

# Prevalence of Transient Anal Incontinence in Patients Undergoing Lateral Sphincterotomy for Chronic Anal Fissure: An Observational Study

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## ABSTRACT

**Introduction:** Lateral Internal Sphincterotomy (LIS) is a time-tested procedure of choice in cases of chronic anal fissure.

**Aim:** To study the rates of transient anal incontinence, pain relief and healing rates of fissure in the operated patients.

**Materials and Methods:** An observational study was done in the Department of Surgery at a tertiary hospital. A total of 62 subjects who underwent lateral sphincterotomy were included in a study duration of 12 months. Subjects were followed-up at four weeks and eight weeks interval after surgery and the following variables were assessed: prevalence of transient anal incontinence, pain relief and outcome in terms of healing of fissure. The descriptive data was studied using frequencies, percentages, mean and standard deviation and the association of study variables was studied with chi-square test and paired t-test.

**Results:** In this study, 8.06% subjects (n=5) complained of anal incontinence at eight weeks postsurgery. Also, the

anal incontinence at eight weeks (mean score=0.08±0.27) compared to that after four weeks (mean score=0.54±0.97) was significantly decreased (p<0.001). About 17.7% subjects (n=11) had pain at four weeks after surgery with mean pain score of 0.35±0.79 which had significantly improved (p<0.001) at eight weeks interval with only 6.4% subjects (n=4) complaining of pain with mean pain score of 0.08±0.3. The rates of healing of fissures at eight weeks (93.5%, n=58) increased as compared to four weeks follow-up (82.3%, n=51) though this increase in healing rates was not statistically significant (p=0.07).

**Conclusion:** The severity and rates of anal incontinence and pain relief had significantly improved at eight weeks follow-up as compared to four weeks postsurgery. These results favour the idea that anal incontinence post lateral sphincterotomy is both transient and mild in most patients. Also, there is significant pain relief with good fissure healing rates at the end of eight weeks follow-up interval after surgery.

**Keywords:** Fissure healing rates, Follow-up, Postoperative pain relief

## INTRODUCTION

Anal fissure is a common trivial looking, yet a very painful condition that brings an anxious patient to an everyday surgical outpatient clinic. Anal fissure involves a separation of the anal epithelium, distal to the dentate line commonly noted in the posterior midline [1]. Patients present with complaints of painful defecation, bleeding per anum, constipation which interferes with patients' daily routine. Such anal fissures with acute presentation are treated by conservative management with local application of lignocaine, calcium channel blockers or nitrates achieving local analgesia and sphincter relaxation properties. This provides excellent management in majority of the patients. There are still a few patients who continue to have symptoms, have a perianal skin tag in addition to these symptoms and a persistent fissure even after three months despite conservative management. This subset of patients grouped as chronic anal fissure [1] who underwent lateral internal sphincterotomy as the definitive procedure. There also exist another set of patients in whom anal fissure is only one of the presentations of a larger primary pathology such as crohns disease, HIV infection, anal carcinoma or tuberculosis [2]. Such patients require definitive treatment of primary pathology along with specific management of the fissure to achieve good results and avoid recurrences. Lateral internal sphincterotomy is the surgical treatment of choice in patients with chronic anal fissure with failed conservative approach [1]. This procedure aims to relieve the elevated sphincter pressure by dividing the hypertrophied internal sphincter in these patients and thus, provide adequate pain relief and achieve healing of the fissure [2,3].

Previous studies assessing lateral sphincterotomy considered the pain relief, healing of fissure and symptom relief as the outcomes of the procedure [3,4]. Few studies reported the complication of anal incontinence after the procedure [3-8]. But the rates of such

incontinence and the duration of the incontinence vary in different studies [3-8].

The present study aimed to evaluate the prevalence of transient anal incontinence in patients undergoing lateral internal sphincterotomy for chronic anal fissure. The pain relief and healing rates of anal fissure at 4-week and 8-week follow-up intervals after surgery were also evaluated.

## MATERIALS AND METHODS

This was a single cohort prospective observational study. The study protocol is approved by Institutional Ethics Committee (IEC/322/18) of the Lokmanya Tilak Municipal General Hospital, Mumbai. A written informed consent was taken from each participant. The study was done in accordance with the principles of the Helsinki declaration.

Our study sample included all eligible patients admitted with chronic anal fissure in the surgical ward at our hospital and underwent lateral sphincterotomy between March 2018 to February 2019 for a study duration of 12 months. In this study, we included only patients with isolated chronic anal fissure with no associated diseases.

### Sample Size Calculation

Sample size was calculated by the following formula:

$$n = \frac{Z_{(1-\alpha/2)}^2 p(1-p)}{d^2}$$

where; p=expected proportion in population based on previous study) [3]

d=precision error

Thus, at p=4.2%, and 5% precision error, minimum sample size required was at least 62 patients. Confidence interval was set at

95% and alpha error at 5% limits. A total of 62 eligible patients underwent lateral sphincterotomy during this period who formed the study sample.

### Inclusion Criteria

Eligibility for inclusion in the study were age 18 years and above, patients/legally acceptable representative willing to give written informed consent, chronic anal fissure cases defined as anal fissure persisting beyond three months duration and/or anal fissures with associated features of chronicity like sentinel pile, hypertrophied papillae, and exposure of internal sphincter and those who had failed conservative treatment for anal fissure.

### Exclusion Criteria

Certain subsets of patients such as pregnant and lactating women, anal fissures with inflammatory bowel disease, patients with immunocompromised state, patients with diabetes mellitus and those who had history of previous surgery for anal fissures were selectively excluded from this study.

### Study Procedure

All the study patients were admitted and operated by the General Surgery Department of the hospital. Patients were operated in lithotomy position under saddle anaesthesia. Either open or closed lateral internal sphincterotomy was done as per the operating surgeon's decision. Closed sphincterotomy technique involved using number 11 scalpel blade to make a small stab incision at 30° clock position in the intersphincteric groove and rotating the sharp side of the blade towards the anal canal and dividing the internal sphincter. Haemostasis was achieved with compression applied for a few minutes and with chemical cauterisation with povidone iodine and hydrogen peroxide local application as necessary. Open sphincterotomy was done with incision on the anoderm below the dentate line and exposing the internal sphincter dividing it under vision [1]. Haemostasis achieved similarly as in closed technique. The length of the sphincterotomy was limited to the level of dentate line in all cases with either technique though some surgeons had opted and performed a more conservative sphincterotomy. Patients received analgesics; antibiotics supplemented with a laxative for immediate postoperative period.

All patients were discharged a day after the surgery once patient was comfortable on oral feeds and advised local antibiotics, oral analgesics, and laxative for seven days. All patients had regular weekly follow-up at outpatient clinics.

The study involved postoperative assessment at two-time frames namely four weeks and eight weeks after surgery at the outpatient clinics for any anal incontinence for faeces and flatus, pain relief and healing of fissure.

The study parameters were evaluated in the following manner.

### Anal Incontinence

Anal incontinence for flatus and/or faeces was evaluated using Jorge-Wexner's Cleveland Clinical Faecal Incontinence Score [9] thus, assessing frequency of the incontinence, the type of incontinence, any necessity for pad application and any impact on daily routine by interviewing the patient at four weeks and eight weeks follow-up after surgery.

### Assessment of Pain

Perception of pain was assessed using Visual Analog Scale [10] with 0 indicating no pain and 10 indicating the worst pain felt. Pain was evaluated at presentation before surgery, at four weeks and at eight weeks follow-up after surgery thus, assessing the relief of pain if any post lateral sphincterotomy and also any improvement in pain relief at eight weeks as compared to four weeks follow-up after surgery.

### Fissure Healing

Healing of fissure [3] in the study was defined as resolution of the presenting symptoms namely pain, bleed per anum and constipation depending on patients' initial presentation supplemented with normalisation of sphincter tone on per rectal exam at either four weeks or eight weeks follow-up. Persistence of any of the symptoms and presence of increased sphincter tone was used to define a persistent fissure [3].

At the four and eight weeks follow-up intervals, study patients were enquired for any persistent symptoms and also examined with per rectal exam to study sphincter tone to decide if the fissure is healed or persistent.

### STATISTICAL ANALYSIS

The data from the study subjects was analysed using SPSS version 21 software (by IBM, based in Chicago, Illinois). Descriptive data described as frequencies, percentages, mean and standard deviation, association between study variables was done using paired t-test. Level of significance was set at p-value <0.05.

### RESULTS

Anal fissures were seen in 55% male (n=34) and 45% female (n=28) patients in the study population. Average age of the total study sample (n=62) was 36.8±9.4 years. Average age of the male patients (n=34) was 38.7±9.1 years and female patients (n=28) was 34.6±9.67 years. Most of them were in the age groups of 36-45 years [Table/Fig-1].

Age groups (years)	Number of patients
18-25	7 (11%)
26-35	18 (29%)
36-45	24 (39%)
46-55	12 (19%)
56-65	1 (2%)
Total	62

[Table/Fig-1]: Demographics of the study population.

In the present study, 65% had constipation and 81% had pain associated with bleeding per rectum [Table/Fig-2].

Symptoms	Frequency among study sample
Constipation	40 (65%)
Pain	62 (100%)
Bleeding	50 (81%)

[Table/Fig-2]: Symptomatology of the study population.

Patients complaining of anal incontinence to flatus after eight weeks postsurgery were significantly less as compared to that after four weeks as p-value <0.001.

In present study, no patient reported incontinence to faeces or soiling of pads at either point of follow-up in postoperative period [Table/Fig-3].

Variables	After 4 weeks	After 8 weeks
Number of patients with incontinence	18 (29%)	5 (8%)
Mean wexner anal incontinence score±standard deviation	0.54±0.97	0.08±0.27
Minimum wexner anal incontinence score	0	0
Maximum wexner anal Incontinence score	3	1
p-value (Wexner score at 8 weeks compared to 4 weeks interval) by paired t-test	p<0.001	

[Table/Fig-3]: Assessment of anal incontinence for flatus on follow-up.

Patients had significant relief in pain at eight weeks as compared to four weeks follow-up interval after surgery. ( $p < 0.001$ ) [Table/Fig-4].

There was an increase in the number of fissures healed at eight weeks follow-up as compared to four weeks interval after surgery but this increase in the rate of fissure healing was not significant. (paired t-test,  $p = 0.07$ ) [Table/Fig-5].

Variables	Preoperative pain	Pain after 4 weeks	Pain after 8 weeks
Number of patients	62	11 (17.74%)	4 (6.45%)
Mean pain score (of the patients who had pain)	4.5±2.02	0.35±0.79	0.08±0.3
Minimum pain score	1	0	0
Maximum pain score	9	3	1
p-value (pain scores at 8 weeks compared with 4 weeks follow-up) by paired t-test			p-value <0.001

[Table/Fig-4]: Assessment of pain on follow-up.

	After 4 weeks	After 4 weeks	After 8 weeks	After 8 weeks
Outcome	Healed	Persistent fissure	Healed	Persistent fissure
Number of patients	51 (82.26%)	11 (17.74%)	58 (93.55%)	4 (6.45%)

[Table/Fig-5]: Assessment of outcome on follow-up (fissure healed or persistent fissure).

## DISCUSSION

All patients in the present study presented with pain during and after defecation, 65% had constipation and 81% had pain associated with bleeding per rectum [Table/Fig-2]. Studies by Singh S et al., and Latif A et al., demonstrated painful defecation and constipation as common symptoms [4,11]. Another study observed that about 84% patients had pain, 1% constipation and 30% bleeding per rectum [5]. Most patients in the present study population presented with complaints of painful defecation which is consistent with previous studies whereas constipation is noted in around two-thirds of the presenting patients. Bleeding per rectum is probably the most inconsistent symptom as seen in different studies in the past [4,5,11].

Post lateral internal sphincterotomy anal incontinence to flatus was found in 29% patients ( $n = 18$ ) at four weeks and 8% patients ( $n = 5$ ) at eight weeks in the study [Table/Fig-3]. Manoharan R et al., reported 4.2% cases of anal incontinence post surgery in which all patients underwent open limited internal sphincterotomy and patients followed-up postoperatively for four weeks or till healing of fissure is complete whichever was earlier [3]. In the study by Nyam DC and Pemberton JH, an incontinence rate of 6% for flatus, 8% for mild soiling and 1% gross faecal incontinence was noted after 5 years follow-up [6]. The same study considered large study population ( $n = 585$ ) and a longer follow-up till 72 months but it did not compare the different surgical techniques and their differences in terms of postoperative anal incontinence. A meta-analysis by Nelson RL, comparing different operative techniques with occurrence of faecal incontinence concluded that there was no significant difference in the rate of incontinence following either open or closed lateral sphincterotomy [7]. In the study conducted by Prakash GV et al., 8% patients had anal incontinence after undergoing a partial lateral sphincterotomy with a follow-up period of 12 months [5]. Hyman N, reported anal incontinence in 3 out of 35 study patients postlateral sphincterotomy after six weeks follow-up [8]. In another study by Elsebae MM, anal incontinence rate of 6.52% was noted after at least four weeks follow-up with traditional lateral sphincterotomy till dentate line noted to have significantly more chances of incontinence as compared to limited lateral sphincterotomy [12]. Also, Hyman N, reported that patients complicated by anal incontinence after lateral sphincterotomy did not experience any significant deterioration in the quality of life [8], while long-term follow-up of patients with

incontinence after sphincterotomy by Nyam DC and Pemberton JH, suggested around 3% did experience an alteration in their lifestyle [6]. The present study used wexner's incontinence score [9] which has lifestyle alteration as one of its components and none of the study patients who experienced anal incontinence anytime during the follow-up complained of alteration in lifestyle probably because all cases of incontinence were mild. Present study suggests that anal incontinence following lateral sphincterotomy is mild in all patients who had incontinence score  $> 0$ . According to present study, lateral sphincterotomy comes with a risk of mild incontinence in very few patients which is further transient in majority of the affected patients.

This study showed that there is a significant improvement in pain at eight weeks follow-up (6.4%,  $n = 4$ , mean pain score = 0.08) compared to four weeks follow-up interval (17.74%,  $n = 11$ , mean pain score = 0.35) after lateral sphincterotomy [Table/Fig-4]. There was significant pain relief at either follow-up interval after surgery compared to preoperative pain in our study patients. Acar T et al., reported that lateral sphincterotomy provided pain relief in 91.4% at eight weeks compared to 87% patients at four weeks after surgery suggesting a continual benefit in pain relief in the first eight weeks after surgery [13]. Singh S et al., reported that only 5.93% patients had mild pain at the end of six months follow-up after surgery [4]. Alawady M et al., in their study demonstrated that a posterolateral sphincterotomy provides superior pain relief compared to lateral sphincterotomy while all our study patients underwent lateral sphincterotomy obtaining adequate and continual pain relief over a 8-week follow-up [14].

In the index study at the end of four weeks post LIS, anal fissures in 82.26% patients had healed and at eight weeks 93.54% fissures had healed [Table/Fig-5]. In the study by Salih AM, 98.6% healed [15] and that by Prakash GV et al., 92% healed [5]. Similar healing rates of  $> 90\%$  for anal fissures were noted post LIS in other studies by Nyam DC and Pemberton JH, Hyman N, [6,8]. In contrast to majority of studies, Latif A et al., reported healing rates of around 74% [11]. We offered a combination of high fibre diet, local analgesics, local application of 2% diltiazem gel, bulk laxatives for a period of at least two weeks for patients with persistent fissure ( $n = 4$ , 6.45% study patients) at the end of eight weeks follow-up interval. Thus, lateral sphincterotomy provides good healing rates in chronic anal fissure with failed conservative treatment.

Future study is required in assessing the nature of anal incontinence and its impact on patients' lifestyle with longer follow-up and with use of a validated scale to assess quality of life.

## Limitation(s)

Present study has heterogeneity of patients who have undergone both open and closed lateral sphincterotomy; length of sphincterotomy was not a study parameter as compared to other studies assessing the outcomes after sphincterotomy. Further, a longer follow-up with assessment of quality of life parameter is warranted to find out the true nature of anal incontinence in the operated patients who had persistent incontinence to gas at the end of eight weeks follow-up period.

## CONCLUSION(S)

Lateral internal sphincterotomy is a safe procedure providing significant pain relief and healing in majority of operated patients but does come with a complication of mild and transient anal incontinence mostly to gas in few patients.

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