** Visual Analogue Scale (VAS), need of NSAIDs and post-operative duration of stay in hospital

		Group A (n=40) No. (%)	Group B (n=40) No. (%)	p value
Visual Analogue Scale	12 h after operation	5.1±0.59	6.18±0.59	<0.001
	24 h after operation	2.33±0.62	2.7±0.61	0.008
	48 h after operation	1.25±0.54	1.40±0.67	0.275
Duration taking NSAIDs	Mean ±SD	5.80±1.50	7.03±1.59	0.001
Hospital stays (Post-op)	Mean ±SD	2.05±0.50	2.52±0.82	0.002

**Table 4:** Post-operative complications

	Group A (n=40) No. (%)	Group B (n=40) No. (%)	p values
Bleeding	4(10.0%)	1(2.5%)	0.166
Haematoma	1(2.5%)	3(7.5%)	0.305
Seroma	0(0.0%)	3(7.5%)	0.077
Perineal abscess	1(2.5%)	2(5.0%)	0.556
Flatus incontinence	6(15.0%)	15(37.5%)	0.022
Stool incontinence	1(2.5%)	6(15.0%)	0.048
Soiling of underclothing	2(5.0%)	8(20.0%)	0.043
Delayed wound healing	1(2.5%)	3(7.5%)	0.305
Delayed fissure healing	1(2.5%)	2(5.0%)	0.556

Post-operative bleeding was more in closed group but incidence of per-operative bleeding, mucosal tearing, wound haematoma, seroma formation, perineal

abscess, flatus incontinence, stool incontinence, soiling of underclothing, delayed wound healing and delayed fissure healing was more in open group.

## Discussion

The mean age of patients presenting with fissures in our study was  $36.45 \pm 10.66$  years. This was comparable with the mean age reported in other studies, which range from 30 to 45 years<sup>10,11</sup>. Women outnumbered men, with a ratio of 1.96:1 in this study. It is not consistent with the results observed in other studies. Nahas et al<sup>12</sup> reported that 70% of their patients with CAFs were men and 30% were women, with a ratio of 2.3:1. Melange et al<sup>13</sup> reported that 55.2% of their patients with CAFs were men and 47.8% were women, with a ratio of 1.15:1. Shafiq and Nadeem<sup>14</sup> reported a much larger male to female ratio of 5.1:1.

Mean duration of surgery of closed lateral internal anal sphincterotomy was  $14.60 \pm 3.11$  minutes and open lateral internal anal sphincterotomy was  $17.10 \pm 3.26$  minutes. Excessive bleeding occurred in 5 (12.5%) cases of closed lateral internal anal sphincterotomy group and 9 (22.5%) cases of open lateral internal anal sphincterotomy group. Mucosal tearing occurred in 6 (15.0%) cases of closed sphincterotomy group and in 20 (50.0%) cases of open sphincterotomy group. SR Mousavi et al found that, there is shorter operation time, less bleeding and less mucosal tearing in closed sphincterotomy technique than open technique<sup>7</sup>.

The mean pain score on the visual analogue 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. Duration of taking NSAIDs for pain relief was also significantly lesser in closed sphincterotomy group. Shafiq and Nadeem concluded in their respective studies that closed sphincterotomy for CAF is effective and may result in significantly less postoperative discomfort, a shorter postoperative length of hospital stay, and a comparable rate of complications with open sphincterotomy<sup>14</sup>. SR Mousavi et al found that there is shorter operation time, less bleeding, less mucosal tearing, less pain and quicker fissure healing in closed sphincterotomy technique<sup>7</sup>.

The incidence of postoperative bleeding, wound hematoma, seroma formation and perineal abscess were almost similar in both open and closed group. There was significantly high rate of development of flatus incontinence (15.0% vs. 37.5%), stool incontinence (2.5% vs. 15.0%) and soiling of underclothing (5.0% vs. 20.0%) in the open than closed lateral internal sphincterotomy group. These findings were almost similar to previous studies.

Although optimum care was taken by the researcher, this study had some limitations. As the study was conducted in a single institute, so the study population might not represent the whole community.

Despite maximum effort by the researcher, due to time and resource limitations, the sample size of the study was small; a larger sample size may give a better result. Long term follow up of patients (minimum 12 weeks) was required to profile cases of recurrence of anal fissure in either group. This was not assessed in this study as the follow up period was limited to six weeks after surgery.

## Conclusion

Post-operative pain, use of NSAIDs and hospital stay is significantly lower in closed lateral internal anal sphincterotomy group. The open and closed lateral internal anal sphincterotomy techniques are not significantly different in terms of post-operative bleeding, haematoma and seroma formation. There is also no significant difference in wound healing and fissure healing between two groups. But there is a significantly higher rate of flatus incontinence, stool incontinence and soiling of underclothing in open lateral internal anal sphincterotomy group. So, closed lateral internal anal sphincterotomy should be 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 patients.

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