Original Research Article

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Outcome of laparoscopic total extraperitoneal approach with direct dissection and mesh hernioplasty in the treatment of inguinal hernias

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ABSTRACT

Background: Laparoscopic inguinal hernia repair has become increasingly popular as an alternative to open surgery. Aim: To evaluate total extraperitoneal repair with direct telescopic dissection and mesh hernioplasty for inguinal hernias.

Methods: This study was conducted at General Surgery department the period of 1 year on 30 patients having inguinal hernia.

Results: This prospective study included 30 adult patients with primary unilateral inguinal hernia, all of them were males. Age of study patients ranged from 22 to 64 years old. Intraoperatively, 6 patients were presented to have direct inguinal hernia (20%) while 21 patients had indirect inguinal hernia (70%). In 3 patients, combined direct and indirect hernia defects were present (10%). Mean operative time was 99.30±25.13 min. Mean time for analgesia was 3.62±1.57 days. Hospital stay mean was 1.43±0.62 days. The mean time until return to work was 14.1±3.13 days, the mean time of follow up was 7.1±2.2 months. Intra operatively 5 (15%) and post operatively 8 (26.6%)complications were observed.

Conclusions: Laparoscopic TEP repair is an excellent alternative to open preperitoneal repair of inguinal hernia. Complication rate was average with other studies while there was no hernia recurrence during the period of follow up.

Keywords: TAPP inguinal hernia, TEP

INTRODUCTION

Since laparoscopic inguinal hernia repair was first reported by Ger and colleagues, the operation has been refined into an attractive alternative to open hernia repair for many patients and surgeons. Although few would argue that laparoscopic inguinal hernia repair can be performed with excellent results, controversy abounds because the results of open mesh repairs are similarly good, and the learning curve for the laparoscopic technique is long. At the center of the controversy is disagreement over whether laparoscopic and open techniques are equivalent with regard to recurrence risk, pain, and recovery. The mechanisms of inguinal hernia

recurrence after laparoscopic repair have been studied by many investigators and are related mostly to technique.²⁻⁵ As techniques have improved and surgeons have gained experience, recurrence rates have declined. One of the most common reasons for recurrence is incomplete dissection of the preperitoneal space and inadequate overlap of the hernia defect from placement of a small mesh.^{6,7}

The laparoscopic total extraperitoneal (TEP) approach allows for mesh placement within the preperitoneal space, without entering the abdominal cavity and the avoidance of the incision and closure of the peritoneum typically required in the TAPP approach.⁸ The creation

of preperitoneal space is an important first step in the TEP hernia repair. The balloon dissection is the most commonly used method to create extraperitoneal space and is said to be helpful during the learning curve. Commercially available balloons are expensive and associated with risk of bleeding, rupture of balloon, rupture of bladder neck and blind dissection without visualizing the important structures.

METHODS

This study was conducted at General Surgery Department, from 1st Jan 2014 to June 2015 on 30 patients having inguinal hernia, to evaluate laparoscopic totally extra-peritoneal approach with direct telescopic dissection and mesh hernioplasty in the treatment of inguinal hernia. This included operative time, hospital stay, post-operative morbidity and recurrence.

Inclusion criteria

All patients were adults above 18 years old with unilateral primary inguinal hernia.

Exclusion criteria

Recurrent, sliding and complicated hernias, previous lower abdominal incision or preperitoneal operations and patients with severe co-morbidities (ASA class > III).

All patients were subjected to full history taking, full clinical and laboratory examination and informed written consent about the benefits, possible risks and recording of the procedure. The patient was placed in supine position on the operating table; after general anesthesia,

Technique of surgery

Transverse sub-umbilical 1.5cm incision was made slightly to the side of hernia; the anterior rectus sheath was incised transversely between two stay sutures of Vicryl 0. The rectus muscle was retracted laterally, and a small tunnel in the midline was made in the direction of pubis, between the rectus muscle and preperitoneal fat firstly by finger dissection then by insertion of 1st trocar (10mm. trocar).

After insertion of 1st trocar between rectus muscle anteriorly and posterior rectus sheath posteriorly we start insufflation of CO₂ at pressure 14 mm Hg. Because the posterior rectus sheath ends at the line of Douglas (arcuate line), the telescope (0°, 10mm.) passed on top of the posterior rectus sheath will automatically fall into the extraperitoneal space. CO₂ gas insufflation facilitates separation of preperitoneal loose areolar tissue which is mostly avascular. The telescope itself was used for dissection of midline tunnel down to the symphysis pubis. After enough space was done by the telescope, the two 5mm. operating ports were inserted under vision both in the midline, the first 2 fingers breadth superior to the

symphysis pubis and the other midway between the other two ports (5cm at least above suprapubic port).

After insertion of all trocars, (30°, 10mm.) telescope is inserted to facilitate further instrumental dissection of preperitoneal space. Two blunt graspers or one grasper with Maryland grasper were used for further dissection of loose areolar tissue, 1st in the midline till complete visualization of posterior surface of pubic bone and space of Retzius. Identification of inferior epigastric vessels is an important land mark that appears in the ceiling of the field.

External downward traction on the ipsilateral testis facilitates identification of cord structures coming lateral and below inferior epigastric vessels through the internal ring associated with indirect (oblique) peritoneal sac.

The hernial sac was identified and reduced. Sac was freed from the cord structures by traction and counter traction by the other hand. Parietalization of cord structures by peeling off the peritoneum is done, continuing the dissection cranially from the internal ring till the crossing of vas deferens with external iliac vessels and freeing all bands extending from the peritoneum to the parietal wall.

Direct hernia sac usually dissected easily and reduced with the midline dissection while the fascial defect appears medial to inferior epigastric vessels and cord structures. Blunt dissection of the lateral space between inferior epigastric vessels superiorly and cord structures inferiorly till reaching anterior superior iliac spine laterally and visualization of psoas muscle inferiorly

A 12 x 15cm fashioned polypropylene mesh rolled from lateral to medial and introduced through the 10 mm infraumbilical port and unfolded from medial to lateral. The mesh should lie unfolded in the preperitoneal space with the cord structures partialized. The lower edge must extend well below the level of the inguinal ligament. The lateral part of the patch should fold over and extend beyond the iliac vessels. Suction drain 14F was used in all cases to prevent hematoma collection and to drain any remaining gas in the scrotum and preperitoneal space to help mesh incorporation in the preperitoneal space. Drain was inserted through lower 5mm suprapubic port. The gas was released under direct vision, ensuring that the inferior border of the mesh will not roll up; mesh was not fixed in all of cases in this study.

Every patient was followed up for at least 6 months postoperatively; follow up was on weekly basis in the 1st month and monthly thereafter for any complications e.g. chronic pain or recurrence.

RESULTS

This prospective study of 30 adult patients with primary unilateral inguinal hernia, all of them were males.

Table 1: Demographic details in study.

Variables	Observations
Mean age	40±12.51 years
Non-smokers	10 (33.3%)
Mild smokers	9 (30%)
Heavy smokers	11 (36.6)
Right inguinal hernia	15 (50%)
Left inguinal hernia	15 (50%)
Direct inguinal hernia	6 (20%)
Indirect inguinal hernia	21 (70%)
Combined direct and indirect hernia defects	3 (10%)

Age of study patients from 22 to 64 years old with the mean age was 40 ± 12.51 years. 10 patients were nonsmokers (33.3%), 9 were mild smokers (30%), and 13 patients were heavy smokers (43.3%). There were 15 patients with right inguinal hernia (50%) and 15 patients with left inguinal hernia (50%).

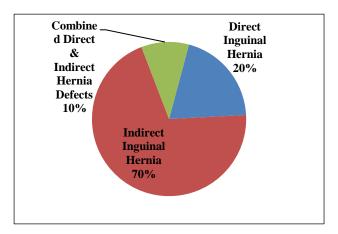


Figure 1: Types of hernia in study.

Intraoperatively, 6 patients were presented to have direct inguinal hernia (20%) while 21 patients had indirect inguinal hernia (70%). In 3 patients, combined direct and indirect hernia defects were present (10%).

Table 2: Operative and follow up results.

Study parameters	Mean±SD	Ranges
Mean operative time	99±26.11 min.	70-170 min
Mean time for analgesia	3.62±1.57 days	3-8 days
Hospital stay	1.43±0.62 days	1-3 days
Mean time until return to work	14.1±3.13 days	7-23 days
Mean time of follow up	7.1±2.2 months	6-12 months

Mean operative time was 99.30 ± 25.13 min. Mean time for analgesia was 3.62 ± 1.57 days. Hospital stay mean was 1.43 ± 0.62 days. The mean time until return to work

was 14.1 ± 3.13 days, the mean time of follow up was 7.1 ± 2.2 months.

Table 3: Complications in study.

Complications	Number of cases	Percentage
Intra operative		
Bladder injury	1	3%
Intestinal perforation	2	6%
Iliac vein injury	1	3%
Vas deferens injury	1	3%
Total	5	15%
Post-operative		
Bleeding	6	20.6%
Intestinal obstructions	2	6%
Total	8	26.6%

Intra operatively 5 (15%) and post operatively 8 (26.6%) complications were observed. The 2 cases of bowel obstructions so these patients underwent laparotomy revision, without need of intestinal resection.

The one perforations of the small intestine resulted from thermal injury during outpatient operation and the symptoms manifested five to eight days after surgery. patient underwent revision of hernioplasty (one laparoscopic, one by laparotomy). The perforations were closed, there was no peritoneal violation or the need to remove the meshes and patient had no more complications.

There were one perforations of the large bowel that caused peritonitis. this patient underwent revisional surgery. There were one injuries to the vas deferens. To date, there are no signs of testicular.

DISCUSSION

less postoperative pain, reduced recovery time, easier repair of recurrent and bilateral hernia with highest possible ligation of the sac. In present study, the operative mean time was 99.30 ± 25.13 min with ranged (70-170min) correlates with study of Osama Hasan Abd-Raboh with the operative mean time was 99.30 ± 25.13 min with ranged (60-160min).

Most of the studies have longer operative time, while some studies showed very short operative time for TEP (17±6 min.) in 3100 hernia repairs over 15 years, this was not the rule. Kuhry et al, found that ten out of fifteen trials reported a TEP repair to be associated with an increased duration of surgery compared to open repair. ^{11,12} A study comparing balloon dissection versus direct telescopic dissection in TEP showed no difference in mean operative time between two groups (77.5±24.1 versus 74.2±24.4 min). ¹³ Direct Hernias are easily reduced. At times, a long indirect sac cannot be completely reduced from the deep inguinal ring and is divided, the peritoneal side being ligated with a

laparoscopic suture. In our study, 6 of indirect (oblique) hernias with long sac necessitated proximal ligation of the sac with extracorporeal knotting.

There were no cases complaining from chronic groin pain during the period of follow up in this study. The incidence of chronic pain after endoscopic hernia repair varies between 1 and 16%. ¹⁴ Postoperative pain (acute or chronic) is a potential complication; injury to the nerves during dissection is a common cause of chronic pain. Such injury can be avoided by gentle dissection in the triangle of pain and not fixing the mesh. ¹⁵

There were no reported cases of intraoperative serious visceral or vascular complications in this study. This is matching with the results of other studies. superficial wound infection (5%). Seroma and scrotal edema are frequent complications after laparoscopic repair of inguinal hernia, with a reported incidence ranging from 1.9% to 11.7.¹⁶ closed-suction drain can be used to reduce the risk of seroma formation without increased risk of infection.¹⁷ In present study, suction drain 14F was used in all cases to prevent hematoma collection and to drain any remaining gas in the scrotum and preperitoneal space. However, the amounts collected by the drain were small (20-50c.c.), so, we don't recommend routine use of drain in these cases.

Dulucq JL et al had studied laparoscopic totally extraperitoneal inguinal hernia repair retrospectively for 15 years on 3,100 hernia repairs showed that the recurrence rate was 0.46%. The recurrence rate for the first 200 repairs was 2.5%, but it decreased to 0.47% for the subsequent 1,254 hernia repairs. Kuhry et al, showed that most trials (n=14) reported no differences in recurrence rates after either TEP or open repair. 12 In present study, there were no reported cases of hernia recurrence during the period of follow up. In our opinion, these excellent results can be confirmed only by studying large numbers of cases and for longer periods of follow up. Hospital stay mean was 1.43±0.62 days. The mean time until return to work was 14.1±3.13 days, the mean time of follow up was 7.1±2.2 months. In this study, hospital stay ranged from 1-3 days, and the mean was1.43±0.62 days, these results coincided with the results of the others as 1.35±0.67 days. 10 in which the mean hospital stay in laparoscopic TEP group was (1.4) days, (1.48) days and (1.5 ± 0.4) days in. 11,18

In this study the mean time until return to work was 14.1±3.13 days, ranged from 7-21 days. Small incision and reduced postoperative pain after laparoscopic TEP are the causes for early ambulation and return to normal activities. ¹⁹ Liem et al, proved that patients who underwent laparoscopic repairs regained their physical performance faster than those who underwent conventional hernia repairs. ²⁰

Laparoscopic TEP repair is an excellent alternative to open preperitoneal repair of inguinal hernia with the ability of using large mesh to cover all inguinal potential defects plus the much better visualization of anatomical landmarks.

Operative time is relatively long but still comparable to many of studies discussing TEP technique and improving over the time of the study indicating the need for long learning curve. TEP proved to be cost effective as we tried in this study to reduce overall cost by using telescopic dissection without balloon and without mesh fixation without any need to convert to other technique in all of our patients. This technique was proved safe, as it was not associated with major morbidity or recurrence. Complication rate was average with other studies while there was no hernia recurrence during the period of follow up. We recommend TEP technique to be used for uncomplicated inguinal hernia when the experience exists and to undergo other studies on large number of cases with more extended periods of follow up to confirm our given results.

CONCLUSION

Laparoscopic TEP repair is an excellent alternative to open preperitoneal repair of inguinal hernia. Operative time is relatively long but still comparable to many of studies discussing TEP technique and improving over the time of the study indicating the need for long learning curve. This technique was proved safe, as it was not associated with major morbidity or recurrence. Complication rate was average with other studies while there was no hernia recurrence during the period of follow up.

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Institutional Ethics Committee

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