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Totally Extra Peritoneal Management of Inguinal Hernia Repair: Our Experience in a Public Sector Hospital

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ABSTRACT

Objective: To analyze the safety and clinical effectiveness of laparoscopic totally extraperitoneal (TEP) repair of inguinal hernia repair in terms of its surgical outcomes
Methodology: A retrospective observational study was carried out at Surgical Unit II, Benazir Bhutto Hospital, Rawalpindi Medical University. Patients aged between 20 to 70 years, presenting with unilateral, bilateral, or recurrent inguinal hernia, who underwent laparoscopic TEP hernia repair between January 2019 to January 2024 and completed their six-month to one-year follow-up were included in the study. Data was analyzed using standard SPSS version 26. The outcomes in terms of early and late postoperative complications were studied.
Results: A total of 76 patients were included in the study, males were 71 (93%) and 5 (7%) were female. 76 (73%) patients had unilateral hernia and 21 (27 %) patients presented with bilateral hernia. Six (8 %) patients presented with recurrent hernia. The majority of patients were in the age group of 45 to 65. Seroma formation was seen in 7 patients (9.2%). Wound infection with superficial surgical site infection was seen in 1 patient (1.3%). Mesh infection or abscess formation was not seen in any of the patients. Chronic pain was observed in 8 patients (10.5 %) and the rate of recurrence was seen in 3 patients (3.9%) at 6 months to 1-year follow-up.
Conclusions: Laparoscopic totally extraperitoneal (TEP) inguinal hernia repair is a safe and effective technique of inguinal hernia repair with good clinical outcomes.
Key Words: Laparoscopic, TEP, Recurrent Inguinal Hernia, Post-Operative Complications

Authors' Contribution:
[1,2]Conception; Literature research; manuscript design and drafting; [3,4] Critical analysis and manuscript review; [5,6]Data analysis; Manuscript Editing.

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Introduction

Inguinal hernia repair stands as one of the most frequently performed surgeries. An estimated 25% of men and 2% of women at risk of developing an inguinal hernia during their lifetimes.[1] The Lichtenstein repair, established in 1984, represents the gold standard technique due to its tension-free nature and consistently low recurrence rates over extended follow-up periods.[2] However, the global acceptance of minimally invasive inguinal hernia surgery, specifically the totally extraperitoneal hernia repair (TEP), is on the rise. This technique involves creating an extraperitoneal space without breaching the peritoneal cavity, thereby reducing the likelihood of visceral and vascular injury. TEP is technically complex requiring advanced anatomical knowledge, specialized training, and a long learning curve.[2] It has shown promising outcomes, including diminished postoperative pain, expedited mobilization, early return to regular activities, and

reduced mesh-related infection and recurrence rates.[3] The laparoscopic approach has also demonstrated advantages, particularly in cases of bilateral and recurrent hernias.[4] TEP enables the careful placement of mesh over the myopectineal orifice reinforcing the potential sites of direct and indirect inguinal hernia, femoral hernia, and obturator hernia.[5] This technique has gained popularity for primary and recurrent hernias, especially following prior open mesh hernioplasty repairs. The optimal technique for repairing inguinal hernias remains a subject of debate, and no consensus has been reached on the gold standard approach. The purpose of this study is to analyze the clinical effectiveness and efficiency of laparoscopic TEP in our setup and to determine surgical outcomes in terms of early post-operative complications like the development of hematoma or seroma, abscess formation with mesh infection, wound infection, and urinary retention and late complications like recurrence rate and chronic groin pain. This study could help in deciding the ideal procedure for a particular patient with an inguinal hernia and thus can contribute to improving long-term goals of patient care, wellbeing, and health in inguinal hernia repair.

Methodology

This was a retrospective observational study. The retrospective chart reviews were done and data was collected from hospital records with the help of a proforma. The study was conducted at Surgical Unit II, Benazir Bhutto Hospital, Rawalpindi Medical University after ethical approval from the institutional review board. Non-probability consecutive sampling technique was used and a total of 76 patients who underwent TEP repair between January 2024 and completed their follow-up were included in the study**.** Adult patients aged between 20 to 70 years, in surgical OPD with unilateral, bilateral, or recurrent inguinal hernia, undergoing laparoscopic TEP hernia repair were included. Patients with concomitant varicocele or undescended testes, a strangulated or obstructed hernia, and patients who were lost to follow-up were excluded from the study. Informed consent was obtain/9ned from all patients, and they were instructed to empty their urinary bladder prior to surgery. A standard three-port TEP repair was performed with all ports positioned in the midline. The surgeons opted for blunt dissection using a telescope alone to create the pre-peritoneal space, forgoing the use of a balloon dissector. Subsequently, the hernia sac was dissected and fully reduced, and careful attention was paid to exposing the "Myopectineal orifice of Fruchaud", as well as dissecting all potential hernia sites (direct/indirect) and femoral hernias. A 15 × 12 cm polypropylene mesh was inserted via a 10-mm trocar, unrolled, and placed within the preperitoneal space. The mesh was positioned to cover all three potential hernia sites, with placement extending from the pubic symphysis medially (with a 2 cm overlap to the opposite side) to the anterior superior iliac spine laterally. Mesh fixation was not undertaken. Paracetamol 1 gm vial every 8 hours was administered after the procedure along with antibiotic Amoxicillin clavulanic acid 1 gm in 12 hourly doses. Paracetamol tablets 8 hourly and tab Amoxicillin 1gm,12 hourly orally was given for 5 days on discharge at first operative day. Data was collected on a proforma. Patients were reviewed at 1st post-operative day, at one week, at 6 months, and 1 year after discharge. Various parameters such as early postoperative complications including wound infection, urinary retention, seromas or hematoma, abscess formation or mesh infection, and late complications including recurrence and chronic pain were observed. Wound infection was defined by the presence of surgical site infection, erythema, serous discharge or any swelling. The presence of purulent discharge in the wound was documented as abscess formation. Any mesh infection leading to the removal of mesh or mesh migration, or mesh

shrinkage was also observed. Urinary retention requiring Foley's catheterization was documented. Pain was measured on a Visual analog scale (VAS). The pain was measured by visual analogue score (VAS). Chronic pain was defined as pain persisting for more than two months with a VAS of 5 or more which requires analgesia. Recurrences defined as inguinal swelling observed at six months and at one-year follow-up and confirmed on U/S inguinoscrotal was also observed. Data was entered into a standard SPSS sheet version 26. Mean and standard deviation were used to measure the quantitative variables like age, while categorical data, including gender, laterality of hernia, and recurrent hernia, early and late postoperative complications were expressed in terms of frequency and percentage.

Results

In total 76 patients were included in the study. The majority of patients were male and presented with unilateral hernia as shown in table I. Only six patients had recurrent inguinal hernia. The mean age of the patients was 49 ± 7 years. Data was stratified for patients' age and showed that the majority of patients were in the age group of 45 to 65. Preoperative complications were also noted. One surgery was converted to open repair due to bleeding from the inferior epigastric artery. Early post-operative complications for which patients were assessed were seroma/hematoma formation, urinary retention, wound infection and mesh infection or abscess formation. Seroma and hematoma formation was seen in 7 patients (9.2%). Seroma formation settled spontaneously or XZcFCwith needle aspiration. Wound infection with superficial surgical site infection was seen in 1 patient (1.3%). This settled with oral antibiotics. Mesh infection or abscess formation was not seen in any of the patients (Figure 1). Patients were also assessed for late post-operative complications developing after two months of surgery, which included chronic pain.

Table I: Demographic features of patients undergoing Totally Extraperitoneal Inguinal Hernia Repair (TEP)

Variables	Values (n:76)
Mean Age	49 ± 7 years
Gender	
• Male	71(93%)
• Female	5 (7%)
Laterality of inguinal hernia	
• Unilateral hernia	55 (73%)
• Bilateral hernia	21 (27%)
Recurrent Inguinal Hernia	6 (8%)
Type of Hernia	
• Direct Inguinal hernia	59 (77.6%)
• Indirect Inguinal hernia	12 (15.7%)
• Both Direct and Indirect Inguinal hernia	5 (6.5%)

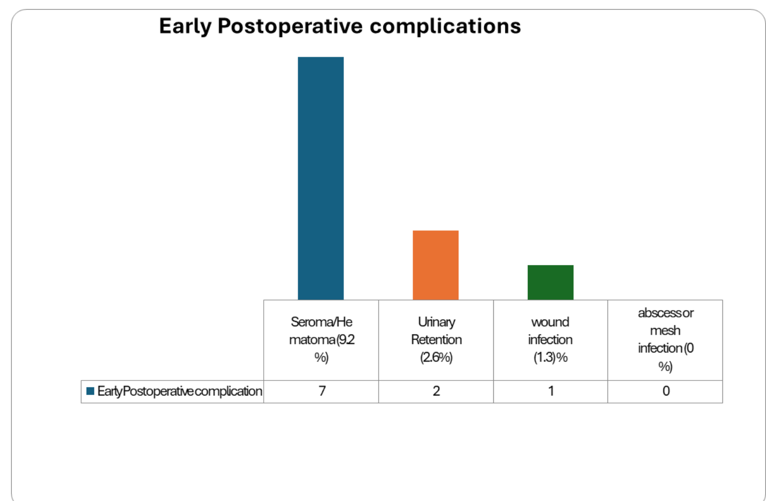

Figure 1: Early Postoperative complications

Chronic pain was observed in 8 patients (10.8 %) and the rate of recurrence was seen in 3 patients (3.9%) at 6 months to 1 year follow up and confirmed on

U/S inguinoscrotal done by consultant radiologist with the expertise of more than 15 years.

Discussion

The laparo-endoscopic repair has become a widely used and standard treatment option for groin hernias. Traditionally, inguinal hernias have been treated with open Lichtenstein hernioplasty. However, in the last two decades, the laparoscopic technique using the total extraperitoneal approach has become popular in the management of inguinal hernias.[4] The technique aims to avoid breach of the peritoneum and allows for the placement of mesh in the pre-peritoneal plane space. The mesh covers the entire "Myopectineal orifice of Fruchaud", providing treatment for femoral, obturator, direct, and indirect inguinal hernias.[5] TEP can be the procedure of choice for bilateral and recurrent inguinal hernias.[6] Several studies have shown that laparoscopic techniques have comparable results to open repair techniques.[6] In our study early postoperative complications noticed on 1st postoperative day and at 1st week included seroma or hematoma in 9.2% of the patients, urinary Retention was observed in 2.6% requiring urinary catheterization, wound infection was seen in 1.3% and mesh infection or abscess formation was not seen in any patient in our study. These results were comparable with other studies. According to WF Khan et al the post-operative complications comprise of ecchymosis in 1.2% of patients, hematoma in 0.6% of patients, 4 % of the patients had post-operative urinary retention, seroma in 9.4% and port site infection in 0.8% of the patients.[5] All were managed conservatively without any surgical intervention. [9]Seroma is the most common complication following laparoscopic hernia repairs.[6] Although seroma is a less dangerous complication, it impairs the quality of life for patients and adds the psychological stress of pseudo-recurrence. Seroma typically resolves on its own within 2 to 3 weeks. Laparoscopic hernia repairs have reduced the incidence of mesh and wound infection to 0.1–0.2% as opposed to open hernia repair, according to various studies.[6] Surgical site infection is uncommon following TEP surgery and mostly affects the umbilical port. The incidence ranges from 0.08% to 1.1% and is usually treated conservatively.[5] Mesh infection is a rarely reported but serious complication of hernia surgery. It may necessitate the removal of the mesh using either laparoscopic or open technique.[5] Elective hernia repair has a low recurrence rate and overall laparoscopic hernia repair is beneficial to the surgeons concerning improved and better postoperative clinical outcomes[1]. Recurrence with laparoscopic mesh repair is lower around 0–4% as the mesh is deeply seated.[5] Our study indicated that TEP repair has a recurrence rate of 3.9 % on follow up at 6 months to 1 year. Whereas Mehmood et al in their study evaluated that the recurrence rate was comparable with TEP to our results which is 3 to 5% but the recurrence rate with suture repair was higher reaching to 10 to 15 % .[1] The recurrences can be managed with open mesh repair. In our study, the incidence of chronic groin pain was 1.4%. This is in comparison with other studies. In one case series chronic groin pain was reported by 4 (2.5%) patients.[4] In a recent study, no patients experienced chronic groin pain after three months; however, 25 (4.9%) patients reported numbness and discomfort in the upper part of the scrotum and thigh during the 3-month follow-up.[5] Chronic pain after inguinal hernia repair is reported in approximately 10% of cases overall, presenting a formidable challenge.[7] In open repairs, the identification and safeguarding of the ilioinguinal, Iliohypogastric and genitofemoral nerves are pivotal in averting nerve entrapment injuries. Conversely, in laparoscopic repairs, it is imperative to place the tacks or sutures to secure the mesh carefully to avoid injury to the genitofemoral or lateral femoral cutaneous nerve injury.[8] This study had a low incidence of chronic pain because we did not use any mesh fixation technique. In our study, we observed an Inferior

epigastric artery (IEA) injury in one patient, which necessitated a conversion to open surgery to control bleeding. The incidence of serious intraoperative complications is minimal for both the TEP and TAPP (Transabdominal preperitoneal repair) procedures. However, major vascular injuries (with an incidence of less than 1%) are less common with TEP when compared to TAPP, largely due to the access-related advantage of TEP. TEP hernia repair has become increasingly popular among surgeons due to less postoperative pain, early return time to routine work, fewer complications, and acceptable recurrence rates compared with the other inguinal herniorrhaphy techniques.[9,10] However TEP repair of inguinal hernia had some disadvantages like a long learning curve, working in small space for dissection and mesh placement and crowded port placement.[7,10] TEP especially offers better results than Lichtenstein repair for treatment of bilateral herniand recurrent inguinal hernia with lower morbidity and less incidence of post-operative pain with subsequent earlier return to normal activities.[11,15] This study comprises a time duration of more than five years giving a good time for reviewing multiple factors and maintenance of following up of patients. The limitation of our study is that it is a single-center study with a limited sample size. This study also has the inherent bias as it was a retrospective study with outcomes in mind and it could not rule out selection bias.

Conclusion

Laparoscopic totally extraperitoneal (TEP) inguinal hernia repair is a safe and effective technique with good clinical outcomes. TEP has fewer early postoperative complications, less chronic postoperative pain and minimal recurrence.

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