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OPEN LATERAL INTERNAL SPHINCTEROTOMY VERSUS CLOSED LATERAL INTERNAL SPHINCTEROTOMY IN THE TREATMENT OF FISSURE IN ANO: COMPARATIVE STUDY

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ABSTRACT

Background: An anal fissure is a painful condition that affects the sensitive squamous epithelium in the lower half of the anal canal. Lateral internal sphincterotomy is still the primary treatment option. There are two techniques used: closed and open methods. The closed lateral internal sphincterotomy technique offers faster healing and fewer postoperative complications, while the open lateral internal sphincterotomy technique allows for direct visualization and controlled release of internal fibers. **Objectives:** To compare the results of open and closed lateral internal sphincterotomy techniques for treating anal fissures. **Methods:** This is a single-blind randomized controlled study conducted at Mosul General Hospital and Shingal (Sinjar) General Hospital From the 1st of February 2019 to the end of May 2020. Patients aged more than 18 years who fit for anesthesia and they were suffered from difficult defecation, blood in stool, and a fissure in ano on clinical examination were enrolled. Patients with Crohn's disease, hidradenitis suppurativa, or sexually transmitted diseases were excluded. The questionnaire consisted from three parts. Part one for sociodemographic information, part two for patients past medical history, part three for preoperative and postoperative pain scores, bleeding per rectum and healing. **Results:** The study includes 60 patients with chronic anal fissure. The mean age ± standard deviation of the study participants was 43.11 ± 16.09 years. Of them, 36 (60%) patients were males and 24 (40%) were females, with male to female ratio of 1.5:1. No statistically significant difference between patients underwent open and closed lateral internal sphincterotomy regarding their age, gender and anal fissure location. Moreover, no statistically significant difference between the two groups regarding their past medical history. Furthermore, no statistically significant difference between the two groups regarding their preoperative and postoperative pain, bleeding per rectum and healing. **Conclusion:** Closed lateral internal sphincterotomy and open lateral internal sphincterotomy had similar fissure healing rates, with no significant difference in postoperative pain or per rectal bleeding. As a result, there is no significant difference in surgical outcomes between them in the treatment of fissures in ano.

KEYWORDS: Closed, Fissure, Open, Outcomes, Sphincterotomy.

1. INTRODUCTION

An anal fissure is a painful condition that affects the sensitive squamous epithelium in the lower half of the anal canal.[1] It is typically located in the posterior midline, followed by the anterior midline, and is one of the most common proctological disorders in the world.[2] The actual etiology of anal fissures is unknown, although variables such large hard stools, poor nutrition, past surgery, childbirth, and laxative misuse may contribute to the condition.[3] However, high resting anal canal pressures and decreased blood flow in the posterior midline could contributing causes.[4] Anal fissures are thought to be caused by hypertonic anal sphincters and consequent mucosal ischemia.[5] Although the exact cause of this illness is unclear, it is widely believed that a spasm of the internal anal sphincter is a key factor in its development. This creates a vicious circle: Fissure-internal anal sphincter spasm causes discomfort.[6]

The idea that hypertonia and decreased blood flow cause anal fissures has aided the development of various innovative treatments.[7] The aim of treatment, in light of this new knowledge of the pathophysiology of anal fissures, is to relax the internal sphincter without resulting in fecal incontinence. As a result, lateral internal sphincterotomy has gained widespread recognition as the preferred therapy for anal fissures because it relaxes the hypertonic sphincter, which lessens anal discomfort and promotes healing.[8-9]

For persistent anal fissures, lateral internal sphincterotomy is still the primary treatment option. There are two techniques used: closed and open methods. The purpose of lateral internal sphincterotomy is to separate the distal third to one-half of the internal anal sphincter.[10] The closed lateral internal sphincterotomy (CLIS) technique offers faster healing and fewer postoperative complications, while the open lateral internal sphincterotomy (OLIS) technique allows for direct visualization and controlled release of internal fibers. Currently, there are no clear guidelines on whether to perform lateral internal sphincterotomy using an open or closed approach.[11]

The study aimed to compare the results of open and closed lateral internal sphincterotomy techniques for treating anal fissures.

2. PATIENT AND METHOD

This is a single-blind randomized controlled study conducted at Mosul General Hospital and Shingal (Sinjar) General Hospital From the 1st of February 2019 to the end of May 2020. Before enrolling patients, the Directorate of Health in Nineveh approved the study and written consent was signed by each patient, outlining the risks and advantages of the surgical technique. Patients aged more than 18 years who fit for anesthesia and they were suffered from difficult defecation, blood in stool, and a fissure in ano on clinical examination were enrolled. Patients with Crohn's disease, hidradenitis suppurativa, or sexually transmitted diseases were excluded.

From 66 patients enrolled in the study, 60 patients were finally enrolled and they randomly divided in two groups equally, odd numbers were treated by OLIS, whereas even number underwent CLIS. Pre-operative investigations included complete blood count, random blood sugar, serum creatinine, blood urea, electrolytes, and serology. After receiving spinal anesthesia, the patients were placed on the operating table in lithotomy position.

For open lateral internal sphincterotomy technique, A radial incision was made lateral to the lower border of the internal sphincter, leading into the intersphincteric groove. The distal internal sphincter was raised using artery forceps, and the fibers in the lower third or half were split. While for closed lateral internal sphincterotomy technique, surgical blade number 11 was inserted between the perianal skin and the internal sphincter. Once the tip reached the dentate line, the blade was rotated outward to separate the sphincter. Adequate release was characterized as a "give way" sensation during fiber division. The bleeding was controlled by removing the blade and applying mild pressure for 5 minutes.

On the day of surgery, patients received injections of metronidazole, cefuroxime, and paracetamol, followed by oral analgesics to reduce pain. Patients were discharged on the first postoperative day. The Visual Analog Scale (VAS) score was used to determine the level of pain. Pain severity was evaluated using provided cut points on the VAS: no pain (0-4 mm), mild pain (5-44 mm), moderate pain (45-74 mm), and severe pain (75-100 mm). Digital rectal examination assessed rectal bleeding and fissure healing.[12] Fissure healing was the main outcome measure, whereas postoperative pain intensity as measured by VAS and rectal bleeding were the secondary outcome measures.

The collected data were coded, entered, and analyzed using the available data base software program statistical package of IBM SPSS-29 (IBM Statistical Packages for Social Sciences- version 29, Chicago, IL, USA). Data were presented in simple measures of percentage, mean, standard deviation, median and interquartile rang. Student's t-test was used to compare numerical variables between the two groups with application of chi square test for categorical variables. Fisher's exact was used when applicable. Statistical significance was considered whenever the P value was equal or less than 0.05.

3. RESULTS

The study includes 60 patients with chronic anal fissure. The mean age ± standard deviation of the study participants was 43.11 ± 16.09 years. Of them, 36 (60%) patients were males and 24 (40%) were females, with male to female ratio of 1.5:1.

Table 1 shows comparison between the two groups regarding their basic information. No statistically significant difference between them their age, gender and anal fissure location (P value > 0.05) for all of these variables.

Table 1: Comparison between the two groups regarding their basic information (number = 60)

Variable	Open lateral internal sphincterotomy = 30	Closed lateral internal sphincterotomy = 30	P-value
Age (years), mean ± standard deviation:	43.47 ± 15.73	42.79 ± 16.32	0.728
Gender: -Male -Female	 18 (60%) 12 (40%)	 18 (60%) 712(40%)	1
Fissure location: -Anterior -Posterior	 4 (13.3%) 26 (86.7%)	 2 (6.7%) 28 (93.3%)	0.578

Table 2 shows comparison between the two groups regarding their past medical history. No statistically significant difference between the two groups regarding this issue (P value = 0.927).

Table 2: Comparison between the two groups regarding their past medical history. (number = 60)

Variable	Open lateral internal sphincterotomy = 30	Closed lateral internal sphincterotomy = 30	P-value
Past medical history: -Negative -Diabetes - Hypertension -Other	 24 (80%) 3 (10%) 2 (6.7%) 1 (3.3)	 23 (76.7%) 4 (13.3%) 2 (6.7%) 1 (3.3%)	0.927

Table 3 shows comparison between the two groups regarding their preoperative and postoperative pain. No statistically significant difference between them (P value > 0.05) for all of these variables.

Table 3: Comparison between the two groups regarding their preoperative and postoperative pain. (number = 60).

Pain severity	Open lateral internal sphincterotomy = 30	Closed lateral internal sphincterotomy = 30	P-value
Preoperative: -No pain - Mild - Moderate - Severe	 0 (0%) 0 (0%) 25 (83.3%) 5 (16.7%)	 0 (0%) 0 (0%) 24 (80%) 6 (20%)	0.863
Day 1 post operation: -No pain - Mild - Moderate Severe	 11 (26.7%) 13 (43.3%) 3 (10%) 4 (13.3%)	 13 (43.3%) 9 (30%) 4 (13.4%) 4 (13.3%)	0.572
Day 7 post operation: -No pain - Mild - Moderate Severe	 12 (40%) 12 (40%) 4 (13.3%) 2 (6.7%)	 14 (43.3%) 10 (33.3%) 3 (10%) 3 (10%)	0.629
Day 14 post operation: -No pain - Mild - Moderate Severe	 15 (50%) 12 (40%) 2 (6.7%) 1 (3.3%)	 15 (50%) 13 (43.3%) 1 (3.3%) 1 (3.3%)	0.790
Day 28 post operation: -No pain - Mild - Moderate Severe	 24 (80%) 6 (20%) 0 (0%) 0 (0%)	 23 (76.7%) 7 (23.3%) 0 (0%) 0 (0%)	0.728

Table 4 shows comparison between the two groups regarding their preoperative and postoperative per rectal bleeding. No statistically significant difference between them (P value > 0.05) for all of these variables.

Table 4: Comparison between the two groups regarding their preoperative and postoperative bleeding. (number = 60).

Per rectal bleeding	Open lateral internal sphincterotomy = 30	Closed lateral internal sphincterotomy = 30	P-value
Preoperative: -Yes -No	 22 (73.3%) 8 (26.7%)	 21 (70%) 9 (30%)	0.721
Day 1 post operation: -Yes -No	 11 (36.7%) 19 (63.3%)	 12 (40%) 18 (60%)	0.709
Day 7 post operation: -Yes -No	 9 (30%) 21 (70%)	 10 (33.3%) 20 (66.7%)	0.772
Day 14 post operation: -Yes -No	 6 (20%) 24 (80%)	 6 (20%) 24 (80%)	1
Day 28 post operation: -Yes -No	 3 (10%) 27 (90%)	 2 (6.7%) 28 (93.3%)	0.729

Table 5 shows comparison between the two groups regarding their preoperative and postoperative healing of fissure on rectal examination. No statistically significant difference between them (P value > 0.05) for all of these variables.

Table 5: Comparison between the two groups regarding their preoperative and postoperative pain. (number = 60).

Healing of fissure	Open lateral internal sphincterotomy = 30	Closed lateral internal sphincterotomy = 30	P-value
Preoperative: -Yes -No	 0 (0%) 30 (100%)	 0 (0%) 30 (100%)	1
Day 1 post operation: -Yes -No	 20 (66.7%) 10 (33.3%)	 18 (60%) 12 (40%)	0.136
Day 7 post operation: -Yes -No	 23 (76.6%) 7 (23.3%)	 22 (73.3%) 8 (26.7%)	0.763
Day 14 post operation: -Yes -No	 27 (90%) 3 (10%)	 27 (90%) 3 (10%)	1
Day 28 post operation: -Yes -No	 29 (96.6%) 1 (3.3%)	 29 (96.6%) 1 (3.3%)	1

4- DISCUSSION

The most frequent surgery for fissure in ano is lateral internal sphincterotomy, which can be open or closed. The current study evaluated the healing of fissures, rectal bleeding, and postoperative pain during defecation between the two groups.

The study found that the mean age of the study participants was around 43 years which falls within the range found by several studies, but it is not a universal constant for all anal fissure patients.[13-14] Moreover, sixty percent of the study patients were males, while one specific study reported 55% males in a patient cohort[15], other state that anal fissures affect males and females equally or show only a slight variation in numbers.[16] Additionally, most of the patients (90%) had posterior anal fissure, this is might due to poor blood flow to this area and increased pressure on the posterior wall during bowel movements, making the epithelium vulnerable to injury. Anyhow, fissures in the anterior or lateral positions are less common and can indicate a secondary cause, requiring further investigation.[17] Consistent findings obtained by Altomare et al.[18]

The present study found that the majority of patient (78.3%) had no previous history of chronic disease, which highlights that fissures are not always a consequence of underlying conditions like inflammatory bowel disease or HIV, although these are known causes in some cases. Instead, factors such as constipation and hard bowel movements are often implicated, and a

fissure can develop from a simple anal injury. Similar results obtained by Mapel et al.[19]

Regarding preoperative and postoperative pain, the study found that both groups had comparable pain-relieving results, suggesting that both techniques are effective in managing pain from chronic anal fissures, which goes with Pathak et al study finding.[20] However, Sadiq et al[21], Asefa et al (10) and Chaudhary et al[22] reported that patients underwent closed operation had less pain than open operation group. The same thing for preoperative and postoperative per rectal bleeding, both groups showed comparable results. Some studies finding comparable rates[10, 20] while other study found higher rates in the closed group.[23] Furthermore, comparable healing results between the two groups found in this study, which aligns with other study finding[20] however, in other studies, closed technique was a better choice, citing lower rates of delayed healing[22, 24] Anyhow, the variability in the results across studies is partly due to differences in sample sizes, assessment tools, and follow-up durations.

5. CONCLUSION

Closed lateral internal sphincterotomy and open lateral internal sphincterotomy had similar fissure healing rates, with no significant difference in postoperative pain or per rectal bleeding. As a result, there is no significant difference in surgical outcomes between them in the treatment of fissures in ano.

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