DOI: https://doi.org/10.53350/pjmhs20221612899

ORIGINAL ARTICLE

To Investigate the Association between the Extent of Lateral Internal Anal Sphincterotomy and Postoperative Fecal Incontinence in Individuals with Chronic Anal Fissure

NIDA AHMED[1], RIZWAN AHMED KHAN[2], AQSA ISMAIL[3], SYED HUMAYUN NAEEM[4], HARIS AHMED[5]
[1]*Senior Registrar at department of surgery Karachi Institute of Medical Sciences (KIMS)*
[2]*Associate Professor, Surgery Unit 1 Abbasi Shaheed Hospital/KMDC.*
[3]*Senior Registrar, Surgery Unit 1 Abbasi Shaheed hospital Karachi/KMDC*
[4]*Postgraduate trainee, Surgery Unit 1 Abbasi Shaheed Hospital Karachi.*
[5]*Post graduate trainee General surgery Abbasi Shaheed Hospital*
Corresponding author: Nida Ahmed, Email: nida-ahmed83@yahoo.com

ABSTRACT

Background: The primary objective of this investigation was to evaluate the prevalence of fecal incontinence after surgery in individuals who underwent open lateral internal anal sphincterotomy up to the dentate line compared to those undergoing anal sphincterotomy (open internal) up to the height of the anal fissure.

Methodology: This study was randomized and controlled and was carried out in Abbasi Shaheed Hospital, Karachi, at the department of surgery between February 2021 and July 2022. The study enrolled patients who were 15 years or older and presented to the outpatient department with chronic anal fissure, regardless of gender. Patients with concomitant anal disease, those with previous history of anorectal surgery & those with systemic neurological disease leading to fecal incontinence were excluded. Analysis of the collected data was performed using SPSS version 23. For quantitative variables, such as age, standard deviation and mean were calculated. Conversely, the qualitative variables, such as gender, location of anal fissure, Browning and Park's classification of incontinence, and final outcome(i.e. fecal incontinence at 5th postoperative day), were assessed using percentages and frequency.

Results: In this study, 198 individuals who are chorincally suffering from anal fissure were identified and divided into two groups, Group A and B, each consisting of 99 patients. Group A underwent an open lateral internal anal sphincterotomy up to the level of the dentate line (referred to as the "dentate line group"), while Group B received an open lateral internal anal sphincterotomy up to the height of the fissure (known as the "height of fissure group").Fecal incontinence was assessed and compared between both groups on 5th postoperative day by using Browning and Park's classification. The findings of this investigation indicated that open lateral anal sphincterotomy up to the level of the dentate line was associated with an 11.1% incidence of fecal incontinence, while a 3% incidence of fecal incontinence was observed in individuals who underwent anal sphincterotomy (lateral internal) up to the height of the anal fissure.

Practical Implication: present study suggests that lateral internal anal sphincterotomy up to the height of anal fissure may be associated with a lower risk of fecal incontinence compared to the dentate line group.

Conclusion: The data obtained from this study suggested that open anal sphincterotomy (lateral internal) up to the height of the anal fissure was linked to reduced incidence rates of postoperative fecal incontinence on the fifth day after surgery, as compared to open anal sphincterotomy (lateral internal) up to the level of the dentate line. Therefore, this modification should be used in future regularly in order to reduce this morbidity.

Keywords: Fecal incontinence, Chronic Anal Fissure, Sphincterotomy.

INTRODUCTION

An anal fissure is a tear that runs longitudinally through the anal mucosa, causing severe pain during defecation.[1] The most frequently reported symptoms include pain during bowel movements, as well as varying degrees of rectal bleeding[2]. The pain associated with anal fissure is caused by involuntary spasm of the internal anal sphincter, which can exacerbate the condition.[3] This condition not only causes physical discomfort, but can also lead to significant emotional distress and reduced quality of life.[4] Acute anal fissures typically heal within a period of one to two weeks, while chronic fissures may take up to six to eight weeks to heal with medical management.[5,6]

According to the guidelines of the ASCRS (American Society of Colon and Rectal Surgeons), the initial management of anal fissure may involve nonsurgical methods such as warm sitz baths, a diet rich in fiber, and stool softeners.[7] Other treatment options designed to promote hypertonic sphincter relaxation include both chemical and physical approaches. One such physical method is lateral internal anal sphincterotomy, which involves the internal anal sphincter's surgical division.[8] The chemical management includes sphincterotomy via topical nitroglycerine, calcium channel blockers & injection of botulinum toxin [9, 10, 11].

Traditionally, chemical sphincterotomy has been adopted over a period of decades for relief of symptoms.

Recent studies have suggested that conservative treatment methods for anal fissure are not as effective, with success rates ranging from 65-75%[12, 13], compared to the success rate of lateral sphincterotomy, which ranges from 90-100%.[4,6] This evidence supports treating anal fissure via surgery. Fecal incontinence is considered the most concerning complication of lateral sphincterotomy, [6] with reported risks as high as 30% in the medical literature.[4, 14] This morbidity has been substantially reduced by modification of surgical technique i.e. the extent of sphincterotomy.[15] Elsebae[16] studied a higher rate of fecal incontinence (10.86%) was observed in patients who underwent lateral internal anal sphincterotomy up to the dentate line, compared to those who underwent conservative division of internal anal sphincters just below the fissure apex or up to the height of it (2.17%).

Postoperative fecal incontinence is distressing sequel of lateral internal anal sphincterotomy.[17] The extent of this surgical procedure is advantageous in minimizing this risk.[15,16] In spite of this, local data regarding this fact is lacking and studies are still continuously carried out to explore the beneficial effects of non-surgical management of anal fissure.[9,10,18] Therefore, this study aimed to compare the frequency of postoperative fecal incontinence after two different techniques of anal sphincterotomy (lateral internal) (i.e. up to the height of anal fissure versus up to dentate line) so that better technique would be opted in future with minimal risk of fecal incontinence.

MATERIAL AND METHODS

This randomized control trial was conducted in the department of surgery at Abbasi Shaheed hospital for a period of 18 months extending from February 2021 till July 2022. A total of 198 patients with chronic anal fissure were randomly allocated to group A and

B. Open internal anal sphincterotomy up to dentate line was carried out in patients of group A whereas patients of group B were subjected to open lateral internal anal sphincterotomy up to the height of fissure. Each group comprised 99 patients.

Patients of either gender, more than 15 years of age with chronic anal fissure. Chronic anal fissure was diagnosed by a consultant surgeon in the outpatient department as a history of painful defecation with bleeding per rectum for more than 6 weeks and clinical finding of tear in the anal mucosa with skin tag (sentinel pile) were included in this study.

Patients with history of concomitant anal disease (perianal abscess, fistula in Ano, Crohn's disease or ulcerative colitis), those with previous history of anorectal surgery and neurological disease were excluded.

Data was analyzed by using SPSS version 23. Mean and standard deviation will be computed for quantitative variables like age; whereas frequency and percentages will be employed to assess the qualitative variable like gender, location of anal fissure, Browning and Park's classification of incontinence, and final outcome (i.e. fecal incontinence at 5th postoperative day).

RESULTS

Total of 198 patients with chronic anal fissure were identified and randomly assigned in Group A and Group B. Each group comprised 99 patients. The procedures were carried out according to groups (A and B). Group A underwent for open lateral internal anal sphincterotomy (up to the level of dentate line - dentate line group) whereas open lateral internal anal sphincterotomy (up to the height of fissure - height of fissure group) was done in group B patients. Fecal incontinence was assessed and compared between both groups on 5th postoperative day by using Browning and Park's classification.

The mean age was 38.90 ±14.36 years with a male predominance. Majority (75.3%) of cases had age ≤ 45 years {76 (51%) in group A and 73 (49%) in group B}. Mean (±SD) ages in two groups (A and B) were 38.67 (±14.34) and 39.14 (±14.46) years respectively.

According to the location of anal fissure, from a total of 198 patients 140 (70.7%) patients had anal fissure located at posterior midline. The anterior midline anal fissure was encountered in 32 (16.2%) patients; whereas 26 (13.1%) patients had anal fissure located at both positions (Figure 1). In group A, 71 (71.7%) patients had posterior midline anal fissure followed by anteriorly placed fissure (17.2%) and on both the location (11.1%). In group B, 69 (69.6%) patients had posterior midline anal fissure. Anterior midline and anal fissures located at both positions were observed in 15 (15.2%) patients respectively (Table 1).

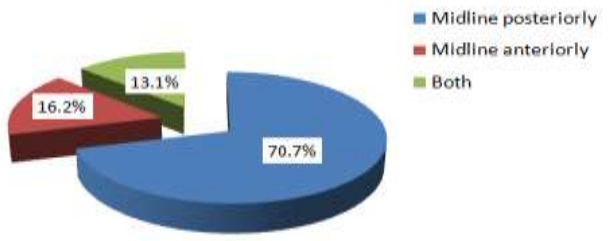

Figure 1: Location of Anal Fissure (n=198)

Table 1: Location of Anal Fissure with Respect to Groups (n=198)

Location of fissure	Group A (Up to dentate line)		Group B (Up to height of fissure)	
	(n = 99)	%	(n = 99)	%
Midline posteriorly	71	71.7	69	69.6
Midline anteriorly	17	17.2	15	15.2
Both	11	11.1	15	15.2

Incontinence Grades According to Browning and Park's Classification: In this study, out of 198 participants, 159 (80.3%) patients were in grade-1, 18 (9.1%) were in grade-2, 07 (3.5%) were in grade-3 and 14 (7.1%) in grade-4 categories of incontinence (Figure 2). In group A, 75 (75.8%) were in grade-1, followed by 08 (8.1%) in grade-2 whereas 5 (5.1%) and 11 (11.1%) in grade-3 and grade-4 respectively. Similarly, the majority of the group B patients were in grade-1 (84.8%) followed by grade-2 (10.2%) according to Browning and Park's classification (Table 2).

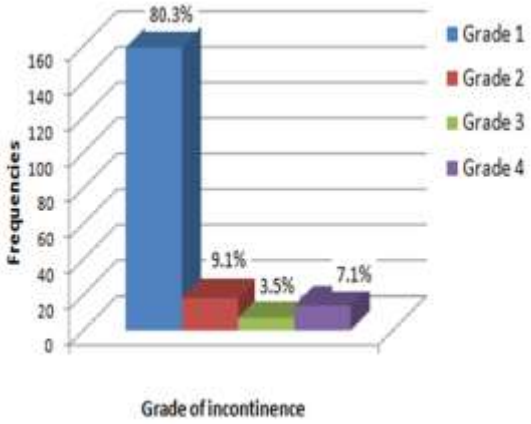

Figure 2: Incontinence Grades According to Browning and Park's Classification (n=198)

Table 2: Incontinence Grades with Respect to Groups (n=198)

Incontinence grades	Group A (Up to dentate line)		Group B (Up to height of fissure)	
	(n = 99)	%	(n = 99)	%
1	75	75.8	84	84.8
2	08	8.1	10	10.2
3	05	5.1	02	2.0
4	11	11.1	03	3.0

Grade-1 = Fully continent for flatus and stool;
Grade-2 = Continent for stool but not for flatus;
Grade-3 = Incontinent for liquid stool;
Grade-4 = Incontinent for solid stool.

Fecal incontinence was encountered in 11 (11.1%) patients of group A, whereas 03 (3%) patients of group B demonstrated fecal incontinence on 5th postoperative day after open lateral internal anal sphincterotomy (p=0.049). (Table 3)

Table 3: Final Outcome (Fecal Incontinence) (n=198)

Incontinence	Group A (Up to dentate line)		Group B (Up to height of fissure)	
	(n = 99)	%	(n = 99)	%
Present	11	11.1	03	3.0
Absent	88	88.9	96	97

p-value = 0.049 (using chi-square test)

DISCUSSION

The findings of this study reveal a significant difference in fecal incontinence between patients who underwent anal sphincterotomy (lateral internal) up to the height of the anal fissure and those who underwent the procedure up to the level of the dentate line. Lateral internal anal sphincterotomy is the most commonly used surgical intervention for chronic anal fissure and is considered the standard treatment.[2, 4, 12] Although, it is considered safe but usually associated with complications like pain, bleeding, hematoma, and fecal incontinence.[6] Postoperative fecal incontinence is a major complication following surgery. The reported incidence of this morbidity is variable in literature.[2,] Hashmat and Ishfaq [29] observed fecal incontinence in 64.3% of

cases. Jaleel et al[18] in their study of 67 patients, reported 2 patients who developed fecal incontinence. Contrary to this, certain studies showed higher prevalence of this morbidity. Nonetheless, this morbidity has been substantially reduced by modification of surgical technique i.e. the extent of sphincterotomy.[15]

This study highlighted that 11.1% cases of fecal incontinence are associated with open and up to the level of dentate line (lateral) anal sphincterotomy and 3% of fecal incontinence was encountered in those patients in whom anal sphincterotomy (internal lateral) was performed anal fissure (up to the height). The study highlights sphincterotomy significance, which traditionally extended up to the dentate line. It suggests a more conservative methodology to open sphincterotomy in anal fissure cases.

Similar to our research, El Muhtaseb and colleagues observed that the occurrence of fecal incontinence following lateral internal anal sphincterotomy (LIS) was 8.1%. Nevertheless, they reported that patients who had preexisting incontinence had a significantly higher incidence (33.3%) than those without preexisting incontinence (5.5%). The study also found that the degree of preoperative incontinence was a significant predictor of postoperative incontinence.[32]

The comprehensive analysis of randomized controlled trials (RCTs) by Boland et al.[33] aimed to evaluate the effectiveness of different treatment modalities for chronic anal fissure in their systematic review.

The study included 19 RCTs involving a total of 1467 patients and evaluated the effectiveness of medical therapies, such as topical agents, botulinum toxin injection, oral medications, and surgical procedures, such as fissurectomy and LIS (lateral internal sphincterotomy). The review found that LIS was the most effective treatment for anal fissure (chronic) when it comes to relief in symptoms and healing, with healing rates ranging from 80-100% and symptom relief rates ranging from 70-95%. However, in comparison to other treatments, there was a higher incidence of postoperative fecal incontinence linked with LIS. Injections of Botulinum toxin and topical treatments, such as diltiazem and nitroglycerin, were found to be effective in promoting healing and symptom relief, but their effects were less durable compared to LIS. Compared to other treatments, fissurectomy was found to have lower efficacy and higher complication rates.[33]

Fecal and flatus incontinence is a severe complication that can arise from open lateral internal sphincterotomy. A number of studies highlight this fact.[15, 16, 18] However, Puche et al [30] emphasize the definitive role of operative intervention in cases of anal fissure (chronic). In this specific case, modification in techniques has been considered in literature.[15, 16, 18]

Mentes et al[15] randomized the chronic anal fissure patients into two groups. Both groups were subjected to open internal anal sphincterotomies. The only difference was the extent of procedure. They observed significant anal incontinence in up to the dentate level group (p=0.016). In this context, they concluded that performing sphincterotomy up to the level of the fissure apex does not cause major disruptions to continence

The cause of incontinence after open sphincterotomy is attributable to extent of sphincter damage. In this context, Sultan et al[31] aimed to investigate the extent of disruption to the internal anal sphincter caused by lateral anal internal sphincterotomy. The study found that patients who underwent lateral sphincterotomy up to the level of the dentate line had a higher prevalence of fecal incontinence compared to those who underwent the procedure at the height of the anal fissure.

Elsebae[16] prospectively randomized 100 chronic anal fissure cases into two groups. Lateral open internal anal sphincterotomy was performed in both groups. In one group, conservative approach of sphincterotomy was considered (i.e. up to the height of anal fissure); whereas, traditional sphincterotomy approach (i.e. up to the level of dentate line) was opted in other groups. He found statistically significant differences in frequencies postoperative incontinence in conservative groups as compared to traditional groups (2.17% versus 10.86%; p=0.039). The present study results are almost comparable to the Elsebae's study.[16]

The limitations of this research are noteworthy, as they comprise a limited number of participants and a brief monitoring period. The study's examination of fecal incontinence solely on the fifth day following the operation may not provide a complete picture of the procedure's enduring effects. Additionally, the study failed to appraise alternative complications that may have arisen from the surgery, including discomfort, hemorrhaging, or the reappearance of anal fissures.

CONCLUSION

In conclusion, the present study suggests that lateral internal anal sphincterotomy up to the height of anal fissure may be associated with a lower risk of fecal incontinence compared to the dentate line group. However, further studies with larger sample sizes and longer follow-up periods are needed to confirm these findings and evaluate other potential complications of the procedure.

REFERENCES

1 Zaghiyan K.N., Fleshner P. Anal fissure, Clin Colon Rectal Surg. 2011;24(1):22–30. doi: 10.1055/s-0031-1272820.

2 Henning W., Deppen J.G. 2020. Internal Anal Sphincterotomy. StatPearls. Treasure Island (FL)

3 Sanchez RA, Arroyo SA, Perez VF, Serrano PP, Candela PF, Tomas GA, et al. Open lateral internal anal sphincterotomy under local anesthesia as the gold standard in the treatment of chronic anal fissures. A prospective clinical and manometric study. Rev Esp Enferm Dig. 2004; 96:856-63

4 Acar T., Acar N., Gungor F., Kamer E., Gungor H., Candan M.S. Treatment of chronic anal fissure: is open lateral internal sphincterotomy (LIS) a safe and adequate option? Asian J. Surg. 2019;42(5):628–633.

5 McCallion K., Gardiner K.R. Progress in the understanding and treatment of chronic anal fissure. Postgrad Med J. 2001;77(914):753–758.

6 Liang J., Church J.M. Lateral internal sphincterotomy for surgically recurrent chronic anal fissure. Am. J. Surg. 2015;210(4):715–719.

7 Perry W.B., Dykes S.L., Buie W.D., Rafferty J.F. Practice parameters for the management of anal fissures (3rd revision) Dis. Colon Rectum. 2010;53(8):1110–1115.

8 Nelson RL. Operative procedures for fissure in ano. Cochrane Database Syst Rev. 2010 ;(1):CD002199.

9 Hashmi F, Akhter K, Jamal A. Conservative lateral internal anal sphincterotomy versus topical diltiazem in the management of chronic anal fissure. Pak Armed Forces Med J. 2011; 61:218-22.

10 Qureshi S, Qureshi S, Urooj R, Butt N, Maher M. Nitroglycerine ointment for anal fissure. J Surg Pak. 2007; 12:185-7.

11. Pilkington S.A., Bhome R., Welch R.E., Ku F., Warden C., Harris S. Bilateral versus unilateral botulinum toxin injections for chronic anal fissure: a randomised trial. Tech. Coloproctol. 2018;22(7):545–551.

12. Nelson R.L., Manuel D., Gumienny C., Spencer B., Patel K., Schmitt K. A systematic review and meta-analysis of the treatment of anal fissure. Tech. Coloproctol. 2017;21(8):605–625.

13. Chen H.L., Woo X.B., Wang H.S., Lin Y.J., Luo H.X., Chen Y.H. Botulinum toxin injection versus lateral internal sphincterotomy for chronic anal fissure: a meta-analysis of randomized control trials. Tech. Coloproctol. 2014;18(8):693–698.

14. Garg P., Garg M., Menon G.R. Long-term continence disturbance after lateral internal sphincterotomy for chronic anal fissure: a systematic review and meta-analysis. Colorectal Dis. 2013;15(3)

15. Mentes BB, Ege B, Leventoglu S, Oguz M, Karadaq A. Extent of lateral internal sphincterotomy: up to the dentate line or up to the fissure apex? Dis Colon Rectum. 2005;48:365-70.

16. Elsebae MM. A study of fecal incontinence in patients with chronic anal fissure: prospective, randomized, controlled trial of the extent of internal anal sphincter division during lateral sphincterotomy. World J Surg. 2007;31:2052-7.

17. Sanchez RA, Arroyo SA, Perez VF, Serrano PP, Candela PF, Tomas GA, et al. Open lateral internal anal sphincterotomy under local anesthesia as the gold standard in the treatment of chronic anal fissures. A prospective clinical and manometric study. Rev Esp Enferm Dig. 2004; 96:856-63.

18. Jaleel F, Habib L, Mirza MR. Outcome of conservative lateral internal Anal Sphincterotomy for chronic anal fissure. J Surg Pak. 2008;13:159-62.

19. Wienert V, Raulf F, Mlitz H. Anal fissure: symptoms, diagnosis and therapies. Chan, Switzerland: Springer International Publishing AG; 2017.
20. Rakinic J. Anal fissure. Clin Colon Rectal Surg. 2007;20:133-7.
21. Bhardwaj R, Parker MC. Modern perspectives in the treatment of chronic anal fissures. Ann R Coll Surg Engl. 2007;89:472-8.
22. Liratzopoulos N, Efremidou EI, Papageorgiou MS, Kouklakis G, Moschos J, Manolas KJ. Lateral subcutaneous internal sphincterotomy in the treatment of chronic anal fissure: our experience. J Gastrointestin Liver Dis. 2006;15:143-7.
23. Danish KF, Chaudhry AR, Khan SS. Intractable headache as a side effect of topical nitroglycerine ointment. Rawal Med J. 2008;33:15-7.
24. Knight J.S., Birks M., Farouk R. Topical diltiazem ointment in the treatment of chronic anal fissure. Br. J. Surg. 2001;88(4):553–556.
25. Hyman NH, Cataldo PA. Nitroglycerin ointment for anal fissures: effective treatment or just a headache? Dis Colon Rectum. 1999;42:383-5.
26. Nelson R. A systematic review of medical therapy for anal fissure. Dis. Colon Rectum. 2004;47(4):422–431.
27. Denoya P, Sands DR. Anorectal physiologic evaluation of constipation. Clin Colon Rectal Surg. 2008;21:114-21.
28. Sharp FR. Patient selection and treatment modalities for chronic anal fissure. Am J Surg. 1996; 171:512-5.
29. Hashmat A, Ishfaq T. Chemical versus surgical sphincterotomy for chronic fissures in ano. J Coll Physicians Surg Pak. 2007;17:44-7.
30. Puche JJ, Garcia-Coret MJ, Villalba FL, Ali-Mahmoud I, Roig JV. Local treatment of a chronic anal fissure with diltiazem vs. nitroglycerine. A comparative study. Cir Esp. 2010; 87:224-30.
31. Sultan AH, Kamm MA, Nicholls RJ, Bartram CI. Prospective study of the extent of internal anal sphincter division during lateral sphincterotomy. Dis Colon Rectum. 1994; 37:1031–3.
32. El Muhtaseb MS, Alfarra N, Rabbaa Y, Abuhannieh E, Alsabateen G, Al Natsheh WAZ, et al. Long-term Fecal incontinence after lateral internal sphincterotomy for anal fissure. Polish Journal of Surgery. 2022 Jan 26;94(4):1–5.
33. Boland PA, Kelly ME, Donlon NE, Bolger JC, Larkin JO, Mehigan BJ, et al. Management options for chronic anal fissure: a systematic review of randomised controlled trials. International Journal of Colorectal Disease. 2020 Jul 25;35(10):1807–15.