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# A Comparative study of Laparoscopic Trans Abdominal Pre-Peritoneal Inguinal Meshplasty [TAPP] Versus Lichtenstein Open Inguinal Meshplasty

KEYWORDS

**Dr. Manish Kumar kashyap**

Resident ,Surgery , Dr. D.Y. Patil medical college and hospital, pimpri, Pune- 411018

**Dr. Virendra S Athavale**

Professor, Dr. D.Y. Patil medical college and hospital, pimpri, Pune- 411018

**Dr. D.S. Nirhale**

Professor, Dr. D.Y. Patil medical college and hospital, pimpri, Pune- 411018

**ABSTRACT** *Background: Hernia surgery has undergone tremendous refinement in technique. Various methods have been advocated by different authors but each has got its own merit. Lichtenstein open inguinal meshplasty (LOIN) involved placement of a mesh over the floor of the inguinal cannel .It is a tension free repair in contrary to Bassini and Shouldice suture repair. Laparoscopic Trans-abdominal Pre-Peritoneal meshplasty (TAPP) is a newer technique which results in less post operative pain, better cosmetic result, improves recovery. The aim of the study was to compare operative time , early complication & recurrence that occurs from both laparoscopic TAPP repair and Lichtenstein repair in patients of inguinal hernia. Mathodology : The present study comprises 25 cases underwent open Lichtenstein mesh repair and 25 cases underwent laparoscopic After surgery all patients were monitored carefully for pain, bleeding, wound infection and seroma formation. Patients were followed up to one year at regular interval postoperatively. Results : In our study duration of surgery in Lichtenstein operation was 45.59 minutes whereas in laparoscopic TAPP repair was 56.39 minutes in case of unilateral inguinal hernia repair. Group A is having significantly more cost of treatment than Group B in unilateral and not significant in bilateral. The hospital stay was significantly low in group A than Group B. Conclusion: Lichtenstein repair, which can be done under regional anaesthesia is a safe and economic technique. With the advancement of minimally invasive surgery laparoscopic hernia repair is gaining popularity. The laparoscopic approach to inguinal hernia surgery is safe and simple and considered to be an appropriate approach for inguinal hernia surgery. mean operative time was more in TAPP as compared to Lichtenstein's meshplasty, post-operative stay in TAPP was less than Lichtenstein's meshplasty, TAPP repair is more expensive compared to Lichtenstein's meshplasty, TAPP repair is associated with faster recovery as compared to open Lichtenstein meshplasty.*

**Introduction.:**

A hernia is a protrusion of a whole or part of a viscous through the wall that contains it. Of the study of the many operations available in a general surgeon's armamentarium, that of hernia repairs has been written about repeatedly [1].The rapid changes that have been witnessed in open approach surgeries, prosthetic materials and laparoscopic surgeries have made hernia surgery, a most interesting field of endeavor that demands renewed discipline and dedication[2] . Though a variety of procedure are performed, none can be termed as an ideal procedure as each one is accompanied by various complications, the most significant being recurrence. In 1981, William Bull, one of the most prominent Surgeons, wrote of hernia repairs, "It is wise to estimate the value of given procedures by the relative proportions of relapses" [3]

The principles governing the moderm techniques of inguinal herniorrhaphy were firstdescribed in the latter decades of the nineteenth century. There has been considerabledebate over the years as to whether Henry Marcy or Eduardo Bassini should haveprecedence in the claim that they developed these principles. In 1871, Marcypublished a description of inguinal hernia repair entitled "A new use of carbolisedcatgut ligatures". Later, in 1892, he claimed to be the first surgeon to have repairedthe deep ring.[4] In 1987, Lichtenstein published a report on his personal experience with over 6,000inguinal hernia repairs. In this paper he described the routine use of polypropylenemesh to reinforce a plication repair for all direct and recurrent hernias. The externaloblique aponeurosis was sutured behind the cord, which transplanted it to a subcutaneous position. After a follow-up of between two and fourteen years fortythree (0.7%) recurrences were reported, the majority of which were attributed to excessive tension in the repair. Lichtenstein therefore refined his repair to avoid suture line tension. Capozzi et al. reported the use of prosthetic repair for all adult inguinal herniasexcluding Nyhus type 1. [5]

In this series the posterior wall of the canal was reinforcedusing prolene mesh, which was fixed in place using a continuous prolene suturearound the entire margin of the prosthesis. Laterally the mesh was split and suturedaround the cord to reconstitute the deep ring. In this series two patients (0.3%)developed mesh infection and both settled with conservative treatment. Four recurrences (0.6%) were recorded from 651 patients followed up for an average offive years. Laparoscopic hernia repair has been developed over past decade with promising result, though large randomized comparison studies have been published. Today TAPP has become the standard of care in inguinal hernia. But, it has been criticized for technical difficulties, cost and long learning curve. The newly developed Trans Abdominal Pre-peritoneal laparoscopic repair(TAPP),combines the advantages of minor access surgery and mesh reinforcement of the groin. This approach is associated with early postoperative return to usual activities with very low recurrence. In our Institution, inguinal hernia repair is one of the common surgeries performed daily. This study aims at studying the operative time, recurrence, complications, advantages, disadvantages, limitations, duration of hospital stay and the cost effectiveness between the open inguinal hernia mesh repair and laparoscopic Transabdominal Pre-peritoneal meshplasty [TAPP] and to arrive at a conclusion as to the best modality of treatment after comparison of morbidity and recurrence of these procedures among them and in relation to standard published material so this study aims at studying the operative time, duration of hospital stay and the cost effectiveness between the open inguinal hernia mesh repair and laparoscopic Transabdominal Pre-peritoneal meshplasty [TAPP] and to arrive at a conclusion as to the best modality of treatment after comparison of morbidity and recurrence of these procedures among them and in relation to standard published material.[6]

**Materials & Methods:** This is a prospective comparative study conducted at Dr. D.Y. Patil Medical College & Hospital And Research Centre, Pimpri, Pune- 18 between july 2014 to September 2016 on sample size-50 cases (2 groups of 25 patients each) where Group A for Laparoscopic Transabdominal Preperitoneal Repair(TAPP) & Group B for Lichtenstein Open Inguinal Meshplasty(LOIM). Institutional Ethical Committee clearance was obtained for the

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study. Patient aged between 15 to 65 years with uncomplicated hernia& unilateral and bilateral inguinal hernia were included in the study. Patient with complications like strangulated hernia, huge inguino scrotal hernias, and irreducible hernia. ,obesity e.g BMI more than 30, coagulations disorders ,co-morbidities COPD, Diabetes Mellitus, Hypertension, previous lower abdominal surgeries, patient unfit for G.A were excluded from the study Informed and written consent of the patient was taken and included in the study . In both the groupspolyprolene mesh of appropriate size (3*6 inch) was used for meshplasty. Anaesthesia was given depending upon type of procedure. General anesthesia for Laparoscopic Transabdominal Pre-peritoneal approach (TAPP) & spinal anesthesia forLOIM repair was given . Patients were given injection cefotaxime 1 gram i.v before induction of anaesthesia. Skin was cleaned with 10% betadine solution and draped.Incision was taken as per the various port-placement for TAPP approach and standard & groin incision for LOIM approach.In both the groups,the intraoperative findings were noted i.e direct or indirect sac,adhesions and contents of sac.. Operative time in (minutes) was calculated starting from making incision till the closure of the incision in open mesh and from introduction of trocar till the removal of trocarin (TAPP). Patients discharged after doing check dressing on 5th post- operative day in LOIM and called for suture removal on 10thpostoperative day. Patients who had discharge or signs of surgical site infections were kept in ward and observed for any wound gape. In TAPP, check dressing done on 2nd post operative day and follow up on day 8th for suture removal.Patients were asked to follow up after 3,6, 9 and 12 monthspost surgery to see for anycomplication like recurrence.

**Observation and Results.**

Total 50 cases were studied. Majority of the cases i.e. 10 were in the age group 46 - 55yrs and 56 to 65 yrs followed by 4 cases in 36 to 45 yrs in Group A. In Group B majority of the cases i.e. 12 were in the age group 46 – 55 yrs followed by 11 cases in 56 to 65 yrs. Difference in age in both groups is not statistically significant. (p>0.05).

Out of total 50 cases were 48 are male & 2 females. In Group A 23 are male &2 female while in Group B 25 were male & no females.

Majority of cases i.e 41 were having unilateral, in which group A contains 19 & group B 22 cases while 9 cases having bilateral, of which 6 cases in group A & 3 cases in group B and the difference in laterality in both groups is not statistically significant. (p > 0.05).

**Table 1:Comparison of operative time in group A and group B.**

| Oprative | Group A | | Group B | | t Value | P Value |
|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | | |
| Unilateral (mints) | 56.39 | 13.42 | 45.59 | 5.84 | 4.22 | <0.0001 |
| Bilateral(mints) | 114 | 8.37 | 79.67 | 4.72 | 7.85 | <0.0001 |

The above table shows comparison of operative time in group A and group B. In unilateral the mean operative time in group A was 56.39 minutes and group B was 45.59 minutes while in bilateral the mean operative time in group A was 114 and group B was 79.67. The operative time was significantly more in group A than group B. (p < 0.05).

**Table 2:Comparison of hospital stay in group A and group B.**

| Parameter | Group A (n=25) | | Group B (n=25) | | t Value | P Value |
|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | | |
| Hospital stay (days) | 2.76 | 0.78 | 6.96 | 3.56 | 5.75 | <0.0001 |

The above table shows hospital stay in group A and group B. The maximum mean stay is with group B i.e. 6.96 daysfollowed by 2.76 days in group A. The hospital stay was significantly low in group A than Group B. (p > 0.05).

**Table 3: Comparison of cost of treatment in group A and group B**

| Parameter | Group A (n=25) | | Group B (n=25) | | t Value | P Value |
|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | | |
| Unilateral (Rupees) | 1502.1 | 34.6 | 1263 | 114 | 9.40 | <0.0001 |
| Bilateral (Rupees) | 1675 | 125 | 1550 | 86.6 | 1.75 | 0.14 |

The above table shows cost of treatment in group A and group B. In unilateral the maximum mean cost of treatment stay was Rs.1502.1 in group A and Rs.1263 in group B and in bilateral Rs.1675 in group A and Rs.1550 in group B. Group A is having significantly more cost of treatment than Group B in unilateral (P<0.0001) and not significant in bilateral. (p> 0.05).

**DISCUSSION.**

The present study is a hospital based comparative study to compare the outcome of both Laparoscopic inguinal hernia mesh repair (TAPP) and Lichtenstein open inguinal hernia repair on the basis of operative time, duration of hospital stay, cost of treatment, complications, and recurrence. Total 50 cases were selected & 2 groups of 25 patients each were included. Group A-Laparoscopic repair(TAPP) & Group B-Lichtenstein open inguinal meshplasty (LOIM) in the study.

Comparison of operative time in group A and group B. In unilateral the mean operative time in group A was 56.39 minutes and group B was 45.59 minutes while in bilateral the mean operative time in group A was 114 and group B was 79.67. The operative time was significantly more in group A than group B. (p < 0.05).(Table 4).In a study byB Mallayaet al [7/31](2016) it is clear that for TAPP, average time taken was more than other methods & may be because of more expertise requiring for this procedure.Similar findings were observed by Bo Johanssonet al [8/33] (1999) and Choudhury et al [9/ 34] (2016),A Comparative Study between Laparoscopic TAPP Repair and Lichtenste in Repair of Inguinal Hernia studied 60 cases of inguinal hernia showed duration of surgery in Lichtenstein operation was 40 minute whereas in laparoscopic TAPP repair was 129 min. Intra operative finding wise distribution of cases in group A and group B. The maximum Intra operative finding wasunilateral inguinal hernia 39 cases followed by bilateral inguinal hernia 11 cases.(Table 5). Similarly, In a study by B Mallaya et al [7/31] (2016) all the patients had uncomplicated inguinal hernia. 112 patients had unilateral while 48 had bilateral inguinal hernia. Similarly Pore M P et al [11/32] (2016) Comparison of Laparoscopic TAPP (TransabdominalPreperitoneal) and Laparoscopic TEP (Totally Extra peritoneal)Techniques for Inguinal Hernia Repair- An Observational Studyof 60 Cases.22 cases of indirect inguinal hernia and 8 cases of direct inguinal hernia in group A whilein Group B there were 25 cases of indirect inguinal hernia and 5 cases of direct inguinal hernia.

For hospital stay comparison in group A and group B the maximum mean stay with group B was 6.96 days followed by 2.76 days in group A. The hospital stay was significantly low in group A than Group B. (p > 0.05). (Table 2) Similar results were obtained by B Mallayaet al (2016) they found average length of stay was 2.8 days for TAPP which was significantly less than Lichtenstein method (4.2 days). The reduction in hospital stay after laparoscopic repair is likely to lead to savings in hospital costs.

In case of cost of treatment comparision in group A and group B, the maximum mean cost of treatment with group A was Rs.1462 followed by Rs.1325 in group B. Group A is having significantly more cost of treatment than Group B (p< 0.0001) (Table 3). In one study (1999)it was showed 12 that cost of treatment for TAPP is more as compared to open inguinal meshplasty. Similarly, In one study 13, In laparo-scopic repair mesh placement, the approach may be TAPP (transabdominal preperitoneal) or TEP (totally extraperitoneal) is associated with longer learning curve and was costlier than open repair. Laparoscopic procedure increases cost by use of general anaesthesia and placement of tackers for fixation of mesh. All

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laparoscopic repairs are more expensive than open repairs as reported by one study. 14 in UK. While Lichtenstein method is easy to learn, safe even for beginners and cost effective.15

In this comparative study of Laparoscopic Trans abdominal Pre-peritoneal Inguinal Meshplasty(TAPP) and Lichtenstein's Open Inguinal Meshplasty (LOIM) revealed that mean operative time was more in TAPP as compared to Lichtenstein's meshplasty. Our comparative study of Laparoscopic Trans abdominal Pre-peritoneal Inguinal Meshplasty(TAPP) and Lichtenstein's Open Inguinal Meshplasty (LOIM) revealed that mean operative time was more in TAPP as compared to Lichtenstein's meshplasty, post-operative stay in TAPP was less than Lichtenstein's meshplasty, TAPP repair is more expensive compared to Lichtenstein's meshplasty, TAPP repair is associated with faster recovery as compared to open Lichtenstein meshplasty.

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