

Evaluation of Outcome of Laparoscopic Transabdominal Pre Peritoneal Repair of Inguinal Hernia with Special Reference to Comparison of Result between Fixation and Non Fixation of Mesh

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Abstract: ***Aim:** This randomized prospective comparative study was done to evaluate and compare fixation with non-fixation of mesh in Trans abdominal pre peritoneal (TAPP) inguinal hernia repair in terms of postoperative complication, recurrence, pain (VAS) regarding the procedure and necessity regarding fixation of mesh. **Methods:** 60 patients with inguinal hernia were selected in which 30 patients were allotted to the group A for fixation of mesh and 30 patients to group B for non-fixation of the mesh during their hernia repairs by laparoscopic TAPP. **Results:** In fixation mean age was 42.36 and in non-fixation 42.44. The operative time for fixation was 95.83 min and for non-fixation 56.83 min ($p=0.000$). Using Visual analog scale, pain among fixation and non-fixation at 12, 24, 72 hrs, 1 and 6 months was statistically significant ($p<0.05$). Average Hospital stay for fixation was 3.63 days and for non-fixation was 2.93 days ($p=0.000$). Intra operative complication for fixation was 3.33% and for non-fixation was 0%, $p=0.313$. Postoperative complication for fixation was 10% and non-fixation was 6.6%, $p=0.640$. **Conclusion:** Stapling mesh in TAPP offers no advantage over non-fixation of mesh and non-fixation of mesh in TAPP appears to be a safer alternative with less pain, shorter operative time and shorter hospital stay.*

Keywords: Trans abdominal pre peritoneal (TAPP), Fixation of Mesh, Complication.

1. Introduction

Hernia repair is one of the most common operations performed by general surgeons. Seventy-five percent of all abdominal wall hernias occur in the groin. ⁽¹⁾ Male: female ratio for inguinal hernias is 7: 1. A hernia is repaired generally using a synthetic mesh either with open surgery or laparoscopic procedures. In early 1990s, a variety of trans-abdominal laparoscopic approaches were reported with trans-abdominal preperitoneal (TAPP) approach and the intraperitoneal onlay mesh (IPOM) techniques being the most common. In 1993 the laparoscopic total extraperitoneal (TEP) approach was reported which allows for mesh placement within the preperitoneal space. Wake BL, McCormack K, Fraser C, Vale L, Perez J, Grant A. Et al in 2005 reported no statistical difference between TAPP and TEP when considering duration of operation, haemotoma, length of stay, time to return to usual activity and recurrence. ⁽²⁾ Thus, this study was done for analysis of outcome in regards to intra and postoperative complications, duration of hospital stay, recurrence, pain regarding the procedure between fixation and non-fixation of mesh in Trans abdominal pre peritoneal laparoscopic repair of inguinal hernia.

2. Materials and Methods

This prospective study is conducted in surgical ward of SVBP Hospital affiliated to LLRM Medical College Meerut from October 2019 to September 2021 in patient with Inguinal Hernia. 60 patients with features of inguinal hernia were selected for the study. 30 patients were allotted to the group A for fixation of mesh and 30 patients to group B for

non-fixation of the mesh during their hernia repairs by laparoscopic TAPP using random allocation.

Inclusion Criteria

- Patient with inguinal hernia admitted in department of surgery, medically fit for general anesthesia and willing to undergo laparoscopic hernia repair.

Exclusion Criteria

- Patient not willing to participate.
- Patient had previous midline, paramedian or suprapubic incision
- Patient had acute or obstructed inguinoscrotal hernia and any conversion of Trans abdominal pre peritoneal repair to open repair.

Study Technique

Patient was subjected to Trans abdominal pre peritoneal repair of inguinal hernia, one group with fixation of mesh and another group without fixation. Fixation of mesh was done by tacker. Out of 60 patients 30 patients had undergone fixation and rest 30 non-fixation of mesh. The two treatment groups were well matched with regard to age. Each patient underwent thorough clinical history taking and physical examination. In clinical history details of onset, duration of hernia, associate risk factor like COPD, bladder outlet obstruction, and chronic constipation, any history of irreducibility and pain, and history of previous midline or paramedian incision. The patients were explained in details about the operative modalities and an informed consent was taken for Trans abdominal pre peritoneal inguinal hernia repair with fixation and without fixation of mesh. All the patients underwent thorough pre-anaesthetic checkup for general anaesthesia. All the patients were thoroughly

explained preoperatively regarding post-operative pain and methods of analgesia available.

Transabdominal Preperitoneal Procedure

A unilateral or bilateral inguinal hernia was assessed and repaired using a combination of three trocars. 10-mm trocar approximately 1 in supraumbilical and one 5-mm trocar in each lower quadrant at the level of the umbilicus at Para rectal was placed.

Care must be taken to avoid injuring the inferior epigastric arteries when placing the 5-mm trocars.

The patient was then placed in a Trendelenburg position and the pelvic anatomy was inspected.

Identification of the bladder, median, medial, lateral umbilical ligaments, and external iliac and inferior epigastric vessels was done. The inguinal hernia was identified in relation to this anatomy. The peritoneum at the medial umbilical ligament was then grasped and incised with endoscopic scissors.⁽⁴⁾

The incision was placed at 3 to 4 cm above the hernia defect to allow placement of a large mesh and allow for closure of the peritoneal defect at the conclusion of the procedure.

The incision was then carried laterally along a horizontal plane until the anterior superior iliac spine is reached.

Cord structures were exposed with blunt dissection.

Hernial sac was identified and skeletonized from cord.

The peritoneum was dissected inferiorly to the level of divergence of the vas deferens and spermatic vessels to allow a large, flat coverage of mesh.

Once the preperitoneum has been adequately dissected, the mesh prosthesis was placed of size measuring 10 x 15 cm (4 x 6 in), to completely cover the myopectineal orifice, and scrolled in a lengthwise fashion to facilitate easier handling.⁽⁵⁾

The mesh was then rolled lengthwise and placed through the 10-mm trocar with the aid of an instrument. The mesh was then unrolled in the preperitoneal space and secured to Cooper's ligament medially using a spiral tacker.

The mesh was then pulled relatively taut and fixed lateral to the anterior superior iliac spine, above the level of the iliopubic tract.

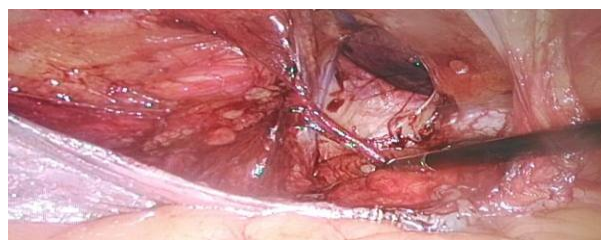
One of the greatest difficulties encountered in the TAPP procedure is the reapproximation of the peritoneum. Through the course of dissection, the peritoneum may

become denuded and prevent complete reconstruction and complete coverage of the mesh implant. After placing the mesh, as patient had been categorised in two groups in one group mesh was not fixed and another whom mesh was fixed using metallic tacker.⁽⁶⁾

Following mesh placement, the preperitoneal space was desufflated slowly and in a deliberate manner under direct vision to ensure proper mesh positioning. Once trocars were removed, the anterior rectus sheath were reclosed with an interrupted suture.

Postoperative patient was monitored daily for first three days with daily assessment of pain, day of ambulance and complication as port site bleeding, seroma formation, emphysema formation with the help of pretested and predesigned Proforma. Then followed up was at two weeks, one month, three months, six months, then every six monthly.

Chi-square test was used to analyse the final data for end result.



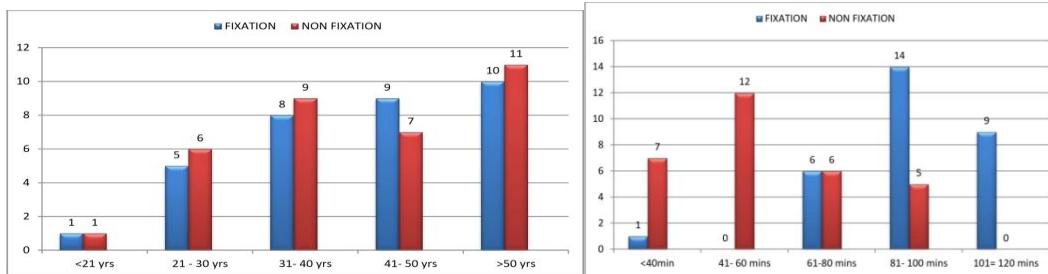
3. Results

This was a prospective comparative study (randomised control study) carried out in the Department of Surgery of SVBP hospital of LLRM Medical College in patients with inguinal hernia to compare fixation and non-fixation of mesh in TAPP inguinal hernia repair.

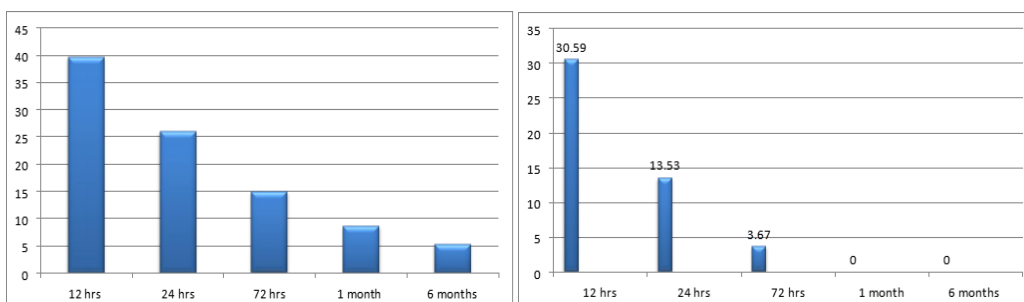
There was 30.30% of inguinal hernia patients in the fixation group and 32.35% in non-fixation group belonging to age more than 50 years.

Mean age of cases in fixation group was 42.36 ± 11.72 y and in non-fixation group was 42.44 ± 12.90 yrs, where pair t test = 0.0257 and $p = 0.979$.

This shows difference in mean age between two groups was not statistically significant ($p = 0.97$). Figure-2 depicts 3.33% of fixation and 23.33% of non-fixation groups required operative time less than 40 mins, fixation (0) and nonfixation (40%) required time 41 to 60 mins, fixation (20%) and nonfixation (20%) needed 61 to 80 mins, 81 to 100 mins required in 46.67% of fixation and 16.67% of non-fixation group, there was 30% of fixation group required 101 to 120 mins time.

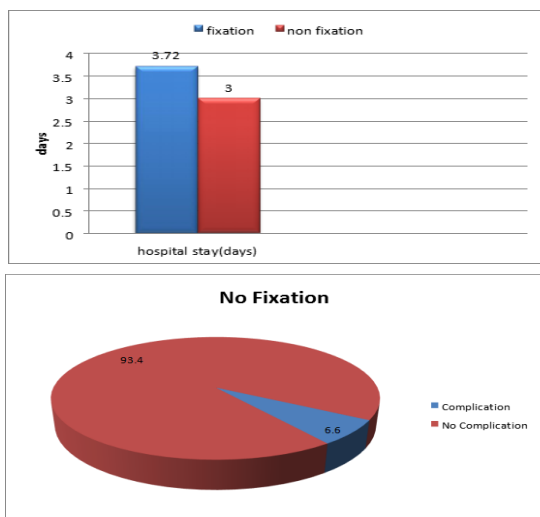


In this figure, during post-operative period of fixation group average pain score at different interval was 39.70 at 12 hours, 26.06 at 24 hours, 14.85 at 72 hours, 8.67 at 1 month and 5.33 at 6 months.



Average duration of hospital stay in fixation was 3.72 days and non-fixation 3.00 days with $t = 4.04$ and $p = 0.001$. Difference in average duration of hospital stay was statistically significant ($p = .001$)

Pie chart shows there was 3.33% intra operative complication in case of fixation of mesh. Pie chart shows there was no complication found in non-fixation of mesh. Pie chart shows only 6.6% complication was noted in non-fixation of mesh post operatively.



There was no recurrence in both groups during study period.

4. Discussion

This study comparing laparoscopic trans abdominal pre peritoneal inguinal hernia repair with fixation and without fixation of mesh has brought out a number of facts, some of which are in accordance with the literature while others differ.

F. Mayer et al 2016 conducted a study on 11, 228 male patients with the TAPP technique for a primary unilateral inguinal hernia and were followed up for 1 year. (7) Mesh fixation was used for 7422 (66.1 %) of these patients and no mesh fixation for 3806 patients (33.9 %). Unadjusted analysis did not find any significant difference in the recurrence rate (0.88 % with fixation vs 1.1 % without fixation; $p = 0.259$). Multivariable analysis of all potential influence factors (age, ASA, BMI, risk factors, defect size, mesh fixation, localization of defect, mesh size) did not identify any factor that impacted recurrence on 1-year follow-up. Only for medial and combined defect localization versus lateral localization was a highly significant effect identified ($p < 0.001$). With mesh fixation and larger mesh size, it was possible to significantly reduce the recurrence rate for larger medial hernias in this series ($p = 0.046$). For TAPP repair of inguinal hernia, mesh fixation is not necessary in a significant number of patients. Patients with a medial and combined hernia are at higher risk of recurrence. In the patient series analyzed, it was possible to significantly reduce the recurrence rate with mesh fixation and larger mesh size for medial defects.

Age:

In this study mean age of cases for fixation group was 42.36 ± 11.72 years and 42.44 ± 12.90 years for non-fixation group, 30.30% in fixation and 32.35% in non-fixation groups with age more than 50 years ($p=0.979$), which was statistically not significant.

Mean operative time

In our study the mean operative time for fixation group was 95.83 ± 18.804 and without fixation 56.83 ± 20.489 with $p=0.00$ which is comparable to the study conducted by Amirzargar 2013 in which operation time for mesh fixation and nonfixation was 68.09 and 21.10 minutes, respectively ($P < 0.001$).

5. Conclusion

We concluded from our study that there was a longer hospital stay in fixation group as compare to non-fixation group which was found to be statistically significant. Pain scores were more with fixation group which was found to be statistically significant. More operative time was needed ($p < 0.05$) with fixation group which was also statistically significant. No recurrence in both groups was observed during the study period.

This study concludes that stapling mesh in TAPP offers no advantage over non-fixation of mesh and non-fixation of mesh in TAPP appears to be a safer alternative with less pain, shorter operative time and shorter hospital stay.

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