

Original Research Article

## A Prospective Study in South India Comparing Post-Operative Pain in Lichtenstein versus Tep Laparoscopic Inguinal Hernia Surgery

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### ABSTRACT

Hernia is derived from the latin word for rupture.

Sound anatomical knowledge is a prerequisite to repair inguinal hernia either by open or laparoscopic method.

This study was undertaken in Department of Surgery, Kerala Institute of Medical Sciences, Trivandrum with the aim of comparing the early post operative pain experienced in Lichtenstein versus TEP inguinal hernia repair surgeries in a total of 132 subjects.

It was observed that the mean VAS score was significantly lower in TEP group as compared to Lichtenstein group in all the 4 time periods after surgery i.e. after 6 hours, after 1 day, after 7 days and after 1 month. ( $p < 0.001$  in first 2 time periods and  $p < 0.05$  in the last two time periods).

The study led to the conclusion that more pain following surgery was experienced by those patients who underwent Lichtenstein procedure as compared to those who underwent TEP surgery.

**Key words:** Inguinal Hernia, Lichtenstein hernioplasty, Totally Extraperitoneal (TEP) hernioplasty, VAS Score.

### INTRODUCTION

*Hernia* is derived from the latin word for rupture. <sup>[1]</sup>

The treatment of inguinal hernias by surgical repair dates back to ancient civilizations of Egypt and Greece. Management of inguinal hernias in those days made use of conservative approach using trusses. However later surgical approach was initiated as it was found to be more efficacious. <sup>[2]</sup>

The success of the Bassini repair ushered in an era of tissue based repairs. <sup>[3]</sup> This was later supplanted by tension-free repairs, initially described by Lichtenstein,

which advocated use of prosthetic materials for inguinal floor reconstruction. <sup>[2]</sup>

Later laparoscopic inguinal hernia repair came to the forefront. <sup>[2]</sup> These are of two types i.e. transabdominal preperitoneal approach (TAPP) and the totally extra peritoneal approach (TEP). TEP repair offers several advantages like lesser postoperative and long-term neurologic pain leading to shorter convalescence as compared to open techniques of inguinal herniorrhaphy. <sup>[3]</sup>

Sound anatomical knowledge is a prerequisite to repair inguinal hernia either by open or laparoscopic method. [2]

Many studies have compared the various surgical methods available for inguinal hernia repair. However, there is a paucity of studies which have compared the incidence of early post operative pain arising out of various surgical methods of inguinal herniorrhaphy.

**Aims and Objectives:** This study was undertaken with the aim of comparing the early post operative pain experienced in the two types of surgeries.

## MATERIALS AND METHODS

The present prospective study was carried out in Department of Surgery, Kerala Institute of Medical Sciences, Trivandrum with the objective of comparing the early postoperative pain of laparoscopic versus Lichtenstein inguinal hernia repair surgeries.

**Sample of study:** The present study included patients treated for inguinal hernia by laparoscopic TEP (total extraperitoneal) and open (Lichtenstein) tension-free hernioplasty. Included in the study group were patients in the age group of 20-50, all cases of primary uncomplicated inguinal hernia and elective surgery cases. Excluded from the study group were patients with age < 20 or > 50 years, those medically unfit for general anesthesia, those having a previous lower midline or paramedian incision, those having an acute or irreducible inguinoscrotal hernia, those having an uncorrected coagulation disorder, those having any acute complication of hernia like obstruction and strangulation and those who were pregnant.

**Sample Size:** To arrive to the sample size, firstly a pilot study was undertaken in patients assigned to Lichtenstein and TEP hernia surgeries. 7 patients were taken up in each group and assessment of VAS score 6 hours after surgery was done for

each of the patients. The following results were found:-

Vas score after 6 hours of surgery		mean	sd
	Lichtenstein	5	2.5
TEP	4	1.3	

To calculate the sample size, following formula was used:

$$\text{Sample size: } n = \frac{2(z_{\alpha} + z_{1-\beta})^2 \sigma^2}{\delta^2}$$

$\alpha$  = Type I error (5%)

$1-\beta$  = Power (80%)

$\sigma$  = Standard deviation of scores (Combined)

$\delta$  = Difference in mean scores

On substituting the various values in the formula, sample size was found to be 66 in each group (n=66) and total sample size=132.

**Period of Study:** The data for this study was collected from February 2012 to February 2013.

**Study Design:** A prospective observational study.

**Methods:** Patients were admitted through outpatient department (OPD). Detailed history along with positive examination findings were recorded. All patients were counselled in detail about the type of anaesthesia, surgical procedure and likely postoperative complications. Approval from the hospital's ethics committee was obtained. Selection of patients for a particular procedure (laparoscopic or open) was done as per patients' wishes after proper explanation about the operative procedure. Those patients who opted for laparoscopic procedure were further screened for fitness to undergo laparoscopic surgery. Patients opting for laparoscopy but unfit for surgery were excluded from the study. An informed consent was obtained from every patient. All patients included in the study who underwent TEP procedure were operated under general anesthesia while majority of the Lichtenstein hernia repairs were done under spinal anaesthesia by using 5%

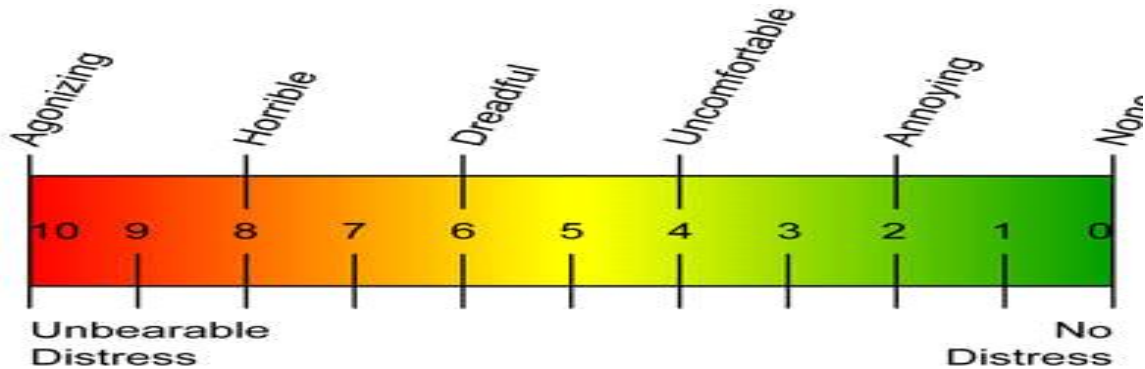
xylocaine and some were done under general anaesthesia. Early post operative pain was defined as that occurring within one month of surgery as a direct result of the surgical procedure. [4]

After surgery, postoperative pain was assessed using the Visual Analog pain scale (VAS) which is a 10 points scale where 0 means feeling no pain while 10 means the worst possible pain. Intensity of

pain was recorded 4 times: six hours postoperatively, on the first and seventh postoperative day and one month after the surgery. [5]

### VISUAL ANALOG SCALE

A 10 cm horizontal line drawn on a piece of paper anchored by various word descriptors was handed over to the patient. It is depicted as below.



The patients were instructed to indicate their pain level on the colored bar of the chart. They were also instructed to go with their instinct and just point and mark the pain level on the line. 3 categories were made to subdivide the

intensity of pain into no pain, mild to moderate pain and severe pain. A score of 0 meant no pain, 1-5 meant mild to moderate pain and a score of 6-10 was regarded as severe pain. [6]

## RESULTS

Table 1: Vas Score At Various Time Periods After Surgery

Vas score after 6 hours	Lichtenstein		TEP		Total	
	N	%	N	%	N	%
0	13	19.7	26	39.4	39	29.5
1-5	46	69.7	40	60.6	86	65.2
6-10	7	10.6	0	0.0	7	5.3
Total	66	100.0	66	100.0	132	100.0
Vas score after 1 day	Lichtenstein		TEP		Total	
	N	%	N	%	N	%
0	14	21.2	30	45.5	44	33.3
1-5	46	69.7	36	54.5	82	62.1
6-10	6	9.1	0	0.0	6	4.6
Total	66	100.0	66	100.0	132	100.0
Vas score after 7 days	Lichtenstein		TEP		Total	
	N	%	N	%	N	%
0	30	45.5	36	54.5	66	50.0
1-5	35	53.0	30	45.5	65	49.2
6-10	1	1.5	0	0.0	1	0.8
Total	66	100.0	66	100.0	132	100.0
Vas score after 1 month	Lichtenstein		TEP		Total	
	N	%	N	%	N	%
0	60	90.9	66	100.0	126	95.5
1-5	6	9.1	0	0.0	6	4.5
6-10	0	0.0	0	0.0	0	0.0
Total	66	100.0	66	100.0	132	100.0

**Table -2: Vas Score Analysis**

	Category	Vas Score						Mann-Whitney U	Z	p	Interpretation Of p value	
		N	mean	sd	Median	Minimum	Maximum					
After 6 hours of surgery	Lichtenstein	66	3.2	2.4	5	0	7	1261.500	-	4.260	<0.001	Significant
	TEP	66	1.5	1.5	0	4	4					
After 1 day	Lichtenstein	66	2.7	2.0	0	7	8	1312.000	-	4.073	<0.001	Significant
	TEP	66	1.3	1.5	0	4	2					
After 7 days	Lichtenstein	66	1.8	1.8	0	6	8	1751.500	-	2.091	0.037	Significant
	TEP	66	1.1	1.4	0	4	8					
After 1 month	Lichtenstein	66	0.4	1.2	0	5	5	1980.000	-	2.497	0.013	Significant
	TEP	66	0.0	0.0	0	0	0					

Table 1 shows the distribution of patients having VAS scores of 0, 1-5 and 6-10 in Lichtenstein and TEP study groups in various post-operative time periods of 6 hours, 1 day, 7 days and 1 month.

Table 2 compares the VAS Scores amongst Lichtenstein and TEP procedures in each of the aforementioned time periods i.e. after 6 hours of surgery, after day 1 and day 7 of surgery and after 1 month of surgery. It can be seen from the table that the mean VAS score is more in Lichtenstein procedure as compared to TEP procedure in all the 4 time periods after surgery and this difference was found to be statistically significant in all the 4 time periods after surgery (p<0.001 in first 2 time periods and p< 0.05 in the last two time periods)

## DISCUSSION

In the present study, it was observed that the mean VAS score was significantly lower in TEP group as compared to Lichtenstein group in all the 4 time periods after surgery i.e. after 6 hours, after 1 day, after 7 days and after 1 month. (p<0.001 in first 2 time periods and p< 0.05 in the last two time periods). This shows that more pain following surgery was experienced by those patients who underwent Lichtenstein procedure as compared to those who underwent TEP surgery. These findings are in agreement with those of Schrenk et al (1997) [7] who found that laparoscopic approaches cause less postoperative pain, at least in the immediate postoperative period, Lal et al (2003) [8] who reported that the mean pain scores in the TEP group at 12 hrs and 24 hrs were significantly lower than the

corresponding scores in the open repair group (p <0.04 and p <0.01 respectively), Colak et al (2003) [9] who showed that the mean VAS was significantly lower with TEP compared to open mesh repair (p=0.001), Bringman et al (2003) [10] who reported that the mean VAS was lower in the TEP group than Lichtenstein group after 2 hours (p=0.009), Neumayer et al (2004) [11] who used a VAS showing that the open group had significantly higher levels of pain shortly after surgery than those in the laparoscopic group, Eklund et al (2006) [12] who used a visual analogue scale showing that the TEP group experienced less pain one week postoperative compared to the Lichtenstein group, Fegade (2008) [13] who performed a literature review in Jalgaon district of Maharashtra and concluded that the laparoscopic operations cause significantly less pain in the early post operative period than open mesh repair, Langeveld et al (2010) [14] who showed significantly lower VAS scores for TEP at day 1, 2, 3, week 1, and week 4 (overall p < 0.001) and Hamza et al (2009) [5] who found that VAS recorded 6 hours after surgery and on the the second postoperative day was significantly higher in patients who had open repairs compared to those who had laparoscopic repairs. The findings in the present study are in contrast to the findings of Singh and De (2009) [15] who reported that the visual pain scores at 6 hours, 1, 4 and 7 days after surgery showed significantly more pain for the laparoscopic group than the open group (p <0.01) and Gokalp et al (2003) [16] who measured pain using visual analogue scores and showed no significant

difference between the two groups-TEP and Lichtenstein.

## CONCLUSION

The mean VAS score was found to be significantly lower in TEP group as compared to Lichtenstein group in all the 4 time periods after surgery i.e. after 6 hours, after 1 day, after 7 days and after 1 month. ( $p < 0.001$  in first 2 time periods and  $p < 0.05$  in the last two time periods). It leads to the conclusion that more pain following surgery was experienced by those patients who underwent Lichtenstein procedure as compared to those who underwent TEP surgery.

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