



EARLY OUTCOME OF LASER INTERNAL SPHINCTEROTOMY VERSUS OPEN INTERNAL SPHINCTEROTOMY IN THE TREATMENT OF ANAL FISSURES

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ABSTRACT **INTRODUCTION :** Fissure-in-Ano is one of the common and most painful anorectal conditions encountered in surgical practice. In spite of several conservative treatment options, surgical treatment in the form of Lateral Internal Sphincterotomy (LIS) remains the gold standard of treatment for anal fissure. However we compare Laser lateral internal sphincterotomy with Open lateral internal Sphincterotomy for better postoperative pain relief and lesser hospital stay.

AIM: Early outcome of laser lateral internal Sphincterotomy versus open lateral internal sphincterotomy in the treatment of anal fissures.

MATERIALS AND METHODS: The study was conducted on 50 cases of Laser lateral internal sphincterotomy compare with 50 cases of Open lateral internal sphincterotomy in Maharani Laxmi Bai Medical College, Jhansi between January 2020 to July 2021.

RESULTS: In our study in Group A 6% were in 16-20 years, 52% in 21-30 years, 20% in 31-40 years, 20% in 41-50 years and 2% 51-60% years and Group B 2% in 16-20 years, 34% in 21-30 years, 32% in 31-40 years, 18% 41-50%, 10% in 51-60 and 4% in >60. Group A mean postoperative VAS pain score in 6 hours 5.12 ± 0.328 , 12 hours 4.32 ± 0.768 , 24 hours 3.74 ± 0.777 , 36 hours 2.76 ± 1.379 and 48 hours 2.3 ± 1.418 . In Group B mean postoperative VAS pain score in 6 hours 5.2 ± 0.452 , 12 hours 2.7 ± 1.741 , 24 hours 1.76 ± 1.451 , 36 hours 0.58 ± 0.971 and 48 hours 0.28 ± 0.671 . Group A 44% presented with Perianal swelling, 42% Pruritis Ani and 40% flatus incontinence. In Group B 6% presented with amount of blood loss 6%, 18% Perianal swelling, 6% infection, 18% flatus incontinence. The mean postoperative pain score was significantly less in Group B at 12 to 48 hours. Group A mean hospital stay was 5.02 ± 1.237 days and in Group B 2.02 ± 0.141 days. It was significantly less in Group B.

CONCLUSION: Laser lateral Internal Sphincterotomy is better than open Lateral Internal Sphincterotomy with respect to less postoperative pain and lesser hospital stay and also less postoperative complications in the treatment of anal fissure.

KEYWORDS : Anorectal conditions fissure-in-ano lateral internal sphincterotomy, Laser surgery Diode laser surgery

INTRODUCTION

An anal fissure is a common benign anorectal disease affecting both children and adults. It is defined as a painful linear tear along the long axis of lower anal canal anoderm extending cephalad to the dentate line. Classically these are caused by a large, firm, forceful bowel movement. This results in cycles of recurring anal pain and bleeding leading to chronic anal fissures in as many as 40% of patients who develops fissures. An anal fissure can typically be diagnosed based on history alone. Patients will describe moderate to severe anal pain with bowel movements with variable amounts of bleeding. The bleeding is described as blood on the toilet paper with wiping. The pain commonly persists for 30 minutes to 1 hour following a bowel movement. The exposed internal anal sphincter frequently spasms, leading to significant pain. If this persists, this muscle becomes hypertrophied leading to nonhealing anal fissures. Typically, in children, these are self-limiting, whereas in adults these can require surgical intervention^[1].

The majority of anal fissures (90%) are located in the posterior midline. Fissures can be located in the anterior midline in as many as 25% of females and 8% of males. Fissures in the lateral position should raise concern for other disease processes like inflammatory bowel disease or granulomatous diseases.

There are several medical therapies including salves, fiber and topical nitroglycerin that aids in spontaneous closure early in the disease process. Surgical therapies include botulinum toxin injections, fissurectomy, advancement flaps, and lateral internal anal sphincterotomy. Surgical intervention is typically indicated with chronic fissures or for fissures that are not amenable to medical therapy.

Lateral internal anal sphincterotomy provides prompt symptomatic relief and has greater than 95% cure rate at 3 weeks post-procedure. Currently, it is considered the gold standard surgical intervention.

Anatomy:

The anal canal can be described in 2 ways, the functional (surgical) or

anatomic anal canal. The surgical anal canal is about 4 cm long and extends from the anal verge to the anorectal ring or puborectalis sling. The anatomic anal canal is approximately 2 cm long and starts at the anal verge extending to the dentate line.

The anal canal consists of 2 muscular structures, which are responsible for anal continence. The first of these structures is the internal anal sphincter, which is the inner layer of the muscular complex and is composed of smooth muscle. The internal anal sphincter is approximately 2.5 to 4 cm long and 2 to 3 mm thick. Since the internal anal sphincter is an involuntary muscle, it is consistently contracted to prevent inadvertent loss of stool. During a bowel movement, the internal anal sphincter muscle relaxes allowing in the expulsion of stool. The second muscular structure is the external anal sphincter, which is the outer muscular layer and is composed of striated muscle. The external anal sphincter is a muscular tube around the anal canal, which merges proximally with the puborectalis and the levator ani muscles. It is the voluntary muscle used during bowel movements.

Lateral internal anal sphincterotomy is indicated in patients who are refractory to medical management. Typically, patients undergo medical management for 1 to 3 months. If it has failed, surgery is recommended. Surgical candidates must have good fecal continence prior to the procedure to reduce the risk of postoperative fecal incontinence

AIMS AND OBJECTIVES

AIM:

Early outcome of laser lateral internal sphincterotomy in versus open lateral internal sphincterotomy in the treatment of anal fissures.

OBJECTIVES

- To compare the postoperative pain pattern among patient undergoing laser lateral internal sphincterotomy in versus open lateral internal sphincterotomy.
- To compare the postoperative bleeding pattern among patient undergoing laser lateral internal sphincterotomy in versus open

lateral internal sphincterotomy

- To compare the risk of developing incontinence to flatus and/or stool in patients undergoing internal Sphincterotomy in the two groups

MATERIALS AND METHODS

The study was conducted on 50 cases of Laser internal sphincterotomy compare with 50 cases of Open internal sphincterotomy in Maharani Laxmi Bai Medical College, Jhansi between January 2020 to July 2021.

All patients admitted to Department of Surgery, Maharani Laxmi Bai Medical College, Jhansi between January 2020 to July 2021 with probable diagnosis of anal fissure would be included in the study.

INCLUSION CRITERIA:

- Patient above 18 years with primary chronic anal fissure, with or without blood in stools.
- Patients giving informed consent.

EXCLUSION CRITERIA:

- Patient who had previous surgery for anal fissure.
- Patients with fissures secondary to other diseases like crohn's disease, ulcerative colitis, tuberculosis or anal warts.
- Any co-morbid condition (diabetes Mellitus, Malignancies)

Randomization:

Random allocation of age and sex matched patients (sample size=50) presenting with symptoms suggestive of, follow up case of internal sphincterotomy will be done into two groups. The two groups will be as follows

Group1: Laser internal sphincterotomy (n=50)

Group2: Open internal sphincterotomy (n=50)

METHOD OF COLLECTION OF DATA

Study design: Prospective study

STATISTICAL ANALYSIS:

The data was summarized as mean values with standard deviations (SD). The statistic analysis will be performed using Student's t-test and chi square test. The SPSS 11.0 for Windows computer software (SPSS Inc., Chicago, IL) will be used for statistic analysis. P value less than 0.05 will be considered significant.

Pre-operative preparation included:

Complete blood count, fasting blood sugar, urea and electrolytes. Patients will be given either general anaesthesia or spinal anaesthesia. Positioned in the lithomy on the operating table. Skin preparation with povidine and iodine then appropriate drappings. Using the operating surgeons index finger, palpation of the tight distal internal sphincter and intersphincteric groove will be done.

Laser technique:

Procedure was performed under general anaesthesia without muscle resection, patients were position in the lithotomy position, insertion of a bivalve type of anal speculum, the tight distal internal sphincter is palpable as a tight band within the canal. The intersphincteric groove, which marks the distal end of the internal sphincter is easily palpable.

A incision of approximate size 0.5mm made over intersphincteric groove at 3^o clock position with laser beam and internal sphincter is hooked with right angled forceps and is cut using **diode laser** of wave length 1470nm and energy of 8W/sec/mm in Continuous wave (CW) operating mode.

Full thickness of internal sphincter is divided with laser and checked for haemostasis. Additionally the chronic fibrosed scar is also debrided with laser along with excision of skin tag. This prevents any long term discomfort and enables a quicker recovery. This procedure was almost bloodless and the surgeon has good control over the operation site.

Laser specifications for internal sphincterotomy-

- Laser type – Diode laser
- Wave length- 1470nm
- Energy- 10w/sec/mm
- Operation mode- Continuous Wave (CW)

Open technique:

In open method, patients were positioned in the lithotomy position,

sterilization of anal region, insertion of a bivalve type of anal speculum to place the internal sphincter on a slight stretch to assist in its identification. A radial incision is made laterally at the lower border of internal sphincter into the **intersphincter groove**. The distal internal sphincter is grasped with Allis forceps and bluntly freed. The lower one third to one half is divided with scissors.

Postoperative pain:

Accurate pain assessment was a prerequisite for successful pain management as well as for study. The American Pain Society emphasizes the importance of obtaining the patients self-report of pain as the gold standard of pain assessment. There are various pain scores to measure post-operative pain.

Visual analogue scale (VAS):

Operationally a VAS is usually a horizontal line, 100 mm in length, anchored by word descriptors at each end, as illustrated in Figure. The patient's marks of the line the point that they feel represents their perception of their current state. The VAS score is determined by measuring in millimeters from the left hand end of the line to the point that the patients marks.

RESULTS

Table 1: Distribution of age (in years)

Age (in years)	Group A (Open L.I.S.) [N=50]		Group B (Laser L.I.S.) [N=50]	
	Number	Percentage	Number	Percentage
16-20 years	3	06.00%	1	02.00%
21-30 years	26	52.00%	17	34.00%
31-40 years	10	20.00%	16	32.00%
41-50 years	10	20.00%	9	18.00%
51-60 years	1	02.00%	5	10.00%
>60 years	0	00.00%	2	04.00%

In our study in Group A 6% were in 16-20 years, 52% in 21-30 years, 20% in 31-40 years, 20% in 41-50 years and 2% 51-60% years and Group B 2% in 16-20 years, 34% in 21-30 years, 32% in 31-40 years, 18% 41-50%, 10% in 51-60 and 4% in >60.

Table 2: Distribution of mean age

Mean age (in years)	Group A (Open L.I.S.) [N=50]	Group B (Laser L.I.S.) [N=50]	p value
	Mean±SD	Mean±SD	
Mean±SD	31.78±9.027	39.04±13.583	0.002 (S)

The mean age of patient in Group A were 31.78±9.027 and in Group B were 39.04±13.583.

Age mentioned in the results section, the mean age of patients differed significantly (p=0.002) between the Group A and Group B.; thus it seems that matching the Group A and Group B was not performed accurately. This was probably because of the importance placed on inclusion criteria including indications for surgery and the willingness of patient to undergo laser internal sphincterotomy.

Table 3: Distribution of sex

Sex	Group A (Open L.I.S.) [N=50]		Group B (Laser L.I.S.) [N=50]	
	Number	Percentage	Number	Percentage
Male	29	58.00%	24	48.00%
Female	31	62.00%	26	52.00%

In our study in Group A (Open) male were 58% and female were 62% and in Group B Male 48% and female 52%.

Table 4: Distribution of Fissure location

Fissure location	Group A (Open L.I.S.) [N=50]		Group B (Laser L.I.S.) [N=50]	
	Number	Percentage	Number	Percentage
Posterior	44	88.00%	43	86.00%
Anterior	06	12.00%	07	14.00%
Other	00	0.00%	0	0.00%

In our study in Group A 88% were posterior, 12% anterior location in Group B 86% were in posterior and 14% in anterior location.

Table 5: Distribution of Clinical Presentation

Symptoms	Group A (Open L.I.S.) [N=50]		Group B (Laser L.I.S.) [N=50]	
	Number	Percentage	Number	Percentage
Pain during defecation	50	100%	50	100%
Haematochezia/Blood in stool	35	70.00%	40	80.00%
Perianal swelling/ Perianal swelling	17	34.00%	21	42.00%
Mucoid discharge	15	30.00%	12	24.00%
Anal pain	50	100%	50	100%
Anal skin tag	50	100%	49	98.00%

In our study in Group A 100% patients presented with pain during defecation, 70% Haematochezia, 34% perianal swelling, 30% mucoid discharge, 100% anal pain and 100% anal skin tag and Group B 100% patients presented with pain during defecation, 80% Haematochezia, 42% perianal swelling, 24% mucoid discharge, 100% anal pain and 98% anal skin tag.

Table 6: Distribution of Mean postoperative pain score (VAS)

Postoperative pain score (VAS)	Group A (Open L.I.S.) [N=50]		Group B (Laser L.I.S.) [N=50]		p value
	Mean±SD	Mean±SD	Mean±SD	Mean±SD	
6 hours	5.12±0.328	5.2±0.452	0.31	(NS)	
12 hours	4.32±0.768	2.7±1.741	0.01	(S)	
24 hours	3.74±0.777	1.76±1.451	0.01	(S)	
36 hours	2.76±1.379	0.58±0.971	0.01	(S)	
48 hours	2.3±1.418	0.28±0.671	0.01	(S)	

In our study in Group A mean postoperative VAS pain score in 6 hours 5.12±0.328, 12 hours 4.32±0.768, 24 hours 3.74±0.777, 36 hours 2.76±1.379 and 48 hours 2.3±1.418. In Group B mean postoperative VAS pain score in 6 hours 5.2±0.452, 12 hours 2.7±1.741, 24 hours 1.76±1.451, 36 hours 0.58±0.971 and 48 hours 0.28±0.671. The mean postoperative score was significantly less in Group B at 12 to 48 hours.

Table 7: Distribution of Postoperative Complications

Parameters	Group A (Open L.I.S.) [N=50]		Group B (Laser L.I.S.) [N=50]	
	Number	Percentage	Number	Percentage
Amount of blood loss/ Bleeding	0	0.00%	3	6.00%
Haematoma/Perianal Swelling	22	44.00%	9	18.00%
Infection	0	0.00%	3	6.00%
Prutis Ani	21	42.00%	0	0.00%
Flatus incontinence	20	40.00%	9	18.00%
Stool incontinence	0	0.00%	5	10.00%
Recurrence	0	0.00%	0	0.00%

In our study in Group A 44% presented with Perianal swelling, 42% Prutis Ani and 40% flatus incontinence. In Group B 6% presented with amount of blood loss 6%, 18% Perianal swelling, 6% infection, 18% flatus incontinence.

Table 8: Distribution of Mean hospital stay

Mean Hospital stay	Group A (Open L.I.S.) [N=50]	Group B (Laser L.I.S.) [N=50]	p value
Mean±SD	5.02±1.237	2.02±0.141	0.01 (S)

In our study in Group A mean hospital stay was 5.02±1.237 days and in Group B 2.02±0.141 days. It was significantly less in Group B.

Table 9: Distribution of Follow up at surgical clinic in 2 weeks

Follow up at surgical clinic in 2 weeks	Group A (Open L.I.S.) [N=50]		Group B (Laser L.I.S.) [N=50]	
	Number	Percentage	Number	Percentage
Pain	26	52.00%	17	34.00%
Bleeding	7	14.00%	0	0.00%
Perineal abscess	0	0.00%	0	0.00%
Infection	3	6.00%	0	0.00%

In our study in Group A 52% patients presented with pain, 14% presented with bleeding per rectal and 6% presented with infection at follow up in 2

weeks. 38% presented with incontinence in 6 weeks of follow up. In Group B 34% presented with pain at 2 weeks of follow up.

Table 10: Distribution of Follow up at surgical clinic in 6 weeks

Follow up at surgical clinic in 6 weeks	Group A (Open L.I.S.) [N=50]		Group B (Laser L.I.S.) [N=50]	
	Number	Percentage	Number	Percentage
Incontinence	19	38.00%	9	18.00%
Fistula	0	0.00%	0	0.00%
Recurrence	0	0.00%	0	0.00%

In our study in Group A 38% patients presented with incontinence and Group B 18.00% patients at 6 weeks of follow up.

DISCUSSION

Anal fissure is a common problem that causes substantial morbidity in who are otherwise healthy. It is one of the frequent cause of pain and bleeding per rectum and cause considerable patient discomfort and disability. A number of pharmacological sphincter relaxants have been introduced and claimed to show good results but surgical treatment is frequently needed.

Age

In our study in Group A 6% were in 16-20 years, 52% in 21-30 years, 20% in 31-40 years, 20% in 41-50 years and 2% 51-60% years and Group B 2% in 16-20 years, 34% in 21-30 years, 32% in 31-40 years, 18% 41-50%, 10% in 51-60 and 4% in >60.

The mean age of patient in Group A were 31.78±9.027 and in Group B were 39.04±13.583.

Age mentioned in the results section, the mean age of patients differed significantly ($p=0.002$) between the Group A and Group B.; thus it seems that matching the Group A and Group B was not performed accurately. This was probably because of the importance placed on inclusion criteria including indications for surgery and the willingness of patient to undergo laser lateral internal sphincterotomy.

In study by Akeel A Kataa et al (2010)^[5] "Closed open lateral internal sphincterotomy in treatment of chronic anal fissure; a comparative study of postoperative complications and outcome" that 20 patients (20%0 were between 21-30 years, 46 patients (46%) were between 31-40 years and 34 patients (34%0 were between 41-50 ears of age.

Study by Vivek Gupta et al (2014)^[6] "Open versus closed lateral internal anal sphincterotomy in the management of chronic anal fissures: A prospective randomized study" showed in the ages of patients who underwent open and closed sphincterotomies were 39.38 12.96 years and 40.88 11.80 years, respectively.

In study by Shahin H Fateh et al (2016)^[7] "Outcome of laser therapy in patients with anal fissure" showed the mean age of the population is 35patients was 41.2±9.23 years in the study Group And 33.3±9.23 years in the control group.

In study by Turan Acar et al (2018)^[8] "Treatment of chronic anal fissure: Is open lateral internal sphincterotomy (LIS) a safe and adequate option?" showed of 417 patients included in the study, 228 (54.7%) were female and the mean±SD age was 36.1±8.96 years

Our study is comparable to above studies with respect to age of presentation.

Sex:

In our study in Group A (Open) male were 58% and female were 62% and in Group B Male 48% and female 52%.

In study by Akeel A Kataa et al (2010)^[5] "Closed open lateral internal sphincterotomy in treatment of chronic anal fissure; a comparative study of post operative complications and outcome" showed male 76% and female 24%

In study by Shahin H Fateh et al (2016)^[7] "Outcome of laser therapy in patients with anal fissure" showed male 5.3% and female 94.7% (case) and male 22% and female 78% (control).

Study by Vivek Gupta et al (2014)^[6] "Open versus closed lateral internal anal sphincterotomy in the management of chronic anal fissures: A prospective randomized study" showed in closed female 44.1% and male 55.9% and in open female 36.8% and male 63.2%.

Fissure location:

In our study in Group A 88% were posterior, 12% anterior location in Group B 86% were in posterior and 14% in anterior location.

Study by Vivek Gupta et al (2014)^[6] "Open versus closed lateral internal anal sphincterotomy in the management of chronic anal fissures: A prospective randomized study" showed in Fifty-six (82.4%) patients in the closed sphincterotomy Group And 65 (95.6%) patients in the open sphincterotomy group presented with a posterior midline anal fissure. Nine (13.2%) patients in the closed sphincterotomy Group And two (2.9%) patients in the open sphincterotomy group presented with an anterior midline anal fissure, i.e. at the 12 o'clock position. Fissures were seen at multiple positions in two (2.90%) patients in the closed sphincterotomy group.

Study by S. R. Mousavi et al (2009)^[9] "A Comparison Between the Results of Fissurectomy and Lateral Internal Sphincterotomy in the Surgical Management of Chronic Anal Fissure" showed in location of fissure was posterior in 56 (90.3%) and anterior in six (9.7%) patients.

Our study In study by Akeel A Kataa et al (2010)^[5] "Closed open lateral internal sphincterotomy in treatment of chronic anal fissure; a comparative study of post operative complications and outcome" showed in all 100 patients included in the study, the position of anal fissure was noted. Eighty nine patients (89%) were having posterior midline fissure (13.3% patients of them are females) and 10 patients (10%) were having anterior fissure (0.9% of them are females). 1 patient (1%) was having fissure on lateral walls of anal canal in both.

Our study also support the above studies that most common location of fissure was posterior.

Clinical presentation:

In our study in Group A 100% patients presented with pain during defecation, 70% Haematochezia, 34% perineal swelling, 30% mucoid discharge, 100% anal pain and 100% anal skin tag and Group B 100% patients presented with pain during defecation, 80% Haematochezia, 42% perineal swelling, 24% mucoid discharge, 100% anal pain and 98% anal skin tag.

Our study in study by Akeel A Kataa et al (2010)^[5] "Closed open lateral internal sphincterotomy in treatment of chronic anal fissure; a comparative study of postoperative complications and outcome" showed in the chief complaint of most of patients was pain on defecation. Out of 100 patients, 54 patients (54%) complained of pain during and after defecation it associated with bleeding per rectum especially in the form of a streak over the stool. Thirty five of patients (35%) had the chief complaint of bleeding per rectum, the bleeding was usually of small amount and occurred at the time of defecation, 6 patients (6%) also presented with perianal swelling. On examination, this was sentinel pile. Only 5 patients (5%) presented with pruritis ani due to discharge

Study by Vivek Gupta et al (2014)^[6] "Open versus closed lateral internal anal sphincterotomy in the management of chronic anal fissures: A prospective randomized study" showed in Patients presented most often with pain during defecation, followed by associated bleeding from the rectum.

In study by Turan Acar et al (2018)^[8] "Treatment of chronic anal fissure: Is open lateral internal sphincterotomy (LIS) a safe and adequate option?" showed the primary complaints were pain (97.4%) and rectal bleeding (77.9%) during and/or after defecation. Additionally, the other major complaints were constipation, pruritis ani and perianal discharge.

Our study support that most common symptoms is pain during defecation forwarded by haematochezia. In our study majority of patients presented with anal skin tag.

Postoperative complication:

In our study in Group A 44% presented with Perianal swelling, 42% Pruritis Ani and 40% flatus incontinence. In Group B 6% presented with amount of blood loss 6%, 18% Perianal swelling, 6% infection, 18% flatus incontinence.

Study by S. R. Mousavi et al (2009)^[9] "A Comparison Between the Results of Fissurectomy and Lateral Internal Sphincterotomy in the Surgical Management of Chronic Anal Fissure" showed in both groups, urinary retention was noted in one patient, which was transient. Incontinence to flatus was seen in the F group in two (6.2%)

patients, but no incontinence was noted in the LIS group. There was one patient (3.1%) with fissure recurrence in the F Group After 20 months, but none with the F group. No patient in either group suffered from anal stenosis or perianal infections. Given the total complications, in patients who underwent LIS, only one case was affected with complications (3.3%), but in the F group, four patients (12.5%) sustained injury due to complications.

In study by Akeel A Kataa et al (2010)^[5] "Closed open lateral internal sphincterotomy in treatment of chronic anal fissure; a comparative study of post operative complications and outcome" showed in postoperatively only few patients showed complications. Five patients (10%) complain of pain in closed method while 3 patients (6%) in Open method. Bleeding was in 2 patients (4%) in closed method, 4 patients (8%) in Open method. Infection was in 3 patients (6%) in each methods. No faecal incontinence only flatus incontinence in closed method i.e. 10 patients (20%) while 14 patients (28%) in Open method. Recurrence was in 4 patients (8%) in Closed method and 4 patients (8%) in Open method.

Our study support above studied that major postoperative complications except postoperative pain was perianal swelling and flatus incontinence. Which were present in Group A but was minimal in Group B.

Postoperative pain score:

In our study in Group A mean postoperative VAS pain score in 6 hours 5.12±0.328, 12 hours 4.32±0.768, 24 hours 3.74±0.777, 36 hours 2.76±1.379 and 48 hours 2.3±1.418. In Group B mean postoperative VAS pain score in 6 hours 5.2±0.452, 12 hours 2.7±1.741, 24 hours 1.76±1.451, 36 hours 0.58±0.971 and 48 hours 0.28±0.671. The mean postoperative score was significantly less in Group B at 12 to 48 hours.

In study by Shahin H Fateh et al (2016)^[7] "Outcome of laser therapy in patients with anal fissure" showed in Mean improvement in pain at months 1 and 3 after surgery or laser therapy did not differ significantly between the groups, but in month 6 was significantly higher in the control group. Significant differences in the mean response to pain for the three periods of assessment in the groups were evaluated using repeated measures analysis and a generalized linear model and a significant interaction was observed (P<0.001).

Study by Vivek Gupta et al (2014)^[6] "Open versus closed lateral internal anal sphincterotomy in the management of chronic anal fissures: A prospective randomized study" showed in the mean score on the visual analog scale for the measurement of pain 12 hours after the operation was 5.62±0.81 in the closed sphincterotomy Group And 6.13±0.75 in the open sphincterotomy group (p < 0.001). The mean score on the visual analog scale 24 hours after the operation was 2.10±0.35 in the closed sphincterotomy Group And 2.35±0.59 in the open sphincterotomy group (p Z 0.003)

Ravikumaran Manoharan et al (2017)^[10] "Lateral Anal Sphincterotomy for Chronic Anal Fissures- A Comparison of Outcomes and Complications under Local Anaesthesia Versus Spinal Anaesthesia" showed in Two patients, one from each group, were declared as surgery failure and repeat surgery was done immediately. Both the patients were included back in the study after the repeat surgery and followed-up like other patients till the fissure healed. Hence, both these patients were included in the final analysis. Of the 71 patients reviewed in the first visit, one patient in spinal group presented with severe pain while others presented with mild or moderate pain. The association between pain and anaesthesia was analyzed using Fisher-exact test, and there was no statistically significant difference in pain between the two groups (p=0.482). Similarly, there was no statistically significant difference (p=0.834) in pain during the second follow-up.

Our study is comparable to above studies that postoperative pain is significantly less in Group B in postoperative 12 hour, 24 hour, 36 hour and 48 hour [p value=0.01].

Mean hospital stay:

In our study in Group A mean hospital stay was 5.02±1.237 days and in Group B 2.02±0.141 days. It was significantly less in Group B.

Study by Vivek Gupta et al (2014)^[6] "Open versus closed lateral internal anal sphincterotomy in the management of chronic anal fissures: A prospective randomized study" showed in there was a statistically significant difference between the mean duration of hospital stay in the two groups. The mean duration of stay was 2.38±1.33 days in patients undergoing closed sphincterotomy compared with 3.38±2.45 days in the open sphincterotomy group (p=0.004).

Out study is comparable to above study that mean hospital stay is significantly less in Group B [$p=0.01$].

Follow up at surgical clinic at 2 weeks and 6 weeks

In our study in Group A 52% patients presented with pain, 14% presented with bleeding per rectal and 6% presented with infection at follow up in 2 weeks. 38% presented with incontinence in 6 weeks of follow up. In Group B 34% presented with pain at 2 weeks of follow up and 18% presented with incontinence at 6 weeks of follow up.

In study by Turan Acar et al (2018)^[8] "Treatment of chronic anal fissure: Is open lateral internal sphincterotomy (LIS) a safe and adequate option?" showed In the early postoperative period, rectal bleeding was a common problem in 182 patients (34.1%). In addition, three patients had perianal abscess and two patients who used anticoagulants (i.e., clopidogrel or acetylsalicylic acid) had perianal hematoma. These patients relieved after drainage of the abscess and hematoma. In long-term follow-up, recurrence occurred in 15 patients (3.6%) (12 males, three females) and eight patients (1.9%) developed incontinence (four with gas, four with soiling and seven females, one male). The recurrence rate was higher in anterior fissures (67%). Of the patients with recurrence, nine of them had one and two of them had two prior surgeries. All females with incontinence had prior vaginal deliveries and the male with incontinence had prior anorectal surgery. The complaints of all patients with gas incontinence and a patient with fluid incontinence (male) regressed on the postoperative fourth month, whereas three patients (all females) had permanent fluid incontinence.

CONCLUSION

Lateral internal sphincterotomy is standard procedure for patients with anal fissure. In our study Laser lateral internal sphincterotomy results in

- Improvement of postoperative pain relief and patient comfort in laser lateral internal sphincterotomy.
- Earlier and quicker healing of fissure noted in laser lateral internal sphincterotomy.
- Duration of hospital stay was less in Laser lateral internal sphincterotomy.
- Postoperative complication after Laser lateral internal sphincterotomy was less as compared to open internal sphincterotomy.
- Majority of patients were female in both open and laser lateral internal sphincterotomy.
- Majority of patients were in age group 21-30 years in both open and laser lateral internal sphincterotomy.
- Majority of patients presented with posterior location of fissure in both open and laser lateral internal sphincterotomy
- Laser lateral internal sphincterotomy surgical method was found to be a successful, easy and quick way of treating anal fissure. The technique also increased blood supply and decreased pain. The benefits of laser therapy include effective resolution of all clinical symptoms, decreased recovery time and minimal risks and side-effects.
- The laser lateral internal sphincterotomy technique is painless and patients are more likely to accept and be satisfied with treatment; however, there are some limitations to this procedure.
- Laser lateral Internal Sphincterotomy is better than open Lateral Internal Sphincterotomy with respect to less postoperative pain and lesser hospital stay and also less postoperative complications in the treatment of anal fissure.
- As laser lateral internal sphincterotomy is new and advance surgical technique, so surgeons need to be trained for proper application of laser in laser lateral internal sphincterotomy technique.

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