Open versus Laparoscopic Mesh Repair of Inguinal Hernia

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Abstract

Background- Inguinal hernia is the most common type of external abdominal hernia. Open Lichtenstein method or laparoscopic method can be employed to repair inguinal hernia. With the advent of laparoscopic mesh hernioplasty. Its superiority over open mesh hernioplasty is debatable.

Method- This prospective study was done on 120 patients in the department of surgery of LLRM Medical College Meerut, to evaluate the usefulness of laparoscopic mesh hernioplasty (TEP Technique) for inguinal hernia repair versus conventional open mesh hernioplasty (Lichtenstein Technique) in terms of complications, pain and recurrence. Equal number of subjects was put in two groups; open mesh repair group and laparoscopic mesh repair group.

Results-The mean age of the patients of inguinal hernia including both groups was 50 years. The mean operation time of Laparoscopic TEP mesh hernioplasty was 71.33 minutes while that of Open Lichtenstein repair was 36.33 minutes. Postoperative analgesic requirement was significantly lower in the patients operated by TEP technique as compared with patients treated by Open Lichtenstein's technique.. In TEP group, two patients develops neuralgia, one patient developed fever, 1 patient developed hematoma, where as in the open group there were 3 cases of neuralgia , 3 cases had fever.

Conclusion- Laparoscopic mesh hernioplasty using TEP technique is a novel technique with its share of advantages and disadvantages. There are potential benefits of laparoscopic repair for inguinal hernias in terms of post-operative pain, hospital stay and post operative complications. We recommend that a surgeon should use this laparoscopic technique for hernia repair after knowing all the pros and cons of the technique, his expertise for the technique and the infrastructure available.

Keywords*-TEP, Laparoscopic, Mesh Hernioplasty, Visual analogue scale.*

Introduction

A hernia is defined as an abnormal protrusion of a viscus or a part of it through the wall that contains it but without a breach in the body. The commonest variety of hernia is the protrusion of abdominal viscera through the abdominal wall. Among this inguinal hernia is still commonest accounting for 75%, incisional and ventral hernias for approx. 10%, femoral hernias for approx. 3% and unusual hernias for remaining 5-10% of all abdominal hernias. Inguinal hernia being the most common type of external abdominal hernia is the matter of our study here.

Inguinal hernioplasty has undergone a gradual evolution over the last 100 years. The introduction of video laparoscopy and the development of new laparoscopic instruments and skills offered the potential to take the posterior approach to inguinal hernioplasty to one step further and make it less invasive and disruptive to patients. Initially most laparoscopic surgeons used a transabdominal preperitoneal (TAPP) approach to access the posterior floor of the groin**. This approach** soon became the standard for laparoscopic hernia repair and many studies were published demonstrating recurrence rates of less than 1%. When complications

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such as internal hernia from inadequate closure of the peritoneum and injury to viscera from trocars and needles placed in the peritoneal cavity were reported, a totally extraperitoneal approach (TEP) was developed and subsequently adopted by many laparoscopic surgeons. This approach required the surgeon to laparoscopically expose the extraperitoneal space without entering the peritoneal cavity.

The present study was conducted to evaluate the usefulness of laparoscopic mesh hernioplasty (TEP Technique) for inguinal hernia repair versus conventional open mesh hernioplasty (Lichtenstein Technique) in terms of learning curve, operative time, complications, hospital stay, wound infection, pain, interfere in routine activities, sick leave, recurrence and overall satisfaction.

Materials and Method

The present study was conducted in the department of surgery at LLRM Medical College Meerut on randomly selected patients of inguinal hernia, who were admitted and undergone hernia repair, either laparoscopic or open repair from July 2017 to October 2018. Total of 120 cases of inguinal hernia were included of which 60 were operated by Laparoscopic technique and the other 60 were operated by Open Lichtenstein's technique. Both direct and indirect hernias were included in the study. The workup of the patient was divided into preoperative, operative and postoperative monitoring and follows up. Informed consent was taken from all the patients before entering the study. All patients were kept nil per orally from midnight before surgery. The operation time from the skin incision to the application of the last stitch was noted. For postoperative pain charting Visual Analogue scale (VAS) was explained and discussed with the patient preoperatively. Operation were performed under general anaesthesia, prophylactic antibiotic was given before skin incision. During surgery note was made of any anatomical abnormalities, type of hernia, extent of sac, any intraoperative complication, size of mesh applied, method of fixation of mesh and operative time. All patients were examined on the evening of surgery by operating surgeon for general condition and any post operative complications like early recurrence, bleeding from port site/ hematoma formation, fever, scrotal swelling and cough.

Complications like seroma formation, wound infection, fever, and recurrence were noted. Wound of patient was assessed and stitch removal was done accordingly.

Statistical Analysis

All the data were compiled on Microsoft excel computer program and was subjected to statistical analysis. Student's 't' test and chi square test were used to study the significance of differences of various parameters in laparoscopic TEP and open inguinal hernia group.

Observations and Results

The peak incidence of hernia was in 41 – 60 yrs of age group. Mean age of the patients who underwent laparoscopic mesh hernioplasty was 44.6years while mean age of the patients who underwent Open mesh hernioplasty was 48.3 years. Table 1 shows the mean range and Standard Deviation of age of both groups. There is no significant difference in age of incidence in two groups. Majority of patients have right sided hernia 62 (51.67%), among these 32(53.3%) were in TEP group and 30 (50%) were in open group. All the patients included in the study are males except one female who was operated by open mesh hernioplasty with male to female ratio being 59:1. The mean operation time of Laparoscopic TEP mesh hernioplasty was 71.33 minutes with STANDARD DEVIATION of ±23.8. The mean operative time of Open Lichtenstein repair was 36.33 minutes with a STANDARD DEVIATION of ±9.643. The postoperative pain was recorded at 12 hrs, 24 hrs, 48 hrs and 7 days after the operation by using Visual Analogue Scale (VAS) pain scoring system. The mean pain out of 5 in Laparoscopy group was significantly lower as compared to mean pain score in Open group (p - value < 0.05) except pain scores at 7 days in which there was no significant statistical difference between the two groups (p – value > 0.05).(Table 2). The mean analgesic consumed was 2.57 in the TEP group and 6.0 in the open group. The analgesic requirement in the TEP group was significantly less than the open group (p value < 0.05).Peritoneal breach was intra-operative complication that occurred in laparoscopic group which occurred in 2 patients, also in 1 patient had major vascular injury (Table 3). There was no incidence of epigastric artery injury or injury to vas deferens in both groups.In the Lichtenstein group58 patients (96.7%) were discharged on days 3 – 6. On the other hand in the laparoscopic group 48 patients(80%) were discharged on day 1 – 3 . There was only one recurrence that was noted during follow up in OPD in the Laparoscopy TEP group and no

recurrence in the Open Lichtenstein . The patient with recurrence then underwent Open Lichtenstein repair . In TEP group majority of patients required 7 days sick leave where as in the Lichtenstein group required more than 7 days sick leave. In TEP group total 4 patients had interfere in daily routine activities whereas in Lichtenstein's group total 24 patients had interference in daily routine activities.

Table 1: Showing patient age profile.

AGE (YEARS)	LAP – TEP	LICHTENSTEIN
Mean	44.60	48.60
RANGE	18 – 67	18– 90
Standard Deviation	±23.6	±21.3

Table 2: Showing visual analogue scale (VAS) pain score mean.

TIME AFTER OPERATION	TEP	LICHTENSTEIN	p VALUE
12 HOURS	1.5	2.43	0.0006
24 HOURS	1.03	2.10	0.013
48 HOURS	0.5	1.83	0.018
7TH DAY	0.2	0.47	0.263

Table 3. Showing intraoperative complications.

COMPLICATIONS	TEP (n=60)(%)	LICHTENSTEIN (n=60) (%)
PERITONEAL BREACH	2 (3.3%)	0(0%)
INFERIOR EPIGASTRIC ARTERIAL INJURY	0 (0%)	0 (0%)
VAS DEFERENS INJURY	0 (0%)	0 (0%)
MAJOR VASCULAR INJURY	1 (1.67%)	0 (0%)
VISCERAL INJURY	0 (0%)	0 (0%)
NERVE INJURY	0 (0%)	0 (0%)

Discussion

The age-wise distribution as reflected in our observation indicates that most of the patients of inguinal hernia belongs to 41 – 60 yrs of age group. In a study by **Fasih and Mahapatra**[1] at Barnsley district general hospital, UK (2000), mean age of patients of inguinal hernia was found to be **54 years** (95% between 46 – 61 years). In a study by **Franciosi**[2] at Milano, in a series of 692 cases of inguinal hernia, mean age was **60 years** (range 18 – 88 years). The mean age calculated in our study is lesser as compared to various studies in literature. This is due to the fact that subjects were allowed to chose the procedure and more patients from the younger age group enrolled in the Laparoscopic group.

According to **Jonathan Macready**, **Surgeon to the city of London truss society**[3], "The tendency to the production of inguinal hernia in males hardly diminishes at all as age advances. Men are subject to this peculiarity, from which women are almost free…"**In our study** also there is male preponderance with 99.16% of cases being males and only 0.83% of cases being females.

In present study 62(51.67%) had right sided inguinal hernia, 32(26.6%) had left sided inguinal hernia and 26 (21.6%) had bilateral hernia . More or less similar data are reported by various workers in the field. **Gross and Snyder**[4] reported right sided inguinal hernia 60%. Left sided hernia 25% and bilateral hernia 15%. **Stoker et al** [5] and **Liemet al.**[6] have shown that operative time correlates inversely with experience.

In our study the mean pain out of 10 according to VAS score in Laparoscopy group was significantly lower as compared to mean pain score in Open group (p - value < 0.05).This was in concordance with the study conducted by **Neumayer et al**[7] [2004] also reported lesser immediate postoperative pain in comparison of TEP versus Open Lichtenstein's repair.

The complication rate reported for laparoscopic repairs ranges from less than 3%[8] to as high as 20%,[9] and is similar to that reported for open repairs.[10]. As discussed earlier, the incidence of complications is directly related to the point on the learning curve studied. The incidence of hydrocele following laparoscopic repair is the same as after open repairs and occurs in less than 1% of patients.[11]

Lal et al [12] in 2003, **Wennstromet al**[13] in 2004 and **Neumayer et al** [7] in 2004 reported similar recurrence rates for both TEP mesh hernioplasty and Lichtenstein mesh hernioplasty. **In our study**, there was only 1 short term recurrence that was noted during follow up in OPD in the Laparoscopy group and in the Open Lichtenstein group.

Conclusion

The various benefits of TEP technique found in the current study include lesser post-operative pain and analgesic requirement, shorter hospital stay and sick leave. Limitations of the TEP technique include longer operative time, longer learning curve, higher conversion rates to open surgery, greater incidence of intraoperative complications and the need for general anaesthesia for the surgery. We recommend that a surgeon should use this laparoscopic technique for hernia repair after knowing about all the pros and cons of the technique, his expertise for the technique and the infrastructure available.

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