

Role of Anorectal Manometry in Anal Fissure and Outcome of Tailored Lateral Sphincterotomy in Hypertensive Internal Anal Sphincter: A Modified Minimal Invasive Technique

BESHOY N. NAEEM, M.Sc.; ABDALLAH B. ABDALLAH, M.D.; ALMOATAZ A. EL-TAYEB, M.D. and RAMY A. HASSAN, M.D.

The Department of General Surgery, Faculty of Medicine, Assiut University, Assiut, Egypt

Abstract

Background: CAF is a common benign anorectal problem that substantially impairs the patient's life. Consequently, a rapid and effective solution is required. 1

Aim of Study: To do lateral internal sphincterotomy extending up to the upper end of the fissure (but not to the dentate line) in patients have CAF with hypertonic IAS to keep continence. In case of low RAP, V-Y plasty will be done.

Patients and Methods: Our study was done on 34 patients with CAF divided into 2 groups, group 1 included 28 patients with hypertonic IAS underwent tailored LIS and group 2 included 6 patients with normotonic/ hypotonic IAS underwent V-Y plasty to keep continence from June 2017 till December 2017 in general surgery department ,Assiut university hospital.

Results: In group 1 there is no incontinence or recurrence, complete healing of fissures occurred in 96.4%. Only one patient had unhealing fissures, postoperative complications include bruising occurred in 3.5% and minor sepsis of sphincterotomy wound in 3.5%, in group 2 there is minor sepsis of the flap in 16.6%.

Conclusion: Our study was done on 34 patients with CAF. These patients were divided according to anomanometric study into 2 groups:

- Group 1 included 28 patients with high RAP in whom tailored LIS was done by modified technique which is tailored equal to the length of the fissure which is minimally invasive with good healing rate and no recurrence or incontinence postoperative and minor bruising and sepsis of the wound and significant reduction in postoperative RAP.
- Group 2 included 6 patients with normotonic /hypotonic IAS in whom excision of fissures were done and the defect is closed by V-Y plasty with good healing rate and low postoperative sepsis.

So tailored lateral internal sphincterotomy is the effective treatment of CAF with anal hypertonia, safe and not affect continence.

Key Words: Anal fissure– Anorectal manometry – Tailored lateral sphincterotomy.

Correspondence to: Dr. Beshoy N. Naeem,
[E-Mail: eshoynobar2013@yahoo.com](mailto:eshoynobar2013@yahoo.com)

Introduction

CAF is a common benign anorectal problem that substantially impairs the patient's life. Consequently, a rapid and effective solution is required [1]. These patients have several anal pressure profiles, but most of them have hypertonic internal anal sphincter with raised resting anal sphincter [2,3]. Surgical internal sphincterotomy is recommended as the first therapeutic approach in those with anal hypertonia [1]. It achieves permanent reduction of hypertonia with relief of symptoms and is very successful at healing CAF but requires an operation with associated low morbidity [4]. Posterior sphincterotomy has largely been abandoned because of the resultant gutter deformity which may impair anal closure with consequent fecal soiling [5]. So, LIS by either open [6] or closed [7] technique is the treatment of choice. There is a possibility of injury of EAS and the anal mucosa as well as the possibility of incomplete sphincterotomy because infiltration of local anesthetic in adrenaline masks its assessment. On the other hand, this technique has the advantages that it avoids an open intra anal wound, the divided IAS is bridged by skin, there is minimal anal wound care, postoperative dilatation is unnecessary and relief from symptoms is almost immediate, with the fissure becoming painless and healing occurs within 3 weeks [8]. In addition, the integrity of IAS must be assessed preoperatively by anal manometry. If it is already compromised and the RAP is not raised, internal sphincterotomy

Abbreviations:

CAF: Chronic anal fissure.
IAS : Internal anal sphincter.
RAP: Resting anal pressure.
EAS: External anal sphincter.
LIS : Lateral internal sphincterotomy.

is contraindicated [9,10] and V-Y plasty will be done.

Patients and Methods

This study was done on 34 patients with chronic anal fissure divided into 2 groups, group 1 included 28 patients with hypertonic internal sphincter underwent tailored lateral sphincterotomy and group 2 included 6 patients with normotonic or hypotonic internal sphincter underwent V-Y plasty and 30 control subjects (age and sex matched) who have no anal complaint to keep continence from June 2017 till December 2017 in General Surgery Department, Assiut University Hospital.

Inclusion criteria:

All cases of chronic anal fissure.

Exclusion criteria:

- Patients with previous anal operation.
- Patients having ulcerative colitis or Crohns disease.
- Patients with perianal fistula.
- Patients with underlying abscess or fistula.
- Patients with anal stenosis.
- Patients with haemorrhoids

Preparation of patients:

Patients fast 6 hours and received single enema one hour before operation. The perianal area was shaved. Each one received antibiotic prophylaxis in the form of metronidazole 500mg tab tds orally 24 hours before the operation and single dose of second generation cephalosporin (1.5 cefuroxime sodium) before induction of anesthesia.

Technique:

Group I patients with hypertonic IAS:

They were underwent modified tailored lateral internal sphincterotomy. The procedure was done in lithotomy position under general or spinal anesthesia according to patient preference and physical fitness. At first examination under anesthesia was carried out then a modified tailored lateral internal sphincterotomy was done as described by Abdallah et al., 2008 [11] through circumferential peri-anal skin landmark about 5mm length was done with tip of scalpel along the intersphincteric groove in the left lateral position of the anal verge.

A bivalve rectal speculum was then introduced into the anal canal and opened in the sagittal plane to expose the left lateral wall of the canal and stretch the IAS. The lower edge of the IAS was palpated by the tip of index finger where

its distal third is hypertrophied and presents a distinct palpable band in patient with hypertonic IAS [12].

Tilting of the speculum slightly to the right side of the patient draws the ISA downwards then a skin incision of about 5-7mm was done in previous skin landmark along the intersphincteric groove just lateral to the edge of IAS. The lower end of the wound will be grasped with a toothed dissecting forceps and the IAS was dissected out from the anoderm using dissecting scissor. While the left index finger in anal canal dissecting scissors was introduced into intersphincteric plane dissecting the IAS from EAS. Under vision known by its white color or under palpation by the tip of left index finger the lower edge of IAS was grasped by haemostat and the lower part of IAS was withdrawn out of the wound and sphincterotomy was done safely using scissors. The extent of sphincterotomy was done to be more or less equal the length of the fissure that marked on the scissors. Sphincterotomy was assessed by pressure with the tip of left index finger to palpate the groove produced in the IAS at the site of sphincterotomy while the speculum was opened in place and the IAS was stretched. If the extent was found insufficient further extension of sphincterotomy was done with scissor while the IAS in place until it reached the upper end of the fissure. Some bleeding usually occurred after this step. This was easily controlled by compression with a gauze for 3-5 minutes. If there was a bleeding from the wound edge it was controlled by diathermy coagulation. The wound was left open for drainage. However there was a slight ooze of blood from the small external wound but this was arrested postoperatively by tamponade as EAS recovered and contracted around the IAS [10], so we applied T shaped bandage for a few hours. Sentinel tag anal polyp and markedly fibrotic fissure were excised if present.

After sterilization with povidone iodine 10% the wound was covered with a flat dressing and secured with a T bandage.

Group II patient with normotonic or hypotonic IA:

Excision of the fissure accompanying sentinel tag or hypertrophic anal papilla were done and the raw area was closed with V-Y plasty flap.

Follow-up:

Follow-up was done for 6 months for:

- Persistence of the symptoms.
- Local complications (bruising, sepsis, soiling and incontinence).

- Healing of fissure (anoderm became intact) was assessed by examination of anus in both left lateral and knee chest positions during straining, while the buttocks were separated. If it was found healed, complete healing is assessed by proctoscopic examination.
- RAP after 6 weeks.
- Recurrence after complete healing
- Statistical study it was done by SPSS ver 11 using paired *t*-test to compare the same variable in the same group (paired quantitative data).

Results

Study included 34 patients, 28 patients with hypertonic IAS and 6 patients with hypotonic or normotonic IAS. Control group included 30 subjects.

According to Anorectal manometric study, patients were divided into two groups: Group I patients with hypertonic IAS.

Twenty eight patients has hypertonic IAS compared with the control group who underwent tailored lateral internal sphincterotomy. There were 10 females and 18 males, the mean age was 40.68 years (ranging from 28 to 52 years) and attended the follow-up for at least six months. The clinical data details are shown in Table (1).

Sentinel tag was found in 13 patients (46.4%), anal polyp in 2 patients (7.1 %) and both in 5 patients (17.9%). Fissures were excised in 9 patients (32.1 %).

All patients had significant increase of preoperative RAP (mean=130.89 ±6.61 cmH₂O) compared with that of controls (mean=79.64 ±7.10 cmH₂O) with *p*-value 0.001 Table (2).

Postoperative progress of patients is outlined in Table (3). Within the first postoperative 24hs, 8 patients (28.6%) who underwent sphincterotomy only responded to a single i.m dose of ketorolac tromethamine 30mg (ketolac, amriya pharmaceutical). The remaining patients, 13 patients (46.4%) needed additional dose of nalbuphine 20mg i.m and 7 patients (25%) needed further dose of i.m ketorolac tromethamine. Within the first week, pain responded to oral diclofenac 50mg twice daily in 25 patient (89.3%) with 2 patients (7.1%) needed oral analgesia and topical anesthetic for additional week. One patient (3.5%) with unhealed fissure needed application of topical anesthetic (lidocaine hydrochloride jelly 2%, Xylocaine by Astra Zeneca)

after defecation for additional 4 weeks. Twenty five patients (89.3%) were comfortable enough to open their bowels normally with laxatives (2 Tablets) each consisted of 5mg bisacodyl and 100mg dioctyl sodium sulphosuccinate at bed time) after 48 hours of operation. Sepsis of sphincterotomy wound (edges were swollen, red, painful and tender without pus discharge) occurred in one patient (3.6%) and sites of excised fissures and sentinel tags (there was pain and tenderness with pus discharge from raw surface) in 5 patients (17.9%). All infections were minor sepsis and controlled by topical antibiotic (Fusidinic acid 2% cream). Improvement occur after its extraction. No incontinence to flatus or solid stool occurred.

Fissures healed completely (intact andoderm with complete disappearance of preoperative symptoms) in 24 patients (85.7%) with in 4 weeks and the end of 6th week fissures healed in 27 patients (96.4%). The other patient (3.5%) with unhealed fissure had had 3 inflammed fissures with edematous anus and sphincterotomy was difficult to be done properly and assessed. Postoperative RAP was 1 08cmH₂O indicating insufficient sphincterotomy which was repeated on the right side of the anus and fissures healed within additional 7 weeks.

Postoperative manometric study after 6 weeks of the operation (after getting complete healing) showed that the mean postoperative RAP dropped significantly in 27 patients (mean=78.09 ±6.62cm H₂O) compared with preoperative mean value with *p*-value is 0.001 Table (4).

The Postoperative RAP of patients was within the range of control group but it mean value was significantly lower (*p*-value=0.003).

After follow-up period of 4 to 6 months (mean 5.3 months), no recurrence is reported.

Group II patients with normotonic/hypotonic IAS:

Six patients has normotonic or hypotonic IAS compared with the control group who underwent V-Y plasty. There were 4 females and 2 males, the mean age was 41.70 years (ranging from 28 to 52 years) and a attended the follow-up for 2 to 6 months.

Sentinel tag was found in all patients (100%), anal polyp in 3 patients (33.3%).

All patients had significant decrease of preoperative RAP (mean=61.37 cmH₂O) compared with that of controls (mean=79.64 cmH₂O) with *p*-value 0.001 Table (6).

Postoperative progress of patients is minor sepsis of the flap in one patient (16.6%) and controlled by topical antibiotic (Fusidinic acid 2% cream).

Table (1): Clinical data of 28 patients with hypertonic IAS.

Patient characteristics	Number	Percentage
Mean Age	28-52 (40.68ys)	
Sex:		
Male	18	64.3
Femle	10	35.7
Main symptom:		
Pain	26	92.9
Bleeding	2	7.1
Site of fissure:		
Anterior	3	10.7
Posterior	19	67.9
Anterior and posterior	4	14.3
Multiple	2	7.1

Table (2): Preoperative RAP of patints with hypertonic IAS and controls.

RAP	Rang in (cmH ₂ O)	Mean (cmH ₂ O)	p-value
Patient group	120-151	132.89	<0.001
Control group	68-91	79.64	

Table (3): Clinical results of sphincterotomy.

Postoperative Course	No.	Percentage
<i>Pain control within 24hs with injectable Analgesia:</i>		
Single dose	8	28.6
2 doses	13	46.4
3 doses	7	25
<i>Response of pain to oral analgesia/local Anaesthetic:</i>		
Within 1 st week	25	89.3
For 2 weeks	2	7.1
For 6 weeks	1	3.6
Return of bowel function after 48hs	25	89.3
<i>Postoperative complications:</i>		
Perianal bruising	1	3.5
Sepsis of sphincterotomy wound	1	3.5
Sepsis at site of excised sentinel tag & fissure	5	17.9
Incontinence to solid stool/flatus	0	
<i>Healing of fissures within 6 ws:</i>		
Healed	27	96.4
Unhealed	1	3.6
Recurrence	0	

Table (4): Pre-and postoperative RAP of patients with hypertonic IAS.

RAP	Preop. RAP (cmH ₂ O)	Postop. RAP (cmH ₂ O)	p-value
Range	120-151	66-89	<0.001
Mean	132.89±6.61	78.09±6.62	

Table (5): Clinical data of 6 patients normotonic or hypotonic IAS.

Patient characteristics	Number	Percentage
Mean Age	28-52 (41.70ys)	
Sex:		
Male	2	33.3
Femle	4	66.6
Main symptom:		
Pain	5	83.3
Bleeding	1	16.6
Site of fissure:		
Posterior	6	100

Table (6): RAP of patints with normotonic or hypotonic IAS.

RAP	Rang in (cmH ₂ O)	Mean (cmH ₂ O)	p-value
Patient group	59-71	61.37	<0.001
Control group	68-91	79.64	

Discussion

Our study was done in patients with anal fissure and included 34 patients and 30 control subjects. These patients were divided according to anomanometric study into 2 groups:

- Group I patients with hypertonic IAS (compared with control).
- Group II patient with normotonic or hypotonic IAS (compared with control).

Group I: Included 28 patients with hypertonic IAS, 18 males (64.3%) and 10 (35.7%) females with mean age 40.68ys (range from 28 to 52 ys). Main complaint of patients is pain in 26 patients (92.9%) and bleeding in 2 patients (7.1%), site of fissure is 19 posterior (67.9%), 3 anterior (10.7%), 4 comined (14.3%) and 2 multiple (7.1%), Sentinel tag was found in 13 patients (46.4%), anal polyp in 2 patients (7.1%) and both in 5 patients (17.9%). Fissures were excised in 9 patients (32.1%). In 2008, Abdallah Badawy et al., reported pain in (95.7%) and bleeding in (4.3%), site of fissure is (72.9%) posterior, (8.6%) anterior, (12.9%) combined, (5.7%) multiple. Sentinel tag was found in (47.1%), anal polyp in (5.7%) and both in (18.6%). Fissures were excised in 18 patients [11]. In another

study pain was present for more than a month in all the patients, constipation was present in (75.42%) and bleeding in (25.42%), site of fissure was posterior in (92%) and anterior in (8%) [13]. Jennifer et al reported pain (100%), bleeding (80%), pruritus ani (39%), constipation (26%) with the most common site being posterior (80%). The presence of anal tag was reported in (47%) patients and hypertrophic papilla was documented in (14%) [14]. Also there is a study reported that constipation in (80%), bleeding in (68.6%), and pain in (74.7%) [15]. However, these variation in the symptomatology due to racial variations and the number of patients in each group.

Our patients in group 1 had significantly high RAP range from 120-150cmH₂O (mean 132.89±7.1 cmH₂O) compared with control subjects range from 68-91cmH₂O (mean 79.64±7.1cmH₂O). Increase RAP was also recorded by other studies and ranging from (85.47±4.48cmH₂O to 132.89±7.1cm H₂O) [11,16].

Tailored lateral internal sphincterotomy was done by modified technique which is tailored equal to the length of the fissure to not affect the continence. This technique is described firstly by Abdallah Badawy et al., [11]. It is done safely under vision without any danger to the anoderm or EAS through a small extra anal incision. So, it is minimally invasive technique and has advantages of both open and closed techniques at the same time.

In our study, 89.3% of patients were comfortable enough to open their bowels normally after 48 hours of the operation with laxative. Local complications related to sphincterotomy incision were minimal. Within the 1st week pain respond to oral analgesia in 89.3% of patients with 7.1% needed oral analgesia and topical anaesthetic for additional week. Abdallah, et al., reported that 90% of patients respond to oral analgesia Within the 1st week and 8.6% for 2 weeks and 1.4% for 6 weeks needed oral analgesia and topical anaesthetic for additional week [11]. In another study, after 6 months (94.06%) patients remained free from symptoms and were fully satisfied with the results of surgery, while 5.93% patients had mild pain. They were symptom free after the second procedure [13].

In our study, postoperative complications include bruising occurred in 3.5% (one patient) and minor sepsis of sphincterotomy wound in 3.5% (one patient) which was easily controlled by topical antibiotics, Sepsis at site of excised sentinel tag and fissure in 5 patients (17.9%). In 2008, Abdallah Badawy et al., reported bruising in 1.4% and minor

sepsis of sphincterotomy wound in 1.4% [11]. Sarabjit, et al reported early post operative complications included mild soiling in 8.47% patients [13]. In another study, 7.5% patients had wound infection, 10.3% patients were in open method and 4.2% patient was in closed method which is treated by antibiotics [17]. In 2017, Ravikumar et al recorded two patients had wound infection during the first follow-up visit, while two patients presented with infection during the second visit and settled without any need for surgical intervention [18].

In our study no incontinence was reported which is the same result reported by Abdallah, et al., and Abdulwahid, [11,15]. In other studies it was reported that incontinence of flatus in 5.93% patients by Sarabjit, et al., [13] and 8.3% patients in closed method had temporary incontinence to flatus which was controlled within 1 week, 3.4% patient in open method had temporary incontinence to flatus which was controlled within 1 week by Harshad et al., [17], 4% patients developed minor incontinence postoperatively by Jennifer et al., 2015 [14], 4.2% patients are reported incontinence during the first follow-up visit by Ravikumar, et al., 2017 [18]. However, in our study we do tailored sphincterotomy and never reach dentate line so no incontinence in our study.

In our study, Complete healing of fissures occurred in 85.7% within 4 weeks and by the end of 6 weeks fissures healed in 96.4% (27 patients). only one patient had unhealing fissures due to insufficient sphincterotomy which was less than the length of the fissures. In other studies it was reported healing rate was 97.2% by the end of 6 weeks [11], 98% of patients [14], 100% of patients had completely healed fissures at the end of 4 weeks [19], patient satisfaction (98.4%) was high and complete healing was seen at 4 weeks [15], fissure healed completely in 88.7% of patients within 4 weeks. It healed by 8 weeks in another 6 patients (8.5%) [18].

In our study no recurrence of fissure occurred. However our follow-up is short 4 to 6 months (mean mean 5.3 months) and until that study completed no recurrence reported. This was the same result reported by Harshad et al., within 6 months follow-up [17]. In other studies reported two recurrence by Abdallah Badawy et al., with follow-up mean (15.8 months) [11] and 3 patient had recurrence by Abdulwahid, 2017 [15].

In our study compared with preoperative RAP, there is significant reduction in postoperative RAP (mean=78.09±6.62cmH₂O, *p*-0.001) which was

close to those of control group ($p=0.003$). Decrease RAP after internal sphincterotomy was also recorded by other studies and ranging from (59.55 ± 3.50 to $72.5\pm6.6\text{mmHg}$) [11,16].

Group 2: Included six Six patients has normotonic/hypotonic IAS ($61.37\text{cmH}_2\text{O}$) compared with the control group ($79.64\text{cmH}_2\text{O}$) with p -value 0.001. Who underwent V-Y plasty. There were 4 females (66.7%) and 2 males (33.3%), the mean age was 41.70 years (ranging from 28 to 52 years) and a attended the follow-up for 2 to 6 month.

Postoperative progress of patients is minor sepsis of the flap in one patient (16.6%) and controlled by topical antibiotic (Fusidinic acid 2% cream).

Conflicts of interest:

No conflict of interest has been declared.

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دور قياس ضغط الشرج والمستقيم فى الشرح الشرجى ونتائج القطع الجانبي لعضلة الشرج الداخلية المفصل على طول الشرح فى حالات زيادة ضغط عضلة الشرج الداخلية من خلال طريقة معدلة بسيطة التدخل

المقدمة: الشرح الشرجى المزمن يعتبر من الأمراض الشرجية الحميدة المشهورة التى تعيق حياة المريض وهناك أنواع من الشرح الشرجى:

١- حالات مصحوبة بزيادة فى ضغط عضلة الشرج الداخلية وفى هذه الحالة يتم عمل قطع جانبي بالعضلة الداخلية من الشرح من أسفل حتى خط عرف الديك بالشرح وهذه ممكن أن تكون مصاحبة بعدم التحكم فى أو أخراج الغازات وهذا يتم عمله من خلال طريقة مفتوحة أو طريقة مغلقة.

٢- حالات مصحوبة بضعف فى العضلة أو ضغط العضلة عادى وهنا يتم عمل أستئصال للشرح وعمل v-y plasty.

نتائج الرسالة: تم إجراء هذه الدراسة على مرضى الشرح الشرجى وتم استخدام جهاز قياس ضغط الشرح لجميع المرضى وهم ٣٤ مريض وكذلك أشخاص غير مرضى ٣٠.

والمرضى قسموا حسب الضغط الشرجى أثناء راحة الشرح إلى مجموعتين:

المجموعة الأولى: وهم المرضى الذين يعانون من الشرح الشرجى المزمن مع ارتفاع الضغط الشرجى وعددهم ٢٨ مريض وتم إجراء لهم عملية قطع جانبي لعضلة الشرج الداخلية مفصل طوله بحيث لا يزيد عن طول الشرح ولا يصل إلى خط عرف الديك من خلال فتحة جانبية بجوار الشرح لا تتعدى نصف سنتيمتر.

المجموعة الثانية: وهم المرضى الذين يعانون من الشرح الشرجى المزمن مع نقص الضغط الشرجى أو الضغط الطبيعى وعددهم ٦ مرضى وتم إجراء لهم عملية إستئصال الشرح وعمل تقنية v-y plasty.

وكانت النتائج كالآتى: فى المجموعة الأولى حدوث كدمة حول الشرح فى مريض واحد بمعدل ٣.٥٪ وحدث تلوث بسيط للجرح فى واحد فقط بمعدل ٣.٥٪ وتم علاجه عن طريق المضادات الحيوية الموضعية.

ولم يتبين وجود حدوث عدم تحكم بالبراز وتبين أيضاً ٨٩.٣٪ من المرضى استجابوا سريعاً للمسكنات عن طريق الفم أول أسبوع بعد العملية بينما أحتاج ١١.٢٪ من المرضى إلى مخدر موضعى بجانب المسكنات.

حدث ألتام تام فى ٢٤ مريض بمعدل ٩٦.٤٪ فى نهاية الأسبوع السادس. ولم يتبين رجوع أعراض الشرح مرة أخرى فى أى مريض. وتبين وجود أنخفاض ملحوظ فى الضغط الشرجى الداخلى بعد العملية مقارنة بالضغط الشرجى العالى قبل العملية.

وفى المجموعة الثانية حدث تلوث بسيط للجرح فى واحد فقط بمعدل ١٦.٦٪ وتم علاجه بالمضادات الحيوية.