

## Experience of Laparoscopic Total Extraperitoneal Inguinal Hernia Repair without Fixation of the Mesh

MUHAMMAD FAROOQ AFZAL, MUHAMMAD WARIS FAROOKA, WASIM HAYAT KHAN, ALLAH NAWAZ, USMAN BUTT, AWAIS AMJAD MALIK, MUBASHER SHAUKAT, SYED MUHAMMAD BILAL, MAHMOOD AYYAZ

### ABSTRACT

**Background:** The main aim of the study is to examine the recurrence rate and postoperative pain in laparoscopic total extraperitoneal repair (TEP) of inguinal hernias performed with and without fixation of the mesh.

**Methods:** This is a retrospective review of a prospectively maintained database and is conducted at a teaching hospital of Lahore. From the period December 1, 2007 to August 31, 2009, 23 patients (27 hernias) who had undergone TEP were included in the study. The main outcome variable was the short term recurrence rate.

**Results:** Of the 23 patients, the mesh was fixed (Fx) for 8 and not fixed (NFx) for 15. The commonest intraop complication (17 cases) was peritoneal tear leading to loss of space. The follow-up period ranged from 6 to 18 months (mean, 9 months). Two patients in the Fixation group and three patients in the Fx group developed recurrence. Majority of recurrence were noted in the first three months. There were two conversions, one to TAPP and other to open.

**Conclusions:** This small study found TEP without mesh fixation to be safe and feasible with no significant increase in recurrence rate activities but has a difficult learning curve.

**Key words:** Inguinal hernia, Extraperitoneal, mesh repair

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### INTRODUCTION

Laparoscopic hernia repair is now recommended as the method of choice for bilateral and recurrent inguinal hernias<sup>1</sup>. Majority of the surgeons now recommend doing total extraperitoneal (TEP) repair as it does not involve opening up of the peritoneal cavity and lesser chance of visceral injuries. However, TEP has the disadvantages of requiring general anesthesia and need for fixation of the mesh. These metal staples, in addition to increasing the cost, may lead to new postoperative groin pain<sup>1,2</sup>.

This has led to various studies showing that non fixation of mesh is quicker, safe, cost effective, associated with less pain, and leads to no increased risk of hernia recurrence compared with conventional open hernia repair<sup>8-13</sup>.

We also wanted to analyze our data to know whether the non fixation of mesh is associated with any increased risk of recurrence rates in the short term.

### MATERIALS AND METHODS

The study enrolled the patients who underwent TEP between the period from December 2007 to August

31, 2009 at a teaching hospital of Lahore. A single surgical team performed all the operations. A retrospective controlled analysis was conducted over 15 month period with 23 patients (27 hernias) who underwent laparoscopic TEP using a 10x15-cm polypropylene mesh. The recurrence rate at 1, 6 and 12 month was noted.

All reducible and incomplete inguinal hernias were included in the study. Large complete, obstructed and strangulated hernias, pediatric hernias were excluded from the study.

**Operative procedure:** The patient was kept in supine position. The operating surgeon and the first assistant (camera person) stood on opposite sides of the hernia. One monitor was used. A 1-2-cm subumbilical incision was made, and the rectus sheath was identified. A 1-cm vertical incision was made over the ipsilateral rectus sheath. The rectus muscle was retracted laterally, and the space between the rectus muscle and posterior rectus sheath was enlarged with a gauze piece for insertion of a 10-mm port cannula. After insufflations with carbon dioxide (CO<sub>2</sub>), the telescope was introduced through the 10mm port, and a space was created in the midline for access to the pubic ramus. After infiltration with local anesthetic (Bupivacaine) two 5mm ports then were inserted in the midline: one between the umbilicus

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Department of Surgery, SIMS / Services Hospital Lahore.  
Correspondence to Dr. Muhammad Farooq Afzal, Associate Professor Surgery

and the pubic symphysis and the other just above the pubic symphysis. The direct sac was identified lateral to the midline.

After reduction of the sac, the inferior epigastric vessels were identified. The internal ring was identified just lateral to the inferior epigastric vessels. Then the peritoneum was laterally reflected to deperitonealize the vas deferens and testicular vessels to the anterior superior iliac spine. Posteriorly, the peritoneum was reflected to the point at which the vas turns medially. A 15x10cm polypropylene mesh was inserted in the preperitoneal space through the 10-mm port. The mesh was placed without any wrinkles to cover all the fascial defects in the groin-Hasselbach triangle, indirect ring, femoral ring, and obturator ring. The mesh was not fixed in most of the patients. However, it was fixed in cases for which the dissection seemed unsatisfactory (due to factors such as bleeding, inadequate relaxation, and difficult dissection), or for cases with a large defect not likely to allow 3 to 5 cm of mesh outside the defect margin.

The mesh fixation was performed by a 5 mm stapler (Protak Autosture, Norwalk, CT, USA). Two staples were used to fix the mesh: the one at the Cooper ligament and the other just above the anterior superior iliac spine. Three injections of first generation cephalosporin antibiotic were given in the postoperative period. The patient was discharged next day with oral analgesia and five days course of oral antibiotic (first generation cephalosporin)

## RESULTS

A total of 27 hernia repairs were performed for 23 patients. Mesh fixation was done in 8 patients and not done in 15. The mean ages were 31.3 ± 12.5 years for the NFX group and 53 ± 6.3 years for the FX group. All patients were men.

The follow-up period was 6 to 18 months (mean, 12 months). The proportion of patients reporting pain both in first 24 hour and at one month higher in Fixation group. Incidence of urinary retention and hospital stay was more in the FX group than in the NFX group.

Two recurrences were reported in the fixation group and three in the non fixation group which were not found significant on chi square analysis.

## DISCUSSION

The issue of whether the mesh needs to be fixed in TEP repair of inguinal hernias is far from settled. Our results indicate that nonfixation of mesh is associated with no increase in recurrence rates,

lesser urinary retention, and pain after 1 month of surgery. Earlier studies have shown that non fixation of mesh is not associated with higher recurrence rates<sup>8-13</sup>. This was corroborated by our study.

We had only 3 recurrences out of 15 hernia repairs without fixation of the mesh. The presence of mesh between the peritoneal layer and the body wall leads to a sandwich effect, which helps stabilize its position and prevents any movement. The recurrence after nonfixation of mesh could be due to migration or folding of the mesh before the tissue in growth fixes the mesh. This would uncover the potential hernial defects and would be expected to cause an early recurrence<sup>4</sup>.

However, in our study, the patients in the mesh fixation group were older (53 ± 6.3) than the nonfixation patients (31.3 ± 12.5 years). This could be a confounding variable partly responsible for causing higher incidence of urinary retention in the mesh fixation group. To counter the problem of pain caused by tacks, several other methods have been used to fix the mesh, most notably the use of fibrin glue<sup>5</sup>. Novik et al.<sup>6</sup> reported significantly less postoperative chronic pain for patients whose mesh was fixed with glue compared with those who had mesh fixation with staple tacks. Lovisetto et al.<sup>7</sup> also demonstrated a significant lower incidence of postoperative neuralgia and earlier resumption of normal activities for 197 patients who underwent laparoscopic hernia repair using fibrin glue for mesh fixation.

The nonfixation of mesh also is cost effective. Ferzli et al.<sup>8</sup> showed that nonfixation of mesh resulted in considerable savings per operation. The two groups in their study were similar in terms of sex ratio, operating time, conversion rates, recurrent hernias, and bilateral hernias repaired.

Our study had several shortcomings. First, the incidence of overall recurrence is high. 5 out of 23 cases had recurrence. One reason is the learning curve for TEP is very long and difficult. Majority of the recurrence are supposed to be mesh migration at the time when extraperitoneal space was desufflated. Second, the fixation group sample was much smaller than the study group sample. Third, mesh fixation was used when available, for cases with difficult dissection or large defects. This could have led to a bias. However the prime purpose of the study was to show that TEP repair without mesh fixation is safe and associated with low recurrence rates. The technical points that must be given special care are adequate dissection, proper size of the mesh used, and accurate placement of the mesh in the preperitoneal space. From the findings

of this study, we can conclude with reasonable confidence that laparoscopic total extraperitoneal repair (TEP) of inguinal hernia performed without mesh fixation is safe cheaper, associated with less pain and no increase in recurrence rates in short term.

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