

## Original Research Article

# Comparative study of laparoscopic and conventional (Lichtenstein tension free) inguinal hernia repair in a tertiary care institute

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## ABSTRACT

**Background:** Inguinal hernia repair is the most frequently performed operation in general surgery. The standard method for inguinal hernia repair had changed little over a hundred years.

**Methods:** Present study was conducted on 60 patients having inguinal hernia and were operated by two different methods i.e. Lichtenstein tension free inguinal hernia repair (Group A) and laparoscopic hernia repair (Group B). Aim of the study conducted was to compare the various observations and complications in post-operative period.

**Results:** There was no statistically significant difference in the age group, side and type of hernia in the two groups. Laparoscopic repair was a longer procedure than Lichtenstein inguinal hernia repair and it was statistically significant ( $p < 0.05$ ). Postoperatively urinary retention was the most common complication in Group A. Other complications were genital oedema (13.33%), haematoma (13.33%), seroma (13.33%) and wound infection (6.67%) which led to increased post-operative hospital stay. In Group B, pneumoscrotum was the most common complication. Other complications included subcutaneous emphysema (6.67%) and seroma (6.67%).

**Conclusions:** Lichtenstein tension free inguinal hernia repair is safe, efficient and cheaper procedure with no extra equipment being required while Laparoscopic repair takes more time, laparoscopic equipment and training in minimal access surgery.

**Keywords:** Lichtenstein repair, Laparoscopic hernia repair, TAPP, TEP

## INTRODUCTION

Inguinal hernia is a protrusion of intra-abdominal contents through a defect in abdominal wall and is the most common procedure that general surgeons undertake all over the world.<sup>1</sup> Surgical procedures for inguinal hernia repair generally fall into three categories: open repair without the use of a mesh implant (i.e., sutured), open repair with a mesh, and laparoscopic repair with a mesh.<sup>2</sup> The most commonly performed laparoscopic repair procedures are trans abdominal preperitoneal repair (TAPP) and totally extra peritoneal repair (TEP). The increasing popularity of laparoscopic inguinal hernia

repair is, in part, due to the clinical potentials with less postoperative pain and a shorter duration of convalescence compared with an open hernia repair technique.<sup>3</sup> The study was carried out to compare operative time, intraoperative as well as postoperative complications along with hospital stay among both groups.

## METHODS

The present prospective study was conducted on 60 patients admitted with diagnosis of inguinal hernia over the period of one and half years (January 2014 to June

2015) in the Department of General Surgery, MMIMSR, Mullana, Ambala, Haryana, India.

These patients were divided at random by lottery system in two groups of 30 patients each i.e. Group A (treated by tension free hernia repair by Lichtenstein technique) and Group B (treated by laparoscopic technique of hernia repair). Among group B patients 15 each were operated laparoscopically by TAPP and TEP.

**Inclusion criteria**

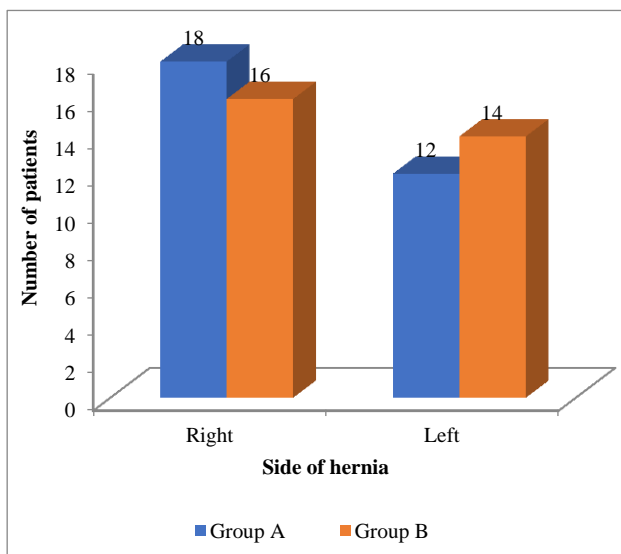
Inclusion criteria were all adult male patients admitted in the Department of Surgery, MMIMSR, Mullana (Ambala) with the diagnosis of unilateral inguinal hernia and fit for surgery.

**Exclusion criteria**

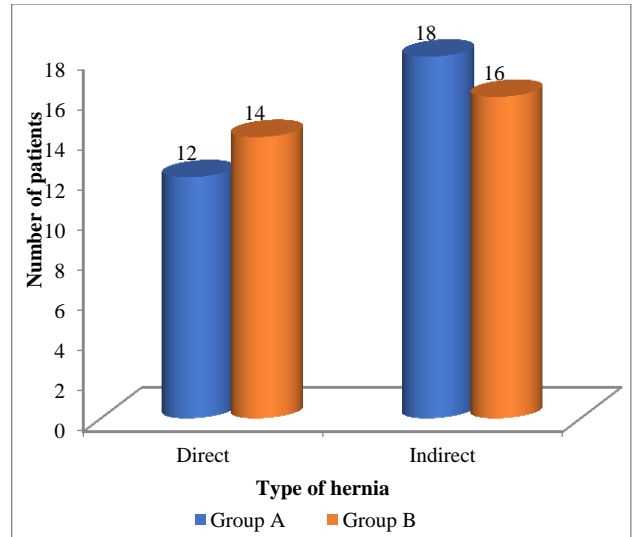
Exclusion criteria were paediatric patients; patients unfit for surgery; obstructed hernia and strangulated hernia.

**Procedure**

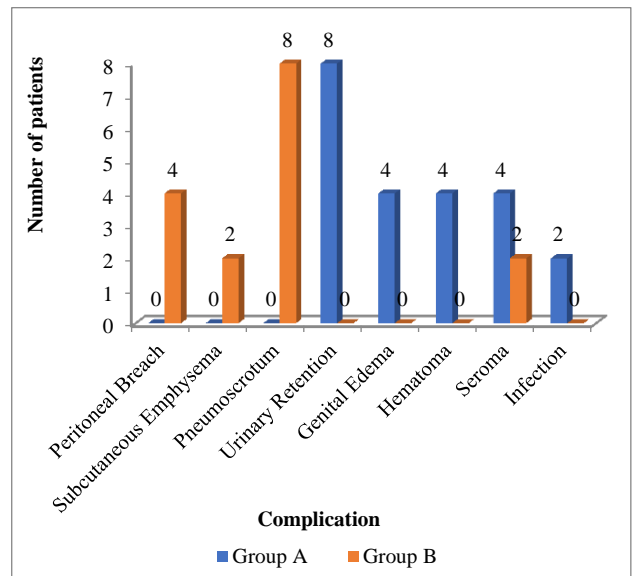
In a similar fashion with no changes in open lichtenstein repair as well as laparoscopic surgery (including port placement) except the usage of suture for fixation of mesh and sparing tackers (Figure 4). Thus the study focuses to compare the various observations i.e. demography, intraoperative time and intraoperative as well as post-operative complications. All patients were administered parenteral analgesic during first 24 hours and then according to the need during the 2<sup>nd</sup> post-operative day. A detailed history, clinical examination was done in all the cases along with written consent of the patients and ethical clearance was taken prior to study.



**Figure 1: Distribution of patients based on side of hernia.**



**Figure 2: Distribution of patients based on type of hernia.**



**Figure 3: Complications.**



**Figure 4: Fixing mesh in TAPP.**

**RESULTS**

The present study was carried on 60 patients admitted with diagnosis of inguinal hernia in the Department of General Surgery, MMIMSR, Mullana. These patients were divided in two groups of 30 patients each i.e. Group A (tension free hernia repair by lichtenstein technique) and Group B (laparoscopic hernia repair) with the following results. All the 30 patients in group B underwent laparoscopic inguinal hernia repair. Trans

abdominal pre peritoneal (TAPP) approach was used in 15 patients and remaining 15 cases were operated by total extra peritoneal (TEP) technique for repair of inguinal hernia.

The mean age of patients who underwent Lichtenstein inguinal hernia repair was 52.87 years and the mean age of patients in laparoscopic inguinal hernia repair group was 51.1 years. There was no statistically significant age group difference between two groups (p>0.05).

**Table 1: Demography, site and side of hernia.**

	Group A (n=30)		Group B (n=30)		P value
	No.	%	No.	%	
<b>Mean age (in yrs)</b>	52.87±13.0		51.1±16.3		>0.10
<b>Site of hernia</b>	Right	18	60.00	16	53.33
	Left	12	40.00	14	46.67
<b>Type of hernia</b>	Direct	12	40	14	46.67
	Indirect	18	60	16	53.33

In the Lichtenstein tension free inguinal hernia repair group, out of 30 patients, 18 (60%) presented with right sided inguinal hernia and 12 (40%) presented with left sided inguinal hernia.

While in the Laparoscopic inguinal hernia repair group, out of 30 patients, 16 (40%) had right sided inguinal hernia and 14 (46.67%) patients presented with left sided inguinal hernia.

In the Lichtenstein tension free inguinal hernia repair group, out of 30 patients, 12 (40%) patients presented with direct hernia and 18 (60%) with indirect hernia.

In the Laparoscopic inguinal hernia repair group, out of 30 patients, 14 (46.67%) patients presented with direct hernia and 16 (53.33%) with indirect hernia.

**Table 2: Comparison of operative time in group A and group B.**

	Group A	Group B
<b>Total patients</b>	30	30
<b>Mean operative time (minutes)</b>	85	132.67
<b>SD</b>	31.79	58.98

P<0.01.

The mean operative time for laparoscopic repair was 132.67 minutes with a SD of 58.98. The mean operative time in open mesh repair was 85.00 minutes with a SD of 31.79. Laparoscopic repair was found to be significantly lengthier procedure than open mesh repair (p value < 0.05).

In laparoscopic group, peritoneal breach was the only intraoperative complication which occurred in 4 patients (13.33%) in total extra peritoneal approach. These cases

were operated by trans abdominal preperitoneal method. There was no incidence of inferior epigastric vessel or vas deferens injury. There was no intraoperative complication in the open mesh repair.

**Table 3: Various operative complications.**

Complications	Group A (n=30)		Group B (n=30)	
	No.	%	No.	%
<b>Peritoneal breach</b>	0	0	4	13.33
<b>Subcutaneous emphysema</b>	0	0	2	6.67
<b>Pneumoscrotum</b>	0	0	8	26.67
<b>Urinary retention</b>	8	26.67	NA	NA
<b>Genital edema</b>	4	13.33	0	0
<b>Hematoma</b>	4	13.33	0	0
<b>Seroma</b>	4	13.33	2	6.67
<b>Infection</b>	2	6.67	0	0

N.B.: patients in group 2 were catheterized preoperatively. Hence no urinary retention was noted in group 2.

There were 8 cases (26.67%) of pneumoscrotum noticed after operation in the laparoscopic group. All resolved within 3 hours spontaneously after operation. Subcutaneous emphysema occurred in 2 (6.67%) of laparoscopic repair group. It resolved by itself within 2 days post operatively. Seroma formation occurred in 2 patients (6.67%) of laparoscopic repair group and 4 (13.33%) of open mesh repair group detected on the 7<sup>th</sup> post-operative day.

Urinary retention occurred postoperatively in 8 patients (26.67%) of open mesh repair group which was managed by catheter insertion (aseptic technique). The catheter was removed in both the groups after 24-48 hours and there was no complaint of urinary retention in any patient.

Hematoma in spermatic cord was noticed in 4 patients (13.33%) of open mesh repair group which was diagnosed on the 2<sup>nd</sup> post-operative day which resolved without intervention within 6 weeks while no hematoma formation in the laparoscopic group. Four (13.33%) patients had genital edema in the Lichtenstein inguinal hernia repair group post-operatively. These patients were advised scrotal support along with anti-inflammatory drugs and genital edema resolved. There was no genital edema in the laparoscopic group.

**Table 4: Comparison of post-operative hospital stay.**

	Group A	Group B
<b>Number of patients</b>	30	30
<b>Mean post-operative hospital stay</b>	2.93	2.80
<b>SD</b>	1.76	0.99

P=0.725.

Two (6.67%) patients had wound infection in the Lichtenstein inguinal hernia repair group which was managed under antibiotic coverage. There was no case of wound infection in the laparoscopic group.

In the Lichtenstein tension free inguinal hernia repair group, the minimum number of days of hospital stay post-operatively was 1 and maximum was 8 days. Whereas in the laparoscopic hernia repair group, the minimum number of post-operative hospital stay days was 1 and maximum was 4 days. The mean post-operative hospital stay for group A was 2.93 days with a standard deviation of 1.76 and for group B was 2.80 with standard deviation of 0.99. There was no statistically significant difference between the two groups in terms of post op hospital stay ( $p > 0.05$ ).

## DISCUSSION

The present study was carried out on 60 patients admitted at MMMSR, Mullana, with the clinical diagnosis of inguinal hernia who underwent Lichtenstein inguinal hernia and laparoscopic inguinal hernia repair (TAPP and TEP). In our study, the mean age of patients who underwent Lichtenstein inguinal hernia repair was 52.87 years and the mean age of patients who underwent laparoscopic inguinal hernia repair was 51.1 years. The youngest patient in the Lichtenstein study group was 19 years and the oldest one was 80 years and in the laparoscopic repair group youngest was 22 years and the oldest one 75 years. There was no statistically significant difference in the age of patients between two groups ( $p > 0.05$ ) which was similar to study done by Spencer et al, with patients who underwent laparoscopic hernia repair were younger (mean age 55 years) as compared to open hernia repair group (mean age 66 years). In the study conducted by Cawich et al, the average age of patients was 35.4 years for laparoscopic repair group.<sup>4,5</sup> In our study all the patients had unilateral inguinal hernia among both open and laparoscopic group similar to study

by Cawich et al with 24 recurrent unilateral hernias and 49 primary unilateral inguinal hernia.<sup>5</sup> Similarly in the study of Spencer et al, among the open inguinal hernia repair group, 117 (92.9%) patients had unilateral inguinal hernia while among the laparoscopic group, 94 (79.7%) patients had unilateral inguinal hernia.<sup>4</sup>

The mean operative time of Lichtenstein tension free inguinal hernia repair in our study was 85 mins which was greater than that of study done by Heikkinen et al (53 minutes), Schrenk et al (38.4 minutes) and comparable to study done by Spencer et al (84 minutes).<sup>4,6,7</sup> While the mean operative time of laparoscopic inguinal hernia repair of our study was 132.67 mins which was more than study done by Kald et al was (80 minutes), Subwongcharoen et al (67.85), and comparable to study done by Spencer et al (101 minutes).<sup>4,8,9</sup> The greater operative time in laparoscopic hernia repair was probably due to technical difficulty in laparoscopic hernia and use of suture instead of tackers for fixation of mesh.

Colak et al reported the incidence of complications to be 13.4% vs 16.4% in the laparoscopic and the open group respectively.<sup>10</sup> Similarly the complications in our study were higher in open lichtenstein repair group than laparoscopic group. Liem et al reported persistence of pneumoscrotum in 3 (1%) cases and urinary tract infection in 3 cases (3%), quite similar to our study with (8 cases) with no case of urinary tract infection.<sup>11</sup> The major intra-operative complications in laparoscopic group range from urinary bladder injury, bleeding from inferior epigastric artery, vas deferens injury were not seen in our study. In our study, peritoneal breach was the only intraoperative complication in total extra peritoneal approach which occurred in 4 patients (13.33%) of the laparoscopic group. 2 (6.67%) patients had wound infection in the Lichtenstein inguinal hernia repair group which was managed under antibiotic coverage. There was no case of wound infection in the laparoscopic group. There were 6 complications in laparoscopic hernia repair in the study conducted by Cawich et al which were groin hematoma in 1 patient, vascular injury in 1 patient, scrotal seroma in 2 patients, bowel injury in 1 patient and urinary retention in 1 patient.<sup>5</sup>

According to Liem et al, the mean post-operative hospital stay was 1 day and 2 days in open and laparoscopic group respectively.<sup>11</sup> Colak et al showed it to be 1.8 vs 2.7 days respectively.<sup>10</sup> The hospital stay was significantly high in the study by Schrenk et al (4.4 days for laparoscopic and 3.7 days for open) similar to our study with no significant difference ( $p > 0.05$ ).<sup>7</sup>

## CONCLUSION

Lichtenstein tension free inguinal hernia repair is safe, efficient and cheaper procedure with no requirement of extra equipment. Laparoscopic repair though a safe technique for treatment of inguinal hernias, is more time consuming requiring instrumentation, and prior training of laparoscopic or minimal invasive procedures.

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