



**ORIGINAL RESEARCH PAPER**

**General Surgery**

**A COMPARATIVE STUDY OF LOCAL AND SPINAL ANESTHESIA FOR REPAIR OF INGUINAL HERNIA**

**KEY WORDS:** Inguinal hernia, Repair, Local versus spinal anesthesia

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**ABSTRACT**

**BACKGROUND:** Men were more commonly affected with inguinal hernias where surgery is the elite form of treating this condition. This study was undertaken to comprehend and buildup an accurate belief concerning both techniques of Local versus spinal anesthesia in the repair of Inguinal hernia by obtaining the data which is analyzed and compared.

**AIM:** To compare the local versus spinal anesthesia in the repair of inguinal hernia and to frame a perfect & safe combination of pain relief, healing period and the hospital stay.

**MATERIALS AND METHODS:** The current study was carried out among 50 randomly selected patients irrespective of age among central Indian population which were grouped into group A and group B respectively having 25 each according to the type of anesthesia (Local anesthesia / Spinal anesthesia) received. Unilateral uncomplicated inguinal hernias were chosen for the present study. Parameters were noted and the data is analyzed with the help of paired student t test

**RESULTS:** The median time taken for the inguinal surgery among both groups is not statistically significant as the p value is greater than 0.05. Pain relief is much better with local anesthesia during the first postoperative day however no statistical difference has been noted later on. Post operative complications were less with Local anesthetic group than spinal anesthetic group. Median hospital stay time post operatively was only few days in local anesthesia group (Group A) in comparison with spinal anesthesia. Median time to get back to work was less in local anesthetic group (7 days) than in Group B Patients (10days).

**CONCLUSION:** Local anesthesia is considered to be the most easy, trustworthy, secure and inexpensive technique for inguinal hernia repair with very minimal complications and a faster recovery.

**INTRODUCTION:**

Inguinal hernia is the most common type accounting for about 78% in comparison with other varieties of hernia. Males were more usually affected with inguinal hernia and the incidence of which increases with advancing age. Several Studies has put forward that the incidence of inguinal hernia among the age group of 16-24 years is about 11 in 10000 whereas in the older age group of 75 and above the incidence was noted as 200 in 10000 reasoning to patients mortality<sup>1</sup>.

In the field of general surgery elective inguinal repair is more frequently done<sup>2</sup>. A variety of techniques are employed to do inguinal hernial repair like general anesthesia, spinal/epidural /local /paravertebral anesthesia<sup>3</sup>. However while initiation and maintenance of the surgical procedure both the techniques of general / regional anesthesia has been reported to have Hemodynamic changes<sup>4</sup>. Some Studies stated the most ideal technique for day care surgery is local anesthesia after comparing the recovery profiles of General/ regional (spinal/ local) anesthesia<sup>5</sup>.

Worldwide accepted procedure considered to be the standard one to perform an adult open inguinal hernial repair is Lichtenstein tension free mesh repair technique. But there exists a dilemma in the preference for best possible anesthetic technique (Spinal/ Local). Several studies were conducted to put a standard combination for inadequate resources although many were conducted in tertiary care setup where anesthetist and supporting staff availability is not the concern<sup>6,7</sup>. The anesthetic technique used and the choice of surgery are two major criteria to provide optimum operating conditions and to please patients safety.

The present study is aimed to compare the role of Local versus spinal anesthesia in terms of patient's safety, efficacy, complications, and recovery period in Lichtenstein repair for inguinal hernia.

**MATERIAL AND METHODS:-**

The present study was done in Chirayu Medical College and Hospital, Bhopal for a period of one year, which includes a total of 50 patients. The patients were randomly selected for

the study irrespective of age. Unilateral uncomplicated inguinal hernias were chosen for the present study. The institutional ethical committee of Chirayu Medical College and Hospital, Bhopal has given the ethical clearance.

Complete details regarding the procedure were explained & later Ethical consent forms were given to the patient's current study and their consent was received. Patient with recurrent hernias, Strangulated or obstructed hernias or with active skin diseases / having a history of hypersensitivity to anesthetics and the patients who has not submitted the consent form, patients with inadequate or ineffective anesthesia has been excluded from the study.

Sample size has been calculated as 46 with Creative Research Systems survey software version 12.0 with value for confidence level as 95%. Patients were divided randomly by using Simple random sampling technique into two groups A & B having 25 patients in each group respectively. Group A patients were subjected to Local anesthesia and group B were treated under spinal anesthesia for inguinal repair.

Detailed history of the patient was taken after admitting into hospital followed by thorough clinical examination. All Routine investigations like complete blood profile, Renal Function tests, X ray chest, ECG, etc were done to the patients and readings were noted. All the patients were offered with Lichtenstein tension free hernioplasty. Same surgeon has performed all the surgeries with the aid of two nursing staff. Local anesthetics used were lignocaine/Xylocaine, and bupivacaine, other sedatives like diazepam, Midazolam etc were used if necessary.

Among group A patients local anesthesia used was a mixture of 1% xylocaine and 0.5% bupivacaine (50:50 mixture) with 1:200,000 adrenaline solution. An incision line was marked 1.5cm above the above and corresponding to the medial two-thirds of the inguinal ligament. Local anesthesia has been administered by means of 26 gauge needle. Along the marked incision line 5ml of anesthetic solution was infiltrated subcutaneously. To block the ilio-inguinal nerve 5 ml of solution was infiltrated above the pubic tubercle. 5ml of

anesthetic solution was once again infiltrated underneath the external oblique aponeurosis when exposed. By opening inguinal canal. External oblique aponeurosis is divided to spot Ilio-hypogastric nerve and ilioinguinal nerve around which 2ml has been infiltrated gaian.3ml of infiltration was done near the deep inguinal ring to block the genital branch of genito-femoral nerve & neck of hernial sac which was then dissected. Later into the conjoint tendon 5ml of anesthetic solution has to be infiltrate prior to the commencement of the posterior hernial wall repair<sup>8</sup> usually done withLichtenstein repair technique (Onlayprolene mesh). Finally Interrupted mattress sutures were used to close the skin. Patient is then turned supine.

On the other hand Group B patients were given 0.5% bupivacaine by an anesthetist for spinal anesthesia. Patient was asked to sit and space between the Lumbar (L3-L4) vertebra has been spotted. With the help of 26 gauge needleunder aseptic conditions subarachnoid puncture is performed, aspirated for free flow of CSF and thereafter 12.5mg of 0.5% bupivacaine has been injected in to the subarachnoid space<sup>9</sup>.

**RESULTS:**

In both (Group A & Group B) the groups there is high Incidence of indirect hernia in comparison with direct hernias. Among Group A (Local anesthesia) 18 (72%) patients has indirect hernia and 7(28%) has indirect hernia while in Group B 14(56%) had indirect hernia 9(36%) had direct inguinal hernia

Time took for the inguinal hernial repair surgery has been calculated from draping to dressing. Median time for surgery under local anesthesia was noted as 65 minutes with in a range of 40-90 minutes and under spinal anesthesia it is 71 minutes with a ranging from 46 to 96 minutes. There is no statistical significance as the observed p value >0.05 (Table-1)

**Table 1: Time taken for surgery in minutes**

Time take in minutes	Local anesthesia Group A		Spinal anesthesia Group B	
	No of cases	Percentage	No of cases	Percentage
20-30	5	20	0	0
31-40	7	28	1	4
41-50	8	32	4	16
51-60	4	16	12	48
61-70	1	4	4	16
71-80	0	0	3	12
81-90	0	0	1	4

Pain experienced during procedure was shown in (Table-2) , no pain was felt in 3(12%) patients of group A while in 1(4%) among Group B, mild pain is noticed among 18(72%) of Group A patients while 8(32%)in Group B. Moderate pain was seen in 4(16%) patients of Group A whereas in 16(64%) in group B. Severe pain is not observed in both the groups. All together it was observed that the Group A patients faced significantly low pain in comparison to group B patients as p value was less than 0.05%.

**Table 2 Pain experienced during surgery**

Pain experienced during surgery	Local anesthesia Group A		Spinal anesthesia Group B	
	No of cases	Percentage	No of cases	Percentage
No pain	3	12	1	4
Mild	18	72	8	32
Moderate	4	16	16	64
Severe	0	0	0	0

As depicted in Table -3 Post operative pains was recorded at 6 hours, 12 hours, 24 hours and 48 hours after surgery with the help of visual analogue scale (VAS) pain scoring system. Statistical significance has been observed during the first day (24hours) postoperatively as the calculated p value was less than 0.05%.

**Table -3 Post operative pains using visual analog scale (VAS)**

Time interval in hours	Local anesthesia Group A	Spinal anesthesia Group B	t-value	p-value
	Mean ± SD	Mean ± SD		
6	2.34±0.8	4.92±0.93	2.009	0.002*
12	3.30±1.12	4.32±1.18	3.04	0.004*
24	1.98±1.02	2.72±1.13	2.37	0.022*
48	0.78±0.70	1.04±0.84	1.26	0.213

The post operative complications as shown in Table-4 wound infection/sepsis and retention of urine was considerably less among Group A patients than in Group B patients.

**Table 4 Incidence of Post operative complications**

Postoperative complications	Local anesthesia Group A		Spinal anesthesia Group B	
	No of cases	Percentage	No of cases	Percentage
Wound infection/ sepsis	2	8	4	16
Wound hematoma	1	4	0	0
Testicular pain/swelling	4	16	5	20
Nausea/Vomiting	0	0	3	12
Urinary retention	2	8	8	32
Headache	0	0	6	24
Respiratory complication	0	0	0	0
Recurrence	0	0	0	0

**DISCUSSION:**

In the present study both (Group A & Group B) the groups there is high Incidence of indirect hernia as compared to direct hernias. Indirect hernia was seen among Group A 18 (72%) patients and in Group B 14(56%). Direct inguinal hernias present in 7(28%) of Group A and in Group B 9 (36%). The results obtained were comparable and almost similar to the previous studies.<sup>10,11,12,13</sup>

For any patient undergoing surgery pain is the most concerned factor which also indicates the primary tissue damage, not necessarily correlate with the underlying cause of injury. Pain perception is usually aided by nociceptors (sensor neurons) and the afferent neuronal pathways<sup>14,15</sup>. In the current study no pain was felt in 3(12%) patients of group A while in 1(4%) among Group B, mild pain is noticed among 18(72%) of Group A patients while 8(32%) in Group B. Moderate pain was seen in 4(16%) patients of Group A whereas in 16(64%) in group B. Severe pain is not observed in both the groups. The Results observed were comparable to the earlier studies. In a study done by Baskerville PA et al<sup>16</sup> in the year 1983 on 129 patients operated under local anesthesia showed that 93% patients felt no pain during procedure and 7% felt the operation was painful.

Post operative pain was recorded in the present study at 6 hours, 12 hours, 24 hours and 48 hours after surgery with the help of visual analogue scale (VAS) pain scoring system. Mean values observed were 2.34±0.8, 3.30±1.12, 1.98±1.02, 0.78±0.70 in group A patients while in group B they were 4.92±0.93, 4.32±1.18, 2.72±1.13, 1.04±0.84 respectively it was comparable to the study by Song D et al<sup>17</sup> which has presented that visual analog scores were 15±1.4 in patients underwent surgery with local anesthesia compared to 34±3.2 in patients treated with spinal anesthesia. The postoperative pain was significantly statistically less in patients treated with local anesthesia and it noted that there was no significant difference in the pain profile in both groups after first postoperative day. Comparable to the results were obtained by Nordin P et al<sup>18</sup>

The post operative complications wound infection/sepsis is observed in 2(8%) of Group A patients while in 4(16%)

among Group B and retention of urine is seen in 2(8%) Group A and 8(32%) of group B, complications was considerably less among Group A patients than in Group B patients similar results to the study done by Gianetta E et al<sup>19</sup> showed that inguinal hernia repair in an elderly patients operated under local anesthesia has 3(1%) wound sepsis/ infections.

#### CONCLUSION:

Local anesthesia is considered to be the simplest, trustworthy, secure and inexpensive technique for inguinal hernia repair with very minimal complications and a faster recovery. In countries especially like India where actually the patients are having enormous resources and the expertise the use of Tension-free mesh repair with local anesthesia will surely increase the effectiveness of the surgery by all means.

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