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Original Research Article

Outcome of bilateral versus unilateral lateral internal sphincterotomy for chronic anal fissures

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ABSTRACT

Background: Gold standard treatment for chronic anal fissure is lateral internal sphincterotomy (LIS) which is usually performed at a single location. This randomized study compares bilateral to unilateral lateral internal sphincterotomy.
Methods: Patients were randomized into two equal groups (64 each) to undergo either bilateral (Group A) or unilateral (Group B) open lateral internal sphincterotomy (LIS). Comparative study was done in terms of symptomatic relief of pain, incontinence, complete healing of fissure, and recurrence. Chi-square test was used as a test of significance.
Results: Both groups had comparable demographic and clinical characteristics. Mean operative time for was longer for bilateral LIS (P-value <0.05). Mean pain score (VAS) in bilateral LIS group was lower in early post-operative period (P-value <0.05). At the end of 4th week 65.6% of patients in bilateral LIS group and 56.25% of patients in unilateral LIS group had completely healed fissures (P-value <0.05). Mean Wexner score for incontinence was comparable, while significant decrease in resting anal pressure was noted at 1 month in BLIS group. There was one recurrence in unilateral LIS group.
Conclusions: Bilateral LIS resulted in better outcome in terms of early pain relief, early reduction of anal pressures, complete healing rate in 4 weeks with no recurrence. It does not increase the risk of incontinence and has better patients' satisfaction as compared to unilateral LIS.

Keywords: Bilateral sphincterotomy, Chronic anal fissure, Incontinence, Lateral internal sphincterotomy

INTRODUCTION

Anal fissure is a painful linear mucosal tear situated in distal anal canal extending from just below dentate line to the anal verge.[1] Anal fissures affect all age groups, with equal incidence across both the sexes. An anal fissure characteristically presents with pain, bright red bleeding, mucous discharge and constipation.[2] Injury to anal mucosa by hard stool appears to be initiating event in the development of anal fissure.[3] Fissures are classified into an acute and a chronic form and into primary and secondary fissures based on their pathogenesis. Chronic anal fissures (CAF) are defined by both or either chronology and morphology. The criteria are duration of symptoms for longer than 8 weeks, the presence of a sentinel pile, a skin tag or an ulcer with exposed internal sphincter fibers.[4] There is evidence that anal fissure is associated with spasm of internal anal sphincter (except in postpartum patients) and reduction in blood flow that leads to delayed or non-healing of the ulcer.[5,6] Therefore,

the aim of treatment strategies is to reduce the sphincter tone which in turn increases local vascularity, with either medical agents, such as glyceryl trinitrate, calcium channel blockers and botulinum toxin, or surgical interventions, such as lateral internal sphincterotomy (LIS).[7] Internal sphincter is formed by circular muscle fibers and dividing it at one point of the circle opens up, relaxes and decreases the tone of the internal sphincter, which is the rationale for doing unilateral LIS in chronic anal fissures. Dividing the internal sphincter at two places may actually relax the sphincter more effectively and help in faster healing and recovery. However, the risk of incontinence may increase. There are very few studies available which have evaluated the role of bilateral internal sphincterotomy or bilateral botulinum toxin injections for treatment in CAF.[8,9] This study aims to compare and evaluate the outcome of bilateral versus unilateral lateral internal sphincterotomy in patients with chronic anal fissure.

METHODS

The study was conducted at SDH Chadoora and New City Hospital in Kashmir, J and K, India from July 2015 to December 2018 and included a total of 128 patients. The inclusion criteria included those with a primary chronic anal fissure of more than 3 months duration with classical symptoms of a chronic anal fissure, who were either unresponsive to medical treatment or had recurrence of symptoms after initial short-term relief. Patients with chronic inflammatory bowel diseases, tuberculosis, HIV positive, pregnant, associated hemorrhoids, syphilis, anorectal tumors, previous ano-rectal surgery and those unfit for anesthesia were excluded from the study. Detailed history, limited local examination, baseline investigations and anesthetic clearance was obtained. All patients were divided into two equal groups (Group A and Group B) of 64 each by computer generated randomization. Demographic data including age, sex, symptoms with their duration and position of fissures were noted in both groups (Tables 1).

Anorectal manometry was done in all patients few days before surgery. The catheter of an eight-channel water perfusion manometry system was placed 6 cm from the anal verge and anal pressures were measured at 1cm intervals. Resting anal pressure of more than 75mmHg was considered high. Pre-operatively all the patients received a single dose of iv antibiotics and early morning enema, and were operated under spinal anaesthesia. In Group A, bilateral lateral internal sphincterotomy (BLIS) was done at 3 and 9^{O} Clock positions, while in Group B unilateral lateral internal sphincterotomy (ULIS) was performed at 3^{O} Clock position. Standard open technique included a 5 mm radial incision at 3^{O} Clock position into the perianal skin along the intersphinteric groove. The internal anal sphincter was then dissected, a segment withdrawn with a pair of mosquito forceps and divided with diathermy for a distance from its distal most end up to the length equal to that of the fissure. In BLIS, similar procedure was repeated at 9 'O' position (Figure 1).

Figure 1: Internal anal sphincter demonstrated bilaterally before division.

Sentinel skin tags when present were also excised. Wound/s were closed with 2-0 catgut. Operative time was recorded. All patients were discharged on 1st post-operative day and were advised to take oral antibiotics and analgesics for a period of 5 days apart from Sitz baths 3-4 times a day, laxatives, high fiber diet and plenty of fluids which were continued for at least two weeks. Patients were followed up for a minimum period of 3 months, initially weekly for two weeks and then bi-weekly for next two and a half months. At 1st post-operative day and subsequently at each visit, they were examined for symptomatic relief of pain using Visual Analogue Scale (VAS of 0-100), degree and type of incontinence by Jorge-Wexner score (0-20), complete healing of fissure, and side effect or complication of the treatment, if any. Post-operatively resting anal pressure evaluation was repeated at the end of one and 3 months. At the end of the study the data was collected and analyzed statistically. Chi-square test was used as a test of significance for data and a p-value of <0.05 was considered significant.

RESULTS

Both BLIS and ULIS groups had comparable demographic and clinical characteristics (Table 1). The surgical outcome is depicted in Table 2. Mean operative time for bilateral LIS was longer than unilateral LIS (15.84 vs. 11.03 minutes) which was statistically significant (P-value <0.05).

In group A (BLIS) mean pain score on VAS was 21 at 24 hours after surgery. On subsequent follow ups at the end of 1st and 2nd weeks the mean pain scores were 10 and Zero respectively. For group B (ULIS) the mean pain score at 24 hours was 54. On subsequent follow ups at the end of 1st and 2nd weeks, mean pain scores were 17 and 3 respectively. All the patients in both groups were completely pain free at the end of 3rd week. The decrease in mean pain score in group A (BLIS) as compared to

group A (ULIS) at 24 hours and at the end of 1st week were statistically significant (P-value <0.05).

Table 1: Demographic and clinical characteristics.

	Group A-Bilateral LIS (n=64)	Group B-Unilateral LIS (n=64)	P-value
Age in years			
Mean	34.32	33.87	0.5634
Range	18-54	19-53	
Sex			
Male	30 (46.8%)	28 (43.7%)	0.7812
Female	34 (53.1%)	36 (56.2%)	0.7634
Site of fissure			
Anterior	10 (15.6%)	12 (18.7%)	0.8862
Posterior	51 (79.6%)	50 (78.1%)	0.9192
Both	3 (4.6%)	2 (3.1%)	0.1213
Mean duration of symptoms (months)	8.82 months (3-22)	9.65 months (3-24)	0.0815
Constipation	56 (87.5%)	57 (89%)	0.8749
Pain at defecation	63 (98.4%)	64 (100%)	0.9982
Bleeding with defecation	56 (87.5%)	54 (84.3%0	0.8659
Sentinel pile	48 (75%)	52 (81.2%)	0.6238
Peri anal pruritis	6 (9.3%)	5 (7.8%)	0.5881

Table 2: Surgical outcome.

	BLIS	ULIS	P-value
Mean operative time in minutes (range)	15.84 minutes (12-18 min)	11.03 minutes (8-15 min)	0.0341
Mean pain score (VAS) [0-100]			
24 hours	21	54	0.0013
1 week	10	17	0.0421
2 weeks	0	3	0.0127
3 weeks	0	0	1.0000
Complete fissure healing			
4 weeks	42 (65.6%)	36 (56.25%)	0.0499
6 weeks	62 (96.87%)	56 (87.5%)	0.0914
8 weeks	64 (100%)	64 (100%)	1.0000
Mean Wexner incontinence score at			
1 week	8.3	7.9	0.1213
3 weeks	6.2	5.8	0.2311
6 weeks	1.6	1.1	0.0698
>8 weeks	0.3	0.1	0.0935
Mean resting anal pressure (mmHg)			
Pre-operative	117.6	115.9	0.3215
4 weeks	92.7	110.3	0.0021
12 weeks	72.8	77.1	0.0468
Recurrence	0	1 (2.2%)	0.0214
Patient satisfaction	62	61	0.9911

None of the patient in either group had complete healing at the end of 2nd week. However, at the end of 4th week 42 (65.6%) patients in group A and 36 (56.25%) patients in group B had completely healed fissures (P-value <0.05). On further follow up at the end of 6th week, complete healing was noted in a total of 62 (96.87%) and 56 (87.5%) of patients in BLIS and ULIS groups respectively. All the patients in both groups had completely healed fissures at the end of 8th week.

Mean Wexner score for incontinence was 8.3 vs 7.9, 6.2 vs 5.8, 1.6 vs 1.1, and 0.3 vs 0.1 at the end of 1st, 3rd, 6th and 8th weeks following BLIS and ULIS respectively (P-value >0.5). Most of the patients had incontinence for flatus and occasionally for liquid stools which resolved by 6th week. There was no case of permanent incontinence in the either group. Prolonged incontinence for flatus was noted in two patients which resolved completely by 16 weeks.

Pre-operative mean resting anal pressures were comparable between the two groups (117.6 vs 115.9 mmHg). However, at four and 12 weeks after surgery, the mean pressures were 92.7 vs 110.3 mmHg and 72.8 vs 77.1 mmHg in BLIS and ULIS groups respectively (P-value <0.5). Only one patient (2.2%) in ULIS group had recurrence of fissure who expressed unsatisfaction to the initial procedure and was managed later by LIS on opposite side.

DISCUSSION

There are many modalities for the treatment of chronic anal fissures, but so far surgical LIS remains the gold standard. Treatment of anal fissures by sphincterotomy was first suggested in 1818 by Boyer.[10] Major breakthrough in the management of chronic anal fissure dates back to 1951 when Eisenhammer described internal sphincterotomy and Parks described open lateral subcutaneous anal sphincterotomy in 1967.[11] In 1969, Notaras further simplified open sphincterotomy to closed lateral anal sphincterotomy.[12] In both these techniques the lower one third to one half of the internal sphincter is divided to lower the resting pressure without destroying the effect of the sphincter. However, there is always inherent risk of incontinence associated with these surgical procedures. Our study aims to compare surgical outcome of bilateral to unilateral LIS in patients with chronic anal fissures.

Both groups in our study had comparable demographic and clinical characteristics, however in each group, females marginally over numbered males (M:F=1:1.2). This is in discordance with most of the previous studies. which have reported male preponderance for anal fissures.[8,13,14] As we live in a conservative society, most of our female patients present late with chronic fissures as compared to males who probably receive early treatment for their acute fissures and do no progress to chronic stage.

Mean operative time for bilateral LIS, as expected, was longer than that for unilateral LIS and was statistically significant (p-value <0.05), but this did not have any major impact on perioperative (surgical/anaesthetic) outcome.

Visual analogue scale (VAS) is used to assess the intensity of pain post-operatively.[15] In the present study, the mean VAS was higher in unilateral LIS group at 24 hours and at the end of 1st week which was statistically significant. However, at the end of 2nd week no significant difference in pain scores was found between two groups and all patients were pain free at the end of 3rd week. Internal anal sphincter consists of 20-30 flat rings of smooth muscle bundles stacked like the slats of a Venetian blind, each covered by its own fascia. They coalesce at three equidistant points around the anal canal to form three columns that extend distally into the lumen and differ in form from the other anal columns.[16] Bilateral LIS releases at least two coalesced arc of the internal bundles and possibly divide and relax the sphincter more effectively than in unilateral cases, leading to early significant pain relief in the former group.

After internal sphincterotomy, most of the chronic anal fissure take 4-8 weeks for complete healing [7,17] , although Oettle GJ reported complete healing in 2 weeks but his sample included only 12 patients.[18] None of our patient had complete healing at the end of 2nd week. However, at the end of 4th week 65.6% and 56.25% of the patients in group A and group B respectively had completely healed fissures (p-value <0.05). No statistical difference in complete healing was noticed in two groups on further follow up. Even though internal sphincterotomies were done up to the length equal to that of the fissure, better healing of fissures in 4 weeks for BLIS group in our study was probably due to more effective reduction of sphincter pressure in initial few weeks. All the patients in both groups had completely healed fissures at 8th week.

Mente et al, reported that a sphincterotomy up to the dentate line results in quick fissure healing but more incontinence.[19] Sphincterotomy up to apex of fissure leads to no incontinence, however, the rate of healing is low and the recurrence rate is higher.[19,20]

In the present study, mean Wexner continence score after surgery was not statistically different in the two study groups. Most of the patients had incontinence for flatus and occasionally for liquid stools which resolved by 6th week. In BLIS group, as the sphincterotomy was done bilaterally and only up to level of fissure apex, this resulted in early and better fissure healing rates with no recurrence, probably secondary to better decrease in anal pressures. As the extent of sphincterotomies were selective and not up to dentate line, there were no cases of permanent incontinence in either groups.

Preoperatively all patients in our study had high anal resting pressure. A better degree of reduction of these values was observed at 4 weeks in patients who underwent BLIS (p-value 0.0021). At the final evaluation at 3 months, the mean resting anal pressure was still higher in ULIS as compared to BLIS groups (p-value 0.0468), although it had become normal or close to the normal reference. According to the most accepted theory regarding anal fissure etiology relies on a relative ischemia of the posterior anal midline. At a glance, the average blood pressure of the terminal arteries that cross the internal sphincter is 85 mmHg. This pressure would not be great enough to overcome the high resting anal pressure (90 mmHg) observed in anal fissure patients. As a result, the blood flow to fistula area would be decreased, preventing its healing.[21] Bilateral LIS is associated with better early reduction of anal pressures, higher earlier healing rate, improvement in quality of life and better patient satisfaction than for unilateral LIS.

CONCLUSION

Although bilateral LIS takes some extra time for the procedure, it is significantly better procedure than unilateral LIS in treatment of chronic anal fissures in terms of early pain relief, reduction of resting anal pressure and complete healing rate in 4 weeks. The risks of incontinence and recurrence of fissure are negligible with superior patients' satisfaction.

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