

# **Tailored Lateral Internal Sphincterotomy in Management of Chronic Anal Fissure with Hypertonic Internal Anal Sphincter. A modified minimal invasive technique and its clinical and manometric outcome.**

**By**

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## **Abstract:**

**Aim:** to do lateral internal sphincterotomy tailored according to length of fissure in patients having hypertonic internal sphincter (IAS) by technique has advantages of open and closed methods. Clinical and anomanometric outcome will be assessed.

**Patients and Methods:** 70 patients and 70 controls were subjected to anorectal manometric study. All patients had hypertonic IAS compared with controls.

Sphincterotomy was done through a 5-7mm circumferential incision just lateral to lower edge of IAS. Its length was more or less equal that of fissure. Sentinel tags, anal polyps and fibrotic fissure were excised.

Results were assessed as persistence of symptoms, complications, healing, postoperative resting anal pressure (RAP) and recurrence.

**Results:** Preoperative RAP significantly higher in patients ( $132.89 \pm 6.61$  cm H<sub>2</sub>O) than controls ( $79.64 \pm 71$ ,  $P < 0.001$ ). Sepsis of sphincterotomy wound occurred in 1.4%, bruising in 1.4%, transient minor soiling in 11.4% and no incontinence. In 97.2%, fissures healed within 6 weeks, postoperative RAP dropped significantly ( $78.09 \pm 6.62$  cm H<sub>2</sub>O,  $P < 0.001$ ). After 15.8 months mean follow up period, recurrence occurred in 4.3%.

**Conclusion:** Tailored lateral internal sphincterotomy is effective treatment of CAF with anal hypertonia. Our technique is safe and does not affect continence.

**Key words:** Anomanometry, fissure healing, recurrence.

## **Introduction**

Chronic anal fissure (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 (2), but most of them have hypertonic internal anal sphincter (IAS) with raised resting anal pressure (RAP) (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 small morbidity (4).

Posterior sphincterotomy has largely been abandoned because of the resultant gutter deformity which may impair anal closure with consequent faecal leakage (5). So, lateral internal sphincterotomy by either open (6) or closed (7) technique is the treatment of choice. In the open technique, after infiltration of local anesthetic in adrenaline into peri-anal skin, submucosa and inter-sphincteric plane, a longitudinal anal incision is done and the IAS was dissected out under vision up to the dentate line and divided (8,9). In the closed method, unlike the open technique, the IAS is not dissected out nor visualized when it is cut (8). There is a possibility of injury of the external anal sphincter (EAS) and the anal mucosa as well as the possibility of incomplete sphincterotomy due to infiltration of local anesthetic in adrenaline. 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 symptom is almost immediate, with the fissure becoming painless and healing within 3 weeks(9).

Troublesome faecal incontinence after lateral internal sphincterotomy is often attributed to faulty surgical technique, division of excessive amount of IAS up to the dentate line or inadvertent injury to EAS (10). Consequently this procedure should be done safely and reduced to the length of the fissure (11, 12).

In addition, the integrity of the IAS must be assessed preoperatively by anal manometry. If it is already compromised and the RAP is not raised, internal sphincterotomy is contraindicated (3, 13).

Aim of our study is to do lateral internal sphincterotomy that its length more or less equal that of the fissure in patients having CAF with hypertonic IAS to keep

continence. It is done by a technique has advantages of both open (safe and under vision) and closed (minimal invasive) methods. Clinical and anomanometric outcome will be assessed.

### **Patients and Methods**

This study was done in Assiut University Hospital during the period from May 2002 to January 2007 on 70 patients with CAF and 70 control subjects who had no anal complaint. All patients had hypertonic IAS compared with the control group and attend the follow up for at least one year. Both the patients and control group had the same sex ratio, 29 females, and 41 males and same age range from 18-67 years with mean age 32.1ys and 33.7ys respectively.

All patients had CAF with or without sentinel skin tag and/or anal polyp. Some of them had had one or more anal procedures for CAF.

All patients and control subjects were subjected to anorectal manometric study to measure RAP. Patients who had RAP within the range of the control group or had hypotensive IAS ( $\downarrow$  60cm H<sub>2</sub>O, 13) were excluded. Also, patients having complicated fissure with underlying abscess, fistula or anal stenosis were excluded.

A written consent was taken from each patient and control subjects after discussion of the procedure.

On admission, clinical details and examination findings were recorded and physical fitness was assessed. RAP was measured preoperatively and 6 weeks postoperatively in all patients.

### **Anal manometric study:**

Manometric study was done with pneumohydrolic capillary perfusion manometry using Sandhil victogram catheter (port- number AG-18). The catheter was inserted into the anal canal up to 6cm and the resting intra-rectal pressure was recorded. It was then with drawn out of anal canal in 1cm increments and RAP at each point was recorded. The maximum RAP was then calculated from the tracing obtained and expressed as cmH<sub>2</sub>o.

### **Surgical technique**

All patients received metronidazole 500mg tds orally 24 hours, and single enema one hour and fasted 6 hours before operation. The procedure was done in lithotomy

position under general or spinal anesthesia according to patient preference and physical fitness. At first, a full rectal examination was carried out then a circumferential peri-anal skin landmark about 5mm length was done with the tip of the scalpel along the intersphincteric groove just lateral to the lower edge of the IAS in the left lateral position of the anal verge.

A bivalved 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 the index finger, where its distal third is hypertrophied and presents a distinct, palpable band in patients with hypertonic IAS (14). While the speculum was opened, a skin incision of about 5-7mm was done in the previous skin landmark along the intersphincteric groove just lateral to the lower edge of the IAS. The inner edge of the wound was grasped with a toothed dissecting forceps and the IAS was dissected out from the skin using dissecting scissors. While the left index finger in anal canal, dissecting scissors introduced into intersphincteric space dissecting the IAS from the skin. Under vision, known by its white color or under palpation by the tip of left index finger, the lower edge of the IAS was grasped by a hemostat and the lower part of IAS was withdrawn out of the wound and sphincterotomy was done safely using the scissors (fig.1). The extent of sphincterotomy was done to be more or less equal the length of the fissure. Completeness of sphincterotomy and its extent were assessed by pressure with the tip of left index finger at the site of sphincterotomy while the speculum opened in place and IAS was stretched. The wound was left open for drainage. If there was a bleeding from the wound edges, it is controlled by diathermy coagulation. Usually, there is a slight ooze of blood from the small external wound, but this is soon arrested postoperatively by tamponade as the skin recovers and contracts around the IAS (9). Sentinel tag, anal polyp and markedly fibrotic fissure were excised.

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

**Postoperative treatment:**

All patients received prophylactic antibiotic in the form of oral metronidazole and a second generation cephalosporin for one week. A single dose of nonsteroidal anti-inflammatory (Ketorolac tromethamine 30mg) was injected i.m on recovery. I.m

nalbuphine hydrochloride 20mg was injected if needed. Oral analgesia was used according to the need. Patients resumed normal oral feeding after recovery starting by fluids and semisolid in the same day. Normal diet was resumed on the second day. Normal bowel habit was initiated by laxative on the 3<sup>rd</sup> postoperative day and the patient was kept on stool softeners for 2-3 weeks.

After 8-12 hours, the wound and peri-anal area were inspected for bruising or hematoma before patient discharge.

Patients were reviewed every week for 2 visits, every 2 weeks for 3 visits and monthly by telephone questionnaire or by examination for at least one year. If there was any anal complaint the patient was examined and assessed.

Results were assessed as

- 1- Persistence of symptoms.
- 2- Local complications (bruising, sepsis, soiling and incontinence).
- 3- Healing of fissure.
- 4- RAP after 6 weeks.
- 5- Recurrence.

Statistical study was done using paired t test to compare the same variable in the same group (paired quantitative data).

## **Results**

All patients had hypertonic IAS compared with the control group and attended the follow up for at least one year. The clinical data details are shown in table (1).

Sentinel tag was found in 33 patients (47.1%), anal polyp in 4 patients (5.7%) and both in 13 patients (18.6%). Fissures were excised in 18 patients

All patients had significant increase of preoperative RAP (mean = 130.89 ± 6.61cmH<sub>2</sub>O) compared with that of controls (mean 79.64 ± 7.10cmH<sub>2</sub>O) with P. value <0.001 (table 2).

Postoperative progress of patients is outlined in table (3). Within the first postoperative 24hs, 20 patients (28.6%) who underwent sphincterotomy only responded to a single i.m dose of ketorolac 30mg. The remaining patients, 31 patients (44.3%) needed additional dose of nalbuphine 20mg i.m and 19 patients (27.1%) needed further dose of i.m ketorolac. Within the first week, pain responded to oral diclofenac 50mg

twice daily in 63 patients (90%) with 7 patients (10%) needed oral analgesia and topical anesthetic for additional week. One patient (1.4%) with unhealed fissure needed application of local anesthetic after defecation for additional 4 weeks. Sixty three patients (90%) were comfortable enough to open their bowels normally within 48 hours after operation. Sepsis of sphincterotomy wound occurred in one patient (1.4%) and of sites of excised fissures and sentinel tags in 12 patients (17%). All infections were minor sepsis and controlled by local antibiotic except in one patient. In the latter patient, pus discharge continued for 4 weeks and by P/R examination a seed of grape was found implanted in the site of excised fissure. Improvement occurred after its extraction. No incontinence to flatus or solid stool occurred. Minor soiling occurred in 8 patients (11.4%) and improved completely after 2 weeks in 6 patients and 4 weeks in two.

Fissures healed completely in 59 patients (84.3%) within 4 weeks and by the end of 6<sup>th</sup> week fissures healed in 68 patients (97.2%). In one patient (1.4%) who had foreign body implanted, fissure healed after 9 weeks. The other patient (1.4%) with unhealed fissure had had 3 inflamed fissures with edematous anus and sphincterotomy was difficult to be done properly and assessed. Postoperative RAP was 108cmH<sub>2</sub>O indicating incomplete 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 showed that the mean postoperative RAP dropped significantly in 69 patients (mean =  $78.09 \pm 6.62$ cmH<sub>2</sub>O) compared with preoperative mean values with P value is <0.001 (table 4). The remaining patient had 3 unhealed fissures and the postoperative RAP was 108cmH<sub>2</sub>O, sphincterotomy was repeated on the right side and RAP became 76cmH<sub>2</sub>O. The postoperative RAP of patients was within the range of control group but its mean value was significantly lower (P value=0.003)

After a follow up period of 12 to 24 months (mean 15.8 months), recurrence occurred in 3 patients (4.3%). Recurrences occurred between the fifth and seventh months. The cause of recurrence was repeated forcible passage of flatus while sitting in one patient (taxi driver), and passage of hard bulky stool after repeated attacks of constipation in the other 2 patients. All fissures healed under medical treatment.

Table (1): Clinical data of 70 patients.

	<b>Number</b>	<b>Percentage</b>
<b>Sex</b>		
Males	41	58.6%
Females	29	41.4%
<b>Main symptom</b>		
Pain	67	95.7%
Bleeding	3	4.3%
<b>Site of fissure</b>		
Anterior	6	8.6%
Posterior	51	72.9%
Anterior and posterior	9	12.9%
Multiple	4	5.7%
<b>Previous anal procedures</b>		
One	8	11.4
Two	2	2.9

**Table (2): Preoperative RAP of patients and controls:**

	<b>Range in cmH2O</b>	<b>Mean <math>\pm</math> SD cmH2O</b>	<b>P. value</b>
Patient group	120-151	132.89 $\pm$ 6.61	<0.001
Control group	68-91	79.64 $\pm$ 7.10	

Table (3): Clinical results of sphincterotomy

	Number	Percentage
• <b><i>Pain control within 24hs with injectable analgesia</i></b>		
Single dose	20	28.6%
2 doses	31	44.3%
3 doses	19	27.1%
• <b><i>Response of pain to oral analgesia/local anesthetic</i></b>		
Within 1 <sup>st</sup> week	63	90%
For 2 weeks	6	8.6%
For 6 weeks	1	1.4%
• Return of bowel function within 48hs.	63	90%
• <b><i>Postoperative complications</i></b>		
Perianal bruising	1	1.4%
Sepsis of sphincterotomy wound	1	1.4%
Sepsis at site of excised sentinel tag & fissure	12	17.2%
Incontinence to solid stool/flatus	0	
Soiling	8	11.4%
• <b><i>Healing of fissures within 6ws</i></b>		
Healed	68	97.2%
Unhealed	2	2.8%
• <b><i>Recurrence</i></b>	3	4.3%

Table (4): Pre-and postoperative RAP of patients

	Preop. RAP cmH2O	Postop. RAP cmH2O	P. value
Range	120-151	66-89	<0.001
Mean	132.89±6.61	78.09 ±6.62	

## Discussion

Our technique was proposed to do tailored lateral internal sphincterotomy that is more or less equal the length of the fissure and never reaches dentate line. In addition, it is done safely under vision without any danger to the anoderm or EAS through a small extra-anal incision. So, it has advantages of both open and closed techniques at the same time. This technique is actually a modification of that described by Boulos and Araujo (1984) (8). They described sphincterotomy through a larger circumferential perianal incision where the IAS is dissected and divided up to the dentate line, bleeding is

controlled by diathermy electro-coagulation and the wound is closed with chronic cat gut sutures and the anal canal is packed. They reported incontinence to flatus in 14.3%, bruising in 7.1% and infection in 7.1% with no incontinence to faeces. They also reported significant reduction of postoperative median RAP (by 50%) with healing of all fissures. Our technique is minimal invasive and sphincterotomy is partial. Bruising occurred in 1.4% (one patient) and minor sepsis of sphincterotomy wound in 1.4% (one patient) which was easily controlled by local antibiotics. These low incidences can be attributed by leaving sphincterotomy wound open for drainage. No incontinence was reported but only soiling occurred in 11.4% which improved completely on the second visit after 2 weeks in 6 of them and in the other 2 patients after 4 weeks. The temporary soiling that occurred in the early postoperative period can be explained by the finding of Gunal et al., (2007)(15) that the RAP dropped markedly at day 2 postoperatively and improved at day 20.

In our study, sphincterotomy was done successfully in 69 out of 70 patients. In the remaining one, she had 3 inflamed fissures with edematous anus so that sphincterotomy and its assessment were difficult. After 6 weeks, fissures unhealed and sphincterotomy was found incomplete. It was repeated on the right side and fissures healed within 7 weeks.

In our study, 90% of patients were comfortable enough to open their bowels normally within 48 hours of the operation. Local complications related to sphincterotomy incision were minimal. Within the 1<sup>st</sup> week pain responded to oral analgesia in 90% of patients with 10% needed oral analgesia and topical anesthetic for additional week. Garcea et al,(2003) (11)reported persistence of symptoms after conservative sphincterotomy in 11.9% with only 9.2% needed topical analgesia.

Complete healing of fissures occurred in 84.3% within 4 weeks and by the end of 6 weeks fissures healed in 97.2% (68 patients). The cause of unhealing of fissures in one patient was incomplete sphincterotomy and in the other one was implantation of a foreign body in the site of excised fissure. A healing rate of 97% after conservative sphincterotomy was reported by Garcea et al., (2003)(11) within a mean period of 6.9 weeks. A healing rates of 95.1% by 7 weeks and 97.5% at 3 months were reported by Liratzopoulos et al.,(2006)(4). On the other hand, 96% healing rate was reported by

Nyam and Pamberton (1999)(16) after 3 weeks and 100% healing rate at one month by Boulos and Araujo (1984)(8).

In our study, no incontinence was reported but minor soiling occurred in 11.4% which completely improved in within 4 weeks. Garcea et al. (2003)(11) reported incontinence to fluid stool and flatus in 1.7% and to flatus only in 1.7% after partial lateral sphincterotomy. Nyam and Pemberton (1999)(16) surveyed patients treated by total sphincterotomy up to dentate line during the period between 1984 and 1996 (585 patients) and reported that some degree of faecal incontinence occurred in 45% of patients at some time in the postoperative period. They also found after a mean period of follow up 5 years that, 6% of patients had incontinence to flatus, 8% minor soiling and 1% loss of solid stool. Also, Liratzopoulos et al., (2006)(4) surveyed patients underwent total subcutaneous lateral sphincterotomy between 1981 to 2004 (246 patients) and found minor incontinence in 7.02% at 48 weeks follow up. Moreover, Hashmat and Ishfaq (2007)(17) reported incontinence of flatus/ faeces in 64.3 at 1<sup>st</sup> week after total lateral internal sphincterotomy but resolved by the 8<sup>th</sup> week. On the other hand, Tocchi et al., (2003)(18), selected patients with hypertonic IAS by anal manometric study for subcutaneous total lateral sphincterotomy. They reported transient incontinence rate of 9.1% and persistent incontinence to flatus and soiling in 3%. However, it was reported that incontinence rate is related to the extent of sphincterotomy with a high rate when division of IAS extends up to dentate line so it must be reduced to the length of fissure (11, 12).

Moreover, Shelygin et al., (2005)(19) followed up patients after fissure excision in combination with lateral subcutaneous sphincterotomy for a mean period of 4.3 years. The follow up included clinical examination, anorectal manometry endorectal ultrasonography and defecography in patients having symptoms. They found different grades of incontinence in 19.7% with excessive division of IAS was the cause in only 3.4%. Other causes were perineal descent syndrome in 13.7% and advanced age in 2.6%. They concluded that it is necessary to examine patients carefully before surgery and the surgical technique must be modified according to anorectal manometric study. However, it was reported that, after 6 years follow up lateral internal sphincterotomy is a good treatment for CAF and does not compromise long term faecal continence (20).

In our study, recurrence occurred in 3 patients (4.3%). Recurrent attacks of constipation and passage of hard bulky stool were the cause in 2 patients and repeated forcible passage of flatus while sitting in the third one. In 3 patients, fissures healed under medical treatment. Garcia et al., (2003) (11) reported that no patient required reoperation for recurrence after conservative sphincterotomy. However, 1-3% recurrence rate after partial sphincterotomy was reported (21). In addition, after total closed sphincterotomy a recurrence rate of 10.2% was reported after a mean period of follow up 4.3 years and the cause was incomplete sphincterotomy (19).

In our study, patients had significantly high RAP (mean  $132.89 \pm 6.61$  cmH<sub>2</sub>O) than that of control subjects (mean  $79.64 \pm 7.1$  cmH<sub>2</sub>O). There was a marked postoperative significant reduction in RAP (mean  $78.09 \pm 6.62$  cmH<sub>2</sub>O) which was close to those of control group (P=0.003). This RAP is within the range of normal as reported by Kenefick et al., (2002)(13) that normal RAP is more than 60cmH<sub>2</sub>O. After total sphincterotomy, Boulos and Araujo (1984)(8) reported a reduction of RAP from a mean 97cmH<sub>2</sub>O to 47.5cmH<sub>2</sub>O and from 107.4 to 52cmH<sub>2</sub>O after open and closed sphincterotomy respectively. Gunal et al.(2007)(15), found that RAP preoperatively was significantly higher in patients with CAF ( $83.4 \pm 1$  mmHg) than in normal control subjects ( $52 \pm 1.2$  mmHg). They found significant drop in RAP postoperatively, marked at day 2 ( $29 \pm 1$  mmHg) than at day 20 ( $47 \pm 1$  mmHg) which was close to those of normal volunteers.

### **Conclusion:**

Tailored lateral internal is effective treatment of chronic anal fissure with anal hypertonia. Our technique of sphincterotomy is safe and does not affect continence.

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Fig. (1): A- Anterior fissure

B- Perianal incision

C- Lower edge of IAS is grasped by hemostat and withdrawn outside perianal wound.