

Research Article

Laparoscopic Management of Inguinal Hernia by TEP Technique - A Single Institution Experience

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Abstract

Objective: The purpose of this study was to evaluate the postoperative short and mid-term effects (like duration of stay, number and type of complications, and inguinal pain) of laparoscopic inguinal hernia repair using the Total Extraperitoneal (TEP) approach. The evaluation encompassed different types of mesh and fixation devices, as well as medications prescribed during hospitalization. TEP is performed in the preperitoneal space and was developed to avoid the risks associated with entering the peritoneal cavity. In experienced hands, this approach has the advantage of eliminating the risk of intra-abdominal adhesion formation. Total Extraperitoneal (TEP) repair for inguinal hernia was first reported in 1993. It has evolved to become a popular method of endoscopic repair of inguinal hernias. It involves placement of a prosthetic mesh in the preperitoneal space to cover all potential hernial sites in the myopectineal orifice. It also offers postoperative benefits in terms of reduced pain, faster recovery, earlier return to work and normal activity and better long-term comfort.

Materials and methods: Retrospective analysis of consecutive laparoscopic inguinal hernia repair by TEP approach done here at Saveetha medical college and hospital. 25 Inguinal hernia cases had undergone TEP procedure. Patient demographics, hernia characteristics, operative details, perioperative and postoperative complications, Universal Pain score were analysed.

Results: The 25 patients undergoing TEP were included in this analysis with appropriate matching in order to reduce bias between them. Mean operative time, blood loss, and length of hospital stay were assessed. Postoperative complications were also noted.

Conclusions: The TEP approach for inguinal hernia repair is safe and efficient method of managing inguinal hernias laparoscopically. Even Though the Learning Curve is a bit longer for TEP procedure when compared with TAPP, it has advantage of avoiding entry into abdomen.

Keywords: TEP Technique; Inguinal hernias; Abdomen

Introduction

Inguinal hernias are a very common pathology, originated from a defect in the abdominal wall and/or the inguinal canal, at a collagenous naturally weak region of the abdominal wall known as myopectineal orifice [1] Repair of this defect is one of the most frequently performed procedures in general surgery [2]. The 27% of men and 3% of women are at risk of developing inguinal hernia in their lifetime [3].

Inguinal hernia repairs can be performed by open or minimally invasive approach. Multiple studies have found that use of mesh in inguinal hernia repairs reduces the risk of recurrence compared to non-mesh approaches [4]. A Cochrane review showed that every 46 hernia repairs using mesh one hernia recurrence was prevented.

The concept of Tension Free Open Mesh Repair was first described by Lichtenstein in 1989. Ger reported the first laparoscopic hernia repair in 1982 by approximating the internal ring with stainless steel clips [5].

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The laparoscopic Trans Abdominal Pre-Peritoneal (TAPP) repair was a revolutionary concept in the hernia surgery and was introduced by Arregui and Dion in the early 1990s. The extraperitoneal approach is based on the time tested Rives-Stoppa technique [6].

Currently 5 laparoscopic techniques are available for repairing an inguinal hernia: Totally Extraperitoneal (TEP) repair, extended view Totally Extraperitoneal (eTEP), Transabdominal Preperitoneal (TAPP), Intra-Peritoneal on Lay Mesh (IPOM), and reduction of sac with or without closure of the ring. Classical TEP technique is considered closest to ideal for lap. Hernia repair but has several difficulties and drawbacks.

In TEP procedure, extra peritoneal space is created by open technique, and 10 mm port inserted in infraumbilical area. Extraperitoneal space is created by blunt dissection using telescope. Next Two 5 mm trocars are introduced in midline. Space of Retzius created, Space of bogras created and lastly the indirect sac is dissected from the cord structures. In complete hernias, sac is transected and endloop applied. In case of Bubonocoele, complete sac is reduced, finally parietalisation is done. In cases of direct sac, it is fully reduced from pseudosac and the pseudosac is inverted and fixed to the anterior abdominal wall. Mesh of size 10 cm × 15 cm used for covering the myopectineal orifice. Mesh fixed with one tackler in the coopers ligament (Figures 1-6).

Aim of the study

The aim of the study is to analyze the inguinal hernia patients who had undergone surgical repair by TEP technique in our hospital which is a tertiary care teaching hospital in Tamilnadu, India. Demographic data, unilateral or bilateral presentation recurrent

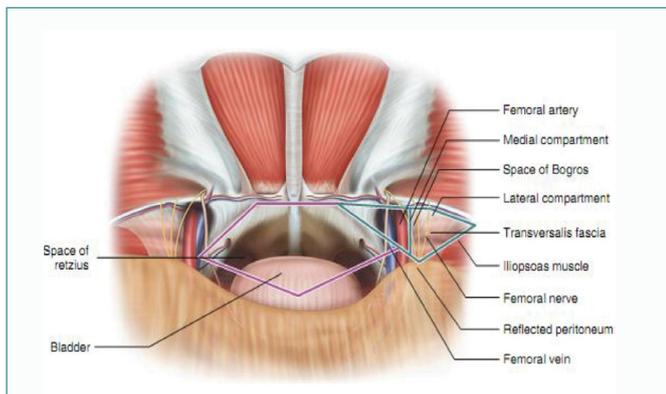


Figure 1: TEP anatomy.



Figure 5: Mesh placement.



Figure 2: Port placement - Midline ports in TEP technique.



Figure 6: Indirect sac.



Figure 3: Space of Retzius.

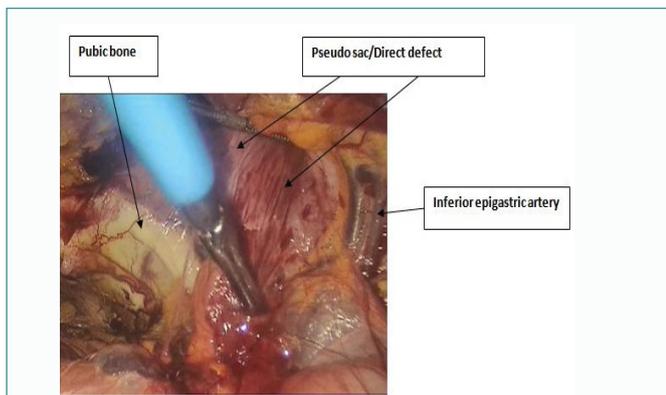


Figure 4: Parietalisation.

hernia, preoperative data, size of mesh used, no. of tackers used, duration of surgery, pre-op complaints, post -op complaints and pain, return to work all are analysed.

Material and Methods

It is Retrospective study conducted in saveetha medical college and hospital. The surgical record was browsed and cases with inguinal hernia operated by TEP technique were selected for study.

Inclusion criteria: Inguinal hernia, recurrent inguinal hernia, uncomplicated inguinal hernia, both unilateral and bilateral were included in this study.

Exclusion criteria: Age <18, Incarcerated hernia, Obstructed hernia, Strangulated hernia, were excluded from this study.

The records were perused and the following details were collected. After anaesthetic clearance, patients were operated by standard technique of totally extraperitoneal repair by a single surgeon. Operative time was recorded from the time of skin incision to closure of ports at the end of the procedure. Any intraoperative complications were noted.

For postoperative pain parenteral analgesics were given. Patient were monitored during their post operative period till day 3 and discharged as per their ambulation and dietary intake. Postoperative pain as assessed by VAS scale, postoperative complications like seroma, recurrence' hematoma or wound infection were noted. Duration of hospitalization, day of return to work was noted. Data analysed was expressed as average, percentage and mean ± SD, median (range) as appropriate.

Results

A total of 25 patients of age less than 18 years were included in the study based on the inclusion criteria, of which 22 patients were unilateral hernia and 3 patients were bilateral hernia. All the patients in this study were male. Distribution of the type of inguinal hernia included in the study is represented in Graph 1.

The mean operative time was 110.4 mins, ranging from 60 to 120 mins. In this bubonocele and direct hernia were able to complete in 60 minutes to 70 minutes time. Complete hernia and congenital hernia took longer time than this. In case of huge inguinal scrotal swelling time taken for surgery is bit longer. When there is complication like accidental pneumoperitoneum it has to be released with veress needle at palmer's point. In such situation time taken for surgery is bit longer Graph 2.

Reinforcement of the defect in the operation is done using 10 cm × 15 cm mesh in all the patients. Mesh used in all 25 surgeries of size 10 cm × 15 cm. Mesh was used to all three orifices in myopectineal are a namely direct, indirect and femoral orifice. All meshes were polypropylene and heavy weight meshes.

Usage of tackers used in series of 25 cases. Number of tackers used is mostly single; in some cases two tackers were reduced. Since TEP procedure there is much closed space the mesh which has been deployed doesn't have chance to migrate. In many series surgeons don't fix the TEP procedure that is also standard practice. In our 25 series of cases we have mostly fixed one single tackler at cooper's ligament and in some cases second tackler was applied to pubic bone.

In 10 cm × 15 cm Mesh, Medial cut was cut given in lower flap to avoid irritation to bladder and lateral oblique cut was given to accommodate cord structures. Mesh was rolled between 3/4th and 1/4th junction and sutured with 2-0 prolene to hold rolled up mesh for easy introduction in abdominal cavity and aligning the mesh appropriately. This method also allows us to handle the mesh easily in peritoneal cavity. Following this suture is divided and mesh is unrolled. Single tackers were used in 64% of the cases Graph 3.

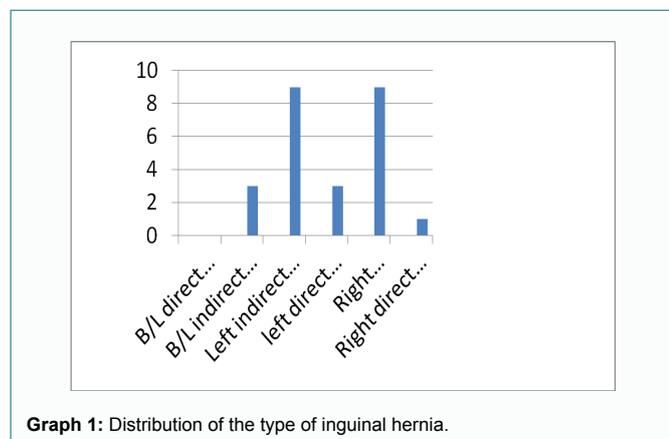
There were no intraoperative complications in most of the cases. Accidental pneumoperitoneum was encountered in 3 patients and conversion to TAPP in none. Intraoperative complications were managed conservatively. 3 patients had post operative complication of which 2 of them had subcutaneous emphysema. Seroma was noted in 4% of the cases which were conservatively managed. Haemtoma, wound infection did not happen in any of the cases Graph 4.

A total of 25 patients underwent TEP surgery on reviewing the results of all patients, the Intra operative and Post operative complications were less. All patients were mobilized early post op and faster return to work and pain was assessed with wong-baker faces pain scale in which 0-No Pain, 2-Hurts little bit, 4-Hurts little more, 6-Hurts more, 8-Hurts lot, 10- Hurts worst.

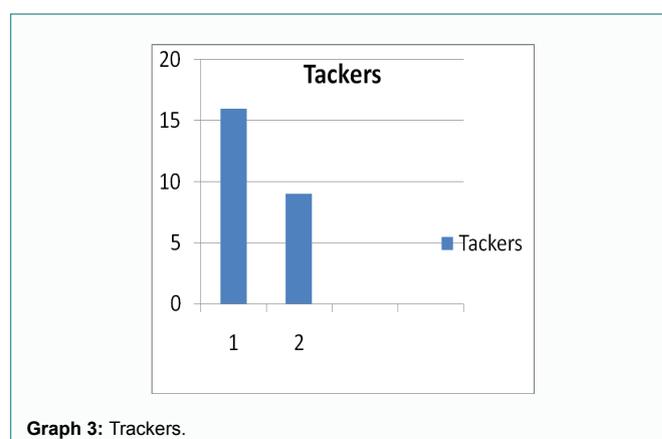
With the follow up of patients at least for 10 months all patients found to be comfortable and no recurrence was complained. Only 2 to 3 patients had an early post op complication which was managed conservatively Graph 5.

Discussion

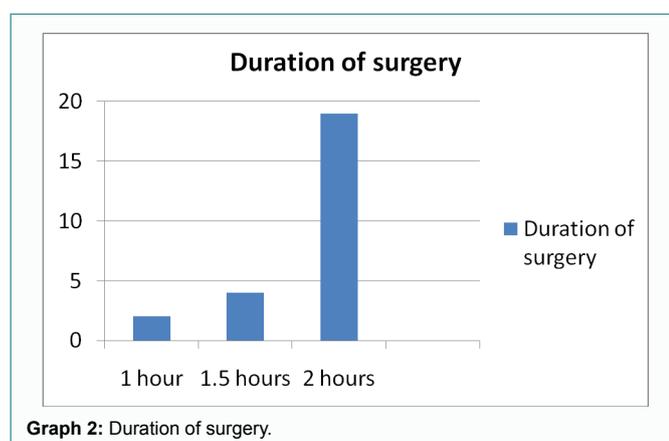
The goal of a hernia repair is to strengthen the weak abdominal



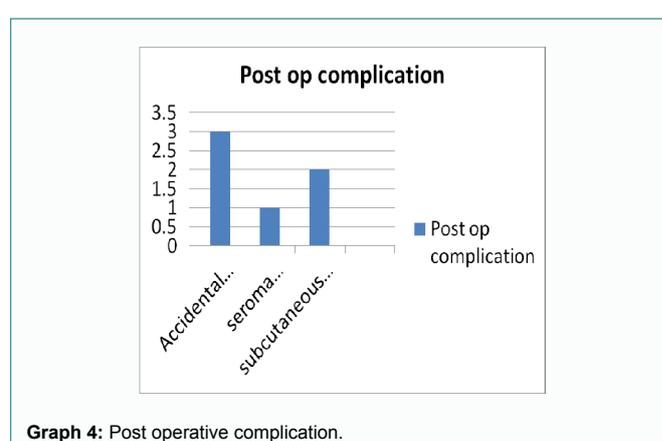
Graph 1: Distribution of the type of inguinal hernia.



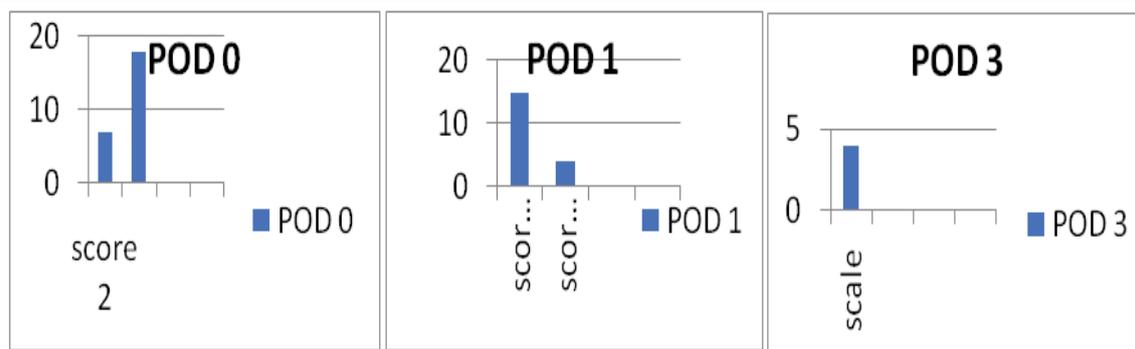
Graph 3: Tackers.



Graph 2: Duration of surgery.



Graph 4: Post operative complication.



Graph 5: Wong-Baker faces pain scale.

wall. In the laparoscopic procedure, the prosthetic mesh cover the entire groin area, including the sites of direct, indirect, femoral and obturator hernias. The totally Extra Peritoneal Procedure (TEP) combines the advantages of tension-free mesh reinforcement of the groin [7].

TEP Laparoscopic hernia repair has many advantages over TAPP method. The major advantages include less chance of visceral injury, less tackers used, less postoperative pain, earlier return to normal activities and work, better cosmetic results and cost effectiveness [8]. Major disadvantage of TEP are Limited space for dissection and mesh placement, restricted port placement, No triangulation, Poor tolerance to pneumoperitoneum, High learning curve. Laparoscopic inguinal hernia repair is a technically demanding procedure. A learning curve of at least 40cases is necessary to reduce the rate of complications and recurrences [9].

The mean operative time in this study is 110.4 minutes. Operative time lasts for 60 minutes to 120 minutes. Mean operative period in this study is more compared to the study conducted by Mir et al. [9,10]. There were no intraoperative complications in 72% of the case. Accidental pneumoperitoneum was encountered in 12% and there was no vascular injury. Due to intraoperative complications TEP procedures was converted to TAPP in 8% of cases. Intra operative complication was managed by creating additional space in 12% whereas most of it was conservatively managed [11-20].

Most common post operative complication that developed in this study is subcutaneous emphysema which accounts for 8%. Seroma developed in 4% patients in this study which is coherent with the study conducted by Mir et al. [9]. All patients who developed seroma postoperatively in this study were managed successfully with conservative management. Authors did not encounter any wound infection or hematoma formation in this study. There was no mortality in this study after 10 months of mean follow up (Table 1).

Conclusion

The TEP (Total Extraperitoneal) approach for laparoscopic inguinal hernia surgery is feasible and safe procedure. It appears to have less complication and more advantages to the patient. In spite of difficult learning curve of procedure the advantages include avoiding entry into the peritoneum and there by having the advantage of avoiding intra abdominal adhesions, visceral injuries, port site hernias, less number of tackers used, reduced pain, faster recovery, earlier return to work and normal activity.

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Table 1: Compared our study with a study made in victor babes university Romania.

	Saveetha medical university	Victor babes university
Gender	All male patients	All male patients
Mesh	10*15	14*10
Hours of surgery	60-120 min	60-100 min
Tackers	permanent trackers	permanent trackers
Intra op complicit when compared our study with a study made in victor babes university Romania action	pneumoperitoneum	Vascular injury
	Conversion to TAPP	Conversion to TAPP
	Mild pain	Mild - moderate pain
	Seroma	Bladder injury
	Subcutaneous emphysema	Seroma
Post op complication		Subcutaneous emphysema

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