International Journal of Medical Science in Clinical Research and Review
Online ISSN: 2581-8945
Available Online at http://www.ijmscrr.in Volume 05|Issue 05 (September-October)|2022|Page: 465-469
NLM ID: 101768774 **SJIF Impact Factor:** 5.782

Original Research Paper

The Laparo- Endoscopic Enhanced View Totally Extraperitoneal (e-TEP) Repair for Inguinal Hernia: Initial experience at Mahatma Gandhi Hospital, Jaipur.

Authors

[1]Dr. Abadhesh Sharma, [2]Dr. Deepak Bishnoi, [3]Dr. Sanjay Singhal, [4]Dr. Saroj Kapoor Chhabra, [5]Dr. Prashant Jain, [6]Dr. Bharat Bhushan Sharma

[1,2,3,4,5,6,]Mahatma Gandhi Hospital, Jaipur.

Corresponding Author: Dr Deepak Bishnoi MBBS MS Resident, *Mahatma Gandhi Hospital, Jaipur.*

Article Received: 27-07-2022 **Revised:** 17-08-2022 **Accepted:** 08-09-2022

ABSTRACT

Background: The laparo-endoscopic totally extraperitoneal approach for repair of inguinal hernia (TEP) is preferred technique over intraperitoneal approach because it does not penetrate the peritoneal cavity and intraperitoneal complications can be avoided but main limitation of this extraperitoneal approach is limited preperitoneal working space. For this, there is new novel Laparo-endoscopic technique enhanced view totally extra peritoneal approach (e-TEP) with less operative time, enlarged working space, no fighting of instruments, easily learned by residents, even for large inguinoscrotal hernia and in obese individual. We present our experience of e-TEP approach for inguinal hernia from a tertiary care centre in North India over one year duration. **Methods:** Electronically maintained data of patients who underwent e-TEP for inguinal hernia during a period of July 2021 to July 2022 was reviewed retrospectively. Their demographic data, intraoperative details, postoperative complications and follow up data for a period of 6 months was noted. **Results:** 37 patients underwent e-TEP repair for inguinal hernia. Out of 37 patients, 33 had unilateral inguinal hernia and 4 patients had bilateral inguinal hernia. There was no need for drain placement in any of the cases. No case was converted to open. No case was converted to open. Zero recurrence rate was noted. **Conclusion:** e-TEP is a minimally invasive approach which is safe, feasible and also avoids placement of mesh in peritoneal cavity.

Keywords: Laparoscopic, Hernia, eTEP

INTRODUCTION:

Inguinal hernia repair is one of the most performed surgeries worldwide. There are different surgical approach for doing inguinal hernia repair including TEP, TAPP, IPOM and primary repair in children. TEP repair has been a procedure of choice for inguinal hernia because it does not penetrate the peritoneal cavity thus peritoneal complications can be avoided. However, issues like limited working space, difficulty to proceed in the presence of pneumoperitoneum and difficult to proceed in presence of large inguinoscrotal hernia have prevented widespread use of this technique. The novel endoscopic Enhanced view-totally extraperitoneal(e-TEP) repair for inguinal hernia was introduced by Jorge Daes in 2012.This new concept provide large working space, minimal hindering of instruments, can proceed in the presence of pneumoperitoneum and minimizes conversion to TAPP. This endoscopic technique has small learning curve, and we think that it has potential to become surgeon's choice in inguinal hernia repair. In this article we present our short-term results of our experience in enhanced view totally extraperitoneal repair (e-TEP) for inguinal hernia.

METHODS:

This was a retrospective analysis of all patients who underwent e-TEP repair for groin hernia operated between July 2021 to July 2022. All surgeries were done at a single center by a single surgeon. Patients were followed after 1week and 3 months from discharge. Their demographic data including age, gender, BMI, comorbid conditions, operative time and post operative complications such as seroma, hematoma, conversion to tap/open, recurrence was noted.

SURGICAL TECHNIQUE:

The endoscopic e-TEP is done under general anesthesia with both arms tucked by the side of patients. We catheterize all the patients preoperatively.

The monitor is kept at foot end of patients. Surgeon stands opposite to the site of hernia. Hernial contents are reduced preoperatively and hernial sites are marked with a marker. If hernia is bilateral then dominant hernial site is chosen for camera port placement.

Salient technical aspects of e-TEP:

CAMERA PORT PLACEMENT:

In case of unilateral hernia, a 10-15 mm incision is placed in upper lateral quadrant of abdomen approximately 3 cm cephalad and 3 cm lateral to the umbilicus on the same side of the hernia. For bilateral hernias, the camera port is placed on dominant side of hernia. The incision is extended to the anterior rectus sheath and the sheath is incised and stay suture are taken with vicryl 2-0. Then rectus muscle is split out and posterior rectus sheath visualized. The retro rectus muscle space is dissected manually, and a balloon trocar is introduced along posterior rectus sheath to reach pubic bone. The balloon is inflated to create a working space. The surgeon stands on the opposite side of hernia and camera operator on same side of hernia.

PORT DISTRIBUTION:

Two additional working ports are placed in midline. We use the infra umbilicus 5mm as one working port and other 5mm port is placed in suprapubic region in midline. In some case in bilateral hernia, we use additional working 5mm port opposite to hernia.

DIVISION OF ARCUATE LINE:

In case of low-lying arcuate line interfering with visibility or small working space, the Douglas line is divided with the help of scissor.

STEPS OF HERNIA REPAIR:

1. Identify the pubic symphysis in the midline.
2. Bluntly dissect the cooper's ligament on both sides and this opens the space of Retzius.
3. Identify the Hasselbach's triangle and the three potential sites of hernia.
4. Identify and elevate the epigastric vessels.
5. Divide the arcuate line and bluntly dissect the space of Bogros up to the level of anterior superior iliac spine.
6. The sac is separated from the cord structures making sure not to injure the vas deferens and the testicular vessels.
7. A polypropylene mesh of adequate size is placed so as to cover the myopectineal orifice. The mesh can be fixed as per the surgeon's choice.

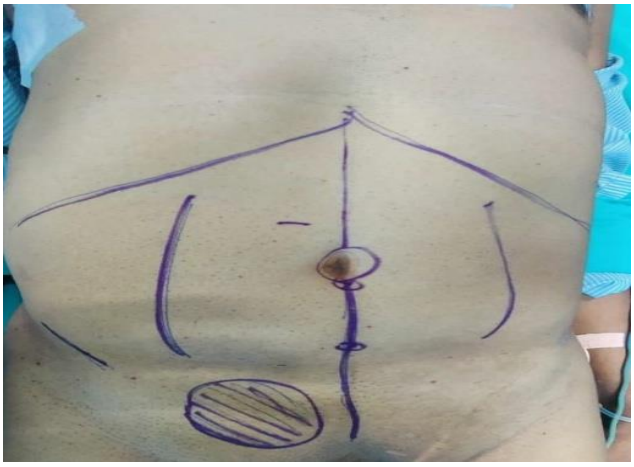

Fig 1 – Shows Pre Operative Markings

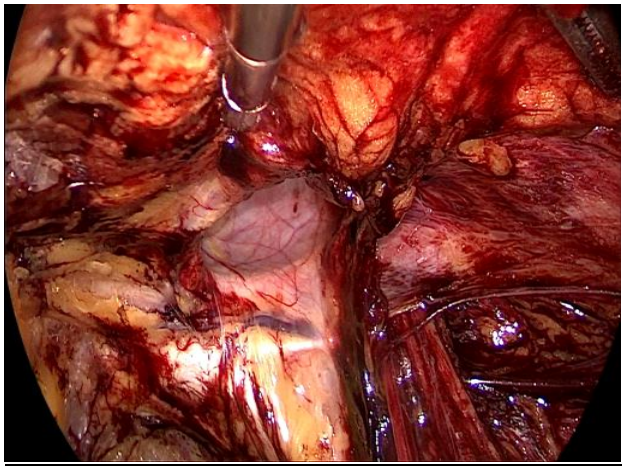

Fig 2 – Shows the Defect

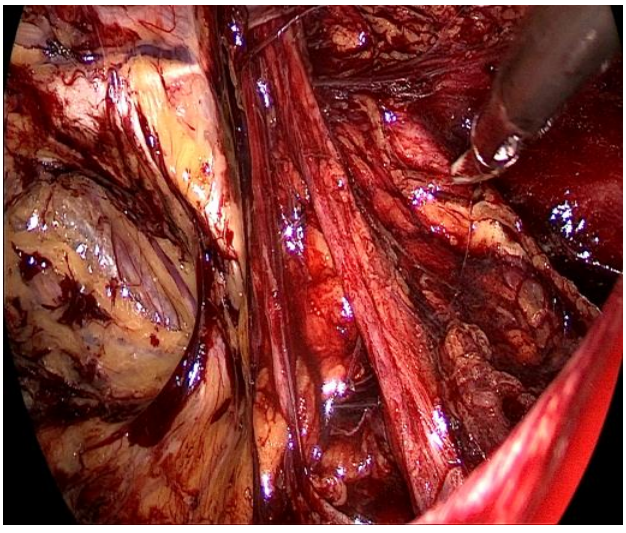

Fig 3 – Shows the Triangle of Doom and Triangle of Pain

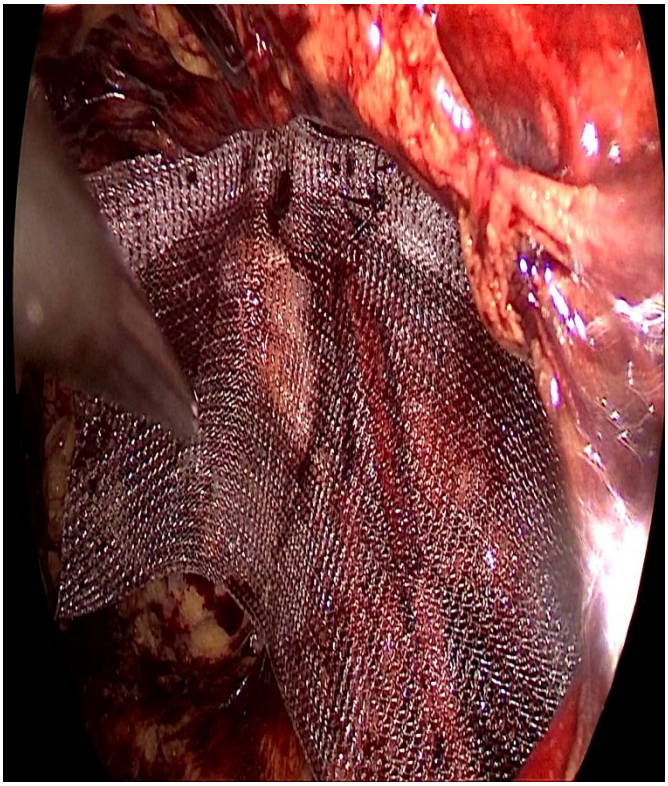

Fig 4 Shows the Mesh placement over Myopectineal Orifice.

Table 1 - Patients' characteristics and results -

Age(avg)	**39.2 yrs**
Gender Female Male	 **2** **35**
Smoking	**19 (51.35%)**
DM	**8 (21.62%)**
Hernia Unilateral Bilateral	 **0-33** **1-4**
Operative time	**U/L - 35.71 ± 33.74** **B/L - 60.43 ± 53 mins**
Conversion	**0**
Seroma	**2 (5.40%)**
Recurrence	**0**
Clavin Dindo classification **0** **1** **2** **3** **4** **5**	 **0-33** **1-4**

RESULTS:

A total of 37 patients underwent e-TEP for inguinal hernia. Out of these, 35 (39.76%) were males and 2 were females. Hypertension and Diabetes Mellitus were the most common comorbidities with smoking as most common addiction. The mean BMI of our patients was 28.2 ± 3.1 kg/m2. In the present study the mean mesh size used was 15*15 cm2. Our mean duration of surgery for unilateral hernia repair was 35.71 ± 33.74 minutes and mean duration for bilateral hernia repair was 60.43 ± 53 minutes. Mean length of stay (LOS) was 2.18 ± 1.27 days. Follow up at 7 days and 3 months were 96.35% and 78.71% respectively. Out of 37 patients, 33 had unilateral inguinal hernia and 4 patients had bilateral inguinal hernia. There was no need for drain placement in any of the cases. No case was converted to open. According to Calvin Dindo classification 33 patients were in [Grade 0] and 4 patients were in [Grade 1] who deviated from the normal postoperative course without the need for pharmacological treatment or surgical, endoscopic and radiological interventions. Zero recurrence rate was noted. There were 2 cases (5.40%) who developed seroma which was managed conservatively. There were no mortalities.

DISCUSSION:

Inguinal hernia repair is one of the most common surgeries performed worldwide, being performed in more than 20 million people annually. [14] Even a watch-and-wait approach in a minority of asymptomatic group of patients result in surgery in approximately 70% within 5 years. [15] The recurrence rate following inguinal hernia repair is still expected to be as high as 11%. [16] 57% of all inguinal hernia recurrences occurred within 10 years after the previous hernia operation, and remaining 43% of recurrences happened even after more than 50 years. Laparoscopic TEP approach for inguinal hernia repair is an excellent approach with results as good as or even better than Lichtenstein's mesh repair according to some studies [9, 10]. Despite being a good approach, it provides a limited working space for dissection. J. Daes conceptualized Extended View TEP (e-TEP) for difficult inguinal hernias, obese patients, presence of previous surgical scars, by placing the camera port higher. The principle is to create a larger space than what is done in TEP to tackle large groin hernias. It is believed that mesh placement in retro muscular space translates into vascularization of the mesh from both sides, translating to less recurrence, solving fixation issues, less pain and reduced chances of bowel adhesions in addition to being economical due to the deployment of a cheaper mesh as composite mesh with anti-adhesion barrier is not needed. [17] This

modification then enabled to create the extraperitoneal space from anywhere in anterior abdominal wall [10]. Novel application of e-TEP approach for ventral hernia was first reported by Belyansky and later by others [11, 12].

Indications for eTEP

We use the e-TEP technique to repair most cases of inguinal hernias; however, there are cases for which e-TEP is especially useful.

1. For the novel surgeon: e-TEP is easier to master for surgeons new to the technique. In our clinical immersion courses, most of the trainees are surgeons who have only performed TAPPs and have no TEP experience. Notably, in follow-up surveys, most of the surgeons (80%) incorporated the e-TEP technique in their practices.
2. Obese or post-bariatric patients: e-TEP allows the surgeon to avoid the difficulties caused by the pannus; in addition, the subcutaneous tissue is thinner higher in the abdomen.
3. When the distance between the umbilicus and pubic tubercle is short.
4. In patients with previous pelvic surgeries.
5. Wide variety of indications: with experience, surgeons can expand the indications for e-TEP for inguinal hernia repair to cases of large inguinoscrotal, sliding, or incarcerated hernias. This may require combination with a 5 mm laparoscopic intraperitoneal approach to verify the viability of the intestine or assist in reducing the incarcerated content.

CONCLUSION:

The e-TEP technique has a place in the armamentarium of hernia surgeons. Residents and surgeons early in their experience will find this technique easier to master than the classic TEP method. It can expand the traditional indications of the extraperitoneal approach to patients with a difficult body habitus, a short umbilicus-pubis distance, and previous pelvic surgery. As the surgeon's experience increases, the indications for the traditional TEP technique can be expanded to more complex cases.

Modus operandi, mastery of the anatomy, and meticulous direction are the 3 M's that need to be remembered in order to perform e-TEP with reproducibility, safety, efficiency and good outcomes. Mastery of the anatomy of the versatile pre-peritoneal space allowed surge1ons to become facile in operations such as prostatectomies and retroperitoneal node dissections (13). When performed sequentially and followed religiously, this technique here allows for improved outcomes and serve as a good teaching base for surgeons training to perform e-TEP repair.

REFERENCES.

1. Daes J. Reparolaparoscopico de la hernia inguinal. Experiencia de la Unidad de Laparoscopia. Clinica Bautista, Barranquilla, Colombia. Rev Colomb Circ. 1999;14:97–103.
2. Wake BL, McCormack K, Fraser C, Vale L, Perez J, Grant AM. Transabdominal preperitoneal (TAPP) vs totally extraperitoneal (TEP) laparoscopic techniques for inguinal hernia repair. Cochrane Database Syst Rev. 2005. doi:10.1089/lap.2008.0212
3. Leibl BJ, Jager C, Kraft B, Swartz J, Ulrich M, Bittner R. Laparoscopic hernia repair—TAPP or/and TEP? Langenbecks Arch Surg. 2005;390:77–8.
4. Ferzly G, Sayad P, Vasisht B. The feasibility of laparoscopic extraperitoneal hernia repair under local anesthesia. SurgEndosc. 1999;13:588–90.
5. Ismail M, Garg P. Laparoscopic inguinal total extraperitoneal hernia repair under spinal anesthesia without mesh fi xation in 1,220 hernia repairs. Hernia. 2009;13:115–9.
6. Daes J. The enhanced view- totally extraperitoneal technique for repair of inguinal hernia, answer to letter to the editor. SurgEndosc. 2012;26:3693–4.
7. Daes J. The enhanced view- totally extraperitoneal technique for repair of inguinal hernia. SurgEndosc. 2012;26:1187–88.
8. Daes J. Endoscopic repair of large inguinoscrotal hernias: management of the distal sac
9. Köckerling F, Stechemesser B, Hukauf M, Kuthe A, Schug-Pass C (2016) TEP versus Lichtenstein: Which technique is better for the repair of primary unilateral inguinal hernias in men? SurgEndosc 30(8):3304–3313. https://doi.org/10.1007/s00464-015-4603-1
10. Feliu X, Clavería R, Besora P, Camps J, Fernández-Sallent E, Viñas X et al (2011) Bilateral inguinal hernia repair: laparoscopic or open approach? Hernia 15(1):15–18
11. Belyansky I, Daes J, Radu VG, Balasubramanian R, Reza Zahiri H, Weltz AS et al (2018) A novel approach using the enhancedview totally extraperitoneal (eTEP) technique for laparoscopic retromuscular hernia repair. SurgEndosc 32(3):1525–1532
12. Baig S, Priya P (2019) Extended totally extraperitoneal repair (eTEP) for ventral hernias:

Short-term results from a single centre. J Minim Access Surg 15(3):198
13. Sayad P, Ferzli G. The extraperitoneal approach and its utility. Surg Endosc 1999;13:1168-9.
14. Hernia Surge Group. International guidelines for groin hernia management. Hernia. 2018;22:1-165. https://doi.org/10.1007/s10029-017-1668-x
15. Fitzgibbons RJ, Ramanan B, Arya S, Tumer SA, Li X, Gibbs JO, et al. Long-term results of a randomized controlled trial of a nonoperative strategy (watchful waiting) for men with minimally symptomatic inguinal hernias. Ann Surg. 2013;258(3):508-515. https://doi.org/10.1097/sla.0b013e3182a19725
16. Köckerling F, Koch A, Lorenz R, Schug-Pass C, Stechemesser B and Reinpold W. How long do we need to follow-up our hernia patients to find the real recurrence rate? Front Surg. 2015;2:24. https://doi.org/10.3389/fsurg.2015.00024
17. Binnebösel M, Klink CD, Otto J, Conze J, Jansen PL, Anurov M, et al. Impact of mesh positioning on foreign body reaction and collagenous ingrowth in a rabbit model of open incisional hernia repair. Hernia. 2010;14(1):71-77. https://doi.org/10.1007/s10029-009-0580-4