Laparoscopic enhanced view totally extraperitoneal repair versus intraperitoneal onlay mesh repair for ventral hernia: A prospective randomized controlled study

Original Article

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ABSTRACT

Background: Ventral hernias represent dehiscence of the musculoaponeurotic plane, which ensures the abdominal wall's solidity and tone. This work aimed to compare laparoscopic enhanced view totally extraperitoneal (eTEP) versus laparoscopic intraperitoneal mesh placement (IPOM) in ventral hernia.

Patients and Methods: This prospective randomized interventional study was carried out on 60 patients aged greater than 18 years old, both sexes, with ventral hernias less than 8 cm in width. Patients were randomly allocated using computer-generated randomization tables into two equal groups: Group I (n=30): Patients who underwent laparoscopic eTEP approach, and group II (n=30): Patients who underwent traditional laparoscopic IPOM.

Results: A significant increase in eTEP compared with IPOM was found regarding operative time, intra-operative complications (No, peritoneal tear, bowel injury, and bleeding through inferior epigastric controlled laparoscopic), conversion to open (*P<0.001*, *0.01*, *0.01*, respectively), but lower in eTEP than IPOM regarding pain visual analogue scale score, and return to work (days) (*P=0.006*, *<0.0001*, respectively).

Conclusion: Overall, eTEP-RS was found to be a better procedure for the management of primary ventral hernias than IPOM Plus.

Key Words: Enhanced-view totally extraperitoneal repair, intraperitoneal onlay mesh repair, laparoscopic, ventral hernia.

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INTRODUCTION

Ventral hernias are caused by a breakdown in the musculoaponeurotic plane, which maintains the tone and firmness of the abdominal wall. They may be rudimentary, the result of a traumatic failure, or, in most cases, the result of a surgical incision. It is believed that 25% of people have congenital wall abnormalities or experience a ventral hernia at some point in their lives[1].

Choosing the surgical approach and repair procedure to perform laparotomy or open surgery, anatomical or mesh repair, and which kind of mesh to use as well as where to place the mesh to ensure the strongest repair with the lowest chance of recurrence are the primary challenges in the management of hernias[2].

Before 1993, only open techniques were used to treat ventral hernias. The laparoscopic method of ventral hernia repair was first reported by pioneers following many studies[3].

Repairing a laparoscopic ventral hernia requires a variety of techniques. Leblanc attempted the first laparoscopic repair of a ventral hernia by using an intraperitoneal onlay mesh (IPOM) to bridge the defect from the peritoneal side[4].

A more recent approach to IPOM repair has been used, known as IPOM plus repair, in which the fascial borders of the defect are sutured in apposition before mesh reinforcement. A unique kind of composite mesh different from regular polypropylene mesh as well as a unique mesh attachment tool are needed for both IPOM and IPOM +. Although both provide good outcomes, they come with a high cost and can cause problems such as adhesive colic, enterocutaneous fistula, and omental adhesions leading to adhesive blockage[4].

For ventral hernia repair (VHR), laparoscopic IPOM is no longer the recommended minimally invasive procedure[5]. There have been reports of persistent discomfort and uncommon but severe side effects, such as intestinal blockage or the development of an enteric fistula, as a result of penetrating fixation and direct contact between mesh and intraperitoneal viscera[6]. According to reports of improved quality of life and reduced postoperative discomfort, laparoscopic enhanced view completely

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extraperitoneal (eTEP) has emerged as a safe substitute for the current minimally invasive VHR procedures[7].

The benefits of electrotherapy are based on the generation of retromuscular space, which dispenses with the requirement for mesh fixation and a composite mesh. Furthermore, and perhaps most significantly, there is no direct contact between the mesh and the viscera[8]. This study compared laparoscopic IPOM and eTEP procedures for ventral hernias.

PATIENTS AND METHODS:

This prospective randomized interventional study was carried out on 60 patients aged greater than 18 years old, both sexes, with ventral hernias, less than 8 cm width.

Exclusion criteria were patients with defect greater than 8 cm, with unfit for general anesthesia, and with incarcerated or strangulated hernias.

Grouping and randomization

Randomization was done by computer-generated system. The list was concealed in sealed envelopes that were numbered and opened sequentially after obtaining patient's consent. Patients were randomly allocated using computer-generated randomization tables into two equal groups: group I (n=30): Patients who underwent laparoscopic eTEP approach, and group II (n=30): Patients who underwent traditional laparoscopic IPOM.

Sample size calculation

Based on pilot research that was completed before the commencement of this investigation, the recurrence rate was used as the major endpoint for the Wilcoxon Mann-Whitney (two groups) test, which was used to analyze the sample size. To detect the difference at a=0.05 and have a power of 80%, a minimum sample size of 25 patients per group was needed (using G power v3.1.3, Institut für Psychologie, Christian-Albrechts-Universität Kiel, Kiel, Germany. ffaul@psychologie.uni-kiel.de). To account for potential dropouts, the sample size was expanded to 60 patients (30 in each group)[9].

Data collection

All patients were subjected to: History taking [Personal history, current complaint, duration of each complaint, review of other GIT (GastroIntestinal Tract) symptoms, review of other body systems, current medical comorbidities with their commenced medications, and previous surgical history], clinical examination, routine laboratory investigations, radiological investigations [ultrasound], and anesthetic consultation was classified according to the American Society of Anesthesiologists.

Operating techniques

eTEP procedure

Preparation:

Similar to the classical technique, patient is put under general anesthesia and prophylactic antibiotic therapy. After induction of general anesthesia and intubation, a Foley catheter is routinely placed. The patient was in dorsal decubitus, arms alongside his body. The table was slightly flexed at the pelvis Ports setting depending on hernia location. The major steps of the eTEP procedure are development of the retrorectus space and port, crossover of the midline, connection of both retrorectus spaces, left and right, TAR (When needed), closure of the posterior fascial layer defect, closure of the anterior fascia (Restoration of linea alba), and exsufflation and closure. We used A 10 mm 30° laparoscope. The set of instruments included graspers, miriland, curved scissors, a suction-irrigation device, and needle drivers and hook electrocautery energy devices and Ports.

Operative Steps:

Step 1: Trocars should be positioned in the opposite abdominal region from the site of the hernia defect. Lower midline defects should be approached cranially, higher midline defects should be approached caudally, and lateral defects should be approached contralaterally lateral. This is the general guideline for port placement (Fig 1).

Step 2: The term 'crossover' describes a surgical dissection that connects a contralateral retrorectus area to its counterpart without entering the intra-abdominal cavity (Fig. 2).

Step 3: The preperitoneal bridge, which is represented by the umbilical ligament and/or falciform ligament, connects the two retrorectus areas (Fig 3).

Step 4: Indications for TAR (Transversus Abdominis Release): strain on the posterior layer, small unilateral retro-rectus gap (<5 cm), poor compliant abdominal wall, and maximal defect breadth that closely resembles or surpasses 2× rectus width (Dr. Alfredo Carbonell, Ninth Annual AWR Summit, Montana, Feb 2018).

Step 5: Closure of the posterior layer is necessary to keep a barrier between the mesh and viscera (Fig. 4).

Step 6: Appropriate mesh size selection: entire dissected area should be covered, medium weight macroporous mesh (poly-propylene or polyester, deployed through a 10 mm trocar, mesh fixation is not necessary, except in the situation of suprapubic defect, and fixation of mesh either by Vicryle 2/0 sutures (Fig. 5).

Step 8: Slow exsufflation under direct vision to ensure the mesh remains in the correct position.

The IPOM procedure

Preparation:

Similar to the classical technique, the patient is put under general anesthesia and prophylactic antibiotic therapy. He must urinate before the procedure. The patient is placed in a supine position.

Operative steps:

Step 1: In the other group, the standard laparoscopic IPOM Plus technique was carried out. Pneumoperitoneum (14 mmHg) insufflation was largely achieved at Palmers Point using a veress needle.

Step 2: Three ports are positioned. Two 5 mm in the left and right midclavicular regions, approximately 3–5 cm below the costal margins, and one 10 mm in the epigastric area, approximately 5 cm below the xiphoid. Triangulation was maintained by laterally placing ports for supraumbilical and epigastric hernias (Fig. 6).

Step 3: The working pressure was kept at 14 mmHg once a pneumoperitoneum had formed. Adherences were gripped, and adhesiolysis was performed ideally using cold scissors or other sealing tools but this step is essential to prevent intestinal damage if the bowel is content. It is better to use cold scissors to prevent thermal injuries from spreading (Fig. 7).

Step 4: Once the margins of the hernia are well delineated and cleared, the defect can be measured by external palpation or with an intra-abdominal ruler/suture, or even with a laparoscopic instrument.

Step 5: Although the authors feel that a tailored strategy should be used to choose the final mesh fixation method based on parameters such as location, size, and previous repair, sutures, tracking devices, and glue fixation methods are widespread in practice. The primary goal of fixation is to prevent problems by preventing the mesh from falling into the peritoneal cavity and maintaining contact between the mesh and the anterior abdominal wall in order to induce fibrosis. Four sutures at the mesh's cardinal points, or angels, identify the biologic mesh. After that, the mesh is put through the 12 mm trocar after being encircled by a laparoscopic grasper (Fig. 8).

Step 6: Once mesh fixation is done, the abdominal cavity should be explored to look for any bleeding or injury.

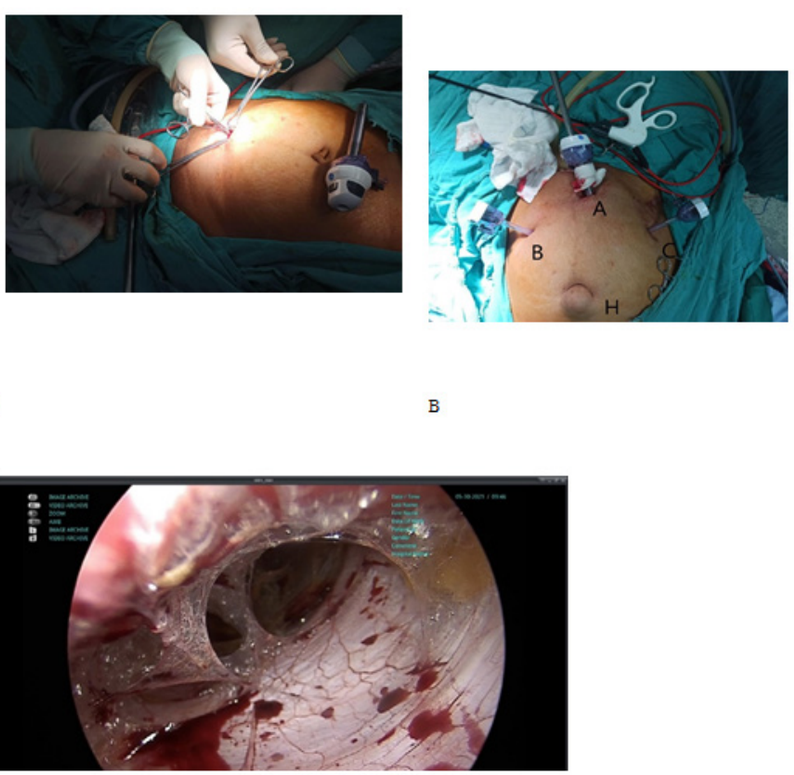


Fig. 1: (A) Optic port (B) Port designing , and (C) Retrorectus dissection via Lens.

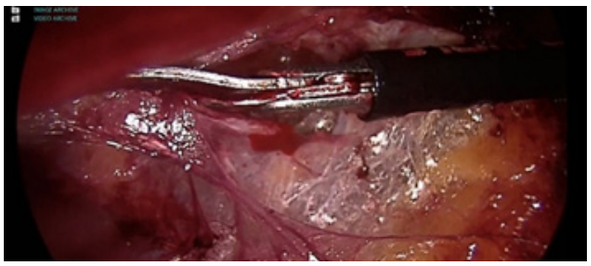


Fig. 2: Retrorectus dissection trying to crossover.

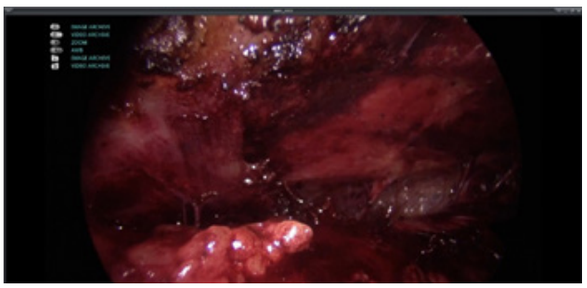


Fig. 3: Connecting the both retrorectus space.

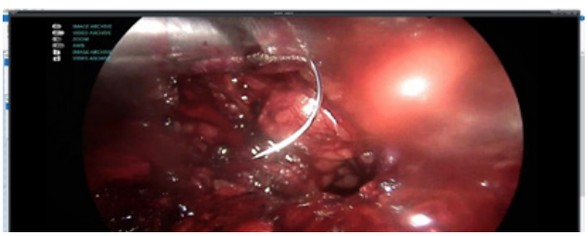


Fig. 4: Closure of the Posterior Rectus defect.

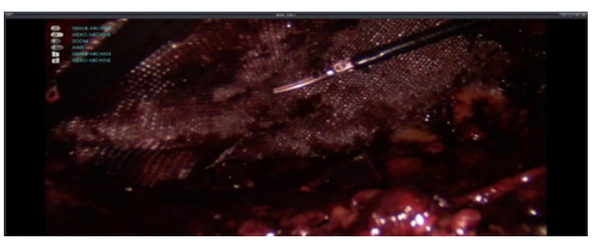


Fig. 5: Mesh fixation.

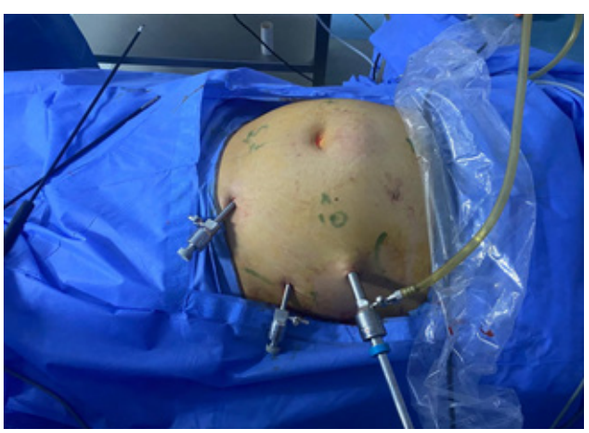
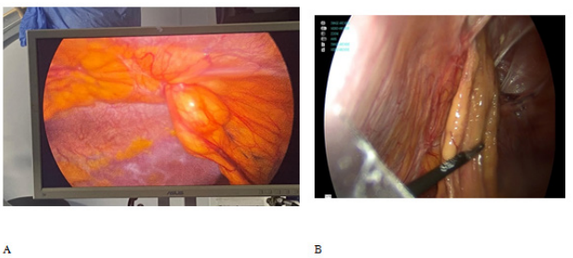


Fig. 6: Ports design in supra umblcal and Epigastric hernia.



A B

Fig. 7: (A) Defect, (B) adhesiolysis.

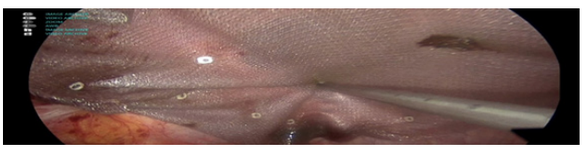


Fig. 8: Mesh Fixation.

Postoperative care

All patients were transferred to the PACU then to the internal ward, where close monitoring was done. Early mobilization was encouraged. Postoperative pain was assessed via the visual analog scale (VAS), which is an eleven-point scale ranging from 0 to 10, with 0 for no pain, and 10 for the worst pain ever[10]. It was recorded every four hours during the first 12 h after the procedure, then at 18 and 24 h. Analgesia was maintained by IV paracetamol (1 gm/ 8 h) and IV ketorolac (30 mg/12 h). If no significant response was achieved (VAS of 4 or more), IV morphine 2–3 mg was commenced for pain relief. Oral fluid intake was allowed 6–8 h after the procedure, unless complications were encountered. Most patients were discharged during the first or second postoperative day. An oral broad-spectrum antibiotic (amoxicillin clavulanic 1 gm/ 12 h for 1 week) in addition to oral analgesics (paracetamol 1 gm/ 8 h were commenced for all cases. The drains were removed if its discharge was less than 30cc/day for two consecutive days[11].

Follow-up

The first follow-up visit was arranged after two weeks for stitch removal. Any postoperative complications, including wound infection, hematoma, and dehiscence, were recorded and managed. Other follow-up visits were arranged at 1, 3, 6, and 9 months after the operation. The incidence of late complications like seroma or recurrence was also recorded.

The outcomes were operative time, intraoperative complications (bowel injury, vascular injury), postoperative complications (hematoma, seroma, wound infection), length of hospital stay, postoperative pain, and recurrence rate with possible risk factors which include age, gender, and location of the hernia.

Ethical consideration

An informed written consent was obtained from the patient or relatives of the patients. The study was done after approval from the Ethical Committee General Surgery Department, Mansoura University Hospitals (MD.22.01.589) from January 2022 to January 2024.

Statistical analysis

The statistical analysis was conducted using IBM, Armonk, New York, USA's SPSS v28. To assess if the data distribution was normally distributed, the Shapiro–Wilks test and histograms were employed. The unpaired Student t test was utilized to analyze the quantitative parametric data, which were shown as mean and SD. The Mann–Whitney test was used to analyze quantitative nonparametric data, which were shown as the median and interquartile range. The frequency and percentage (%) of the qualitative variables were reported, and when applicable, the Fisher's exact test or the χ^2 test were used for analysis. A statistically significant result was defined as a two-tailed *P value* less than 0.05.

RESULTS:

In this study, 70 patients were assessed for eligibility, 10 patients did not meet the criteria. The remaining 60 patients were randomly allocated into two groups (30 patients in each). All allocated patients were followed-up and analyzed statistically (Fig. 9).

Table 1 shows no significant differences between both groups regarding age, sex comorbidity (diabetes mellitus and hypertension), type of hernia (Incisional Hernia, para-umbilical hernia, spigelian hernia, and epigastric hernia), and defect size.

There was a significant increase in eTEP compared with IPOM regarding operative time, intra-operative complications (no, peritoneal tear, bowel injury, and bleeding through inferior epigastric controlled laparoscopically), and conversion to open (*P<0.001, 0.01, 0.01*, respectively), while no significant differences were observed between both groups regarding drain. (Table 2).

A significant reduction in eTEP compared with IPOM was found regarding pain VAS score and return to work (days) (*P= 0.006, <0.0001*, respectively), while no significant differences were observed between both groups regarding hospital stay (days), and post-operative complications (Seroma, postoperative bleeding, postoperative ileus, and recurrence) except hematoma were significantly different between both groups (*P=0.042*) (Table 3).

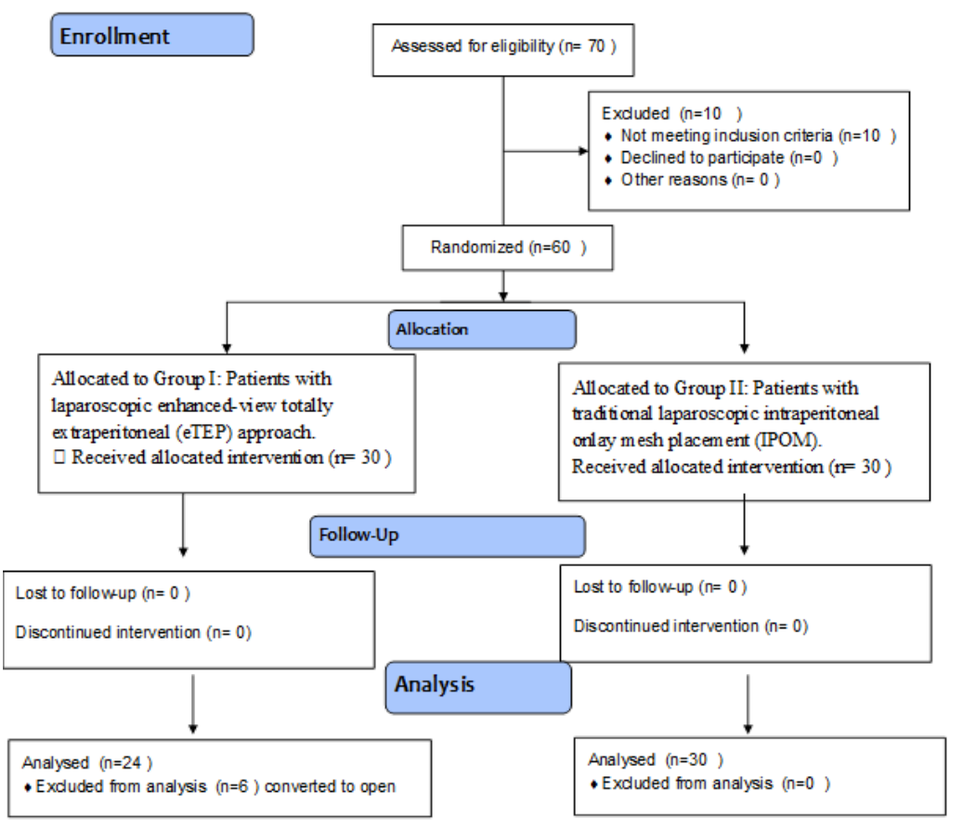


Fig. 9: CONSORT flowchart of the studied patients.

Table 1: Comparison of demographic data, associated comorbidities, hernia type, defect size (n=60)

	eTEP (*n*=30)	IPOM (*n*=30)	*P* value
Age (years)	42.43±9.86	39.93±8.55	0.299
Sex			
Male	8 (26.7)	6 (20.0)	0.542
Female	22 (73.3)	24 (80.0)	
Comorbidity			
FREE	13 (43.3)	11 (36.7)	0.194
DM	6 (20.0)	7 (23.3)	
HTN	0	4 (13.3)	
DM and HTN	11 (36.7)	8 (26.7)	
Type of hernia			
Incisional Hernia	3 (10.0)	0	0.318
Para-Umbilical Hernia	15 (50.0)	19 (63.3)	
Spigelian Hernia	2 (6.7)	2 (6.7)	
Epigastric hernia	10 (33.3)	9 (30.0)	
Defect size (cm)	3.13±1.08	2.75±0.89	0.143

Data are presented as mean ± SD or frequency (%). eTEP: enhanced-view totally extraperitoneal, IPOM: intraperitoneal mesh placement DM: diabetes mellites, HTN: hypertension.

Table 2: Comparison of operative time, use of drain, intraoperative complications, and conversion to open between studied groups (n=60)

	eTEP (*n*=30)	IPOM (*n*=30)	*P* value
Operative time (min)	112.67±21.49	83.0±20.82	**<0.001****
Drain	7 (23.3)	8 (26.7)	0.766
Intraoperative complications			
No	21 (70.0)	29 (96.7)	**0.01***
Peritoneal tear	7 (23.3)	0	
Bowel injury	0	1 (3.3)	
Bleeding through inferior epigastric controlled laparoscopic	2 (6.7)	0	
Conversion to open	6 (20.0)	0	**0.01***

Data are presented as frequency (%). eTEP: enhanced-view totally extraperitoneal, IPOM: intraperitoneal mesh placement *: significant as *P value* less than 0.05, **: highly significant as *P value* less than 0.001.

Table 3: Comparison of postoperative complications, pain visual analogue scale score, hospital stay, and return to work activity between studied groups (n=60)

	eTEP (*n*=30)	IPOM (*n*=30)	*P* value
Postoperative complications			
Seroma	2 (8.7)	8 (26.7)	0.097
Postoperative Bleeding	2 (8.7)	0	0.100
Postoperative ileus	3 (13.0)	6 (20.0)	0.504
Recurrence	2 (8.7%)	3 (10.0)	1.0
Hematoma	3 (13.0)	0	**0.042***
Pain VAS score			
Mean ±SD	3.23 ±1.65	4.33±1.29	**0.006***
Median (minimum–maximum)	3 (1–6)	4 (3–7)	
Hospital stay (days)	1.54±1.57	1.67±0.99	0.704
Return to work (days)	5.28±1.21	6.88±1.39	**<0.0001****

Data are presented as mean ± SD, median, or frequency (%). eTEP: enhanced-view totally extraperitoneal, IPOM: intraperitoneal mesh placement VAS: visual analogue score, SD: standard deviation, *: significant as *P value* less than 0.05, **: highly significant as *P value* less than 0.001.

DISCUSSION

Primary ventral hernias are aberrant outgrowths of the abdominal viscera through the abdominal wall's weak spots in the fascia. Primary defect closure and strengthening with a prosthetic mesh are steps in the conventional VHR process[12].

Compared with open hernia repair, laparoscopic repair has demonstrated promise in terms of fewer complications such as intraoperative blood loss, postoperative pain, infection, seromas, length of hospital stay, and ICU admissions. These outcomes can result in an earlier recovery, improved quality of life, and a significant reduction in overall hospital costs[13].

The current study's findings on age, sex, and related comorbidities revealed no statistically significant differences between the groups under investigation.

Fifty patients were split evenly into two groups in Sholapur et al.'s study[12] to assess the therapy of primary ventral hernia between eTEP repair and intraperitoneal onlay mesh repair. The majority of the study's participants were middle-aged adults, with mean patient ages of 45 and 44 in the eTEP and IPOM groups, respectively. The results demonstrated that the patients in both groups were statistically equivalent in terms of age and sex.

It was discovered in our study that there was no statistically significant difference between the groups under investigation in terms of the kind of hernia. In comparison to the IPOM group, which had 63.3% Para-Umbilical Hernia, 30.0% and 6.7% Spigelian Hernia, the eTEP group had 50% Para-Umbilical Hernia, 33.3% Epigastric Hernia, 10% Incisional Hernia, and 6.7% Spigelian Hernia.

In the IPOM group, there were 14 (35%) patients with ventral hernias and 26 (65%) patients with incisional hernias. The number of patients with incisional hernias was marginally greater in the IPOM group, according to Bui *et al*.'s research[8].

The eTEP procedure is technically demanding and requires dissection and creation of a preperitoneal space. As a result, the operative time in the eTEP group is usually longer than in the IPOM group. Additionally, the eTEP procedure has a longer learning curve than the more well-established IPOM approach. Furthermore, IPOM may involve more standardized steps and a shorter learning curve, resulting in less variation in operative times among surgeons, whereas eTEP procedure may be more influenced by anatomical considerations and require more intraoperative decision-making, leading to increased operative times, especially for surgeons who are still in the learning phase of the eTEP technique[8,14].

Our research revealed a statistically significant difference in mean intraoperative complications between the study groups. The distribution of intraoperative complications is as follows: for the eTEP group, there were 23.3% peritonitis, 6.7% bleeding by inferior epigastric controlled laparoscopic surgery, and 3.3% bowel damage. For the IPOM group, intracorporeal suturing was used to control laparoscopic procedures.

According to Kumar *et al*.[15], not a single patient had a drain inserted, and none of the patients experienced intraoperative problems. According to Bellido Luque *et al*.[16], the eTEP group did not have any intraoperative problems. However, in the IPOM group, two rips of the jejunal serosa during laparoscopic adhesiolysis and one lesion to the inferior epigastric arteries as a result of tackers fixation were found intraoperatively (3.8%).

Within our project, it was discovered that the frequency of conversion to open was higher in the eTEP group than in the IPOM group, with a statistically significant difference between the analyzed groups.

The following are the main reasons why a minimally invasive hernia repair procedure, like eTEP, might need to be converted to an open procedure: anatomical challenges, like extensive adhesions or distorted anatomy; intraoperative complications, like uncontrolled bleeding or visceral injury; technical difficulties in creating a suitable working space or positioning the mesh; surgeon inexperience with the minimally invasive techniques; unexpected intraoperative findings, like incarcerated hernia contents or concomitant pathologies; and patient factors, like obesity, recurrent hernias, or complex hernia configurations. All of these factors can make the minimally invasive approach unsafe or impractical, necessitating conversion to an open procedure so that the surgeon can safely manage the underlying problems and finish the hernia repair[8,15,16].

According to Jain *et al*.[17], there were no conversions in the IPOM group while three patients with significant adhesions in the eTEP group underwent open hernioplasty. The mean defect area varied between 4 and 25 cm^2 (mean defect area 10.7±5.5 cm^2), and there was no statistically significant difference between the two groups (*P 0.1*). Compared with IPOM, the eTEP group's mean mesh size was significantly greater (415.5±103.7 against 300±108.2, *P 0.0003*).

According to our research, the IPOM group exhibited a statistically significant increased frequency of higher mean pain scores than the eTEP group.

According to Sholapur *et al*.[12], the IPOM group had mean postoperative VAS scores of 3.2±1.11, 2.64±1.11, and 1.68±1.46 on days 1, 7, and 90, whereas the eTEP group had mean ratings of 1.84±0.688, 0.76±0.66, and 0.08±0.40 (*P=0.001*). Regarding postoperative discomfort, there was a substantial statistical difference between the groups.

According to Kumar *et al*.[15], patients in the eTEP group reported far less discomfort than those in the IPOM group at 12 and 24 h after the treatment.

Regarding postoperative bleeding, no statistically significant difference was found between the groups evaluated in the current study.

According to Sholapur *et al*.[12], there was no discernible statistically significant variation in postoperative bleeding across the groups under investigation.

Regarding postoperative seroma, no statistically significant difference was found between the groups examined in this study.

Compared with one patient in the eTEP group, four patients in the IPOM group had seroma, according to Arish and Masudi's[13] research. According to Bellido Luque *et al*.[16], there was no statistically significant difference seen in post-operative seroma between the groups under investigation.

According to Bellido Luque *et al*.[16], there was no statistically significant difference seen in the post-operative ileus between the groups under investigation.

In our thesis, we found no statistically significant variation in recurrence across the groups under investigation.

Penchev *et al*.[18] reported that one recurrence with lateral mesh failure happened in the IPOM group eight months after the treatment, but the patient declined further repair. Regarding postoperative hematoma. There is a statistically significant difference was found between the groups for eTEP group.

According to Bui *et al*.[8], there were similar rates of 30-day postoperative complications in both groups. A little superficial hematoma occurred in two (6.9%) individuals, none of these complications required medical attention.

It was discovered in this study that there was no statistically significant difference in the length of hospital stay but there is a significant difference between 2 groups according return to work for eTEp group.

According to Kumar *et al*.[15], who reported similar findings, the mean length of hospital stay following surgery in the eTEP group was 1.11 days, but it was much shorter in the IPOM group (1.7 days). The mean duration of stay between the groups was observed by Penchev *et al*.[18] to be 2.9 days after eTEP and 3.4 days after IPOM.

Nevertheless, Sholapur *et al*.[12] noted that the IPOM group's mean hospital stay duration (5.9±2.19 days) was greater than the eTEP group's (4.6±3.17 days, *P=0.02*) The mesh does not need to be corrected when using the eTEP approach. There is very little likelihood of mesh migration since the mesh is put in a confined retro-muscular region. Comparatively speaking, eTEP is a painless treatment because it does not include tacks or trans-fascial sutures[7]. Furthermore, somewhat less analgesia is needed[19]. Postoperative paralytic ileus occurred in 24% of patients in the IPOM group and 4% of patients in the eTEP group. The direct contact of mesh with the abdominal viscera is known to cause bowel wall adhesions and resultant paralytic ileus in the postoperative period[20].

The cost analysis showed that the IPOM in our study was much more expensive than the eTEP. These high costs are a result of using Tackers and Biologic Mesh. and our research's primary concern is this. eTEP is substantially less expensive. The use of Tackers and Biologic Mesh is the reason for this high expense. and our research's primary concern is this. eTEP was much less expensive.

According to Jain *et al*.[17], the IPOM group's mean cost per patient was significantly greater than that of the eTEP group, which was 2.4 times more costly. By calculating the incremental cost-effectiveness ratio, which came out to be 16, 14, 142, two groups were also compared for cost-effectiveness. With negative costs and positive effects, eTEP group was more cost-effective than IPOM group.

In comparison to composite mesh with an anti-adhesion barrier utilized for intraperitoneal position, mesh in sublay position is thought to provide better quality of postoperative connective tissue creation, less recurrence, and lower cost[21].

A covered mesh and fixation device are necessary for IPOM repair, which significantly raises the cost to the healthcare system. eTEP, on the other hand, combines the advantages of laparoscopic repair with the better results that come with sublay mesh implantation. It does this by using a less expensive polypropylene mesh without the need for any fixation devices. No prior research has examined the cost-effectiveness of ventral wall hernia repair using eTEP versus IPOM methods.

We suggested that more multicentric, randomized, controlled trials with bigger sample sizes be conducted to assess recurrence after ventral hernia repair, and that our findings be confirmed by extended follow-up. Additionally, considerably stronger data is required to confirm the short- and long-term results of eTEP and IPOM in a much more thorough manner. The study's limitations include its single-center design, limited sample size, inclusion of only primary ventral hernias; incisional hernias were excluded, and no follow-up time.

CONCLUSION

IPOM was shown to have a number of drawbacks, including increased postoperative discomfort, longer hospital stays, a higher risk of wound site seromas, and a higher rate of postoperative paralytic ileus, while being a technically simple technique requiring less intraoperative time. Conversely, eTEP was shown to be a more difficult technique that required longer intraoperative times; on the other hand, it offered a number of benefits, including less postoperative discomfort, a shorter hospital stay, quicker recovery, and a lower risk of seromas and paralytic ileus. Overall, it was discovered that eTEP was superior than IPOM as a method for managing primary ventral hernias.

CONFLICT OF INTEREST

There are no conflicts of interest.

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