

Comparative Study Between Closed Versus Open Internal Sphincterotomy for Management of Chronic Anal Fissure

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ABSTRACT

Background: Chronic anal fissure is one of the most common annoying anal disorders. Many medical treatments are used to help the healing of the fissure but the recurrence rate is so high after the stoppage of medicine, so the surgical treatment by lateral internal sphincterotomy is still the best way of management.

Objective: In our study, we compared two different techniques of lateral sphincterotomy either open or closed techniques.

Patients and methods: This is a prospective study done on 150 patients with chronic anal fissures managed by lateral sphincterotomy between June 2017 till May 2019. The patients were divided into two groups (group A) 70 patients managed by open internal sphincterotomy and (group B) 80 patients managed by closed lateral sphincterotomy.

Results: In the present study, the main complaint of most patients was anal pain during defecation. The most common site of the fissure was posterior at midline with Sentinel pile. Delayed postoperative healing was found in 4.28% of group A. The mean pain score and duration of hospital stay were lower in group B. The risk of post-operative complications such as anal fistula and bleeding was high in group A than in group B.

Conclusion: Closed lateral internal sphincterotomy is a better choice for the management of chronic anal fissure as it was less in postoperative complications and early recovery.

Keywords: Lateral sphincterotomy, Anal pain, Anal bleeding.

INTRODUCTION

Anal fissure is a common benign disease that usually causes irritability and variable degrees of anal pain during defecation. It could be defined as a longitudinal tear of the anal canal usually at the mucocutaneous junction extending from the anal verge towards the dentate line proximally. Most anal fissures are superficial involving the superficial layer of the mucosa of the anal canal however some fissures are deep involving the whole mucosa. Fissures occur most often in the posterior midline and are less common anteriorly seems to be a result of poor blood supply to the posterior commissural region ⁽¹⁾.

Some anal fissures occur laterally (not in the midline) and this is usually considered an indicator of underlying diseases such as Crohn's disease, viral illness, or malignancy ⁽²⁾. The main cause that prevents anal fissures from healing is irritation of the anal sphincter which leads to a decrease in the blood supply and displaced fissure edges, also sphincteric spasm leads to more constipation, and constipation leads to more injury. Anal fissure for more than 6 weeks usually turns into a chronic fissure. A chronic anal fissure (CAF) is accompanied by a sentinel skin tag and hypertrophied anal papilla on examination ⁽³⁾.

In most cases of acute anal fissures and some cases of chronic fissures, medical treatment is effective and leads to fissure healing in about two weeks of medication. Conservative medical treatment uses muscle relaxants, topical drugs, and sometimes drugs given by mouth. These drugs include calcium channel blockers, nitrates (glyceryl-trinitrate), alpha-adrenoreceptor antagonists, and beta-adrenoreceptor agonists ⁽⁴⁾.

Surgical treatment is the best choice for the

management of chronic anal fissures after the failure of medical treatment. Surgery for a CAF aims to decrease the tone of the internal sphincter and hence increase the blood flow with subsequent tissue healing. Surgical options include manual anal dilatation and lateral or posterior internal sphincterotomy. Manual anal dilatation obsolete method by many surgeons as it has been associated with anal incontinence ⁽⁵⁾.

Sphincterolysis is a new method of treatment that is done by blunt division of the internal sphincter fibers also been described ⁽⁶⁾. The golden standard for the treatment of CAFs is lateral sphincterotomy. Various studies have shown the superiority of lateral sphincterotomy over posterior sphincterotomy ⁽⁷⁾.

Lateral sphincterotomy could be done by open or closed methods. So this study aimed to compare both methods as regards safety, efficacy in fissure healing, and postoperative complications.

PATIENTS AND METHODS

This was a prospective study done over 150 patients with chronic anal fissures managed by lateral sphincterotomy between June 2017 till May 2019 at General Surgery Department, Bab Al-Sharia Hospital, Al-Azhar University. The patients were divided into two groups, group A contained seventy patients managed by open lateral sphincterotomy, and group B consisted of eighty patients which were managed by closed lateral sphincterotomy.

All the included patients had midline chronic anal fissures with recurrent anal pain and bleeding during defecation.

Exclusion criteria include patients below 14 years or over 60 years old, patients with previous rectal surgery, previous sphincterotomy, weak anal tone at the preoperative examination, or patients with associated inflammatory bowel disorders or malignancies.

All patients were subjected to a full medical history of symptoms taken for all patients such as constipation, bleeding per rectum, anal discharge. Past surgical and medical history fulfilled.

Examination findings also were recorded. Anal fissures were considered to be chronic when they failed to heal with conservative management for more than six weeks. They are characterized by a lack of granulation tissue with secondary features such as a sentinel pile, hypertrophied anal papilla, or a degree of anal stenosis. After the patient's clinical assessment preoperative investigations and anesthesia consultation were done.

Surgical techniques:

All operations in this study were done under general or regional anesthesia. The patient was positioned in the lithotomy position, followed by sterilization and taweling then a digital rectal examination was done under anesthesia and the anoscope was used to visualize the anal canal before the operation.

In group **A**, a longitudinal incision was made at the mucocutaneous junction at the intersphincteric groove, and the distal half of the internal anal sphincter was delivered outside the wound using a mosquito artery and then divided under vision followed by a sterile pack (**Fig. 1**).



Figure (1): Showing open lateral sphincterotomy. The internal sphincter is delivered using a mosquito artery to divide it.

In group **B**, we used a von graffe's blade to make a stab incision at the inter sphincteric groove. We rotate

the blade knife side toward the internal sphincter to divide it. The stab incision was left unsutured (**Fig. 2**).



Figure (2): Showing the closed internal sphincterotomy through inter sphincteric groove stab incision.

The patients were advised for eating a soft diet by mouth after 4 hours of the operation. We used a visual analog scale to assess the intensity of pain from 0 (no pain) to 10 (worst agonizing pain) and was assessed at 12 and 24 hours after the operation. After the operation, we examined the wound for any complications like hematomas or bleeding 12 hours postoperatively to determine the mean duration of hospital stay. Patients were advised to follow up at the outpatient clinic every week to monitor fissure healing, and then they were subsequently followed up monthly for at least 1 year.

Ethical consent:

Approval of the study was obtained from Al-Azhar University academic and ethical committee. Every patient signed informed written consent for the acceptance of the operation. This work has been carried out following The Code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans.

Statistical analysis

Qualitative data were presented as numbers and percentages. Comparison between groups as regard sex, fissure position, symptoms at presentation, and postoperative complications in the two groups was done by Chi-Square test. Mean \pm SD and range were used to present Quantitative data. Student t-test was used to compare between two groups regarding age, postoperative pain, and length of stay. $P < 0.05$ was considered to be statistically significant.

RESULTS

The attainable results showed a statistically non-significant difference between different surgical techniques regarding either age or gender (**Table 1**). The predominant symptom before the operation was pain during defecation in 37 (52.8%) patients in open sphincterotomy group **A** and 42(52.5%) patients in the

closed sphincterotomy group **B**. Bleeding with pain during defecation was seen in 33 (47.14%) patients in the open sphincterotomy group **A** 38 (47.5%) patients in the closed sphincterotomy group **B** (**Table 1**).

66 (82.5%) patients in the closed sphincterotomy group and 67(95.7%) patients in the open sphincterotomy group presented with a posterior midline anal fissure. 11 (13.75%) patients in the closed sphincterotomy group and two(2.9%) patients in the open sphincterotomy group presented with an anterior midline anal fissure, i.e. at the 12 o'clock position. Combined anterior and posterior chronic anal fissures were seen in 3 (3.75%) patients in the closed sphincterotomy group and one (1.42) patient in the open sphincterotomy group (**Table 2**).

The measurement of pain 12 hours after the operation

using the visual analog scale was 6.82 ± 0.81 in the closed sphincterotomy group and 7.13 ± 0.75 in the open sphincterotomy group ($p < 0.001$). The mean score on the visual analog scale 24 hours after the operation was 3.10 ± 0.35 in the closed sphincterotomy group and 3.35 ± 0.59 in the open sphincterotomy group ($p = 0.003$). The mean duration of hospital stay was 1.38 ± 1.33 days in patients undergoing closed sphincterotomy compared with 2.38 ± 2.45 days in the open sphincterotomy group ($p=0.004$). Although delayed healing was seen in 4.28% ($p=0.08$) of the open sphincterotomy patients, no patients in the closed sphincterotomy group had delayed wound healing (**Table 2**).

No recorded cases of Postoperative incontinence or recurrence after healing in both groups.

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

	Group A Opened sphincterotomy N=70 n (%)	Group B Closed sphincterotomy N=80 n (%)	P-value
Age			
Range	19 -55	25 - 58	P = 0.482
Mean	39.38 ± 12.96	40.88 ± 11.80	
Sex			
Male	43 (63.2)	38 (55.9)	P=.382
Female	25 (36.8)	30 (44.1)	
Symptoms			
Pain during defecation without bleeding	37 (52.8%)	42 (52.5%)	P=.362
Bleeding with pain during defecation	33 (47.14%)	38 (47.5%)	
Fissure position			
Anterior	2(2.9%)	11 (13.75%)	P=.078
Posterior	67(95.7%)	66 (82.5%)	
Combined	1(1.42)	3 (3.75%)	

Table (2): Comparison between both groups as regards pain score, hospital stay and wound healing time.

	Group A Opened sphincterotomy N=70 n (%)	Group B Closed sphincterotomy N=80 n (%)	P-value
Visual analog pain score			
After 12 hour	7.13 ± 0.75	6.82 ± 0.81	($p < 0.001$)
After 24 hour	3.35 ± 0.59	3.10 ± 0.35	($p = 0.003$)
Days of Hospital stay	2.38 ± 0.45	1.38 ± 0.33	($p = 0.004$)
Delayed healing	3 (4.28)%	0%	($p = 0.08$)

DISCUSSION

Surgical lateral internal sphincterotomy is still the golden standard for the treatment of chronic anal fissures (CAFs) although there are new modalities for the treatment such as botulinum toxin injection and sphincterolysis. Sphincterotomy was first described by Boyer in 1818. 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 CAFs (8, 9).

Most of the fissures were found in the middle age group, with 29.4% of patients in the closed sphincterotomy group aged between 40 and 51 years and 30.9% of patients in the open sphincterotomy group aged between 31 and 45 years. In our study, the patients' mean ages were 40.13 ± 12.37 years. This is comparable with the mean age recorded in other studies, which range from 30 to 50 years (10, 11, 12).

The total number of male patients is more than females in our study with a ratio of 1.47. **Nahas et al.** (13), reported that 70% of their patients with CAFs were men and 30% were women, with a ratio of 2.3:1. **Melange et al.** (14) 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** (15) reported a much larger male to female ratio of 5.1:1.

The main presentation of patients in this study was pain during defecation with a lower incidence of bleeding from the rectum was noted this coincides with the same study done by **Mousavi et al.** (16). Most of the patients (88.6%) presented with posterior midline anal fissures. Other positions seen were anterior midline (12.3%), and both positions were seen in four patients. A lot of studies of anal fissures have established the posterior midline fissure to be the most common location (10, 15, 17).

As regards complication rates in both groups, both methods are effective in the treatment of fissures. No case of incontinence was noted and most of the patients underwent rapid healing and resolution of symptoms. **Kortbeek and colleagues** (18) also reported that closed sphincterotomy is effective in the treatment of CAFs with fewer postoperative complications. **Pernkoff and colleagues** (9) reported that the complication rate was relatively higher in open compared with closed sphincterotomy.

In this study, three cases of delayed healing were noted in the open group while No cases of delayed or absent healing were noted in the closed group, whereas No recurrence of CAF, or incontinence was noted on long-term follow up in our study. Also, **Arroyo and colleagues** (4) reported that closed lateral sphincterotomy is effective with fewer postoperative complications. In a long-term study, **Garcia-Aguilar and colleagues** (19) concluded that closed lateral sphincterotomy is preferred to open lateral sphincterotomy as it carries less impairment of control.

According to the visual analog scale twenty-four hours after the operation the mean pain score was lower in group **B** than in group **A**. There was a statistically significant difference between the duration of hospital stay in the two groups. The mean duration of stay was 1.38 days in the closed sphincterotomy group and 2.38 days in the open sphincterotomy group. In a study done by **Shafiq and Nadeem** (15) they concluded that closed sphincterotomy for CAF is effective and may result in significantly less post-operative pain, a shorter postoperative length of hospital stay, and a lower rate of complications rather than open sphincterotomy.

Some authors believe that the length of the sphincter divided plays a role in the incidence of postoperative incontinence so they suggested that there was a higher risk of incontinence in open than the closed technique as the length of the sphincter divided is more in the open method (8, 15, 17, 19).

CONCLUSION

Our study conducted that closed sphincterotomy is preferred over open sphincterotomy as it is effective and safer with a less cost burden for the patient. Healing was better with closed than in the open sphincterotomy group, there was a significant statistical difference between the mean pain score at 12 hours and 24 hours after the operation and also the duration of hospital stay in both groups. There was no significant difference between open and closed techniques of sphincterotomy as regards postoperative complications and healing rates although Postoperative pain was less in the closed method.

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