

# Lateral Sphincterotomy Under Local Anaesthesia; A Safe and Time-Efficient Alternative Without Compromising Patient Satisfaction

Syed Ali Haider<sup>1</sup>, Muhammad Abid Owais<sup>2</sup>, Sidra Abbas<sup>3</sup>,  
Saeed Ahmed<sup>4</sup>, Akram Rajput<sup>5</sup>, Khalid Ahmed<sup>6</sup>

## Abstract

**Objective:** The objective of this study was to find out whether Lateral Internal Sphincterotomy (LIS) can be carried out using Local Anaesthesia (LA) hence, lowering down the cost and anaesthesia related complications in patients without compromising operative easiness or final result.

**Methods:** One hundred patients who were diagnosed clinically as anal fissure patients and were scheduled for LIS were randomly distributed into two treatment arms. Non-probability consecutive sampling approach was employed. In the first group, LIS was carried out using LA while in the second group LIS was performed in spinal anaesthesia (SA). Age, gender, BMI, procedure time, post-operative complications like pain, post-operative nausea and vomiting (PONV), bleeding, headache, incontinence, urinary retention and patient satisfaction were the main outcome variables which were studied.

**Results:** Out of 100 patients who were treated with LIS, 50 of these patients had SA whereas, the rests of the 50 patients were given LA. We found no statistically significant difference in the post-operative pain, PONV, bleeding, incontinence, and overall patient satisfaction but duration of surgery and post-operative complications like headache and retention of urine were considerably less in LA group. The difference between two groups dictated that LIS under local anaesthesia (Group A) took 13.46 minutes (SEM 0.808) lesser than Group B which was statistically significant. But the Mean postoperative pain scores of patients in both groups were not significantly different on statistical analysis nor pain scores at 12 hours from surgery and 24 hours from surgery separately i-e 'p-value >0.05'

**Conclusions:** LIS under LA is less time intensive, safe and has comparable patient satisfaction rate to SA. Besides, the advantage of significant cost benefit, duration of surgery, exemption of the requirement of an anaesthetist, and less post-operative headache and PONV, LA also shows no noteworthy difference in the post-operative complications in comparison with SA.

**Keywords:** Internal Sphincterotomy, Anal Fissure, Local Anaesthesia

**IRB:** Approved by Ethics Committee of Baqai Medical University.

**Citation:** Syed AH, Muhammad AO2, Sidra A, Saeed A, Akram R, Khalid A. Lateral Sphincterotomy Under Local Anaesthesia; A Safe and Time-Efficient Alternative Without Compromising Patient Satisfaction [Online]. Annals ASH KMDC 2021;26.

(ASH & KMDC 26(2):76;2021)

## Introduction

An anal fissure is a longitudinal tear in the distal canal anoderm and it extends from the anal

verge distally to the pectinate line proximally. It presents as one of the agonizing anorectal problems that come across in surgical practice<sup>1</sup>.

It affects both men and women equally. It can affect any age group, from infants to the old age however, commonly it affects young individuals with mean age is 39.9 years. Over 75% of anal fissure occurs in posterior midline as it is the most common site for both males and females. Around 25% of fissures tend to occur in the anterior location especially in females. Atypical fissures which involve less than 1% of all fissures occur at a site away

<sup>1,4,5</sup>Department of Surgery,  
Dow Medical College and Dr. Ruth K. M. Pfau, Civil Hospital  
<sup>2,3,6</sup>Department of Surgery,  
Baqai Medical University

### Correspondence:

Muhammad Abid Owais  
Department of Surgery, Baqai Medical University  
Email: abidowais74@gmail.com  
Date of Submission: 8<sup>th</sup> August 2020  
Date of Acceptance: 9<sup>th</sup> August 2021

from the midline site as in case of inflammatory bowel disease, anal carcinoma, tuberculosis, HIV, syphilis, herpes, and leukemia<sup>2</sup>.

It is one of the commonest anorectal diseases and affects every 5th individual in their lifespan. Despite the fact that the accurate cause of anal fissure is unknown, the injury caused by the hard stool passage with painful bowel movement is regarded as the initiating factor<sup>3</sup>.

Anal fissures can be acute or chronic. Mostly are acute and they heal in less than 2 weeks either spontaneously or with conservative management<sup>3</sup>, but if they persist more than 6 weeks they are known as Chronic Anal Fissures (CAF)<sup>4</sup>.

Conservative methods that are used to treat acute anal fissure are stool softeners, topical analgesics, proper fluid intake and glyceryltrinitrate, but if conservative and medical treatments remain futile, surgery becomes mandatory<sup>5</sup>. The gold standard procedure is lateral internal sphincterotomy<sup>6</sup>.

CAF has hypertrophied anal papilla proximally, sentinel pile distally and base of the fissure shows internal anal sphincter fibres<sup>7</sup>. The option of anaesthesia for LIS has been discussed for a longtime, with initial researches favours general or spinal anaesthesia because of the excruciating pain of the fissure. Afterward, some researchers discovered the similar effectiveness for local anaesthesia and at times beneficial than general anaesthesia<sup>8</sup>. But still the choice of anaesthesia is mostly dependent upon choice of the operating surgeon and the accessibility of an anaesthetist besides expenses and ease to the patient<sup>8</sup>.

Sadly, for a lot of non-affording patients requiring proper surgical treatment, the cost of treatment becomes high because not only do they lose the opportunity of daily income but also have to bear daily expenses of hospital stay. Type of anaesthesia used for the surgery can greatly influence the total expenses of the patient. Patients having procedures done using SA need a series of investigations as a requirement for fitness for anaesthesia, on the contrary patients do not have to go through

any costly laboratory or radiological tests for LIS performed in LA. This results in invisibles is similarity in the overall expenditure to the patient for the LIS performed under local and spinal anaesthesia<sup>8</sup>.

In addition, surgeons practicing in a distant area have to undergo many restraints and restrictions; especially availability of an anaesthetist is the most important constraint and cannot be under emphasized. Therefore, it becomes important to recognize means and methods to do cost effective procedures in the under privileged regions without affecting the final result of the patient and the management of the disease. This research was carried out to compare the result of lateral internal sphincterotomy performed for anal fissure under SA and LA.

## Patients and Methods

This prospective, randomized, case control study was carried out from July 2016 to June 2020 in the Department of Surgery, Fatima Hospital, Baqai Medical University after approval of ethical review board. Sample size derived by keeping level of significance 5% and confidence interval 90% utilizing WHO calculator for sample size. Non-probability consecutive sampling approach was employed. A total of 100 patients above 12 years of age, who underwent lateral internal sphincterotomy for anal fissure diagnosed clinically by consultants' surgeons (Senior Registrars and above) were included in this study. Informed and written consent were obtained from all the participants of this research. All the patients were randomly distributed equally into two arms, 50 patients in Group A (SA) and 50 patients in Group B (LA) with the help of computer-based randomization software (Research randomizer). The data was analysed using statistical software SPSS version 19. Mean was calculated for age and frequencies were calculated for qualitative data like gender. Significance was taken as ' $p < 0.05$ '.

Patients with known allergy to local anaesthesia, perineal infection in the area of local anaesthesia, patients on anticoagulant therapy and associated anal pathologies like anal incontinence,

anal stenosis, fistula in ano, perianal abscess and hemorrhoids were excluded from this study.

For patients undergoing spinal anaesthesia, complete blood count (CBC), random blood sugars (RBS), urea, creatinine and electrolytes (UCE) and radiological investigations like chest X-ray were performed pre-operatively for the purpose of anaesthesia fitness. Once anaesthesia fitness was taken these patients were instructed to get admitted in surgical ward one day before surgery and were kept nil peroral (NPO) preoperatively from the midnight of the operative day as a prerequisite of SA according to ward protocol. Kleen enema was given to all the patients early in the morning on the day of procedure. Before shifting them to the operation theatre intravenous fluids of dextrose saline were started and a single dose of ceftriaxone and metronidazole were given prior to spinal anaesthesia given by the anaesthetist and observed until the completion of the surgery. For patients having LA, just CBC and RBS were performed because they did not need any anaesthesia fitness. They came in the morning on the day of procedure without NPO and before administration of local anaesthesia; all patients were given clean enema early in the morning and a single dose of ceftriaxone and metronidazole on the operation table just before the surgery. During surgery, one litre of dextrose saline was given intravenously. LA was administered by the consultant surgeons (Senior Registrar and above) themselves using aseptic measures. A solution of 10ml is made by combining 5ml of 0.5 % Bupivacaine and 5ml of 2% lignocaine and then 5ml was infiltrated at the site of sphincterotomy while the rest of 5ml infiltrated at fissure base. The results of LA were quite effective and conversions from LA to SA was not required for any patient.

Both groups had standard open internal anal sphincterotomy in lithotomy position by the consultant surgeons. With the help of electrocautery under direct vision the sphincter was cut up to anal fissure length. The inverted 'V' shaped defect in the sphincter was palpated to confirm the effectiveness of division. The dressing of the wound was done

with polyfax soaked gauze without primary closure. After procedure patients were kept in recovery for a while before shifting to surgery ward for one day. All the patients were discharged after 24 hours and then followed up weekly for 2 months when required. Details regarding duration of surgery, post-operative pain, and complications were recorded. Pain was assessed using Visual Analogue Scale (VAS) at 12 hours and 24 hours postoperatively. Jorge and Wexner's Cleveland Clinic Florida Fecal Incontinence Score (CCFFIS) (Figure 1) and 5 point LIKERT scale were employed to measure postoperative fecal incontinence and patient satisfaction respectively. Patient responding "Very Satisfied" and "Satisfied" on LIKERT scale were considered to be satisfied with the procedural undertaking while the rest were considered dissatisfied including those which opted for "neither satisfied nor dissatisfied" on the scale.

## Results

Mean age of the cumulative study participants was  $35.58 \pm 11.38$ , where the mean age of Group A and B were  $36.60 \pm 12.14$  and  $34.57 \pm 10.68$  respectively. The youngest participant in the study aged 18 years while the oldest was 61 years of age. Thirty-four of the participants were male while 66 females agreed and signed up for the study. Most of the patients had education up to matriculation (58%). Table 1.

Upon statistical analysis, the participants of both groups were not different statistically on grounds of age, BMI, gender distribution, educational status, co-morbid conditions i-e diabetes mellitus and hypertension 'p-value  $>0.05$ '. Table 1.

The mean procedure duration  $\pm$  SD, scaled in minutes, was  $23.86 \pm 7.46$  and the mean procedure duration difference between two groups dictated that LIS under local anaesthesia (Group A) took 13.46 minutes (SEM 0.808) lesser than Group B which was statistically significant i-e 'p-value  $<0.05$ '. Table 1.

The mean pain score  $\pm$  SD, scaled by VAS, was  $3.90 \pm 1.32$ . The mean postoperative pain scores of patients in both groups were not signifi-

Type of incontinence	Frequency of incontinence				
	Never	Rarely	Sometimes	Usually	Always
Solid	0	1	2	3	4
Liquid	0	1	2	3	4
Gas	0	1	2	3	4
Pad usage	0	1	2	3	4
Impact on lifestyle	0	1	2	3	4

A score of 0 = perfect continence; 20 = complete incontinence  
 Never = 0; rarely = <1/month; sometimes = >1/month; usually = >1/week, <1/day; always = >1/day.

Fig 1. Cleveland Clinic Florida Fecal incontinence score (Jorge &Wexner 1993)

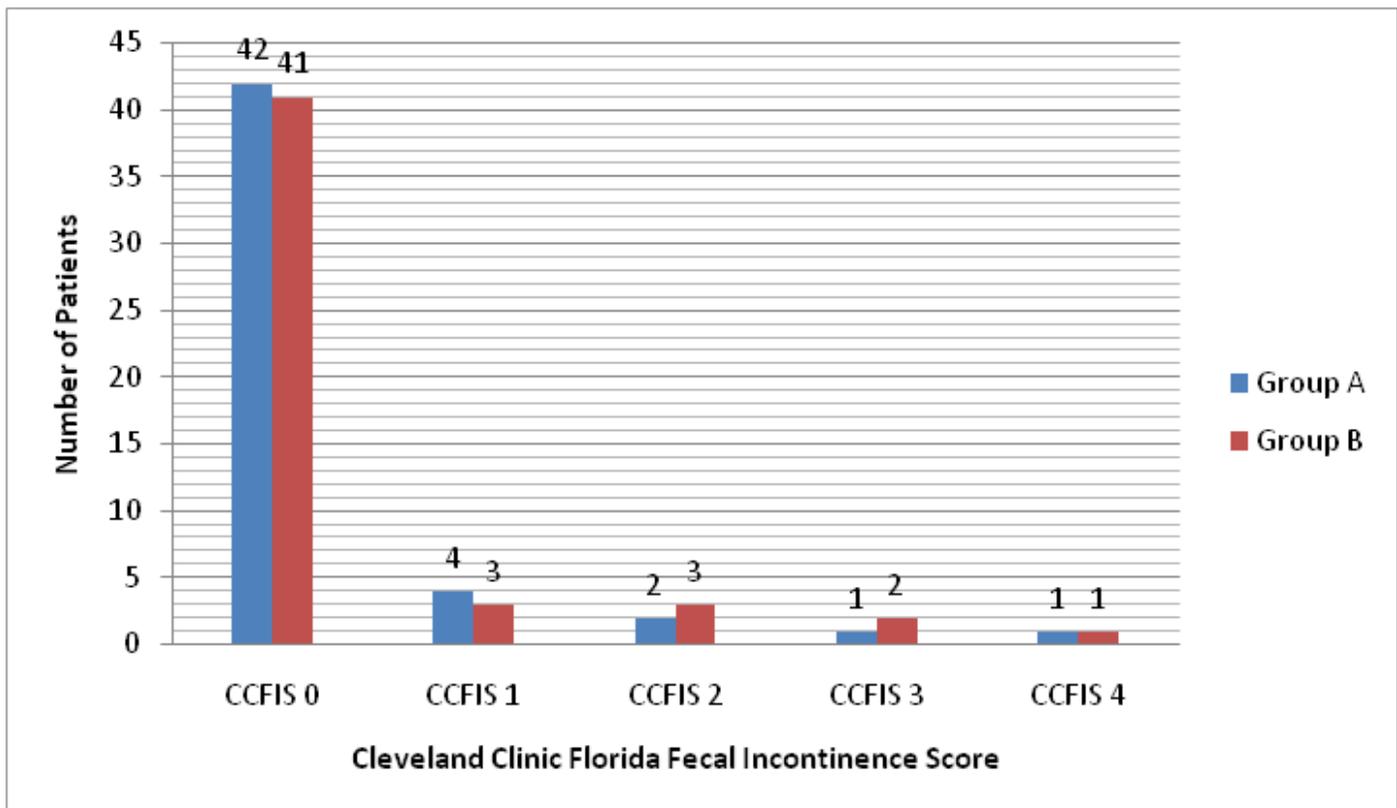


Fig 2. Postoperative Fecal Incontinence

cantly different on statistical analysis nor pain scores at 12 hours from surgery and 24 hours from surgery separately i-e 'p-value >0.05'. Table 2.

**Table 1.** Demographic and clinical detail.

Characteristics	Total	Group A	Group B	P-value
Mean age in years	35.5±11.38	36.60±12.14	34.57±10.68	0.494
Male	34	20(40%)	14(28%)	0.371
Female	66	30(60%)	36(72%)	0.527
Hypertension	12	6(12%)	6(12%)	1.000
Diabetes Mellitus	13	6(12%)	7(14%)	0.384
BMI	29.24±5.03	28.86±4.71	29.63±5.36	0.447
Education				
Illiterate	18	10(20%)	8(16%)	0.301
Matric	40	18(36%)	22(44%)	0.207
Intermediate	25	11(22%)	14(28%)	0.244
Graduate	14	8(16%)	6(12%)	0.282
Post graduate	3	2(4%)	1(2%)	0.278
Mean Procedure Duration(Minutes)	23.86±7.46	17.13±1.69	30.60±4.09	0.000*

\*p-value <0.05 denoting statistical significance

**Table 2.** Postoperative pain

	Group A	Group B	P-Value
Pain VAS* Score (12 hours)	5.36±1.88	6.17±1.76	0.095
Pain VAS score (24 Hours)	1.90±1.21	2.13±1.10	0.439
Mean Pain Score	3.66±1.31	4.15±1.30	0.158

VAS=Visual analogue score

**Table 3.** Postoperative complications

Complications	Total (N=100)	Group A (N=50)	Group B (N=50)	P-value
Post-Operative Nausea and Vomiting	7(7%)	2(4%)	5(5%)	0.119
Headache	11(11%)	1(2%)	10(20%)	0.002*
Urinary retention	10(10%)	2(4%)	8(16%)	0.022*
Mean CCFFIS	0.56±1.06	0.50±1.00	0.63±1.12	0.631
Post operative Bleeding				
No Bleeding	84(84%)	40(80%)	44(88%)	0.137
Mild Bleeding	14(14%)	8(16%)	6(12%)	0.282
Moderate Bleeding	3(3%)	1(2%)	2(4%)	0.278

**Table 4.** Postoperative Patient Satisfaction

Patient Satisfaction	Total	Group A	Group B	P-Value
Very Satisfied	56	27(54%)	29(58%)	0.343
Satisfied	25	11(22%)	14(28%)	0.244
Neither Satisfied / Non Dissatisfied	9	5(10%)	4(8%)	0.363
Dissatisfied	6	4(8%)	2(4%)	0.199
Very Dissatisfied	4	1(2%)	3(6%)	0.153

Postoperatively, 7 patients had PONV without statistical difference in groups while 11 patients developed headache and 10 patients developed retention of urine, most of them were from Group B and the 'p-value <0.5' signifying statistical difference. There was no case of severe postoperative bleeding requiring intervention in the study population and the occurrence of mild and moderate bleeding was in 17 cases with no statistical difference in distribution in between both groups 'p-value >0.05'. Table 3.

Postoperative fecal incontinence was assessed using Cleveland Clinic Florida Fecal Incontinence Score. No patient developed solid incontinence or severe incontinence requiring pad usage. 83% of the patients had CCFFIS of 0 and the maximum CCFFIS noted in the study population was 4 (out of maximum possible score of 20) in two patients. Seven patients complained of mild degree of incontinence (CCFFIS 1-2/20), 12 (75%) of them only had gas or liquid incontinence rarely Fig 1. These patients were followed for 2 months and all of them were completely continent for gas too on their last follow up.

The mean CCFFIS was 0.56 ± 1.06 while that of Group A and B separately were 0.50 ± 1.00 and 0.63 ± 1.12 respectively. Comparison of means revealed no significant difference statistically between the mean scores of two groups Table 3. Overall patient satisfaction was 81% while 76% in Group A and 86% in Group B were satisfied with the undertaking signifying no statistical difference in between LA and SA groups 'p-value = 0.101'. Table 4.

## Discussion

Despite several conservative treatment options for fissure in ano, Lateral anal sphincterotomy is currently recognized as the standard management option because it produces the excellent cure rates and minimum recurrence. For the last 20 years or so significant evolvement is seen in operative management of anorectal pathologies. From preference to general anaesthesia previously, tendencies have gradually moved in favour of LA<sup>9,10,11</sup>. Surgical stress of the treated patient, duration of hospital

stay, complications of anaesthesia and duration of surgery are reduced in outpatient procedure and local anaesthesia<sup>12</sup>.

While performing LIS under LA, we noticed some benefits of LA in this study. Like, sufficient pain relief for the surgery was adequately attained in majority of the patients. Good analgesic effect over the fissure was achieved when we injected lignocaine at fissure base. This helped in pain free digital rectal examination of the anal sphincter. After that lignocaine was injected at the operative site to provide adequate analgesia for sphincterotomy.

Similarly, LA does not relax internal sphincter. As a result the sphincter is in a state of spasm, which helps in appreciating the sphincter length thus, adequacy of the length of division demonstrated clearly. While in case of SA or GA the sphincter is totally relaxed causing problems in appreciating its extent.

In countryside hospitals there is a lacking of experienced anaesthetists in surgical setups and most of the time it is the surgeon who gives SA to the patients and vitals are monitored by experienced nurse during the course of surgery. If surgeon himself gives the LA in these cases then it is better as it avoids the risks of SA.

In our study, all cases that underwent surgery under local anaesthesia, pain ranged from mild-to-moderate in some patients. Most patients felt pain at the time of first needle prick in the perianal area and during the holding and division of the sphincter. If pain persisted during surgery few ml of lignocaine was infiltrated locally. Neither patient needed sedation or conversion to general anaesthesia.

After surgery all patients of this research were able to start their regular work in the span of one week. After one week majority of the patients got completely relieved from their symptoms.

Majority of researches have shown that after LIS for fissure, cure rates are more than 95%<sup>13,14</sup>.

Shahi K and colleagues found no significant differences between the LA and SA groups in terms

of duration of surgery, intraoperative and post-operative pain, post-operative need for analgesia nausea or vomiting and acceptance of patient with the choice of anaesthesia<sup>15</sup>.

A study conducted at Nishtar Hospital Multan on 30 patients showed that LIS can be carried out in safety using local anaesthesia as an outpatient procedure. It also reduced the post-operative duration of stay and complication rates. Immediately after the procedure patients were able to go home. Average stay after surgery was for twelve (12) minutes. Complications that were recorded after surgery were soiling (6.6%), flatus incontinence (3.3%) and recurrence (3.3%)<sup>16</sup>.

Sarkar and Kapur et al.<sup>17</sup> found LA superior to SA for lateral sphincterotomy because of better healing of fissures, and less postoperative complications. Moreover, LA does not require hospital admission, an operating theatre, or preoperative studies. The lower morbidity associated with local anaesthesia as compared to spinal or general anaesthesia gives the patient a higher degree of satisfaction. They also found an augmented frequency of incontinence in their patients due to a lower anal tone, caused by spinal anaesthesia that resulted in the extensive division the internal anal sphincter as compared to the portion of the internal anal sphincter divided under local anaesthesia.

Arora et al.<sup>18</sup> also found local anaesthesia is effective as a day care surgery for fissures as good healing rates were obtained. Goudar et al.<sup>19</sup> found no statistically difference in the pain at surgery, but anaesthesia appreciably reduced the pain postoperatively in LA group at 5th h and 24 h after surgery. Hospital stay in LA group is significantly less when compared to SA group (1.92, vs. 3.75 days, respectively).

A study carried out in Mayo Hospital, Lahore of 50 patients underwent day case surgery of lateral sphincterotomy under local anaesthesia showed substantial cost to patient and hospital, morbidity was lessened but the acceptance of the patient was high. The patients were operated as a daycare

procedure using local anaesthesia. With the exception of 1 (2%) patient, all the patients 49 (98%) had sudden pain relief and passed first stool after surgery without pain<sup>20</sup>.

The benefits of local anaesthesia, as our study showed, is the minimal incidence of postoperative headache, early mobilization, less chances of catheterization as only 2 patients of LA group had retention of urine in the postoperative period compared to 8 patients of SA group. All patients were ambulatory 2-4 h after surgery and diet were resumed as soon as possible.

Contrary to above mentioned studies, Keighley et al.<sup>21</sup> recommend that lateral anal sphincterotomy should be performed under general anaesthesia. He attributed poor results of lateral subcutaneous sphincterotomy under local anaesthetic due to the inadequate division of the internal sphincter, intense fear of patients having a procedure on the anal canal which was inherently painful or frightening to them. In contrast to this study, fissure healing was excellent in patients who had LA in our study. Local infiltration of lignocaine provided adequate anaesthesia and in all cases internal sphincter was divided under direct vision till dentate line. Another advantage is internal sphincter is easily felt under local anaesthesia, whereas it may be difficult to feel under spinal as it is completely relaxed and the extent of division is difficult to estimate intraoperatively.

Notaras<sup>22</sup> also recommended that most of the ano-rectal surgeries can be done under local anaesthesia and on an ambulatory basis.

AL Raymoony<sup>23</sup> demonstrated no difference between two groups operated under local anaesthesia and general anaesthesia in terms of operating time and patient satisfaction with the method of anaesthesia.

## **Conclusion**

LIS under LA is less time intensive, safe and has comparable patient satisfaction rate to SA.

Besides the advantage of significant cost benefit, duration of surgery, exemption of the requirement of an anaesthetist and less post-operative headache and PONV, LA also shows no noteworthy difference in the post-operative complications in comparison with SA.

## **Conflict of Interest**

Authors have no conflict of interest and no grant/funding from any organization.

## **References**

1. Nugent K, The anus and anal canal. In: Williams NS, O'Connell PR, McCaskie A. Bailey and Love's short practice of surgery. 27th ed. Milton: Chapman and Hall/CRC; 2018; 1339-1373.
2. Beaty JS, Shashidharan M. Anal Fissure. Clin Colon Rectal Surg 2016; 29:30-7. [DOI: 10.1055/s-0035-1570390]
3. Derakhshan A. Natural Treatments for Fissure in Ano Used by Traditional Persian Scholars, Razi (Rhazes) and IbnSina (Avicenna). J Evid Based Complementary Altern Med 2017;22:324-333.[ DOI: 10.1177/2156587216650302]
4. Pilkington S, Bhome R, Welch R, Ku F, Warden C, Harris S et al. Bilateral versus unilateral botulinum toxin injections for chronic anal fissure: a randomised trial. Tech Coloproctol 2018;22:545-551.[ DOI: 10.1007/s10151-018-1821-2]
5. Farkas N, Solanki K, Frampton A, Black J, Gupta A, West N. Are we following an algorithm for managing chronic anal fissure? A completed audit cycle. Ann Med Surg (Lond) 2015;5:38-44. [DOI: 10.1016/j.amsu.2015.11.008]
6. Nessar G, Topbas M. Lateral Internal Partial Sphincterotomy Technique for Chronic Anal Fissure. Indian J Surg 2017;79:185-187. [DOI: 10.1007/s12262-016-1467-0]
7. Shashidharan M, Beaty J. Anal Fissure. Clin Colon Rectal Surg 2016;29:030-037.
8. Manoharan R, Jacob T, Benjamin S, Kirishnan S. Lateral Anal Sphincterotomy for Chronic Anal Fissures- A Comparison of Outcomes and Complications under Local Anaesthesia Versus Spinal Anaesthesia. J ClinDiagn Res 2017;11:PC08-PC12. [DOI: 10.7860/JCDR/2017/21779.9299]
9. Sanchez Romero A, Arroyo Sebastian A, Perez Vicente F, Serrano Paz P, Candela Polo F, Tomas Gomez A, et al. Open lateral internal anal sphincterotomy under local anaesthesia as the gold standard in the treatment of chronic anal fissures.

- A prospective clinical and manometric study. *Rev Esp Enferm Dig* 2004; 96:856-63. [DOI: 10.4321/s1130-01082004001200006]
10. Arroyo A, Perez F, Serrano P, Candela F, Calpena R. Open versus closed lateral sphincterotomy performed as an outpatient procedure under local anaesthesia for chronic anal fissure: prospective randomized study of clinical and manometric long term results. *J Am Coll Surg* 2004; 199:361-67. [DOI: 10.1016/j.jamcollsurg.2004.04.016]
  11. Liratzopoulos N, Efremidou EI, Papageorgiou MS, Kouklakis G, Moschos J, Manolas KJ, et al. Lateral subcutaneous internal sphincterotomy in the treatment of chronic anal fissure: our experience. *J Gastrointest Liver Dis* 2006;15:143-47.
  12. Dowling V, Cortez J. Efficacy in the use of local anesthesia in patients with surgical intervention for the resolution of anorectal pathologies [Internet]. *Journal of Coloproctology* 2018;38:37-41. Available from: <https://www.thieme-connect.de/products/ejournals/pdf/10.1016/j.jcol.2017.10.004.pdf>. Accessed on: 27 July 2021. [DOI:10.1016/j.jcol.2017.10.004]
  13. C M G, Babu P, Rao KS. A comparative study of lateral sphincterotomy and 2% diltiazem gel local application in the treatment of chronic fissure in ANO. *J Clin Diagn Res* 2014;8:NC01-2. [DOI: 10.7860/JCDR/2014/10480.4925.]
  14. Liang J, Church JM. Lateral internal sphincterotomy for surgically recurrent chronic anal fissure. *Am J Surg* 2015; 210:715-19. [DOI: 10.1016/j.amjsurg.2015.05.005]
  15. Shahi K, Bhandari G, Bhuvan B, Prashant P, Sanjeev S, Rakesh R et al. Lateral sphincterotomy for anal fissure under local anesthesia: is it feasible? [Internet] *Journal of Evolution of Medical and Dental Sciences* 2014; 3: 4249-4253. Available from: [https://www.jemds.com/data\\_pdf/1\\_shahi%202nd.pdf](https://www.jemds.com/data_pdf/1_shahi%202nd.pdf). Accessed on: 27 July 2021. [DOI: 10.14260/jemds/2014/2427]
  16. Ahmad N, Aziz M, F. Closed lateral Internal Sphincterotomy under local anesthesia in OPD in the treatment of chronic Anal Fissure [Internet]. *Annals of King Edward Medical University* 2004; 10. Available from: <https://annalskemu.org/journal/index.php/annals/article/view/1133>. Accessed on: 27 July 2021. [DOI: 10.21649/akemu.v10i1.1133]
  17. Sarkar S, Kapur N. Lateral internal sphincterotomy under local and spinal anaesthesia for chronic anal fissure: A randomised control trial [Internet]. *Hellenic Journal of Surgery* 2016; 88: 398-401. Available from: <https://link.springer.com/article/10.1007/s13126-016-0358-y>. Accessed on: 27 July 2021. [DOI: 10.1007/s13126-016-0358-y]
  18. Arora B. Closed lateral internal sphincterotomy under local anaesthesia: A day surgery Procedure [Internet]. *Global J Res Analysis* 2016;5:150-151. Available from: <https://www.worldwidejournals.com/global-journal-for-research-analysis-GJRA/article/closed-lateral-internal-sphincterotomy-under-local-anaesthesia-a-day-surgery-procedure/NDM1NQ==/>. Accessed on: 27 July 2021.
  19. Goudar BY, Kalburgi EB, Lamani YP, Gowd YC. Feasibility of local anaesthesia in lateral internal anal sphincterotomy for chronic anal fissure [Internet]. *International Surgery Journal* 2018; 5: 2578-81. Available from: <https://www.ijurgery.com/index.php/ij/article/view/3068>. Accessed on: 27 July 2021. [DOI: 10.18203/2349-2902.ij20182777]
  20. Siddique T, Khan S, Rehman M, Islam H, Ahmad W. Lateral Internal Sphincterotomy for Chronic Anal Fissure under local anaesthesia as a Day Case Surgery [Internet]. *Annals of King Edward Medical University* 2003; 9:52-54. Available from: <https://annalskemu.org/journal/index.php/annals/article/view/1322>. Accessed on: 27 July 2021. [DOI: 10.21649/akemu.v9i1.1322]
  21. Keighley MR, Greca F, Nevah E, Hares M, Alexander-Williams J. Treatment of anal fissure by lateral subcutaneous sphincterotomy should be under general anaesthesia. *Br J Surg* 1981; 68:400-1. [DOI:10.1002/bjs.1800680611]
  22. Notaras MJ. Treating fissure in ano in outpatients under local anaesthesia [Internet]. *Br Med J (Clin Res Ed)* 1984; 289:1539. Available from: <https://www.bmj.com/content/289/6457/1539.2>. Accessed on: 27 July 2021. [DOI: 10.1136/bmj.289.6457.1539-a]
  23. AL Raymoony AE. Surgical treatment of anal fissure under local anaesthesia. *Saudi Med J* 2001; 22: 114-6.