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Original Article

Comparative Study between Spinal Anesthesia versus Local Anesthesia for Lateral Internal Sphincterotomy for Chronic Fissure in ANO

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Abstract

Introduction: Anal fissure cases are commonly encountered in routine clinical practice, where patients present with hematochezia, intense, and painful anal spasm lasting for several hours after bowel movement. Conventionally, lateral sphincterotomy under spinal anesthesia is the procedure of choice for failed medical therapy. At present, there are few attempts to perform lateral sphincterotomy on an Ambulatory basis under local anesthesia. This study will assess the post-operative pain, average duration of hospital stays, and cost effectiveness of open lateral anal sphincterotomy under local anesthesia over spinal anesthesia.

Materials and Methods: Patients admitted in surgical wards GGH, Mahabubnagar, Telangana diagnosed as case of chronic fissure in ano by through clinical history and per rectal examination, are included in this study by applying the following inclusion and exclusion criteria. The study was conducted during the period June 2018 to July 2022 with 90 numbers of cases which are assigned to Group A (local) and Group B (spinal) randomly. A pre-structured pro forma is used to collect relevant information of each individual patient selected. Data are tabulated in Excel sheet and analyzed using SPSS software.

Results: LIS can be done under both spinal anesthesia and local infiltration. However, LA patient has lower duration of hospital stay, less expensive when compared to SA. Post-operative pain scores more in LA group in early post-operative time, whereas we do not find any difference at 5 h post-operative and post-operative day-1. Patient's satisfaction is good in LA group, whereas surgeon's satisfaction is similar in both groups.

Conclusion: LIS can be effectively and safely done as day care procedure under local anesthesia and provides alternative to SA, which is beneficial in terms of less hospital stay and less cost.

Key words: Chronic fissure in ano, Local anesthesia, Open lateral internal sphincterotomy, Spinal anesthesia

INTRODUCTION

Fissure in ano is a common anal disorder and causes significant agony and distress to the patient. An anal fissure is a linear ulcer in the mucosa of anal canal distal to dentate line and present with anal pain, spasm and/or with bleeding during defecation.[1] The cause of fissure is multifactorial. Most commonly, the fissure is single and located in the posterior midline, but it can also develop in the midline anteriorly, especially in parous females. There is no clear definition between acute and chronic fissure in ano, but many authorities believe that more than 6 weeks of persistence despite with conservative treatment is considered chronic fissure in ano. Most of fissure heal with conservative management within 4–6 weeks and some persist beyond 6 weeks and chronic.

Many believe that nonhealing of fissure is due to compromised blood circulation to the anoderm which is due to hypertonia of internal anal sphincter.[2] There is an increase in resting anal pressure in most of the patients as measured by anal manometry.[3,4] Blood flow to internal anal sphincter is also decreased in those patients as evidenced by muscle probes.[5,6] This explains how disruption of

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internal anal sphincter by surgery decreases anal tone and increases blood flow and promotes healing. Anal fissures with chronicity are unlikely to heal with conservative treatment as significant irreversible changes will happen in sphincter including fibrosis. Acute fissures usually heal with medical management but for reasons not well understood some fissures do not heal and become chronic and fail to respond to medical/conservative management.

Internal anal partial sphincterotomy (open or closed) is reserved for chronic fissures that fails or recurs frequently after non-surgical management.[7] Sphincterotomy using local anesthesia instead of spinal or general anesthesia has been proposed as an alternative method that does not lead to increases in associated morbidity or recurrence.[8,9] Until recently surgeons were hesitant to perform anal and rectal procedures in an ambulatory setting because of fear of postoperative pain and retention of urine.

This study is aimed at comparing the advantages and disadvantages of conducting open lateral anal sphincterotomy for chronic fissure in ano under local anesthesia versus spinal anesthesia.

Aim and Objectives

The aim of the study was to assess the post-operative pain, average duration of hospital stay, and cost effectiveness of open lateral internal sphincterotomy under local anesthesia over spinal anesthesia.

Anal Canal Anatomy

The anal canal is a continuation of the rectum and about 4 cm long. It extends from anorectal junction to anal verge. Interior of the anal canal shows many important features. The upper half of anal canal above dentate line is lined by columnar mucosa of the rectum and insensitive to pain. The mucosa below the dentate line is lined by squamous epithelium and is highly sensitive to pain and touch. Hence, any pathology below dentate line such as fissure in ano is very painful, and any pathology above dentate line such as hemorrhoids is painless in nature.

The anal canal is a muscular tube and has internal and external anal sphincters. The internal anal sphincter is a thickened involuntary muscle which is surrounded by voluntary external anal sphincter which is derived from the pelvic diaphragm. The external anal sphincter is divided into deep, superficial, and subcutaneous parts by longitudinal muscle of rectum which becomes fibrous in between anal sphincters.

Anal canal has a good blood supply and is supplied by the superior rectal artery above the dentate line and by the inferior rectal artery below the dentate line.

Above dentate line anal canal mucosa is supplied by autonomic nerves from both sympathetic (L1–L2) and parasympathetic (S2, 3, 4) through pelvic splanchnic nerves. Below pectinate line, it is supplied by inferior rectal nerve (S2, 3, 4) and carry pain, touch, and temperature sensations. Sympathetic nerves cause contraction of the internal anal sphincter and parasympathetic causes relaxation of internal sphincter. Contraction of external sphincter is effected by inferior rectal nerves and perineal branch of fourth sacral nerve.

METHODS

Randomized prospective comparative study conducted on patients diagnosed with chronic fissure in ano, admitted in surgical ward at GGH, Mahabubnagar, Telangana during the period of 3 years from 2018 to 2021, was taken for study considering the inclusion and exclusion criteria.

According to the study done by Kulkarni, *et al.*[10,11] proportion of proportion of patients getting discharged on day one operated under pudendal block; 93%. Proportion of proportion of patients getting discharged on day one operated under spinal anesthesia: 70%. At 95% confidence limit, 80% power of the study, sample size calculated is 44 and approximated to 45 in each group. Calculation was done using open Epi software version 2.3.1. This study included a total of 90 patients randomly divided into two groups each consisting of 45 patients: 45 patients undergoing surgery in local anesthesia (Group-A) and 45 patients undergoing surgery in spinal anesthesia (Group-B).

Inclusion Criteria and Exclusion Criteria

In this study, both male and female patients between the age group of 15 and 70 years with complaints of severe pain in the anal region, bleeding during defecation, constipation, and failed treatment in the past for fissure in ano were included in the study. In all cases, diagnosis of acute and chronic fissure was made by clinical examination only.

Patients with other, coexisting anal problems such as malignancy, anal incontinence, hemorrhoids, and fistula in ano were excluded from this study.

Patients with diagnosed hypersensitivity to local anesthesia, perineal infection in the area of local anesthesia, Patients on anticoagulant therapy and associated anal pathologies such as malignancy, incontinence, stenosis, fistula, hemorrhoids, and medical comorbid conditions such as with the history of coronary artery disease and chronic obstructive respiratory diseases were excluded from the study.

Informed written consent is taken for both procedures, that is, surgery either by local or spinal anesthesia from all

patients who are included in study. Ethical clearance was obtained. The data were analyzed using statistical software SPSS. It is a single blinded RCT, decision of surgery under local or spinal anesthesia to the patient is taken by cheat method, computer generated random numbers.

Before administration of local anesthesia, all patients were given a single dose of ceftriaxone and metronidazole. During surgery, one unit of fluid-containing normal saline with dextrose was administered. No special pre-operative investigations were done except routine blood and urine investigations.

Group A - Surgery Under Local Anesthesia

Patient in lithotomy position, under aseptic precautions, parts are painted and draped. 15–20 cc 2% of local anesthesia, lignocaine hydrochloride without adrenaline is infiltrated using 25 G needle including skin and over line of incision, intersphincteric space, and internal anal sphincter in left side of anal canal.

Group B - Surgery under Spinal Anesthesia

Intrathecal injection of 0.5% bupivacaine heavy is given at L3–L4 space in sitting position with aseptic measures; patient is then put in lithotomy position. Parts are painted and draped. Surgical procedure is common in both groups.

All the patients underwent standard open lateral internal anal sphincterectomy in lithotomy position irrespective of the groups. Intersphincteric groove was felt and radial incision was taken. Sphincter was divided to the length of fissure, under direct vision using surgical blade or electrocautery. Details regarding duration of hospital stay, intra and post-operative pain, complications, patient, and surgeons satisfaction were recorded.

RESULTS

Most of the patients were aged between 20 and 50 years in both groups. Maximum age in the study was 70 years and minimum was 19 years. The mean age in Group A (those who underwent local anesthesia) was 38.8 years and the mean age in Group B (those who underwent spinal anesthesia) was 41.33. In the Group A, there were 57.8% males and 42.2% females and in Group B, 60% were males and 40% were females. And the two groups were comparable and there is no statistical significance $P = 0.83$. In Group A, minimum number of days stayed in hospital was 1 day and maximum was 3 days with mean 1.92 days. In Group B, minimum number of days stayed in hospital was 3 days and maximum was 5 days with mean 3.73 days. It was noted that surgery under local infiltration had discharged earlier compared to Group B patients with $P < 0.001$, which is significant (Table 1).

Intra operative pain

Pain was assessed using visual analog scale (VAS). All the patients operated under spinal anesthesia had no intra-operative pain, but the patients operated under local infiltration has intra-operative pain score 2 (VAS score 2). $P < 0.001$ which is statically significant, that is, Group A (local) patients had experienced more pain compared to Group B (spinal) intra-operative. Surgery under local infiltration had little more pain and discomfort due to lithotomy position as limbs are not paralyzed, during giving local anesthesia, and during use of cautery compared to spinal anesthesia (Table 2).

Post-operative pain at 30 min

At 30 min of operation, patients operated under spinal anesthesia had no pain as they were still under effect of spinal anesthesia, whereas patients operated under local infiltration had VAS-2 in 11 patients (24.4%) and VAS-0 in remaining 34 patients (75.6%). $P < 0.001$ which is statically significant, that is, Group A (local) patients had experienced more pain compared to Group B (spinal) at 30 min post-operative (Table 3).

Post-operative pain at 5 h

At 5 h after operation, patients operated under spinal anesthesia had VAS-2 in 7 (15.5%) patients and VAS-0 in 38 (84.5%) patients, whereas patients operated under local

Table 1: Number of days stayed in the hospital

Days stayed					
Anesthesia	**N**	**Minimum**	**Maximum**	**Mean**	**SD**
Local infiltration	45	1.0	3.0	1.96	0.30
Spinal anesthesia	45	3.0	5.0	3.73	0.72

Z=8.6; *P*<0.001

Table 2: Intraoperative pain

VAS-intra operative	Local infiltration		Spinal anesthesia		Total	
	Count	%	Count	%	Count	%
No pain	10	22.2	45	100.0	55	61.1
Mild pain	35	77.8	0	0.0%	35	38.9
Total	45	100.0	45	100.0	90	100.0

P<0.001. VAS: Visual analog scale

Table 3: Post-operative pain at 30 min

VAS-post-operative 30 min	Anesthesia				Total	
	Local infiltration		Spinal anesthesia			
	Count	%	Count	%	Count	%
0	34	75.6	45	100.0	79	87.8
2	11	24.4	0	0.0	11	12.2
Total	45	100.0	45	100.0	90	100.0

P<0.001. VAS: Visual analog scale

infiltration had VAS-2 in 10 patients (22.2%) and VAS-0 in remaining 35 patients (77.8%). P =0.419, which is not statically significant, that is, spinal anesthesia is wear off in group B at 5 h post-operative period, and both group experienced same pain score (Table 4).

Post-operative pain at POD-1

After 1 day, patients operated under spinal anesthesia had VAS-2 in 8 (17.8%) patients and VAS-0 in 37 (82.2%) patients, whereas patients operated under local infiltration had VAS-2 in 9 patients (20%) and VAS-0 in remaining 36 patients (80%). P =0.7977, which is not statically significant, that is, both group experienced same pain on post-operative day 1 (Table 5).

In the all the patients underwent open lateral internal sphincterotomy, about 80% of patients were free of symptoms such as pain and bleeding during defecation on the next post-operative day. Rest 20% of patients had mild pain or bleeding during defecation, which are relieved on conservative treatment.

DISCUSSION

Medical management is the first line of treatment for fissure in ano. Even the in the advance of conservative management of chronic fissure in ano, the lateral internal sphincterotomy is considered as the gold standard. The surgical care definitely provides best healing rate and reduce the recurrence. The preference of anesthesia is also shifting towards the LA.[12-14] On the other hand, LA safely carried out by surgeon, and has virtually no complications.[12] Studies done by Ahmed *et al.* showed that there was no significant difference in post-operative pain. Whereas, study done by Towliat *et al.* found a significant difference ($P < 0.05$) in post-operative pain score after 6 h of LIS (group local - 1.90 ± 1.07 and group Spinal - 1.90 ± 1.07).

It is generally accepted that today the majority of minor ano rectal diseases such as chronic anal fissure should be performed on ambulatory basis.

Requirements for ambulatory basis are: Rapid onset, lack of intra operative and post-operative complications.[15] We all know that spinal anesthetic associated with hypotension more than 33% and bradycardia around 13%. However, post-dural puncture headache is most common complication of spinal anesthesia and although not life threatening, restricting daily life and causing hospital admission. In our study also, hospital stay is statistically significant ($P < 0.001$).

Bell from the University of British Columbia is of opinion that as the experience of surgeon increases, so does his confidence and ability to perform the lateral internal Anal sphincterotomy under LA.[16] In the present study, we firmly believe that patient with anal fissure should be admitted to hospital 1 day prior to surgery, those patients underwent under spinal anesthesia and post-operative recovery requires 3–5 days added 1-week rest at home. Hence, total loss of work may be 2 weeks, while patients operated under LA admitted on same day of surgery and discharged on same on ambulatory basis. All in all, pain is one of the postoperative complications that leads to longer hospital stay.[17]

Internal sphincter is not relaxed under LA. As the sphincter is in spasm, the length of the sphincter could be appreciated easily and the adequacy of the length of division verified distinctly. This benefit is lacking under spinal or general anesthesia where the sphincter is fully relaxed, presenting difficulties in defining its length. Since, we performed conservative or limited sphincterotomy in the study, defining the length of the sphincter carried major importance. Longer division of sphincter would lead to a higher rate of incontinence while shorter division may not relieve the spasm or heal the fissure.[18]

Considering the cost of pre-operative evaluation, surgery cost and postoperative medications and stay in spinal group patients spent at least 3 times more money than the local group patients for the same surgery. This carries greater significance in this setting where most of the patients come from poor economic backgrounds. In view of these benefits with LA, Hiltunen and Matikainen called it ambulatory treatment for CAF where patients were allowed to leave the clinic immediately after the surgery.[9]

Table 4: Post-operative pain at 5 h

VAS-post-operative 5 h	Anesthesia				Total	
	Local infiltration		Spinal anesthesia			
	Count	%	Count	%	Count	%
0	35	77.8	38	84.5	73	81.1
2	10	22.2	07	15.5	17	18.9
Total	45	100.0	45	100.0	90	100.0

P<0.419. VAS: Visual analog scale

Table 5: Post-operative pain on POD-1

VAS-post -operative POD–1	Anesthesia				Total	
	Local infiltration		Spinal anesthesia			
	Count	%	Count	%	Count	%
0	36	80	37	82.2	73	81.1
2	09	20	08	17.8	17	18.9
Total	45	100.0	45	100.0	90	100.0

P<0.7877. VAS: Visual analog scale

CONCLUSION

Better post-operative pain relief could be achieved by local anesthesia in ambulatory surgery in lateral anal sphincterotomy. LA provides adequate pain relief for the procedure apart from the advantage of easy palpability of the sphincter. It can be done as an outpatient procedure without the need for an anesthetist. There is no significant difference in the complications or the healing of the fissure as compared to SA, but LA procedure carries a significant cost benefit.

Ethical Approval

The study was approved by the Institutional Ethics Committee.

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