

Cutting Whole Length or Partial Length of Internal Anal Sphincter in Management of Fissure in Ano

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Abstract

A chronic anal fissure is a common painful perianal condition. The main operative procedure to treat this painful condition is a lateral internal sphincterotomy (LIS). The aim of study is to compare the outcome and complications of closed LIS up to the dentate line (whole length of internal sphincter) or up to the fissure apex (partial length of internal sphincter) in the treatment of anal fissure. It is a prospective comparative study including 100 patients with chronic fissure in ano. All patients assigned to undergo closed LIS. Those patients were randomly divided into two groups: 50 patients underwent LIS to the level of dentate line (whole length) and other 50 patients underwent LIS to the level of fissure apex (partial length). Patients were followed up weekly in the 1st month, twice monthly in the second month then monthly for next 2 months and finally after 1 year. There was satisfactory relief of pain in all patients in both groups & complete healing of the fissure occurred. Regarding post operative incontinence no major degree of incontinence occur in both group but minor degree of incontinence persists In 7 patients after whole length LIS after one year. In conclusion, both whole length & partial length LIS associated with improvement of pain, good chance of healing but whole length LIS associated with more chance of long term flatus incontinence. Hence, we recommend partial length LIS as treatment for chronic anal fissure.

Key word: chronic anal fissure , lateral internal sphincterotomy LIS, whole length (up to dentate line), partial length (up to fissure apex),incontinence

الخلاصة

الفطر الشرجي المزمن هو حالة شائعة مؤلمة في المنطقه حول الشرج. والاجراء الجراحي الرئيسي لعلاج هذه الحالة المؤلمة هو استئصال جانبي للمصرة الداخلية. الهدف من هذه الدراسة هو مقارنة النتيجة ومضاعفات قص المصرّة الداخلية الجانبية بالطريقه المسدوده الى الخط المسنن (كل طول المصرّة الداخلية) او الى قمة الفطر (جزء من طول المصرّة الداخلية) كعلاج للفطر الشرجي. هذه الدراسة قائمة على المنهج المقارناجريرت في مستشفى البصرة العام للفترة من الشر العاشر 2008 حتى الشهر العاشر 2013 حيث تضمنت 100 حالة مرضية تعاني من الفطرالشرجي المزمن. جميع المرضى وافقوا على استئصال المصرّة الداخلية بالطريقه المسدوده ثم تم تقسيم المرضى بالطريقة العشوائية الى مجموعتين. 50 مريضاً خضع الى استئصال المصرّة الداخلية الى الخط المسنن(طوله كله)و 50 مريضاً خضعوا الى عملية الاستئصال الى مستوى قمة الفطر(جزء من الطولة). تم متابعة المرضى أسبوعياً خلال الشهر الأول. ومرتين في الشهر الثاني وبعد ذلك شهرياً في الشهرين التاليين ومرة اخيرة بعد سنة كاملة. حيث كان هناك ارتياح جيد من الألم لدى كل المرضى وشفاء كامل للشق لدى المجموعتان. فيما يخص السلس بعد العملية لا وجود للسلس بدرجة كبيرة (عدم السيطرة على الخروج)لدى المجموعتان لكن ظهر سلس من الدرجة البسيطة (عدم السيطرة على خروج الهواء) لدى 7 حالات فقط للذين خضعوا للاستئصال الكامل للمصرة بعد سنة كاملة. نستنتج ان كلتا الاستئصالان الكامل و الجزئي للمصرة الداخلية أدى الى تحسن حالة المريض والتخلص من الألم لكن الاستئصال الكامل كان مصحوب لفترة طويلة للدرجة البسيطة من السلس. ولذلك ننصح بالاستئصال الجزئي للمصرة الداخلية الجانبية كعلاج للفطر الشرجي المزمن.

الكلمات المفتاحية:الفطر الشرجي المزمن, استئصال جانبي للمصره, كل المصره الداخليه, جزء من المصره الداخليه,السلس

Introduction

Anal fissure is mostly due to high tone or hypertrophy of the internal sphincter of anal canal. The main operative procedure to treat this painful condition is a lateral internal sphincterotomy (LIS) . (Poh *et al.*, 2010) and (Richard *et al.*, 2000). Relaxation of the internal anal sphincter is the main aim of this procedure. Hence, it provides pain relief and ultimately healing of the fissure.

An anal fissure is an ulceration or tear in the mucosa of anal canal (the squamous epithelium) distal to dentate line and the local trauma considered as a main cause of it. The fissure leads to anal pain at the time of defecation that continues for 1-2 hours. It is reported that anal pain and non-healing of the fissure and sometime ischemia can be caused by severe hypertonicity and hypertrophy of the internal anal sphincter. (Schouten *et al.*, 1994). LIS procedure considered as the procedure of choice for all anal fissures when the internal anal sphincter becomes hypertrophied and its tone is abnormally high (Poh *et al.*, 2010) and (Richard *et al.*, 2000). It is known that there are two approaches (open or closed) can be used to achieve this procedure. And in any of these approaches LIS procedure involves whole length (Keighley,1993; Timmcke & Hicks ,1996) or partial division of the internal anal sphincter (Littlejohn DR & Newstead, 1997), and (Menteş *et al.*, 2005). In the open LIS approach, the mucosa is going to be incised to achieve exposure and division of the band of muscle fibers of internal sphincter under direct vision. While in closed LIS approach, the mucosa is going to be left intact, and a blade will be passed either directly under the mucosa or into the intersphincteric groove and followed by division of band of muscle fibers.

The pathophysiological changes leading to fissure in ano start with stretching of mucosa of anal canal above its normal elasticity leading to a tear and ulceration which results in series of sequential injury. Then, a spasm in muscle fiber of internal sphincter occurs. Then, such a spasm will lead to sever anal pain and separation of edges of fissure apart. This sequence of events results in formation of chronic anal fissure in about 40% of patients ((Madalinski, 2011). It is reported that many factors participated in development of the fissure in ano. Firstly, ischemia may participate in formation of a fissure in ano. The common site of fissure in ano is posterior midline of anal canal. This is attributed to that the blood supply in the anoderm of this site is less than 50% that in other sites of the anal canal (Schouten *et al.*, 1994) and (Klosterhalfen *et al.*, 1989) . Anterior anal fissure occurs in 1% of males and 10% of females (Madalinski, 2011)..

Secondly, Elevated internal sphincter pressures are not confined to the site of the fissure; in one study, they were highest on the distal anterior surface, which may favor posterior mucosal tearing during defecation (Keck *et al.*, 1995) Thirdly, it is suggested that there is a less support to the posterior aspect of the anal canal due to the elliptical arrangement of anal sphincter fibers. This considered as another factor explaining the reason behind posterior predilection of anal fissure. Lastly, cellular abnormalities have been reported including hypothesis of immunological components that react to the fibers of anal canal endothelium contributing to hypertonicity and ischemia (Maria *et al.*, 1999) Investigation has also revealed abnormalities at the cellular level, neural proliferation in chronic fissure in ano has been hypothesized as a participant factor to the fissure pain and pruritis .(Horsch *et al.*, 1998) .This means the underlying pathology of fissure in ano extending wider (not limited to) the site of fissure. Hence, some surgeons adopted a whole length cutting of internal anal sphincter. However, many others prefer using partial length cutting (till the apex of anal sphincter) so far. So that, the aim of study is to compare and evaluate the

technique, outcome and complications of closed LIS up to the dentate line (whole length of internal sphincter) or up to the fissure apex (partial length of internal sphincter) in the treatment of anal fissure.

Patients & Methods

The current study is a prospective comparative study which was conducted in the department of surgery Basra General Hospital over a period of time from October 2008 till October 2013. In this study, there were 100 patients with chronic fissure in ano. All of them diagnosed by history and physical examination including inspection of anal area by spreading the buttocks a part gently in knee elbow position for males and lateral position for females looking carefully in the posterior and anterior midline of anal area. In all cases the chronic fissures have raised edges exposing white horizontal fibers of internal sphincter at the base of fissure accompanied by external skin tags at the distal ends of anal fissure. Patients with secondary fissure in ano excluded from this study.

All patients assigned to undergo closed lateral internal sphincterotomy (LIS). Those 100 patients were randomly divided into two groups: group (A) includes 50 patients underwent LIS to the level of dentate line (whole length) and group (B) includes 50 patients underwent LIS to the level of fissure apex (partial length).

The operation was done either under general anesthesia or spinal anesthesia in lithotomy position. The anesthetist was informed not to give muscle relaxant so that sphincter tone is preserved and a clear demarcation between internal sphincter and ano-rectal ring can be felt. The anal retractor was used for stretching the anal canal and a knife no. 11 was introduced in the intersphincteric space with blade pointing downward. In the whole length sphincterotomy the knife turned with blade facing anal canal in order to cut the internal sphincter from the dentate line downwards with aid of left index finger introduced inside anal canal feeling fiber of internal sphincter during its cutting. In partial length sphincterotomy, the internal sphincter cutting was up to apex of the fissure. Sentinel piles were excised in most of the patients. at the end of operation Simple dressing was used without using packs.

All patients were examined generally and locally for bleeding or haematoma before discharge home within 24 hours. Postoperative instructions were given including advises for sitz baths for comfort, adequate intake of fluid and fiber to avoid constipation, and limited activity for a few days.

Patients were followed up weekly in the 1st month, twice monthly in the second month then monthly for next 2 months and finally after 1 year. Specific questions were asked regarding leakage of fluid, faeces or flatus as well as recurrence of symptoms. Statistics were used in currents study using SPSS version 19 to check the P value.

Results

In the current study 100 patients with chronic anal fissure were involved; 57 (%57) patients were female & 43(%43) patients were male. The age of patients was ranged from 18 years to 55 years as in table 1 and 2.

Table 1 shows age distribution of all patients underwent LIS.

age	Whole length	Partial length	total
	N %	N %	N %
<20	2 4%	3 6%	5 5%
20-29	11 22%	17 34%	28 28%
30-39	14 28%	17 34%	31 31%
40-49	14 28%	12 24%	26 26%
>50	9 18%	1 2%	10 10%

$\chi^2=8.330$

df=4

P=0.080

Table 2 shows Sex distribution of all patients underwent LIS.

SEX	Whole length	Partial length	total	
	N %	N %	N	%
Female	29 58%	28 56%	57	57%
male	21 42%	22 44%	43	43%

$\chi^2 = 0.041$

df=1

p=0.5

All 100 patients with anal fissure presented with tearing agonizing pain concomitant with the bowel motion. There were 68 patients (68%) presented with pain alone, 18 patients (18%) presented with pain and bright rectal bleeding and 14 patients (14%) presented with pain and perianal pruritus as in figure 1.

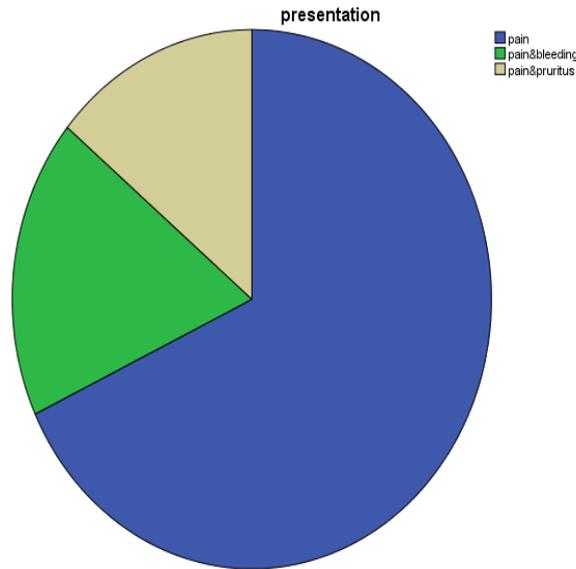


Figure 1: Shows distribution of presentations of patients with anal fissure.

In this study, 92 patients (92%) presented with posterior fissure & the other 8 patients (8%) presented with anterior fissure.

Closed lateral internal sphincterotomy (LIS) was done in all patients. In group A, there were 50 patients (50%) underwent LIS which was done up to dentate line (whole length sphincterotomy) & in group B, the other 50 (50%) patients underwent LIS which was done up to fissure apex (partial sphincterotomy).

There was satisfactory relief of usual previous agonizing stretching pain in all patients in both groups in second post operative day without using significant narcotics or analgesia

However, all patients experienced a new character of pain which was mild pricking pain mostly attributed to surgery itself. In group A (whole length LIS), 23 patients (46%) this mild pricking pain relieved within 7 days and in 27 patients (54%) this pain relieved within 2 weeks. Whereas, in group B (Partial length LIS), 33 patients (66%) this mild pricking pain relieved within 1 week and in 17 patients (34%) pain relieved within 2 weeks which statistically significant as in table 3.

Table 3 shows durations of mild post operative Pain for both types of LIS.

Pain period	Whole length	Partial length	total	
	N %	N %	N	%
One week	23 46%	33 66%	56	56%
Two weeks	27 54%	17 34%	44	44%

$\chi^2=4.058$
 $p=0.035$

df=1

In group A, complete healing of the fissure occurred after 3 weeks in 29 patients (58%) and after 4 weeks in 14 patients (28%) while the rest 7 patients (14%) required 6 weeks for complete healing. In group B, healing of fissure occurred after 3 weeks in 25 patients (50%) and after 4 weeks in 16 patients (32%) while the rest 9 patients (18%) required 6 weeks to get complete healing which statistically not significant as in table 4.

Table 4 shows period of post operative fissure healing after both types of LIS

Period of healing	Whole length	Partial length	total
	N %	N %	N %
3 Weeks	29 58%	25 50%	54 54%
4 Weeks	14 28%	16 32%	30 30%
6 Weeks	7 14%	9 18%	16 16%

$\chi^2=0.680$
 $p=0.712$

df=2

Intraoperative bleeding from site of sphincterotomy was reported in current work in 7 patients (14%) of group A & in 5 patients (10%) of group B which was controlled by suturing of sphincterotomy opening.

Post-operative perianal abscess with subsequent fistula formation occurred in 2 patients in group A which required fistulectomy 4 weeks after initial operation. But, there were no post operative perianal abscess or fistula in group B.

Regarding post-operative incontinence, no patients in either group developed a major degree of incontinence (involuntary excretion of faeces). But, all patients in group A developed minor degree of incontinence (inadvertent escape of flatus or partial soiling of undergarments with liquid stool.) within the 1st week after surgery. This incontinence was gradually improved including that 15 patients (30%) were improved after 2 months and the other 28 patients (56%) were improved after 3 months. But, in the rest 7 patients (14%), flatus incontinence persists after one year. In group B, only 35 patients developed minor degree of incontinence within first week. 26 patients (52%) improved after 2 months & 9 patients (18%) improved after 3 months. This results shows that partial length LIS leading to less incontinence in comparison to whole length LIS which was statistically significant as in table 5.

In both groups, there was no evidence of recurrence after one year.

Table 5 shows improvement of post operative incontinence after each type of LIS

Absence of incontinence	Whole length	Partial length	total
	N %	N %	N %
1 st week	0 0%	15 30%	15 15%
8 Weeks	15 30%	26 52%	41 41%
12 weeks	28 56%	9 18%	37 37%
More than one year	7 14%	0 0%	7 7%

X²=34.708

df=3

p=0.000

Discussion

In this study two types of LIS were used (in group A; whole length LIS and in group B; partial length LIS). In current study, relief of agonizing stretching pain occurred in all patient in both groups in second post operative day and this supported by other studies in which there is prompt symptomatic relief in 95% of patients. ((Menteş *et al.*, 2005; Nelson 2005; Garcea *et al.*, 2003) . In contrast, in one research work, which was randomized trial of 76 cases, patients treated with a whole length LIS had more rapid symptomatic relief than those treated with partial length LIS (2.1 versus 4.7 days) .((Menteş *et al.*, 2005) . In other study, pain improved also in approximately 95% of patients (Hyman , 2004; Nyam ; Pemberton ,1999)

Furthermore, in our series, it was observed that the patients developed a new pain which is mild pricking mostly attributed to surgery which was absolutely not the same previous pain before surgery (agonizing stretching). This new pain was mild to moderate pricking pain improve after 1-2 weeks.

Healing of the fissure occurred in 58% of patients treated with whole length LIS within 3 weeks compared with 50% in partial length LIS group which is statistically not significant. In other records, status of wound healing whether complete or not has been not mentioned in details in most of studies , On the reverse, in our study, the timing of wound healing is detailed as follow; in whole length LIS 28% healing within 4weeks & 14% within 6 weeks while healing occurred in 32% in 4 weeks & 18% in 6 weeks in partial length LIS group. In both groups all patient 100% need 3-6 week for complete healing. However, there was no statistical difference between two groups regarding rate of healing.

In one series of 350 patients who underwent closed LIS for chronic anal fissure, only 21 patients (6 %) failed to heal or developed a recurrence (Lewis *et al.*, 1988) while in our study no patient in either group fail to heal or develop recurrence.

In whole length LIS group, all patients developed minor degree of incontinence in 1st week after surgery which improved gradually with time and 7 patients inadvertent escape of flatus persist after 1 year especially during stress. In a retrospective review of 298 patients who underwent a lateral internal sphincterotomy,

persistent flatus incontinence was reported in 30% and persistent fecal incontinence in 8% of patients at five years following the procedure (Casillas *et al.*, 2005), While in our study in partial length LIS group only 35 patients developed minor degree of incontinence in 1stwk and in all those patients the incontinence was improved within 3 months & no incontinence persist for 1 year. In another study, 287 patients with a partial length LIS, there is incontinence of flatus (1.4%) after one year . (Littlejohn and Newstead, 1997) Most series of partial sphincterotomy for anal fissures have described only minor incontinence. (Elsebae ,2007) reports in his study that partial length LIS shown lower rates of minor incontinence (2%) compared with whole length LIS (11%) as in our series.

The risk of incontinence has varied among reports from as low as 0 to as high as 24%. In most reports the risk has been less than 10% .(Nelson R,2005)

In our study, no patients in either group develop a major degree of incontinence (which is the involuntary excretion of faeces) which is comparable to other study (Casillas *et al.*, 2005),

Perianal abscess with subsequent fistula formation occurred in 2 patients (4%) with whole length LIS group which required fistulotomy & this complication was not happend in partial length group. In one study postoperative perianal abscess developed in eight patients (2%), four of them associated with fistulas . (Lewis *et al.*, 1988)

In conclusion, both whole length & partial length LIS associated with improvement of pain, good chance of healing but whole length LIS associated with more chance of long term flatus incontinence. Hence, we recommend partial length LIS as treatment for chronic anal fissure.

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