

**A COMPARATIVE STUDY BETWEEN OPEN INGUINAL HERNIA REPAIR AND LAPAROSCOPIC INGUINAL HERNIA REPAIR**

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**ABSTRACT****Background:-**

The word “hernia” derived from Latin term meaning “a rupture”<sup>[1]</sup>. A hernia is defined as an area of weakness or complete disruption of fibromuscular tissue of body wall can pass through or herniate through defect<sup>[1]</sup>. In all ventral abdominal hernias, Inguinal hernia is the most common. Inguinal hernia repair is common in surgical practice. In past, the repair was pure open tissue repair which was changed to open prosthetic mesh repair. Laparoscopic groin hernia repair was first performed by Ger in 1979<sup>[1]</sup>. The laparoscopic approach to hernia repair has since evolved into common and effective procedure.

**Methods:-**

The presented study is a prospective, open labelled, randomized, comparative study during a period from May-2017 to March-2019. After taking written consent from the patients were randomly allocated to two groups. **Group A**, Open hernioplasty were operated with open tension free Lichtenstein’s hernioplasty. **Group B**, laparoscopic hernioplasty were operated with Transabdominal Preperitoneal(TAPP) repair. Those patients who fulfilled the inclusion criteria are included in study. The mode of presentation, surgical treatment and postoperative complications were all evaluated and compared.

**Results:-**

During the study there were no major life threatening complications were reported in either group. The postoperative pain and need of analgesics, presence of surgical site infections were more in Open hernioplasty group compared to laparoscopy group. The time taken for return to routine daily activities and work was earlier in patients treated with laparoscopy compared to open surgery and good cosmetic results.

## **Conclusions:-**

Laparoscopic hernia repair has better, evolving & effective procedure in recent days compared to open hernia repair in terms of less postoperative complications, early recovery with good cosmetic results.

**Keywords:-** Inguinal hernia repair, Laparoscopic hernioplasty, Open hernioplasty, Transabdominal Preperitoneal repair(TAPP)

## **Aims & Objectives:-**

- To compare the time taken for repair, patient's hospital duration of stay, surgical repair, complications that occur intraoperatively and postoperatively and outcome of open inguinal hernia mesh repair and laparoscopic hernia mesh repair.
- To evaluate the limitations of laparoscopic inguinal hernia mesh repair.

## **INTRODUCTION**

Repair of inguinal hernia is one of the commonest operations performed by surgeons around the world. The treatment has been in evolution from the pure tissue repairs to the prosthetic repairs and in the recent laparoscopic repair. Preferred approach for open inguinal hernia repair is Lichtenstein's tension free open inguinal hernioplasty using a prosthetic mesh. The recurrence rate is 10.1% in laparoscopic group compared to open hernioplasty(4.9%)<sup>[1,2]</sup>.The postoperative morbidity is low and recovery is quick in laparoscopy group<sup>[2]</sup>.

Laparoscopy had gained widespread acceptance in today's era of surgery. Several studies have shown the benefit of the laparoscopic hernioplasty over open hernioplasty (OH) in terms of less postoperative pain and morbidity, wound complications, postoperative pain, early resumption of daily activities and work with better cosmetic results.<sup>[1,2]</sup> But it had some limitations like longer operative time, longer learning curve, higher cost, a potential for serious life threatening accidents and a higher recurrence rate as compared with open surgery<sup>[1,2]</sup>.

Laparoscopic hernioplasty can be accomplished in two ways i.e. Trans-Abdominal Preperitoneal repair (TAPP) and Totally Extraperitoneal repair (TEP). TEP repair and open hernioplasty does not need invasion of the peritoneal cavity. Technically it eliminates the hazards of intra operational injuries. The objective of the study was to evaluate the safety and efficacy of laparoscopic hernia repair & standard open anterior tension free Lichtenstein's hernioplasty

## **METHODOLOGY**

The present study is a prospective study of 100 cases of an inguinal hernia admitted in Smt. Shardaben Hospital, Saraspur, under N. H. L Medical College, Ahmedabad during the study period of May-2017 to March-2019. Written and informed consent was taken from the patients. All the laparoscopic hernia operation were performed by a same operative surgeon. 100 cases for the purpose of the study were selected by the nonprobability (purposive) sampling method.

### **Inclusion Criteria**

Adults above 20 years and below 75 years of age of Male patients ASA(American Society of Anaesthesia) grade I & II with Primary unilateral or bilateral inguinal hernia are included in study.

### **Exclusion Criteria**

Patients with complicated hernia (irreducible, obstructed, strangulated), those with recurrent hernia, female patients were excluded. Those unfit for general anaesthesia(ASA Grade  $\geq$  III), laparoscopy or pneumoperitoneum i.e. those with cardiac diseases (MI, IHD), respiratory diseases (chronic asthma, COPD), renal or hepatic diseases, bleeding disorders, immunocompromised patients with malignancy etc are excluded from the study.

### **Choice of Procedure**

The procedure was based on the general condition of patients and associated cost of the procedure.

All patients were clinically evaluated and underwent routine investigations for fitness. Elderly patients above 50 years of age are evaluated for prostate enlargement by digital rectal examination & ultrasonography. After taking written consent from the patients are randomly allocated with help of lottery technique into study group A & group B.

Group A - Open Inguinal Hernioplasty

Group B – Laparoscopic Inguinal Hernioplasty(TAPP)

### **Surgical Procedure**

#### **1. Open Lichtenstein's Tension free inguinal hernioplasty**

The patient was laid down in the supine position under spinal anaesthesia. After the asepsis using betadine solution, an oblique incision of approximately 4-6 cm long kept over inguinal canal. Dissection done upto separation of spermatic cord and hernia sac. Hernial sac opened & content reduced into abdominal cavity and closed with vicryl suture. With help of On lay technique prolene mesh placed & fixed. External oblique sheath, subcutaneous tissue & skin closed.

#### **2. Transabdominal Preperitoneal Repair(TAPP)**

For the TAPP procedure, the patient laid down in the Trendelenburg position under general anaesthesia. Pneumoperitoneum was created through 10mm Supraumbilical port &

another two 5 mm port in midclavicular plane on the left and right lumbar region. An incision kept on the peritoneum from anterior superior iliac spine to medial umbilical ligament with help of electrocautery to raise Peritoneal flap. The Peritoneum mobilized & Preperitoneal space created. Dissection done into Preperitoneal space. Hernial sac dissected from cord structures & reduced into abdominal cavity. A 15×12cm Prolene mesh placed into preperitoneal space & fixed using tacker. Peritoneum closed with vicryl suture. Port site closed with vicryl port closure.

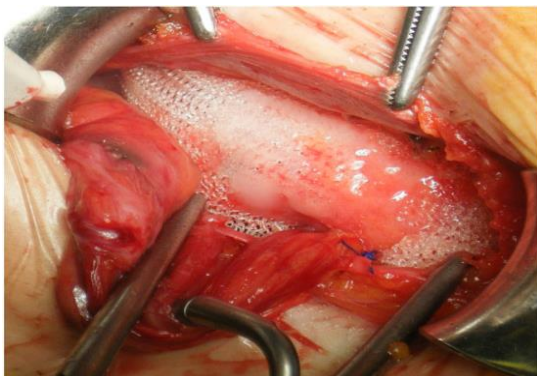


Figure 1:- Open Inguinal Hernioplasty



Figure 2:- Laparoscopic inguinal Hernioplasty

Patients were admitted one day prior to surgery. They were operated as per allocated group and relevant operative findings were noted. The antibiotic protocol was preoperative antibiotics consisting of intravenous dose of injectable Co-amoxiclav 1.2 gm given in morning as prophylaxis. The analgesic were used in postoperative period. The patients were encouraged to move in the early postoperative period and to take liquid diet on the evening of surgery. Foley's catheter, which was inserted in all patients in laparoscopic and bilateral inguinal hernia and was removed in the next morning and the patients were discharged in the 2<sup>nd</sup> & 3<sup>rd</sup> postoperative day after surgery.

Sutures were removed between 7-10 days. The wounds were checked and graded accordingly. Patients were postoperatively evaluated for presence of any cough impulse, swelling, and signs of recurrence. The follow up done during postoperative in 1<sup>st</sup> week, 2<sup>nd</sup> week, 1 month & 6 month. The scars were checked at each visit.

Descriptive statistics were used where ever is applicable. All the parameters are compared between the two groups. The mean age of the patients, time taken for surgery, duration of hospital stay & time taken to return normal activities are compared. The distribution and type of hernias, ease of detection, amount of bleeding during surgery, operative time for surgery, postoperative surgical site infection and cosmetic appearance results are compared.

## RESULTS

A total 100 male patients are included in the study out of which 76 patients had open hernioplasty allocated into group A and 24 patients had laparoscopic hernioplasty into group B. There was no mortality or surgery related major complications in both group.

**Table 1- Age distribution**

Age(yrs.)	Right	Left	Bilateral	Total
20-30	7	3	0	10
31-40	18	12	2	32
41-50	12	9	5	26
51-60	9	6	8	23
61-75	3	2	4	9
Total	49	32	19	100

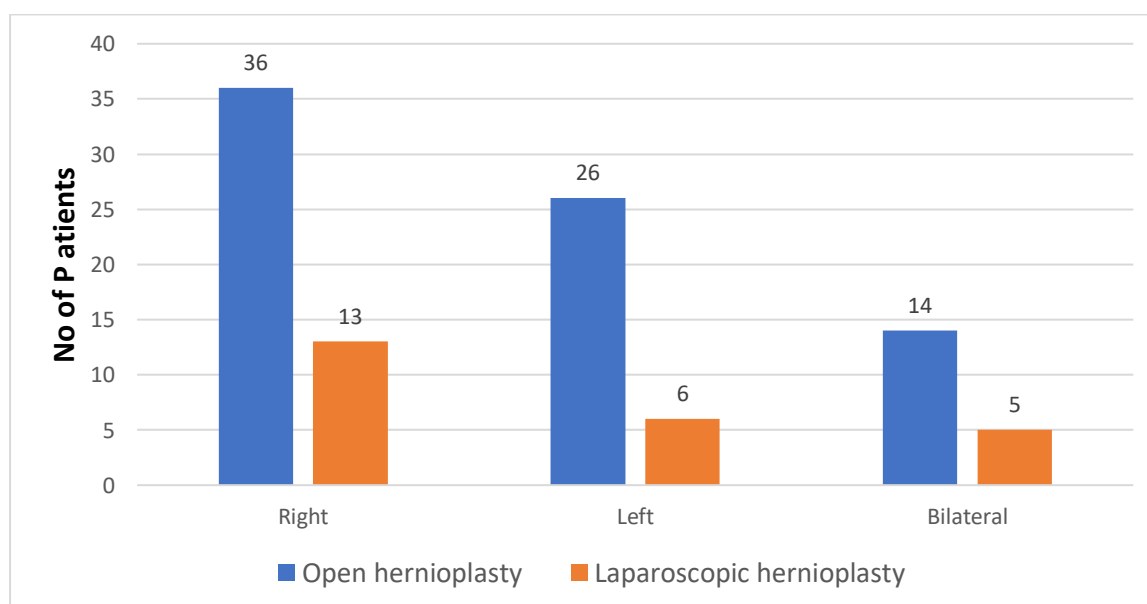
According to age distribution inguinal hernia is more common in 30-50 year age group.

**TABLE-2 :- Comparison of mean age in study groups**

Type	Open hernioplasty	Laparoscopic hernioplasty	TOTAL
Mean age	39.63	45.20	42.41

**TABLE-3:- Site of hernia in study group**

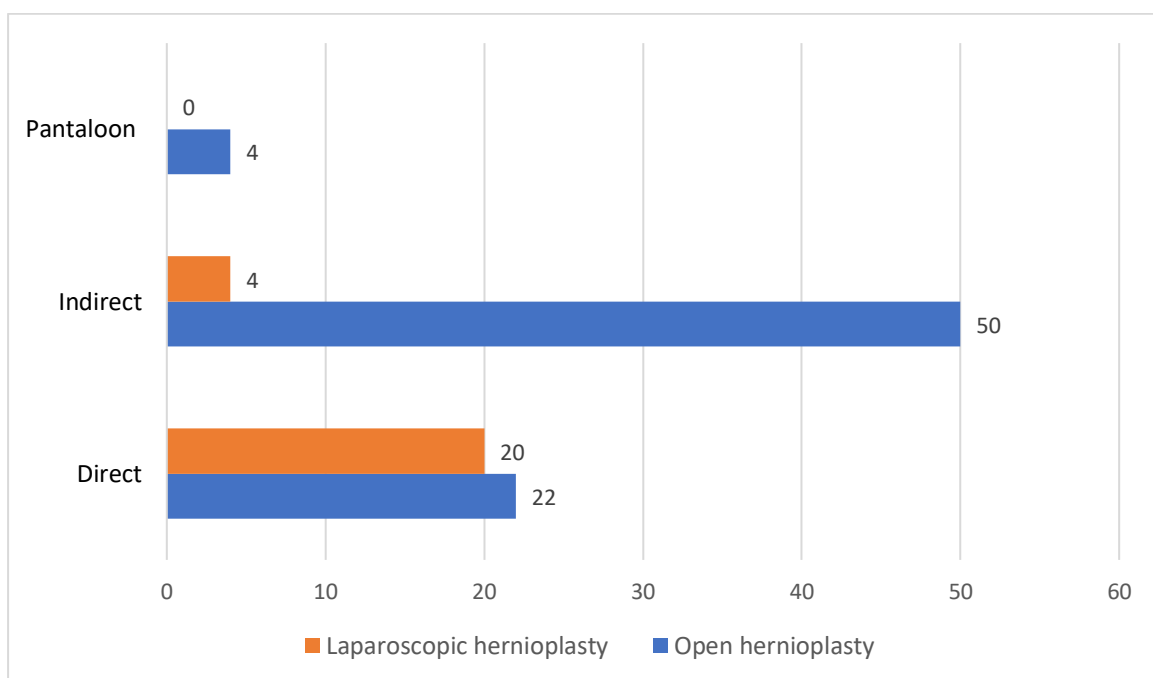
Site	Open hernioplasty	Laparoscopic hernioplasty	TOTAL
Right	36	13	49
Left	26	6	32
Bilateral	14	5	19
TOTAL	76	24	100



**Table 4:- Types of hernia in study groups**

Type	Open hernioplasty	Laparoscopic hernioplasty	TOTAL
Direct	22	20	42
Indirect	50	4	54
Pantaloon	4	0	4
TOTAL	76	24	100

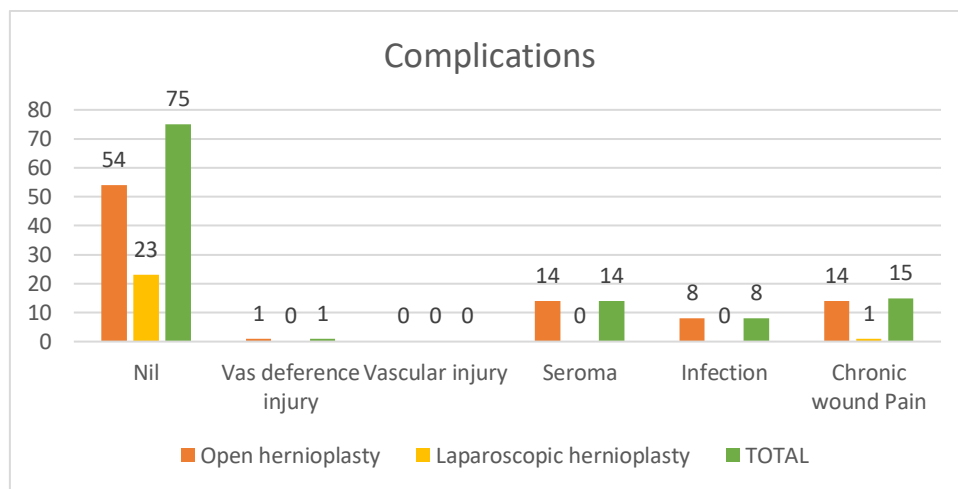
The type & side of hernia in both the groups reveals that, Right side indirect inguinal hernia was more common.



**Table 5:- Intraoperative & Postoperative complications in study groups**

Complications	Open hernioplasty	Laparoscopic hernioplasty	TOTAL
Nil	54	23	75
Vas deference injury	1	0	1
Vascular injury	0	0	0
Seroma	14	0	14
Infection	8	0	8
Chronic wound Pain	14	1	15

In postoperative period chances of wound infection is 10.5% in open group and 0% in laparoscopic group. The postoperative chronic pain was observed in open group was 18.42% and in laparoscopic group 4.16%.



**Table 6:- Operative Mean time based on type of hernioplasty**

Operative time	Open hernioplasty	Laparoscopic hernioplasty
Direct	58.6 minutes	63.4 minutes
Indirect	61.5 minutes	65.9 minutes
Unilateral	59.7 minutes	62.1 minutes
Bilateral	116.8 minutes	122.9 minutes

The mean operative time for Open hernioplasty(OH) group was 59.62 minutes and that for laparoscopic group was 65.3 minutes. During the initial period in laparoscopic procedure, mean time for surgery was 75.24 minutes which gradually reduced to 65.30 minutes. So the mean time during initial laparoscopic procedure was higher which was gradually reduced due to experience in laparoscopic procedure.

The mean postoperative hospital stay after laparoscopic repair was 1.68 days (ranges, 1-3 days) & in open group was 2.40 days (ranges, 1-4 days). All the patients underwent laparoscopic repair were discharged within 24-48 hours.

**Table 7:- Mean time to return daily activities and work**

	Open hernioplasty	Laparoscopic hernioplasty
Mean time	22.7 days	10.5 days

The mean time to return to activity also was lower in the laparoscopic group compared to open group. Thus patients in laparoscopic group returned to their work early compared to open hernioplasty group.

**DISCUSSION:-**

Laparoscopic surgery has led to many changes in the management of inguinal hernia and significantly reduced the morbidity associated with open surgical procedures. At present, the laparoscopic repair of hernias gained clinical importance in patients with bilateral or recurrent hernias<sup>[4]</sup>.

In the my study, time taken the laparoscopic procedures was 65.30 minutes & in Open hernia repair was 59.62 minutes. In my study, the mean time during initial laparoscopic procedure was higher which was gradually reduced due to experience in laparoscopic procedure. It was compared with the study of Lal et al in which laparoscopic repair mean time was  $75.72 \pm 4.6$  minutes & in open repair mean time was  $54.00 \pm 3.16$  minutes. So time taken for laparoscopy procedure was more than open procedure<sup>[6]</sup>.

In my study It was found that the return to daily activities and work in laparoscopy group was 10.5 days and in open group was 22.7 days. It was compared with the study of Lal in which mean time for return to daily activity in laparoscopy group was  $12.8 \pm 7.1$  days & in open repair group was  $19.3 \pm 4.3$  days. So it was found that return to daily activities was earlier in the laparoscopic group than open group<sup>[6]</sup>. This was due to minimal pain in the postoperative period and less chances of cord oedema<sup>[11-13]</sup>.

Chronic wound related pain described as dull aching pain or sensation of mesh pricking in the groin. This is mainly related to nerve injuries which occur in Open hernioplasty due to cutting of nerves and also use of electrocautery around nerves. In this study the postoperative chronic pain was observed in open group was 18.42% and in laparoscopic group 4.16%. This finding was compared with the study of Winslow et al in which chronic wound pain was 6.8% in open group and 0 % in laparoscopic group. It was found that postoperative pain following laparoscopic surgery was lower compared to Open surgery group<sup>[11-13]</sup>.

In laparoscopy there is smaller size of incision, no need of extra or bilateral incisions in case of bilateral hernias, minimal dissection and less handling of cord structures<sup>[11-13]</sup>.

In study, the postoperative hospital stay in laparoscopic group was 1.68 days and in open group was 2.40 days. This was similar with study of Colak et al in which postoperative hospital stay in laparoscopy group was 1.80 days and in open group was 2.73 days. So, the postoperative hospital stay in laparoscopic group was shorter than open group<sup>[7]</sup>.

In study, postoperative wound infection is 10.5% in open group and 0% in laparoscopic group. This was similar with study by Lal et al in which wound infection in laparoscopic group was 1.1% and in open group was 3.9%. The incidence of wound infection though slightly higher in open hernioplasty group<sup>[6]</sup>.

### **CONCLUSION :-**

Laparoscopic hernia repair is better and evolving surgical procedure compared open repair. It has advantages like minimal postoperative wound pain, early return to daily activities, better cosmetic results. But it has limitations like longer operative time and long learning curves.



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Conflict of interest: None declared

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