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ORIGINAL ARTICLE

EXTENT OF LATERAL INTERNAL SPHINCTEROTOMY FOR CHRONIC ANAL FISSURE: SPASM CONTROLLED VERSUS CONVENTIONAL METHOD: A PROSPECTIVE RANDOMIZED STUDY

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Aim: *This study was designed to compare the results of spasm controlled lateral sphincterotomy by using anal calibrator with those of conventional sphincterotomy*
Method: *This study included 96 patients with chronic anal fissure divided into two groups. In conventional sphincterotomy group, the extent of sphincterotomy was up to dentate line and in spasm controlled group the extent of sphincterotomy at first to the apex of fissure then serial small sphincterotomies and anal caliber measurements followed up until an anal caliber of 30 mm was obtained*
Results: *The preoperative anal caliber was 26±2.9 (19-26) and 26±2.7 (18-28) mm in conventional group and spasm controlled group respectively. Postoperatively the spasm controlled group had a mean anal caliber 32.8±2.4 and in conventional group had 34.7±2.4. Delayed healing was occurred in 12.5% of patients in conventional group vs. 4.2% in spasm controlled group p =0.06. Incontinence to flatus occurred in 4.2 % of patients in spasm controlled and 16.7 % in conventional group p =0.05. relief of pain postoperatively was after 2.1±2.6 days in conventional group and in controlled sphincterotomy group after 3.7±3.5 days p=0.09.*
Conclusion: *spasm controlled sphincterotomy provided better healing with lower rate of early and late postoperative disturbance of continence compared with conventional sphincterotomy*

Keywords: *Dentate line, manometery, incontinence.*

INTRODUCTION

Anal fissure is a common clinical anal problem characterized by a lesion involving the distal part of anal canal. The etiology has not been completely clarified, even if it is frequently associated with internal anal sphincter spasm. It has estimated that chronic anal fissure affects about 10% of patients attending colorectal clinics. Both sexes affected equally.[1-3]

Lateral sphincterotomy remains the main stay treatment for chronic anal fissure. However, some surgeons have reported that 30 or more of patients experience varying degree of incontinence after lateral sphincterotomy.[4]

To overcome the risk of incontinence with lateral internal sphincterotomy (LIS), surgeons have tried a more limited division of internal sphincterotomy .Littlejohn and Newstead[5] describe a tailored lateral sphincterotomy, they divide the internal sphincter (I.S) to the proximal level of the fissure during the procedure which significantly reduced the incontinence rates. However, persistence and recurrences of anal fissure increased.

Pescatori suggested a spasm related internal sphincterotomy to overcome incontinence or recurrences. The extent of sphincterotomy depends on increase in anal pressure (the high the tone, the longer the myotomy).[16] Controlled lateral sphincterotomy is another modification the extent of sphincter division is controlled according to degree of anal stenosis.[6]

The risk of incontinence has generated interest in pharmacologic approach such as topical glycerine trinitrate and botulinum toxin injection into internal sphincter, which are less effective and may poorly tolerated.[7-8]

The aim of the study to compare lateral conventional sphincterotomy versus controlled lateral sphincterotomy in chronic anal fissure.

PATIENTS AND METHODS

This prospective randomized study included 96 patients suffering from chronic anal fissure in the period from September 2005 to April 2008. They admitted to colorectal surgery unit, Mansoura university hospital, Egypt.

Chronic anal fissure considered to be present if the patients presented with a history of anal pain during defecation for at least two months that had failed to resolve also presence of a sentinel piles, hypertrophied anal papilla, fibrosis, indurations, or exposed internal fibers in fissure base.[21]

Exclusion criteria were a history of fecal incontinence, previous anal sphincter injury or surgery, concurrent fistula or hemorrhoids, recent obstetric delivery; inflammatory bowel disease, diabetes or other endocrinal disorder, patients using calcium channel blockers and oral, sublingual nitrite were ineligible for this study.

Informed consent was obtained from all patents after explanations of the nature of anal fissure and possible treatment. Patients were randomly assigned to lateral conventional sphincterotomy and lateral controlled sphincterotomy group by a closed envelope method.

All patients were subjected to careful history taking, clinical examination, and laboratory investigation including manometery study. Ano-rectal manometery was performed using a standard low compliance water perfusion system and eight-channels catheters with pressure transducer connected to 5.5 mm manometeric probe with spirally located ports at 0.5 cm interval. The protocol of performance is stationary pull through technique with recording the functional length of the anal canal (FL), mean maximum resting pressure, mean squeeze pressure. Pressures were recorded using a computerized recording device (Sandhil Bioview programs, USA).

Preoperative preparation in the form of rectal enemas fore cleaning of the colon. Prophylactic antibiotic in the form of 3rd generation cephalosporin two hours before operation.

The anal caliber was noted for each group .The lubricated calibrators were introduced into the anal canal and anal caliber was evaluated such that the perineum around the calibrator maintain its original position when some or whole of calibrator was inserted. If the calibrator was over inserted it depress the perineum with it.

Group (A) included 48 patients this group underwent conventional lateral sphincterotomy. After adequate lubrication of anal retractor was positioned and inter sphincteric groove was identified. A blade knife (No 11) was inserted between internal and external sphincter. The tip of blade was angled medially pointing just above dentate line and IS was divided and when the knife was seen beneath the intacted mucosa. It was withdrawn. Digital pressure was applied to ensure haemostasis.

Group (B) included 48 patients this group underwent controlled lateral sphincterotomy. The internal sphincter was divided to the proximal level of the fissure as tailored lateral sphincterotomy. Then reassess the anal canal caliber and serial small sphincterotomies (1 ml in length) were done till reaching an anal caliber 30 mm based on the finding of Cho[6] on healthy subject. After that, if anal spasm (anal caliber less than 30 mm) still presents serial small sphincterotomies (1 ml in length) were done on the other side. Haemostasis was checked. Sitz bath after each bowel postoperative for one week.

All patients were reexamined on postoperative on postoperative days 1, 7, and then after one month, then every month for 3 months and then every 6 months fore one year. They were asked to come immediately if they developed symptoms. The parameters investigated were preoperative anal caliber, time of relief of pain (days), postoperative anal caliber, postoperative anal incontinence, postoperative anal manometery, healing rate. Complete healing is completely epthelilialized scare or no sign of fissure. Anal incontinence was determined according to Pescatori scoring system.[9]

Statistical analysis of data in this study was performed using SPSS version 10. For continuous variables, descriptive statistics were calculated and were reported as mean $\pm$ SD. Categorical variables were described using frequency distributions. The Student's t- test for paired samples was used to detect differences in the means of continuous variables and Chi-square test was used in cases with low expected frequencies (P value < 0.05 was considered to be significant).

RESULTS

The present study included 96 patients presented with chronic anal fissure. They were classified into two groups A and B. Group A included 48 patients with a mean age 43 ± 2.5 years (22-63). They were treated by conventional lateral sphincterotomy. Group B included 48 patients with a mean age 48.2 ± 4.7 years (25-66) they were treated by controlled lateral sphincterotomy Table 1.

Table 1. Demographic data.

Variables	Conventional LIS	Controlled LIS	P value
Mean age (years)	43± 2.5 (22-63)	48.2± 4.7 (25-66)	0.652
Sex male/ female	26/ 22	28/20	0.56
Site anterior/ posterior	12/36	14/34	0.49
Mean duration of symptoms (month)	4.5± 2.5 (2-9)	5.1± 2.1 (2-11)	0.32

The patients in group B had an average caliber 26±2.7 mm. The measurement after step 1 was 33.8±2.4 mm in 30 patients the rest of patients (18 patients) still had anal stenosis after step 1 and their average caliber was 27±1.3 they underwent several small sphincterotomy and anal caliber reassessed reaching 31.1± 1.2 mm. two patients still had anal stenosis after step 2 and their caliber was 28±1.27 mm, they underwent bilateral sphincterotomy and then measured 33.3 ±0.6 mm and none had anal stenosis. The patients in group A had an average caliber 26+2.90 mm. The measurement after conventional sphincterotomy was 34±2.40 mm. The mean postoperative anal caliber was higher in conventional sphincterotomy. The measurements at various follow up are shown in Table 2. The mean anal calibers recovered with time and did not reach statistical significance between both groups.

Healing: Forty four patients in group A had complete healing of fissure within 4-6 month which characterized by reepithlialization of the anal canal with no further episodes of pain or bleeding only two patients had delayed healing (6 weeks) and another two patients had recurrence. Forty six patients in group B had complete healing of fissure within 4-6 month only two patients had delayed healing (6 weeks) the difference did not reach statistical significance Table 3.

Continence: no patients in both groups develop incontinence of stool. Eight patients in group A reported diminished ability to differentiate between flatus and liquid stool. This was transient in two patients but continued in the last six patients. Only two patients in group B suffered transit soiling, which improved completely after completely healing of the wound the difference was statistically significance. None of two patients who underwent bilateral sphincterotomy complained of incontinence Table 3

Pain: the time required for relief of pain postoperatively was 2.1+2.6 days in conventional group which was shorter than in controlled sphincterotomy group 3.7±3.5 days Table 3.

On manometeric evaluation, there were significant decrease in both mean maximum resting and mean maximum squeeze pressure following both controlled and conventional sphincterotomy but the difference between both groups did not reach statistical significance Table 4.

DISCUSSION

Chronic anal fissure presents a common anorectal disease affecting all ages and often associated with underlying hypertonic internal sphincter.[2,3] Chronic anal fissure often are associated with anatomic anal stenosis resulting from a fibrotic I.S , in conjunction with functional anal stenosis caused by IS spasm.[17]

Most recent studies have reported excellent results with LIS, recurrence or failed healing in range of 1.1 to 3 % and subsequent incontinence in range of 1 to 8 % (11:13). However, some authors have reported a significant incidence of fecal incontinence. Garcia Angulier et al[4] reported that 37.8% after LIS complicating with some changes of anal continence. The incontinence following LIS may be due to a wide sphincteric division; perhaps more than the surgeon had intended. Several factors may contribute to wide variation in incontinence risk, including patients' selection, follow up length, definition of incontinence and surgical technique. The extent of the division of IS may the main factor.[4,6]

Most recent studied have confirmed excellent results with LIS and many studies discuss in details local vs. general/regional anesthesia or closed vs. open.[3,8,12,14] One of the problems leading to drawbacks and confusion is the extent of lateral sphincterotomy, the extent of division of IS has not been standardized. An endosongraphic study of the extent of IS division during LIS revealing that division of IS was more extensive than intended.[10,15]

Table 2. Anal caliber measurement of the study group.

Variables	Preoperative	Postoperative	1 month	6 months
Conventional group	26± 2.9 (19-26)	34.7± 2.4 (29-36)	31.3± 2.37 (27-34)	30.6± 2.33 (27-31)
Controlled group	26± 2.7 (18-28)	32.8± 2.4 (29-34)	30.6± 1.1 (26-33)	30± 1.05 (26-30
P values	0.27	0.03	0.05	0.061

Table 3. Outcome.

Variables		Conventional LIS	Controlled LIS	P Value
Recurrence		2 (4.2 %)	0	0.52
Delayed healing		6 (12.5 %)	2 (4.2 %)	0.06
Incontinence	early	8 (16.7 %)	2 (4.2 %)	0.05
	late	6 (12.5 %)	0	
*Incontinence score				
Early	0	40	46	
	A1	4	2	0.05
	A2	4	0	
late	0	42	48	0.05
	A1	2	0	
	A2	4	0	
Pain relived (days)		2.1± 2.6 (1-10)	3.7± 3.5 (1-12)	0.09

* Score 0 continent, A1 incontinent to flatus < once / week, score A2 Incontinent to flatus >once / week.

Spasm – related internal sphincterotomy was first suggested by Pescatori in 1999. [16] Cho[6] innovation suggested that controlled sphincterotomy according to the level of anal stenosis decrease the risk of incontinence. He deigned anal calibrators to evaluate anal stenosis and adjust the extent of sphincterotomy according to the level anal stenosis.

In our study, we compare controlled lateral sphincterotomy vs. conventional lateral sphincterotomy. The anal calibrators used in controlled sphincterotomy is simply designed, sphincterotomy in controlled group is done till we obtain anal caliber 30 mm.

Local anesthesia was used by infiltration the base of the fissure with 2 ml of lidocaine; we were able to use the calibrators in all patients without considerable pain. local anesthesia itself may cause some relaxation of IS. However this was neglected in this study. Although beyond the scope of our study, the use of regional or general anesthesia may influence the anal pressure or anal caliber measurement as reported by Menetes etal.[18]

In our study, controlled lateral sphincterotomy divides the IS according to the degree of anal stenosis. The rates of healing and recurrence was better in controlled lateral sphincterotomy group than conventional group but not reach statistical significance as reported by Cho[6] and Menetes etal.[18]

The early postoperative anal incontinence score significantly higher in conventional group. Eight patients in group A reported change in continence This was transient in two patient but continued in the last six patients. But only two patients in group B suffered transit soiling, which improved completely after completely healing of the wound the difference was statistically significance.

As regards manometeric finding in our study there were significant decrease in both mean maximum resting and mean maximum squeeze pressure following both controlled and conventional sphincterotomy but the difference between both groups did not reach statistical significance. Reduction of resting pressure goes with length of sphincterotomy this in agree with Prohn and Bonnner 1995.[19] We found also, that the drop in resting pressure is more pronounced in patients who develops incontinence this results agree with Zbar et al 2001[20] but Garcia Angulier et al 1998[4] failed to demonstrate any correlation between decrease in anal resting pressure and postoperative disturbance of anal continence.

We conclude that the controlled LIS better than conventional LIS with less incidence of incontinence disorder, give idea about the proper extent of sphincterotomy and provide lower rate of treatment failure further studies with large numbers of patients are needed. Incontinence is directly related to the extent of muscle division at IS.

Tables 4. Manometeric changes.

	Conventional LIS		P Values	Controlled LIS		P Values	P* Values
Anal canal length mm	26± 8.3	26± 8.1	0.07	26± 7.5	26± 7.2	0.08	0.24
Mean resting pressure	93.4± 16.6	63± 5.6	0.005	94.4±11.3	67.6± 6.6	0.006	0.09
Mean squeezing pressure	145± 16.6	122.4±14.6	0.007	148.4±16.7	127± 7.5	0.004	0.06

P* for comparison of conventional LIS group change to controlled LIS group change.

REFERENCES

1. McCallion K, Gardiner KR. Progress in the understanding treatment of chronic anal fissure. Postgrad Med J. 2001;77:753-8.

2. Pescatori M, Interisano A. Annual report of Italian coloproctology unit. Tech Coloproctol. 1995;3:29-30.

3. Lund JN, Scholefield JH. Aetiology and treatment of anal fissure . Br J Surg. 1996;83:1335-44.

4. Garcia – Anguilar J, Belmonte C, Wong WD, Lowry AC, Madoff RD. Open vs. closed sphincterotomy for chronic anal fissure : long term results . Dis Colon Rectum. 1996;39:440-30.

5. Littlejohn DR, Newstead GL. Tailored lateral sphincterotomy for anal fissure. Dis Colon Rectum. 1997;40:1439-42.

6. Cho Dong Yoon .controlled lateral sphincterotomy for chronic anal fissure. Dis Colon Rectum. 2005;48:1037-41.

7. Riched CS, Gregoire R, Plewes EA. Internal sphincterotomy is superior to topical nitroglycerine in treatment of chronic anal fissure: results of a randomized, controlled trial by the Canadian colorectal surgical trials Dis Colon Rectum. 2000;43:1048-58.

8. Mentes BB, Irkorucu O,Akin M, Leventoglu S, Tathcioglu E. Comparison of botulinum toxin injection and lateral internal sphincterotomy for the treatment of chronic anal fissure Dis Colon Rectum. 2003;46:232-7.

9. Pescatori M, Anastasio G, Bottini C. Anew grading and scoring for anal incontinence Dis Colon Rectum. 1992;38:482-7.

10. Farouk R, Monson JR, Duthie GS. Technical failure of Lateral sphincterotomy for treatment of chronic anal fissure: a study using endoanal ultrsonography. Br J Surg. 1997;84:84-5.

11. Abcarian H. Surgical correction of chronic anal fissure: results of lateral internal sphincterotomy vs. fissurectomy midline sphincterotomy Dis Colon Rectum. 1980;23:31-6.

12. Pernikoff BJ, Eisenstat TH, Rubin RJ, Oliver GC, Salivati Ep. Reappraisal of partial lateral sphincterotomy Dis Colon Rectum. 1994;37:1291-5.

13. Hananel N, Gorden PH. Lateral sphincterotomy for fissure in ano revisited. Dis Colon Rectum. 1997; 40:597-602.

14. Rudd WW. Lateral subcutaneous internal sphincterotomy for chronic anal fissure, an outpatient's procedure. Dis Colon Rectum. 1975;18:319-23.

15. Sultan AH, Kamm MA, Nicholls RJ, Bartram CL. Prospective study of the extent of internal anal sphincter division during lateral sphincterotomy Dis Colon Rectum. 1994;37:1031-3.

16. Pescatori M. soiling and recurrence after internal sphincterotomy for anal fissure Dis Colon Rectum. 1999; 83:687-8.

17. Rosen L, Abel ME, Gorden PH. Practice parameter for management of anal fissure. The standards task force. the American society of colon and rectal surgeons Dis Colon Rectum. 1992;35:206-8.

18. Mentes BB, Melike KG, Sezai L, Nusret A, Fine-tuning of the extent of lateral internal sphincterotomy: spasm – controlled vs. up to the fissure apex. Dis Colon Rectum. 2008;51:128-33.

19. Prohn P, Bonner C. IS manometery essential for surgery of chronic fissure in ano? Dis Colon Rectum. 2008;1995;44:735-8.

20. Zbar AP, Beer Gabbel M, Chiappa AC, Aslam M. Incontinence after minor anorectal surgery. Dis Colon Rectum. 2001;44:1610-23.

21. Abraham A, Ayantunde, Samuel AD. Current concept in anal fissures. World J Surg. 2006;30:2246-60.