

## A Comparative Study of Lichtenstein Tension Free Hernia Repair in Local Anaesthesia versus Spinal Anaesthesia

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**Abstract:** The incidence of inguinal hernia is very common especially in older individuals. Often patients are unaware of the presence due to absence of any symptoms unless detected accidentally or detected in those causing presence of pain or other symptoms. The anterior open inguinal hernia repair with mesh was described by Lichtenstein in 1989. This tension free operation has become popular. We in the present study operated on the patients with uncomplicated unilateral inguinal hernia with Lichtenstein tension free technique under Local Anesthesia and Spinal Anesthesia to evaluate their outcomes. Methods: This prospective study was conducted in the Department of General Surgery, Prathima Institute of Medical Sciences, Naganoor, Karimnagar. A total of 74 patients admitted to the hospital with the diagnosis of uncomplicated inguinal hernia were included in the study. They were divided into two groups Group I (LA) included 36 patients and group II [GA] 38 patients. The investigations required as routine for diagnosis and to test the sensitivity to the local anesthetic night before surgery. Lichtenstein tension free hernioplasty is performed irrespective of type of anesthesia. The postoperative pain was measured with the Visual analogue scale (VAS) at 4h, 8h, 12h & 24h. Results: Mean time taken for duration of surgery in LA group is 58.8 + 6.02 minutes & in SA group is 56.6 + 6.74 minutes. P = 0.246 not significant. Mean time spent in operating room in LA group is 68.1 + 6.35 minutes & in SA group is 76.4+6.52 minutes with a significant P value of <0.01. The mean VAS score at 4h, 8h, 12 h, & 24h for 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 at 3.13 ± 1.26 as compared to SA group 4.31 ± 1.66 at 12 hours also VAS was less in LA at 1.97 ± 1.02 as compared to SA 3.15 ± 1.88. Conclusion: From our study it is observed that Lichtenstein tension free hernioplasty done under local anesthesia offers following several advantages over spinal anesthesia and it is Safer even in the patients with medical comorbidities and on antiplatelet therapy. Therefore local anesthesia may be considered as the anesthesia of choice for Lichtenstein tension free hernioplasty for an uncomplicated, primary, inguinal hernia.

**Keywords:** Lichtenstein Tension Free hernioplasty, Local Anesthesia, General Anesthesia.

### INTRODUCTION

Hernia is the “protrusion of the viscous or part of the viscous through and abnormal opening in the walls of its containing cavity”. Inguinal hernias are the commonest of all hernias and it occurs in about 15% of adult men. Hernioplasty is one of the most commonly performed operation world-wide by the general surgeons. Edoardo Bassini (1844-1924) of Pavia of Italy revolutionized the treatment of inguinal hernia [1]. He initiated the use of transversalis fascia, rectus sheath and interrupted silk suture. He did bilateral repairs and management of cryptorchidism in same sitting. William. S. Halsted (1852-1922) independently developed a similar procedure with few differences which included the complete excision of all the musculoaponeurotic layers there by reforming the

internal ring and transplantation of the cord to a subcutaneous position and debulking the cord [2]. Local anaesthesia for repair of hernias reported by Harvey Cushing at the end of 19th century. He used cocaine infiltration. Two major techniques that have proved to be done effectively under local anaesthesia, the Canadian Shouldice repair and Lichtenstein tension free hernia repair. Lichtenstein hernioplasty is a tension-free inguinal hernia repair using polypropylene mesh has become the “gold standard” during the past decade. In the past, general and spinal anaesthesia were used for hernia surgery, but nowadays local anaesthesia has become the popular anaesthesia method for hernioplasty, especially in outpatient clinics [3]. It is claimed that the long-term outcome of hernia repair is not affected by the method of anaesthesia. It is found

from the studies that local anesthesia reduced the hospital stay and cost with fewer complications. So this study was designed to compare effectiveness of local and spinal anesthesia for Lichtenstein tension free hernioplasty.

**MATERIALS AND METHODS**

This prospective 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. A written consent was obtained from all the patients involved in the study after explaining the procedure and possible outcomes in the local language. Inclusion criteria: Age > 20 years and unilateral uncomplicated inguinal hernias. Exclusion criteria were < 20 years, complicated hernia, recurrent inguinal hernia, femoral hernia, any contraindication to local anesthetics. A total of 74 patients admitted to the hospital with the diagnosis of uncomplicated inguinal hernia were included in the study. They were divided into two groups Group I (LA) included 36 patients and group II (GA) 38 patients. The investigations required as routine for diagnosis and to test the sensitivity to the local anesthetic patients were shaved in night before surgery. Antibiotic was given 30 minutes prior to skin incision. Local anesthesia was given by the operative surgeon as described. Spinal anesthesia was given according to the anesthesiologists' method of choice, preferable by a 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 Patients who had pain in spite of adequate local anesthetic infiltration the procedure was converted to general / spinal anesthesia and were excluded from the study. A 50:50 mixture of 2% Lignocaine and 0.5% Bupivacaine was used for local anesthesia. Local anesthesia was given by the operating surgeon and spinal by anesthesiologist. Then Lichtenstein tension free hernioplasty is performed irrespective of type of anesthesia. The postoperative pain was measured with the Visual analogue scale (VAS) at 4h, 8h, 12h & 24h. During immediate postoperative period all patients were given injectable analgesics NSAIDS /Opioid congeners at the standard dose required, first dose being 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 given to the patents & encouraged keeping in mind the socio economic condition & convenience of the patient. Patients were followed up at 1 month, 6 month for pain, chronic groin pain or Inguinodynia/recurrence. Final outcome was evaluated.

**RESULTS**

In the present study age of the patient varied from 20 to 80 years with highest prevalence noted in age group of 41 to 60 years. Men age of presentation is 51.3 yrs. In our study all the patients were male and we did not had a case of female inguinal hernia during the study period.

**Table-1: Age distribution of the patients involved in the study**

Age in years	No. of patients	%
20-40	21	28.3
41-60	32	43.2
61-80	19	25.6
>81	2	2.7
<b>Total</b>	74	100

**Table-2: Type of hernia detected in the patients for the study**

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%)
others	0	1	1(2.2%)
<b>Total</b>	28 (37.8%)	46 (62.1%)	74 (100)

Mean time taken for duration of surgery in LA group is 58.8 + 6.02 minutes & in SA group is 56.6 + 6.74 minutes. P = 0.246 not significant. Mean time spent in operating room in LA group is 68.1 + 6.35 minutes & in SA group is 76.4+6.52 minutes with a

significant P value of <0.01 (Table-3) patient among the LA group had persisting pain in spite of adequate sedation and analgesia and his procedure was continued after conversion to General anesthesia P value of 0.486 which is not significant.

**Table-3: Duration of surgery and time spent in operating room**

Time	local	spinal	P value
<b>Duration of SX (Mean + SD)</b>	58.5 ± 6.02	56.6 ± 6.74	0.246
<b>Time in OR (Mean + SD)</b>	68.1 ± 6.35	76.4 ± 6.52	<0.01

19 patients (50%) in SA group & 5 patient (13.9%) in LA group experienced retention of urine with P value of 0.001, significant. 8 patients (21.1%) in SA group & 2 patients (5.6%) in LA group experienced post-operative nausea & vomiting (PONV). P

value=0.087 not significant. 35 patients (97.2%) in LA group were ambulant at end of 1 hour & none in SA group with P value of <0.001. Post-operative had ache seen in 7(18.4%) patients in SA group & 1(2.8%) of LA group (p=0.056, significant) Table-4.

**Table-4: Immediate post-operative observations Immediate**

	Local	Spinal	Total	P Value
<b>Ambulation at 1 hour</b>	35 (97.2%)	0	35	<0.001
<b>Urinary retention</b>	5 (13.9%)	19 (50%)	24 (32.4%)	0.001
<b>PNOV</b>	2 (5.6%)	8 (21.1%)	10 (13.5%)	0.087
<b>Head ache</b>	1 (2.8%)	7 (18.4%)	8 (10.8%)	0.056

The mean VAS score at 4h, 8h, 12 h, & 24h for 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 at 3.13 ± 1.26 as

compared to SA group 4.31 ± 1.66 at 12 hours also VAS was less in LA at 1.97 ± 1.02 as compared to SA 3.15 ± 1.88 Table-5.

**Table-5: Post-operative pain measurements [VAS scale]**

VAS	Type of Anesthesia	Mean score ± SD	P value
4 hours	Local	2.33 ± 0.63	0.556
	Spinal	2.42 ± 0.64	
8 hours	Local	3.13 ± 1.26	0.001
	Spinal	4.31 ± 1.66	
12 hours	Local	1.97 ± 1.02	0.001
	Spinal	3.15 ± 1.88	
24 hours	Local	1.19 ± 0.74	0.025
	Spinal	1.63 ± 0.88	

9(23.7%) of SA group & 8(22.2%) LA group developed scrotal edema & in total 17 (23%) developed scrotal edema. 7(18.4%) patients in SA group & 7(19.4%) in LA group developed seroma and in total patients 14(18.9%) developed seroma. Hematoma developed in 1 patient of each of SA group so also the surgical site infection / would infection which accounts for 1 (2.6%) in SA group. Hematoma and Surgical site infection was not observed in LA group

## DISCUSSION

In this study the incidence of age at presentation of inguinal hernia was maximum between 41-60 years of life it is similar to the other studies done in this area [4, 5]. In our study we found the incidence of hernia occurring more commonly in male as compared to female. And 100% of the patients included in the present study were male. The reason could be because it is a tertiary referral hospital. As compared to other studies [4, 5] our study also showed that Right sided hernias are commoner than left side with indirect being the commonest followed by direct, pantaloon

and others. There was 1 case of Ogilvie's hernia in our study which was operated under LA. There was one patient in our study in LA group was converted to GA as decided by the monitoring anesthetist as the patient had persistent pain in spite of adequate infiltration and sedation. Conversion rate was 2.8% in our study which was comparable with study by Ruben N. *et al.*, [6]. The difference in mean time spent in operating room is statistically significant as compared with Gultekin *et al.*, [7] This is due to the time taken for injecting the spinal anesthesia which adds to the total time spent in or the local anesthesia is infiltrated by the operating surgeon himself which doesn't take much time when compared with the time for spinal injection. The major disadvantage of spinal anesthesia is hypotension secondary to the production of sympathetic blockade [8]. When post-operative pain values were evaluated with regard to VAS at 4, 8, 12 and 24th, 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 4h Reason for very low VAS score at 4h may be due to the fact that all patients

have received the dose of analgesics at 3hr following surgery. In both the group the peak mean score is maximum at 8h, and also LA group has statistically significant low score compared to SA group. The peaks mean score at 8h may be due to the fact that the analgesic effect would have reduced in both the groups. VAS belonging to the LA group was lower; their score at 4, 12 and 24 h were below 3, indicating a mild pain and moderate pain at 8h as against SA group where it was moderate at 8h and 12h and mild at 4h and 24h. Our results were contrary to Gultekin *et al.*, [7] found no significant change in VAS scores of the LA group and SA group. All the immediate postoperative complications were significantly lower in LA group when compared to SA. However, it is possible that the incidence of nausea, which occurred during spinal anesthesia, was related to hypovolemia, intrathecal injection of anesthetic and epinephrine induced serotonin release. All patients in LA group was ambulated at 1 hr which was not so in SA group as compared with other studies the delayed postoperative complications were not statistically significant between LA and SA group. Most of these complications are not directly related to the type of anesthesia.

#### CONCLUSION

From our study it is observed that Lichtenstein tension free hernioplasty done under local anaesthesia offers following advantages over spinal anaesthesia: Shorter time in operating room, Less incidence of intra operative hypotension, Less incidence of postoperative nausea & vomiting, headache, urinary retention and need for catheterization, Early ambulation, Less postoperative pain, Faster recovery, early return to normal work and Safer even in the patients with medical comorbidities and on antiplatelet therapy. Therefore local anesthesia may be considered as the anesthesia of choice for Lichtenstein tension free hernioplasty for an uncomplicated, primary, inguinal hernia.

**Conflict of Interest:** None

**Source of Support:** Nil

**Ethical permission:** Obtained

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