

# Tension-Free Inguinal Hernia Repair in Local Anaesthesia versus Spinal Anaesthesia

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## ABSTRACT

**Background:** Inguinal hernia is a common presentation in surgical clinics. In the past, the hernia surgeries were done under general and spinal anesthesia. Recently local anesthesia is being increasingly used due to the increased efficacy of local anesthetics and economic reasons. We in the current study tried to evaluate the effectiveness of Lichtenstein repair under local anesthesia and spinal anesthesia and the overall outcomes of both methods.

**Methods:** This cross-sectional study was conducted in the Department of General Surgery, Prathima Institute of Medical Sciences, Naganoor, Karimnagar. Successive cases of uncomplicated inguinal hernia were selected for the study. A total of n=60 cases randomly allotted in two groups The LA group and SA group were taken and studied. Post-operatively VAS scale was used to evaluate pain, other postoperative complications such as testicular swelling and pain, urinary retention, nausea/vomiting, postural hypotension, and wound infections were recorded.

**Results :** The age of the patient varied from 20 to 80 years with the highest prevalence noted in the age group of 41 to 60 years. The Mean age of presentation is 51.3 years. The anatomical location and type of hernia are given in table 1. 60.9% of inguinal hernia in this study was an indirect type, 30.4% was direct, 6.5% was pantaloon type and 2.2% was Ogilvie's hernia. Out of 74 patients, 62.1% had a right-sided inguinal hernia compared to the left side which accounted for 37.8%. Complication records showed N=9(23.7%) of the SA group and n=8(22.2%) LA group developed scrotal edema and in total n=17(23%) developed scrotal edema. N=7(18.4%) patients in the SA group and n=7(19.4%) in the LA group developed seroma and in total patients, n=14(18.9%) developed seroma.

**Conclusion:** Lichtenstein tension-free hernioplasty done under local anesthesia is with less immediate postoperative complications, also the best suitable for patients with

medical comorbidities and those who are on antiplatelet therapy where spinal anesthesia is contraindicated.

**KEYWORDS:** Inguinal Hernia, Mesh Repair, Local Anaesthesia, Spinal Anaesthesia

## INTRODUCTION

A hernia is the protrusion of the viscous or part of the viscous through an abnormal opening in the walls of its containing cavity. Historical records of hernia dates to 1500 BC. It is derived from a Greek word meaning offshoot or budding or bulge. The Latin word hernia means rupture or tear. Hernias can occur in any part of the body however commonest site is the inguinal region since the abdominal wall here is not covered by striated muscle.<sup>[1]</sup> The first surgical repair of hernias was carried by E Bassini in 1884 and is called the father of modern herniorrhaphy.<sup>[2]</sup> It is estimated that inguinal hernias occur in about 15% of adult men most of whom are not cosmetically obvious or without pain hence patients do not seek medical attention. Hernioplasty is one of the most frequently performed operations worldwide by the general surgeon.<sup>[3]</sup> Lichtenstein hernioplasty is a tension-free inguinal hernia repair using polypropylene mesh that has become the gold standard during the past decade. In the past, general and spinal anesthesia was used for hernia surgery; but nowadays local anesthesia has become the popular anesthesia method for hernioplasty, especially in outpatient clinics.<sup>[4]</sup> The choice of anesthesia is dependent on the operating conditions, patient safety, and operating technique. General anesthesia can cause hemodynamic changes during induction and maintenance. Local anesthesia is being used frequently because of its advantages such as better patients' safety, shorter recovery period, reduced stay in hospital reduced post-operative pain, and economic reasons.

## MATERIAL AND METHODS

This cross-sectional study was conducted in the Department of General Surgery, Prathima Institute of Medical Sciences, Naganoor, Karimnagar. Institutional Ethical committee permission was obtained for the study. Written consent was obtained from all the participants of the study. Inclusion criteria were diagnosis of inguinal hernia, Aged > 20 years, ASA(American Society of Anesthesiology) I and II category cases, unilateral and uncomplicated hernias while the exclusion criteria were complicated hernia, recurrent hernia, bilateral hernia and any contraindications to the usage of Lignocaine / Bupivacaine. A total of n=74 patients were selected for the study based on the inclusion and exclusion criteria. They were randomly allotted in two groups by computer-generated random numbers. The local group (LA): A total of n=36 patients selected for the study underwent surgery under LA. N=2 patients lost to follow up at 1 month and n=3 patients lost to follow up at 6 months and n=1 patient was converted to GA due to intractable pain despite adequate infiltration. The spinal group (SA): N=38 patients selected for the study underwent surgery under SA. N= 3 patients lost to follow up at 1 month and N=5 patients lost to follow up at 6months. The selected cases were recorded including history, clinical examination; and investigations are done. All patients were operated on by the standard technique of Lichtenstein tension-free hernioplasty. Intravenous Antibiotics were given 30 minutes before skin incision. The local anesthesia was obtained as per standard protocol. A 50:50 mixture of 2% Lignocaine and 0.5% bupivacaine was used for local anesthesia. Spinal anesthesia was given according to the anesthesiologist's method of choice, preferable by an L3-4 intervertebral midline approach. Conscious sedation was provided by the infusion of rapid-acting amnesic and anxiolytic Midazolam was given at 0.1 mg/Kg/hr. while operating under local anesthesia. Lichtenstein tension-free hernioplasty is performed irrespective of the type of anesthesia. The above-mentioned parameters were recorded. The postoperative pain was measured with the Visual analog scale at 4h,8h, 12h & 24h. During the immediate postoperative period, all patients were given injectable analgesics NSAIDS/Opioid congeners at the standard dose required; the first dose is given at 3 hrs after surgery. From postoperative day-1 patients were given oral analgesics at the standard dosage. From postoperative day-2 patients were given oral analgesics as and when required. Early discharge option is given to the patients and encouraged keeping in mind the socio-economic condition and convenience of the patient. Patients were followed up at 1 month, 6 months for pain, chronic groin pain, or Inguinodynia/recurrence. The outcome was evaluated.

## RESULT

Out of n=74 cases, n=21 (28.3%) were in the age group 20 – 40 years. N=32(43.2%) were in the age group 41 – 60 years. N= 19(25.6%) were in the age group 61– 80 and n=2 (2.7%) cases were above 80 years of age. The age

of the patient varied from 20 to 80 years with the highest prevalence noted in the age group of 41 to 60 years. The Mean age of presentation is 51.3 years. The anatomical location and type of hernia are given in Table 1. 60.9% of inguinal hernia in this study was an indirect type, 30.4% was direct, 6.5% was pantaloon type and 2.2% was Ogilvie's hernia. Out of 74 patients, 62.1% had a right-sided inguinal hernia compared to the left side which accounted for 37.8%.

Type of hernia	Side of hernia		Total
	Left	Right	
Indirect	16	28	44 (60.9%)
Direct	8	14	22(30.4%)
Pantaloon	4	3	7(6.5%)
Other	0	1	1(2.2%)
Total	28(37.8%)	46(62.1%)	74(100%)

**Table 1: Location & types of Hernia**

The mean time duration taken for the duration of surgery in the LA group is  $58.8 \pm 6.02$  minutes and in the SA group is  $56.6 \pm 6.74$  minutes.  $P = 0.246$  was not significant. The Meantime spent in the operating room in the LA group is  $68.1 \pm 6.35$  minutes and in the SA group is  $76.4 \pm 6.52$  minutes with a significant P value of  $<0.001$ . Table 1

Intraoperative	Local No.(%)	Spinal No.(%)	Total No.(%)	P value
No complication	31(86.1)	24(63.2)	55(74.3)	0.55
Bradycardia	1(1.8)	3(7.9)	4(5.4)	0.62
Hypotension	0	11(28.9)	11(15)	$<0.001^*$
Pain	4(11.1)	0	4(5.4)	0.05

**Table 2: : Intraoperative observations /complications**

In the study, none of the patients met with troublesome hemorrhage during surgery. Bradycardia was noted in n=3 (7.9%) of the SA group and N=1 (2.8%) of the LA group. They are treated with injection atropine 1 mg IV and heart rate was brought back to normal rate with an insignificant P-value of 0.615. N=11 (28.9%) patients experienced hypotension in the SA group, who were treated with crystalloids and vasopressors. None in the LA group experienced hypotension with a P-value of  $<0.001$  which is significant. Table 2 In the LA group, 4 (11.1%) patients experienced severe pain and needed sedation and analgesia during surgery, none of the patients experienced pain in the SA group with a P value of 0.05, significant. The mean volume of the anesthetic mixture used for the LA group was  $38.32 \pm 3.72$  and for the SA group was  $2.27 \pm 0.26$ .

The mean VAS score at 4h, 8h, 12 h, and 24h for the LA group was low when compared to the SA group. The maximum VAS score was observed at 8h in both the groups and less in LA group 10(26%) patients among 19 patients who developed urinary retention in the SA group was catheterized and none of the patients in the LA group was catheterized. THE significant P-value is 0.001 depicted in Table 3.

VAS	Type of Anesthesia	Mean score + SD	P value
VAS 4h	Local	2.33 ± 0.63	0.556
	Spinal	2.42 ± 0.64	
VAS 8h	Local	3.13 ± 1.26	0.001*
	Spinal	4.31 ± 1.66	
VAS 12h	Local	1.97 ± 1.02	0.001*
	Spinal	3.15 ± 1.88	
VAS 24h	Local	1.19 ± 0.74	0.025*

VAS- Visual Analog scale

**Table 3: Postoperative pain measurement (VAS Scores)**

Complication records showed N=9(23.7%) of the SA group and n=8(22.2%) LA group developed scrotal edema and in total n=17(23%) developed scrotal edema. N=7(18.4%) patients in the SA group and n=7(19.4%) in the LA group developed seroma and in total patients, n=14 (18.9%) developed seroma. Hematoma developed in n=1 patients of each of SA group so also the surgical site infection / would infection which accounts for n=1 (2.6%) in SA group. Hematoma and Surgical site infection were not observed in the LA group. P values for all are not significant in table 5. The mean duration of hospital stay in the LA group is 3.61 ± 2.24 days In SA groups is 4.55 ± 2.00 days the p-value of 0.061 hence not significant. The data is as shown in Table 4

Delayed	Local No.(%)	Spinal No.(%)	Total No.(%)	P Value
No complication	21 (58.3)	20(52)	41(50)	0.22
Scrotal edema	8(22.2)	9(23.7)	17(23)	0.78
Seroma	7(19.4)	7(18.4)	14(18.9)	0.56
Hematoma	0	1(2.6)	1(1.4)	0.99
SSI	0	1(2.6)	1(1.4)	0.12

SSI- surgical site infection

**Table 4: Delayed postoperative complication**

## DISCUSSION

The incidence of age at presentation of inguinal hernia was maximum between 41-60 years of life this was comparable to Delvin et al; [5] and Bholla Singh Sidhu et al; [6] in this study inguinal hernia was exclusively found in males. The present study showed right-sided hernias more common than left side indirect hernias are commonest followed by pantaloon hernias. In this study, one patient in our study in the LA group was converted to GA as decided by the monitoring anesthetist as he had persistent pain despite adequate infiltration and sedation. The Conversion rate was 2.8% it is comparable with a study by Ruben N. Van Veen et al; [7] The difference in the mean duration of surgery in both groups in our study is not statistically significant as compared with the study by Gultekin FA et al; [8] The difference in mean time spent in the operating room is statistically significant as compared with Gultekin et al; [8]. This is due to the time taken for injecting the spinal anesthesia which adds to the total time spent in or Whereas the local anesthesia is infiltrated by the operating surgeon himself which doesn't take much time when compared with the time for a spinal injection. The major disadvantage of spinal anesthesia is hypotension secondary to the production of sympathetic blockade. [9] Even though all patients of the SA group have been transfused with LR to counteract venodilatation this occurs quite frequently as much as 20-25% [9] Bradycardia may be due to a high level of blockade 36. N=4 patients (11.1%) in the LA group complains of pain during surgery for which additional LA was infiltrated and n=1 patient was converted to GA as mentioned earlier. In the case of the SA group, none of the patients complains of pain. Unlike our study, several series have reported the need to add general anesthesia in about 5% to 10% of patients during spinal anesthesia because of insufficient intraoperative pain. [10] When post-operative pain values were evaluated about VAS at 4 hours, 8 hours, 12 hours, and 24 hours, VAS mean values of patients in the LA group were found to be lower than in the SA group and it is statistically significant except for score at 4 hours. The reason for the very low VAS score at 4 hours maybe since all patients has received the dose of analgesics at 3 hours following surgery. In both, the group the peak mean score is a maximum of 8 hours and the LA group has a statistically significant low score compared to the SA group. The peak means score at 8h maybe since the analgesic effect would have reduced in both groups. VAS belonging to the LA group were lower, their score at 4, 12, and 24 hours were below 3, indicating a mild pain and moderate pain at 8 hours as against the SA group where it was moderate at 8 hours and 12 hours and mild at 4 hours and 24 hours. In the present study, there is one patient with recurrence in the LA group and no recurrence in the SA group. Although the result of recurrence is insignificant, there are numerous factors involved in the recurrence of the hernia. In an ideal Lichtenstein's hernioplasty the recurrence rate would be < 1% which will be possible only in Hernia specialization centers. It is also difficult to project the accurate incidence of recurrence, as it will

depend on the length of follow-up and small study group and the follow-up period was less.

## CONCLUSION

Lichtenstein tension-free hernioplasty done under local anesthesia is with less immediate postoperative complications, also the best suitable for patients with medical comorbidities and those who are on antiplatelet therapy where spinal anesthesia is contraindicated. From our study it is observed that Lichtenstein tension-free hernioplasty done under local anesthesia offers quite a few advantages over spinal anesthesia. Local anesthesia may be considered as the anesthesia of choice for Lichtenstein tension-free hernioplasty for an uncomplicated, primary, inguinal hernia.

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