ORIGINAL ARTICLE ASIAN JOURNAL OF MEDICAL SCIENCES

A comparative study of the outcome of unilateral versus bilateral internal anal sphincterotomy in treatment of chronic anal fissure

Partha Pratim Mandal[1], Shivaji Mandal[2], Debayan Chowdhury[3]

[1]Associate Professor, Department of General Surgery, College of Medicine and Sagore Dutta Hospital, [2]Associate Professor, [3]Assistant Professor, Department of General Surgery, Ramakrishna Mission Seva Pratishthan, Vivekananda Institute of Medical Sciences, Kolkata, West Bengal, India

Submission: 18-05-2024 Revision: 28-07-2024 Publication: 01-09-2024

ABSTRACT

Background: Gold standard treatment for chronic anal fissure is lateral internal sphincterotomy. Bilateral internal sphincterotomy (BIS) as a treatment option for chronic anal fissure has not been evaluated. **Aims and Objectives:** The aims and objectives of the study are to compare the efficacy of unilateral versus bilateral internal anal sphincterotomy in treatment of chronic anal fissure. **Materials and Methods:** Study design: A prospective randomized comparative study. Study area: Patients coming to General Surgery outpatient department at College of Medicine and Sagore Dutta Hospital with chronic anal fissure. Study period: July 2022 to December 2023 (18 months). Sample Size: 100 patients. Study Group: Group A = Patients who had undergone unilateral internal sphincterotomy (UIS) = 50 patients and Group B = Patients who had undergone BIS = 50 patients. **Results:** 2 (4%) patients in Group A and 3 (6%) patients in Group B developed incontinence for flatus postoperatively. No patients in either group developed incontinence for stools. The Mean Fissure Healing Time (Mean ± SD) (Weeks) post-sphincterotomy was 4.32 ± 0.91339 in Group A and 2.66 ± 0.65807 in Group B. There were 6 cases of recurrence in the unilateral sphincterotomy group. Second surgery was needed in 4 patients who underwent unilateral sphincterotomy. **Conclusion:** As compared to UIS, BIS results in a faster healing of chronic anal fissure, with no increase in incontinence, decreased pain score, and less recurrence rates.

Key words: Unilateral internal anal sphincterotomy; Bilateral internal anal sphincterotomy; Lateral internal anal sphincterotomy

Access this article online

Website: http://nepjol.info/index.php/AJMS

DOI: 10.3126/ajms.v15i9.65960

E-ISSN: 2091-0576

P-ISSN: 2467-9100

INTRODUCTION

An anal fissure is a common benign anorectal disease affecting both children and adults. It is defined as a painful linear tear in the posterior anoderm extending cephalad to the dentate line. Classically these are caused by a large, firm, forceful bowel movement. This results in cycles of recurring anal pain and bleeding leading to chronic anal fissures in as many as 40% of patients who develop fissures after 6–8 weeks.[1]

It is characterized by spasm of the internal anal sphincter and decrease in blood flow, and this results in a delayed healing of the ulcer (except in postpartum individuals).[2]

There are several medical therapies including salves, fiber, topical nitroglycerin, and calcium channel blockers that aid in spontaneous closure early in the disease process causing a chemical sphincterotomy. The aim of medical therapy is to relieve the sphincter spasm that eventually relieves the pain and aids in healing. Surgical therapies include botulinum toxin injections, fissurectomy, advancement flaps, and internal lateral anal sphincterotomy. Surgical intervention is typically indicated with chronic fissures or for fissures that are not amenable to medical therapy.[1]

Internal lateral anal sphincterotomy was first introduced in 1951, by Eisenhammer. At present, it is considered the

Address for Correspondence:
Dr. Debayan Chowdhury, Assistant Professor, Department of General Surgery, Ramakrishna Mission Seva Pratishthan, Vivekananda Institute of Medical Sciences, Kolkata, West Bengal, India. **Mobile:** +91-8584063373. **E-mail:** dbayn169@gmail.com

gold standard surgical intervention though associated with risk of recurrence in about 30% of patients.[3]

The rationale of unilateral internal anal sphincterotomy is that the internal sphincter is formed of circular muscle fibers and cutting the fibers at one point decreases the tone and relaxes the sphincter completely and thus pain relief and healing occurs. Therefore, cutting at one or two points of the sphincter should not matter. Our study aims to compare unilateral internal sphincterotomy (UIS) versus bilateral internal sphincterotomy (BIS).

Aims and objectives

Aims

To compare the efficacy of unilateral versus BIS in the treatment of chronic anal fissure.

Objectives

1. To compare post-operative pain and incontinence among patients of the two groups
2. To compare the complications, recurrence rates, and the requirement for a second surgery among the two groups of patients
3. To compare the healing time of fissure post-internal sphincterotomy of both the patient groups.

MATERIALS AND METHODS

Study design

A prospective randomized comparative study.

Study area

Patients coming to the General Surgery outpatient department at College of Medicine and Sagore Dutta Hospital with Chronic anal Fissure.

Study period

July 2022–December 2023 (18 months).

Sample size

100 patients.

Inclusion criteria

1. Patients with anal fissures>3 months
2. Both sexes
3. Unresponsive to medical treatment
4. Patients with recurrent anal fissure.

Exclusion criteria

1. Immunocompromised patients
2. Patients history of previous anorectal surgery
3. Pregnant patients
4. Patients with anorectal malignancies
5. Patients not willing to take part in the study.

Study group

Group A=Patients who had undergone UIS=50 patients
Group B=Patients who had undergone BIS=50 patients.

Statistical analysis

Analysis was done using Statistical Package for the Social Sciences software version 25.0. Pearson's Chi-square test was used to test the significance between the variables of the two groups. Analysis of pain Visual Analog Scale (VAS), fissure healing time, was done using independent student t-test. $P<0.05$ was considered statistically significant.

Methodology

After obtaining proper informed consent, thorough history was taken in a pre-designed proforma. Diagnosis was by clinical anal examination. Routine blood investigations along with other tests for procuring anesthetic fitness were done, and finally, the patient was posted for surgery.

Procedure of surgery (UIS and BIS)

Under spinal anesthesia, the patient was positioned in lithotomy position with proper draping and strict asepsis. Digital rectal examination and proctoscopy were done to confirm the diagnosis and to rule out any other pathology. Any sentinel piles or papilloma if present was excised. UIS was done at 3'O' clock position (Figure 1) and BIS was done at 3 'O' clock and 9 'O' clock subsequently (Figure 2). 2–3 mm incision was made and dilated with a curved hemostat. With the guidance of the left index finger inside the anorectal lumen, the tight internal sphincter was felt and hooked from outside with the hemostat through the incision, and its fibers were transected slowly with diathermy.

Post-operative care

The patient was put-on broad-spectrum oral antibiotics covering the anal flora, analgesics, and stool softeners

Figure 1: Unilateral sphincterotomy - internal anal sphincter dissected out at 3 'O' Clock and lifted up by a gauge piece

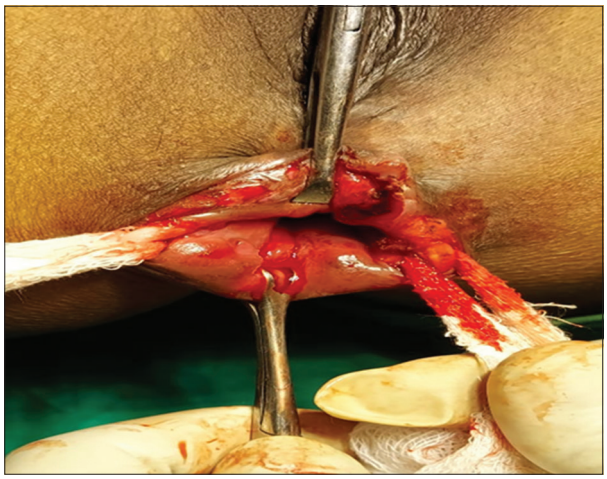

Figure 2: Bilateral sphincterotomy - internal anal sphincter dissected out at 3 'O' Clock and 9 'O' Clock and lifted up by a gauge piece on both sides

(Lactulose syrup). Sitz bath and dry dressing were prescribed 3 times a day along with the application of ano-metrogyl (Lidocaine+Metronidazole+Sucralfate) ointment locally after sitz bath. The condition of the wound, healing time, and post-operative pain were monitored.

Discharge and follow-up

Patients were discharged with a healthy wound with advice to take oral antibiotics (Cefuroxime), sitz bath 3 times a day, and ointments to be applied locally over the wound. The patients were instructed to follow-up at 1 week, 2 weeks, 1 month, and 6 months.

RESULTS

The mean age (years) (Mean±SD) of the patients in Group A was 44.24±12.737 while that of Group B was 45.82±10.722. There was no significant difference between the age of the patients of the two groups (P=0.504, 2-tailed independent samples t-test). Thus, the two groups were comparable in terms of age.

In our study, there were 53 females and 47 males. In Group A, there were 25 (50%) females and 25 (50%) males. In Group B, there were 28 (56%) females and 22 (44%) males. There was no significant difference between gender and the type of surgery performed (P=0.548, Chi-square test). Thus, the two groups were comparable in terms of Sex.

87 patients had posterior anal fistula whereas 13 patients had anterior anal fistula. 43 patients had posterior fistula and 7 patients had anterior fistula in Group A. 44 patients had posterior fistula and 6 patients had anterior fistula in Group B. There was no significant difference between the site of fistula of the two groups (P=0.766, Chi-square test). Thus, both groups were comparable in terms of site of fistula.

The mean post-operative VAS at 72 h (Mean±SD) of Group A is 3.68±1.25 and Group B is 1.32±0.91. The mean post-operative VAS at 72 h was significantly higher in the unilateral sphincterotomy group (P=0.039, independent samples t-test).

2 (4%) patients in Group A and 3 (6%) patients in Group B developed incontinence for flatus postoperatively. There is no significant difference between the development of incontinence of flatus among the two groups (P=0.646, Chi-square test).

No patients in either group developed incontinence for stools in our study.

The mean fissure healing time (Mean±SD) (weeks) post-sphincterotomy was 4.32±0.91339 in Group A and 2.66±0.65807 in Group B. The mean fissure healing time of bilateral sphincterotomy group was significantly lower than the unilateral group (P=0.019, independent samples t-test).

There were 6 cases of recurrence in unilateral sphincterotomy group which was statistically significant (P=0.012, Chi-square test).

Second surgery was needed in 4 patients who underwent unilateral sphincterotomy, which was statistically significant (P=0.041, Chi-square test) (Table 1).

DISCUSSION

Chronic anal fissure is managed surgically when conservative medical management fails.[4] At present, lateral internal sphincterotomy is the surgical treatment of choice for refractory anal fissures and may be offered without pharmacologic treatment failure according to the practice parameters by the American Society of Colon and Rectal Surgeons.[5] However, there is always an inherent risk of incontinence associated with these surgical procedures. Our study aims to compare surgical outcomes of BIS vs. UIS.

Beaty and Shashidharan[4] mentioned that fissures are seen with equal frequency in males and females. In our study also, female: male ratio was also 1.1:1.

Hananel and Gordon[6] study depicted that fissures are most commonly seen in middle-aged and younger patients, with mean age of onset 39.9 years. In our study also, the overall mean age was 45.03 years.

Table 1: Results obtained in the study summarized

Parameters	Group A (UIS)	Group B (BIS)	P-value
Number	50	50	
Age range in years	21–71	27–71	
Mean age in years	44.24 (±12.737)	45.82 (±10.722)	ns
Female: Male	25:25 i.e. 1:1	28:22 i.e. 14:11	ns
Site of fistula	43-posterior 7-anterior	44-posterior 6-anterior	ns
Mean post-operative VAS at 72 h (range 1–10)	3.68 (±1.25)	1.32 (±0.91)	0.039 sig
Incontinence of flatus	2	3	ns
Incontinence of stool	0	0	
Fissure healing time (weeks)	4.32 (±0.91339)	2.66 (±0.65807)	0.019 sig
Recurrence	6	0	0.012 sig
Second surgery required	4	0	0.041 sig

UIS: Unilateral internal sphincterotomy, BIS: Bilateral internal sphincterotomy, VAS: Visual Analog Scale

The most common site for primary anal fissure is the posterior midline (90%).[7] In our study also, 87% patients had posterior fissure.

In our study, the mean post-operative VAS at 72 h was significantly higher in the unilateral sphincterotomy group. In Borhamand Naroz[8] study, UIS patients had significantly higher 24-h and 1-week post-surgery VAS scores than the BIS group.

2 (4%) patients in Group A and 3 (6%) patients in Group B developed incontinence for flatus postoperatively. There is no significant difference between the development of incontinence of flatus among the two groups. In Pujahari[9] study, 4 patients in UIS group and 2 patients in BIS developed incontinence for flatus (statistically not significant).

No patients in either group developed incontinence for stools in our study which was similar to Pujahari[9] study.

The mean fissure healing time (mean±SD)(weeks) post-sphincterotomy was 4.32±0.91339 in Group A and 2.66±0.65807 in Group B. The mean fissure healing time of bilateral sphincterotomy group was significantly lower than the unilateral group. Oettlé[10] reported complete healing rates in 2 weeks but his sample included only 12 patients. In Borham and Naroz[8] study, 65.6% and 56.25% of patients in BIS and UIS, respectively, had fully healed fissures at the conclusion of the 4th week (statistically significant).

There were 6 cases of recurrence in unilateral sphincterotomy group which was statistically significant. The second surgery was needed in 4 patients who underwent unilateral sphincterotomy, which was statistically significant. In Pujahari[9] study, there were 12 cases of recurrence in UIS group and 1 recurrence in BIS group (Statistically significant) and second surgery was required in 5 patients in UIS group which was statistically significant.

Limitations of the study

1. Sample size was small. Only 100 patients were chosen
2. Study was conducted in a single center
3. Study was conducted in a tertiary care hospital, so hospital bias cannot be ruled out.

CONCLUSION

As compared to UIS, BIS results in a faster healing of chronic anal fissures, with no increase in incontinence. The pain score decreases significantly post-BIS and the recurrence rates and need for a second surgery are lower.

ACKNOWLEDGMENT

The authors would like to acknowledge the contribution of Dr. Subhasish Sarkar, Assistant Professor, Department of General Surgery, College of Medicine and Sagore Dutta Hospital for his immense help, constant guidance, patronage, and procuring necessary permission for the conduct of this study.

REFERENCES

1. Villanueva Herrero JA, Henning W, Sharma N and Deppen JG. Internal anal sphincterotomy. In: StatPearls. Treasure Island, FL: StatPearls Publishing; 2022. Available from: https://www.ncbi.nlm.nih.gov/books/NBK493213 [Last accessed on 2022 Oct 03].
2. Lindsey I. Anal fissure. In: Givel JC, Mortensen N and Roche B, editors. Anorectal and Colonic Diseases. *New York*: Springer; 2010. p. 325-337.
3. Jonas M and Scholefield JH. Anal fissure. Gastroenterol Clin North Am. 2001;30(1):167-181. https://doi.org/10.1016/s0889-8553(05)70172-2
4. Beaty JS and Shashidharan M. Anal fissure. Clin Colon Rectal Surg. 2016;29(1):30-37. https://doi.org/10.1055/s-0035-1570390
5. Perry WB, Dykes SL, Buie WD, Rafferty JF and Standards Practice Task Force of the American Society of Colon and Rectal Surgeons. Practice parameters for the management of anal

fissures (3rd revision). Dis Colon Rectum. 2010;53(8):1110-1105. https://doi.org/10.1007/DCR.0b013e3181e23dfe

6. Hananel N and Gordon PH. Re-examination of clinical manifestations and response to therapy of fissure-in-ano. Dis Colon Rectum. 1997;40(2):229-233. https://doi.org/10.1007/BF02054993
7. Gordon PH and Nivatvongs S. Principles and Practice of Surgery for the Colon, Rectum and Anus. 2nd ed. St. Louis, MO: Quality Medical Publishing, Inc.; 1999. p. 218.
8. Borham M and Naroz M. Comparative study between bilateral versus unilateral internal sphinectrotomy in the management of chronic anal fissure. Al-Azhar Int Med J. 2022;3(3):145-148. https://doi.org/10.21608/aimj.2022.118186.1816
9. Pujahari AK. Unilateral versus bilateral lateral internal sphincterotomy: A randomized controlled trial for chronic fissure in ano. Trop Gastroenterol. 2010;31(1):69-71.
10. Oettlé GJ. Glyceryl trinitrate vs. sphincterotomy for treatment of chronic fissure-in-ano: A randomized, controlled trial. Dis Colon Rectum. 1997;40(11):1318-1320. https://doi.org/10.1007/BF02050816

Authors' Contributions:
DC- Definition of intellectual content, literature survey, prepared first draft of manuscript, implementation of study protocol, data collection, data analysis, manuscript preparation, and submission of article; **PPM-** Concept, design, clinical protocol, manuscript preparation, editing, statistical evaluation, and manuscript revision; **SM-** Coordination and manuscript revision.

Work attributed to:
College of Medicine and Sagore Dutta Hospital, Kamarhati, Kolkata, West Bengal, India.

Orcid ID:
Partha Pratim Mandal - https://orcid.org/0009-0001-9518-533X
Shivaji Mandal - https://orcid.org/0009-0008-0879-557X
Debayan Chowdhury - https://orcid.org/0009-0005-8778-7137

Source of Support: Nil, **Conflicts of Interest:** None declared.