

A Comparative Study and Outcomes Between Laparoscopic Totally Extra Peritoneal Repair (TEP) and Open Lichtenstein Mesh Repair for Inguinal Hernia. A Hospital Based Study



Medical Science

KEYWORDS : Laparoscopic totally extra-peritoneal repair (TEP), Lichtenstein's repair, Inguinal hernia

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ABSTRACT

Inguinal hernia repair is now one of the most commonly performed general surgical procedures in practice. 'Tension-free repair' is the procedure of choice (1) due to its low recurrence rate. These tension-free repair procedures can be roughly categorized into two groups: laparoscopic and open anterior approach. Laparoscopic method can be Trans-abdominal pre-peritoneal (TAPP) mesh repair or Totally extra-peritoneal (TEP) repair. TEP is accepted as the most ideal method because it avoids entry into the peritoneal cavity, while TAPP can cause intra-peritoneal complication such as bowel injury or obstruction (2). Among open tension-free methods are Lichtenstein's operation or Prolene hernia repair system. In this article, we are comparing the advantages and disadvantages of two extra peritoneal inguinal hernia repair methods, i.e. open Lichtenstein's and laparoscopic Totally Extra Peritoneal (TEP) approaches of inguinal hernia repair.

AIMS AND OBJECTIVES :

The aim of this study was to compare the effectiveness and safety of laparoscopic TEP repair and conventional open Lichtenstein hernia repair in the treatment of inguinal hernia and their results were studied and compared in terms of duration of surgery, intra-op and post-op complications, number of days of hospitalization, cost of hospitalization.

METHODS :

60 cases of inguinal hernia admitted in Subharti medical college and hospital, Meerut were selected on the basis of the non-probability (purposive) sampling method. Patients with uncomplicated direct and indirect inguinal hernias treated by open or laparoscopic (TEP) method were included. 30 cases each were operated by Laparoscopic (TEP) repair and open Lichtenstein hernia repair. Outcome were compared in demographics and peri-operative details with post-operative data.

RESULTS :

In the post operative period, wound infection developed in 2 case of open Lichtenstein hernioplasty. Hematoma at the operated site was found in 1 case of open Lichtenstein hernioplasty. Intra-operative peritoneal tear was seen in 3 case of Laparoscopic (TEP) repair. The duration of hospitalization was 6.8 days (Mean) in open hernioplasty group where as 3.5 days in the laparoscopic (TEP) group. The duration for surgery was significantly longer in the laparoscopic group around 34.54 minutes. The cost of surgery was 5234 INR (Mean) in open Lichtenstein repair as compared to 7636 INR in Laparoscopic (TEP) repair. The difference in cost of surgery was around 2400 INR, laparoscopic repair being costlier than open surgery. It may be due to use of laparoscopic instruments and general anaesthesia in case of laparoscopic repair of inguinal hernia as compared to spinal anaesthesia in open lichtenstein repair.

There were none recurrences in the laparoscopic hernia repair group as compared to 1 case in open lichtenstein repair group.

CONCLUSION :

Since evidence in the literature does not point to either laparoscopic or open approaches, the clear superior procedure, surgeon preference and circumstantial influences will probably continue to dictate the approach employed in inguinal hernia repair. Laparoscopic TEP repair was safe with less complications, early hospital discharge and return to routine activities.

INTRODUCTION :

Inguinal hernia is one of the most common surgical problems and is a leading cause of work loss and disability (3). Open surgery for inguinal hernia has gone through many stages of development. Understanding of the hernia anatomy was appreciated and understood in the mid 1700's by means of dissection of cadavers. Two advancements which enabled the development of hernia surgery greatly were the aseptic technique and improvement of anaesthesia.

Eldorado Bassini was an Italian surgeon who described a durable inguinal hernia repair based on an understanding of inguinal (groin) anatomy. Shouldice developed an anatomic based surgical technique which produced a very low recurrence rate. From the 1940's various forms of synthetic polymers were used in inguinal hernia repair. Lichtenstein published the results of 6,321 patients followed for 2-14 years after inguinal hernia repair with polypropylene mesh in 1987. This approach revolutionized hernia repair (4). Today tension free mesh repair is regarded as gold standard (5). This technique is

simple, safe and effective, with relapse rate of 0.7% (6).

Laparoscopic approach has markedly improved recovery time that prompted surgeons to attempt laparoscopic approach in hernia repair (7). Ger was the first surgeon to attempt the laparoscopic hernia repair (8). The open surgery techniques are gradually being replaced by the trans-abdominal pre-peritoneal repair (TAPP) and total extraperitoneal repair (TEP) (9).

Recently, there are many reports comparing laparoscopic (TEP & TAPP) and open tension-free methods (10-12). However, there have been few reports comparing open tension free mesh repair with laparoscopic TEP. Thus, we designed this study and reviewed our data to compare open lichtenstein mesh repair and laparoscopic TEP repair.

The operative time to perform unilateral primary inguinal repair has been reported as longer for Laparoscopic TEP compared to open repair.

The mean difference in 36 of 37 randomized trials is 14.81 minutes (13). Patients experiences less pain after laparoscopic repair as compared to any open inguinal hernia repair. Complications were more commonly seen in Laparoscopic repairs earlier due to steep learning curve for the surgeons as compared to open approaches but nowadays it has become less after proper steps and protocols are followed (14,15).

Better post-operative outcomes has been reported with regards to reduced postoperative pain and early return to daily activity (16). Also Laparoscopic approaches allow assessment and treatment of the co-existing contra-lateral side inguinal hernia during the same operation without the need for further surgical incisions (17).

METHODOLOGY :

A randomized clinical trial was conducted in Subharti medical college and hospital, Meerut from September 2014 to December 2015. A total of 60 patients of inguinal hernia were included in the study All males above 18 year of age presenting with Un-complicated primary unilateral/ Bilateral, reducible, direct /indirect inguinal hernia, were included. Patients with co-morbid conditions were excluded. All patients were evaluated by history and clinical examination. They were allocated into two groups A and B according to patients choice and compliance of anaesthesia as laparoscopic (TEP) inguinal hernia repair (Group A) was done under general anaesthesia and open inguinal hernia repair (Group B) was done under spinal anaesthesia.

Outcome was compared in demographics and perioperative details with post-operative data. The study was done to compare the effectiveness and safety of laparoscopic totally extra-peritoneal repair (TEP) and conventional open lichtenstein hernia repair in the treatment of inguinal hernia in terms of operating time and techniques used, recovery, intra-op and post-op complications, cost of hospitalization. Patient who came with recurrent inguinal hernia and congenital hernia were excluded from the study.

For group A, laparoscopic repair was performed with total extra-peritoneal approach. A 10 cm x 15 cm polypropylene mesh was placed in the preperitoneal pocket and fixed with tackers.



Photo 1 : Port placement in Laparoscopic TEP Repair.

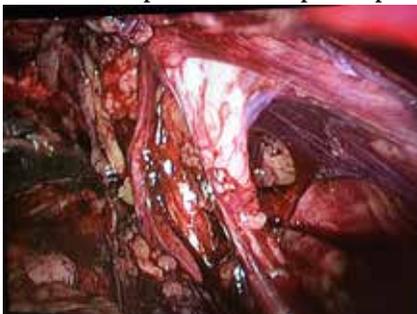


Photo 2: Laparoscopic dissection done in extra-peritoneal space.



Photo 3 : Mesh placement done in pre-peritoneal space in laparoscopic repair.

For group B, Lichtenstein repair was performed through suprainguinal incision. The posterior wall was strengthened with the 10 cm x 15 cm polypropylene mesh fixed with polypropylene suture.



Photo 4 : Supra-inguinal incision in open inguinal hernia repair.

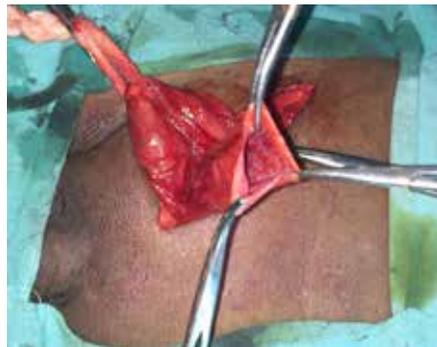


Photo 5 : Identification of sac and reduction of contents in open repair.



Photo 6 : Mesh placement and fixation in open inguinal hernia repair.

Frequency and percentages were calculated for all variables; intra-op and post op complications, duration of hospital stay, cost of hospitalization, recurrence etc. Mean and standard deviation were calculated for numerical variables like age. For comparison of group A and group B Chi square test or Fisher's Exact test was applied. A p value of < 0.05 or less was taken as significant.

OBSERVATION & RESULTS:

Demographics for Cases operated by TEP and Open Hernioplasty were:

- Age of the patients were between 18 years to 76 years.
- All cases included in the study were male.
- Right sided Inguinal Hernia were 38. Left sided Inguinal Hernias were 22.
- Indirect Inguinal Hernia were 41 cases. Direct Inguinal Hernia were 19 cases.
- Laparoscopic Total Extraperitoneal repair was done under endotracheal intubation, General Anaesthesia. Open Lichtenstein Hernia repair was done under Spinal Anaesthesia.

Perioperative Outcomes between Laparoscopic (TEP) and Open Lichtenstein Hernioplasty Repair were:

- Operative Time: Mean time of 49.42 mins in open repair as compared to 83.96 mins in TEP.
- Hospital Stay: 3.5 days in laparoscopic repair as compared to 6.8 days in open repair
- Cost of Hospitalization : 5234 in open Lichtenstein repair as compared to 7636 in Laparoscopic inguinal hernia repair.

Intra-op complications were :

- Bleeding was seen in 1 case of Laparoscopic (TEP) inguinal hernia repair as compared to none in open Lichtenstein hernia repair.
- Peritoneal tear occurred in 3 cases of Laparoscopic inguinal hernia repair which may be due to learning curve
- Vas deferens injury, Bladder injury and Bowel injury were absent in both the groups.

Post-Operative Complications between TEP and Open Hernioplasty Repair were:

- Hematoma was seen in 1 case of open Lichtenstein inguinal hernia repair as compared to none in Laparoscopic (TEP) inguinal hernia repair.
- Wound infection was present in 2 case of open Lichtenstein inguinal hernia repair as compared to none in Laparoscopic (TEP) inguinal hernia repair.
- Seroma developed in 2 cases of open Lichtenstein inguinal hernia repair as compared to none in Laparoscopic inguinal hernia repair.

DISCUSSION :

This study compared two tension-free, mesh-based extraperitoneal hernia-repair techniques: Group (A) Laparoscopic (TEP) inguinal hernia repair and Group (B) Open Lichtenstein inguinal hernia repair. Intra-operative complications were more in case of laparoscopic (TEP) inguinal hernia repair (peritoneal tear being the most common complication) and postoperative complications were more frequent in the open Lichtenstein inguinal hernia repair.

These results are consistent with others studies which have reported that patients who underwent laparoscopic repair returned to their usual activities one day sooner than those who underwent an open repair. Laparoscopic repair compared favourably with Lichtenstein repair for primary indirect and direct hernias, bilateral recurrent hernias (18).

Advantages of Total Extraperitoneal Laparoscopic Repair:

The laparoscopic operations caused significantly less pain in the early post-operative period, leading to earlier mobilization and earlier return to work than open mesh repair. Furthermore, laparoscopic TEP repair is associated with greater patient satisfaction and better cosmetic results than its open counterpart. On the basis of these early experiences, laparoscopic extraperitoneal hernia repair seems to be as good as, if not superior to, the existing open Lichtenstein repair in terms of less hospital stay, return to work, and cosmesis provided the long-term recurrence rates also are comparable.

It is possible to achieve high standards even during the learning phase of the surgeon if there is strict adherence to the protocols (19). The TEP technique took no longer to perform and was associated with a shorter period of sick leave and a faster recovery, compared with open Lichtenstein hernia repair. At present, the laparoscopic repair of hernias finds its clinical niche in patients with bilateral or recurrent hernias or in patients with unilateral hernia who desire a minimal period of postoperative disability (20).

Open hernia repair requires an incision at the point of maximum weakness, dividing of muscle and then suturing to repair the defect. This damage must heal before the wound become comfortable. Type of anaesthetic used to affect the repair does not affect the period of discomfort. In a laparoscopic repair no incision is made in the groin.

The small wounds which are made heal rapidly and have been shown to cause negligible postoperative pain. Further mesh is placed inside the groin muscle in the pre-peritoneal layer and this seems a more logical position to prevent peritoneal contents bulging out of a muscle defect than placing a mesh on the outside of the defect. Laparoscopic repair has no surgical weakness postoperatively.

Advantages of Open Hernioplasty:

Laparoscopic hernia repair is relatively costly; difficult to learn with a steep learning curve, carries the risk of serious visceral and or vascular injuries. All cases of groin hernia are not suitable for laparoscopic hernia repair as it is contraindicated in strangulated hernia, sliding hernia, irreducible hernia and patients who are elderly or have co-morbid conditions.

Laparoscopic hernia repair cannot be performed as day care surgery or under local anaesthesia. Open mesh repair is economical, easy to teach and learn without any steep learning curve. Open hernia repair does not need any specialized training and results are same in both specialist and non-specialist centre.

Open hernia repair does not carry any risk of serious visceral or bowel injuries. Open mesh repair is suitable for all types of groin hernias including strangulated, irreducible, sliding hernia or in elderly patients and patients with co-morbidity (21).

CONCLUSION:

We conclude that Laparoscopic (TEP) hernia repair is safe and provide less post-operative morbidity in experienced hands and definitely has many advantages over open Lichtenstein inguinal hernia repair like less post-operative pain and complications, less duration of hospitalization leading to earlier discharge and return to daily activities, better cosmetic results. Although some of the disadvantages found were increase in the total cost of surgery and better learning curve which can be overcome by earlier return to

work and daily activities along with improvement in minimal invasive surgery respectively.

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