



Laparoscopic Hernioplasty By Transabdominal Pre-Peritoneal Procedure Hernia Repair (TAPP) Technique

Wesam M. Amr, Amr Abdel Bari, NourAldeen Alhadi Mihedi Alfirjani*, Ahmed Shafik
Mohamed El Hefnawy

Department of General Surgery, Faculty of Medicine, Zagazig University, Egypt

*Corresponding author: Nour Aldeen Alhadi Mihedi Alfirjani,

E-mail: Nooralforjany@gmail.com

Abstract:

Laparoscopic inguinal hernia repair is a new but accepted method of treatment for this common condition. It has several distinct advantages over traditional open types of repair but also has the potential for complications not found with open repair. We present a description of the technique.

Background: Groin hernia is the most common hernia presented of all types of hernia. An inguinal hernia is a defect in the endo-abdominal fascia of sufficient size to allow escape of intra-peritoneal or pre-peritoneal contents into the groin, Inguinal hernias usually present as a lump, with or without some discomfort, which may limit daily activities and the ability to work (2).

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Laparoscopic indirect inguinal hernia repair (TAPP):

Laparoscopic inguinal hernia techniques result in a lower incidence of wound infection and hematoma formation and an earlier return to normal activities or work than the Lichtenstein technique (level 1A). Laparoscopic mesh techniques result in a lower incidence of chronic pain/numbness than the Lichtenstein technique (level 1B) (4).

For recurrent hernia after conventional open repair, Laparoscopic inguinal hernia techniques result in less postoperative pain and faster convalescence than the Lichtenstein technique (level 1B). From the perspective of the hospital, an open mesh

procedure is the most cost-effective operation for treatment of primary unilateral hernias (level 1B) (5).

From a socioeconomic perspective, an endoscopic procedure is probably the most cost-effective approach for patients who are employed, especially for patients with bilateral hernias (level 1B). In cost-benefit analyses including quality of life, endoscopic techniques may be preferable since they cause less numbness and chronic pain (level 1B) (6).

The advantages of this new patient-friendly approach are:

(1) Minimal trauma to the abdominal wall, resulting in less pain, almost no



infection, and a very low rate of hematoma formation.

- (2) No cutting or suturing of fascia structures (aponeurosis of external abdominal oblique muscle; transverse fascia), which is notorious for producing pain in Lichtenstein and Shouldice repairs.
- (3) Complete absence of tension due to Pascal's law of physics, resulting in less risk of chronic pain.
- (4) Greater distance from the testis, resulting in less probability of direct damage to the testes or severe disturbing vascularization **(4)**.
- (5) Earlier return to normal activities, repair of bilateral hernias through the same port, good option to repair recurrent hernias and excellent cosmetic results.

A disadvantage of laparoscopic inguinal hernia repair is that the operative procedures are difficult, implying a high risk of complications, especially when the surgeon has not yet overcome his so-called "learning curve." Indeed, even for a surgeon with advanced skills and considerable surgical experience it takes time to learn the revolutionary new technique due to the unfamiliar anatomy, new instruments, and completely new coordination of the eye-brain-hand axis required to use the video-endoscopic technique. Studies show that use of endoscopic inguinal hernia techniques results in a longer operation (level 1A) **(5)**.

Vascular injury most commonly occurs during abdominal access and is second only to anesthesia as a cause of death from laparoscopy. The most common vascular injury overall is laceration of the inferior epigastric artery and Injury to the bladder most commonly occurs during abdominal access rather than during the course of dissection. A history of prior pelvic surgery increases the risk of bladder injury and injury to the bowel can relate to initial abdominal access or occur during the

course of the operation due to electrocautery**(1)**.

Between the laparoscopic operating field and the testes, there are numerous collateral vessels which will continue to provide blood to the testes if the operation leads to a disruption of the intra-abdominally located part of the testicular vessels **(3)**.

The operative technique used for laparoscopic hernia repair has been described several times in detail. It was clearly demonstrated that in experienced hands, TAPP is a safe and effective technique for treatment of inguinal hernia. Moreover, it was shown that all types of inguinal hernia can be successfully treated with TAPP, even the most complicated cases: strangulated hernias, scrotal hernias, hernias after radical transabdominal prostatectomy, and recurrences after previous preperitoneal repair. Furthermore, the outcomes of patients who have undergone TAPP for bilateral hernia are in no way worse than after repair of a unilateral hernia **(1)**.

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Procedure oflaparoscopic indirect inguinal hernia repair (TAPP):

1.Preparation:

- a. The patient was placed in the supine position on the operating table, after administration of general anesthesia, routine scrubbing of the whole abdominal wall, from the nipple line till the midthighs.
- b. Urinary catheter was applied.
- c. The patient is placed in Trendelenburg position. and tilting of the table toward the surgeon (after trocar inserted).
- d. Surgeon stand towards the opposite side at the shoulder and the assistant should stand opposite the surgeon.

2. Procedural steps:

Step 1: Placement of trocars:

The camera trocar is introduced supra umbilical with open technique and two 5mm trocars are introduced at the same

level of umbilicus on both sides of the rectus sheath. The abdomen is inflated with CO2 with pressure set at 14 mmHg

flow adjusted at 10 L/min. A 30-degree telescope provides better view. (Figure 1) (a& b)

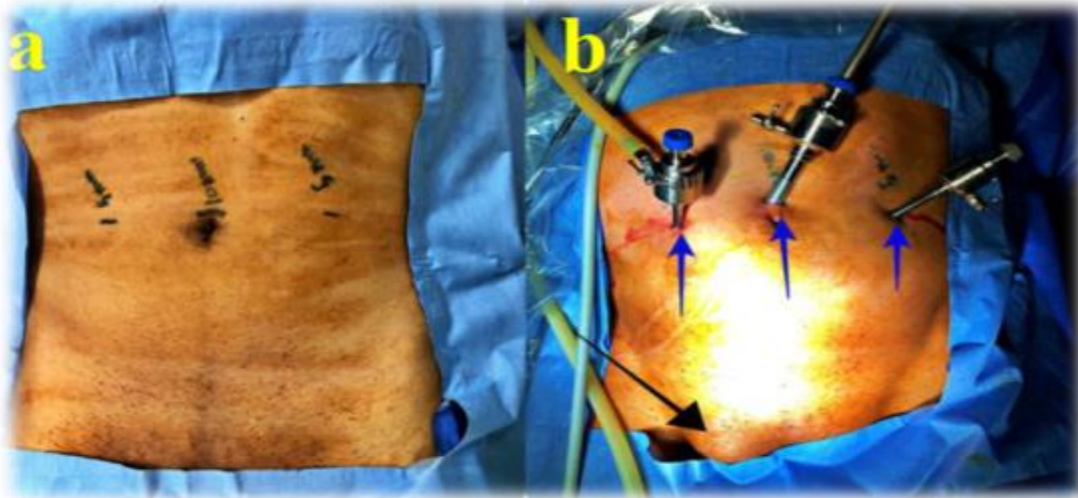


Figure (1): (a) show the site of trocars. (b) show the trocars in place (blue arrow), and hernia site (black arrow).

Step 2: Identification of anatomic landmarks:

Exploratory laparoscopy is carried out at first to identify the inguinal area and the important anatomical landmarks like epigastric vessels and umbilical ligament (medial umbilical fold, median umbilical fold and lateral umbilical fold)

and the triangle of doom and triangle of pain. Once in position, the small bowel should be moved away from the surgical area; if the hernia defects have content, they should be reduced by direct careful grasping or external abdominal wall manual pressure to assess the hernia sac if reduced or not. **Figure (2) (a & b).**

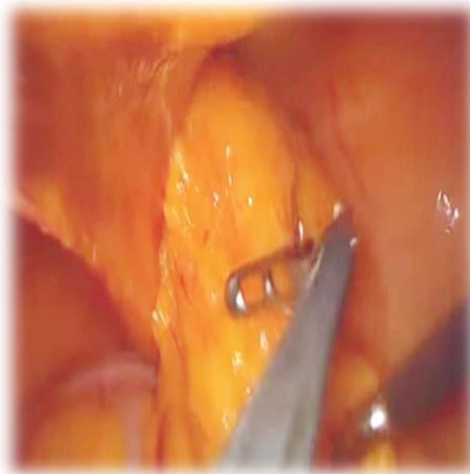
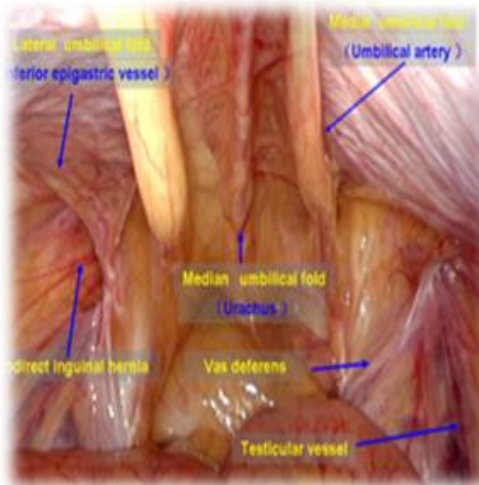


Figure (2): Identification of anatomic landmarks.

Step 3: Dissection of the peritoneal flap:

Dissection of the peritoneal flap was started at a point near the ASIS and running medially up to the midline then the space is created by dissection of the peritoneum from the fascia transversalis. **Figure 3(a&b) Figure 4**

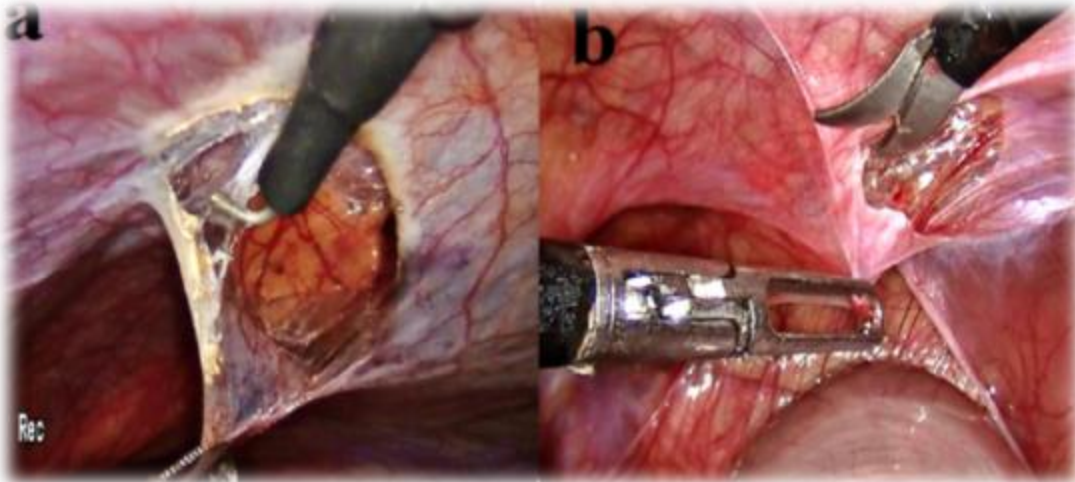


Figure (3):Dissection of the peritoneal flap.(a) using electric dissection. (b) using scissor dissection.



Figure (4): Dissection of the peritoneal flap.

Step 4: Dissection around the hernia sac:

Dissection was done until the sac is completely separated from the cord and other structures and dissection continues medially to the side of the bladder to give enough room for mesh placement. **Figure (5)**

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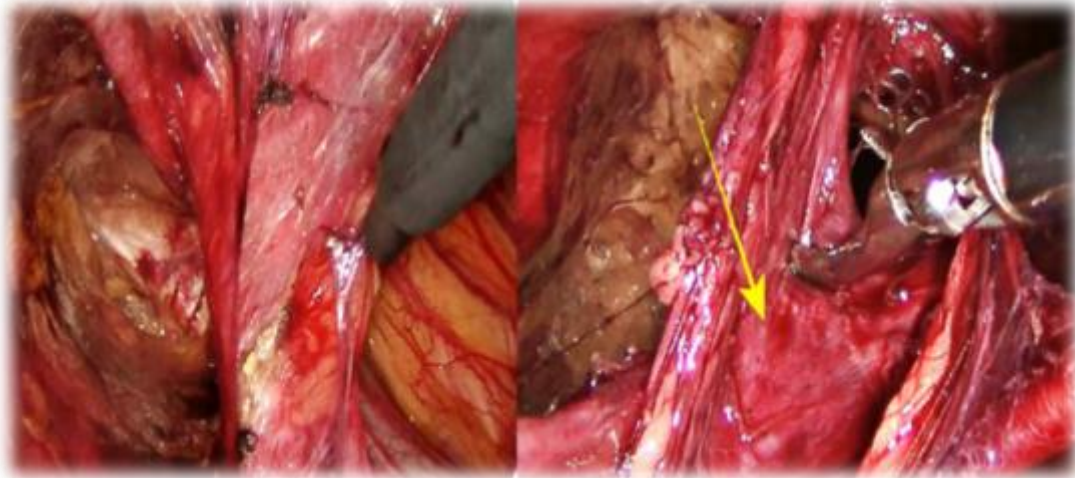


Figure (5):Dissection around the hernia sac.(yellow arrow) hernia sac.

Group (A) underwent indirect hernia sac transection:

- a) The Retzius and Bogros spaces were separated first.
- b) A gap was carefully created between the hernia sac and the spermatic cord at about 1–2 cm away from the neck of the hernia sac.

c) The hernia sac was ligated with clips, and the hernia sac was cut off at the distal end of this hernia sac ligation.**(Figure 6)**

d) The distal hernia sac was not removed. The proximal hernia sac was separated from the spermatic cord.

e) We performed peritonealization of the spermatic cord for 6–8 cm.

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Figure (6): Hernia sac transection.

Group (B) underwent complete sac reduction:

- f) The operative strategy was to perform complete reduction of the hernia sac, but transection of the sac was performed in cases with severe adhesions.

g) The sac was isolated from the vas deferens and testicular vessels, and then it was completely reduced.

Step 5: Fixation of the mesh:

h) A 15 x 15 cm sheet of polypropylene mesh is rolled into a tubular shape and introduced through the 10 mm umbilical trocar. The mesh is used to cover the direct space, the indirect

space, and the femoral ring area.(Figure 7: a & b)

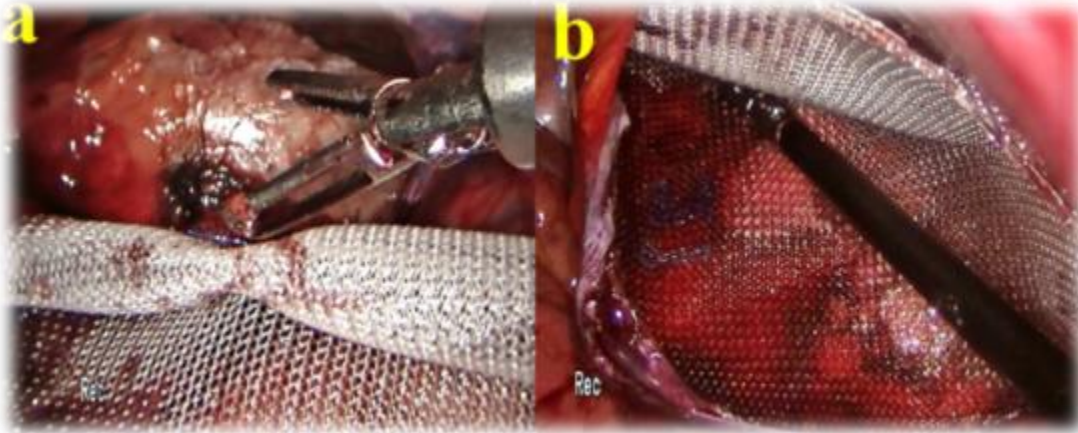


Figure (7): (a) mesh insertion. (b) mesh in place.

- i) Fixation by tacker in the cooper's ligament and in the anterior abdominal wall on both sides of the inferior epigastric vessels to avoid haemorrhage. **Figure (8)**

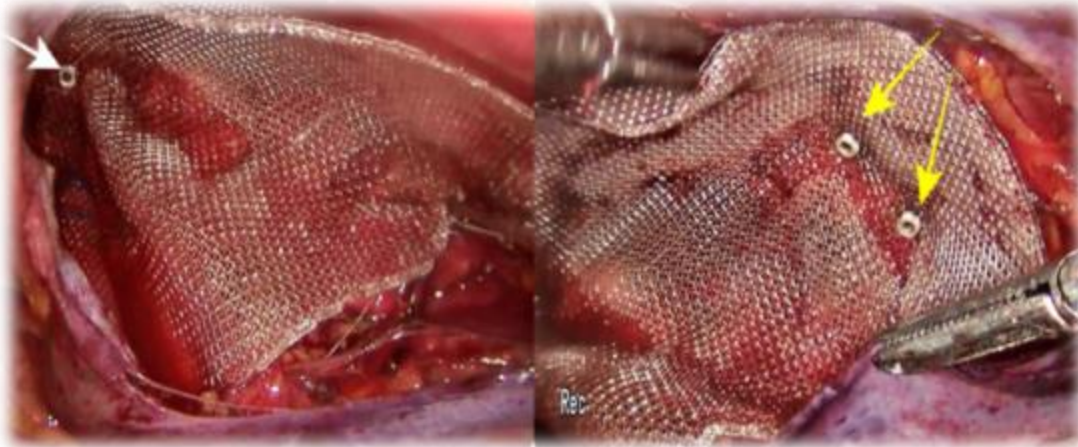


Figure (8): Fixation of the mesh by the tackers. (arrows).

Step 6: Closure of the peritoneum:

Closure of the peritoneal flap is done using 2/0 Vicryl sutures (Continuous sutures) or by tackers. Figure (9) & Figure (10)

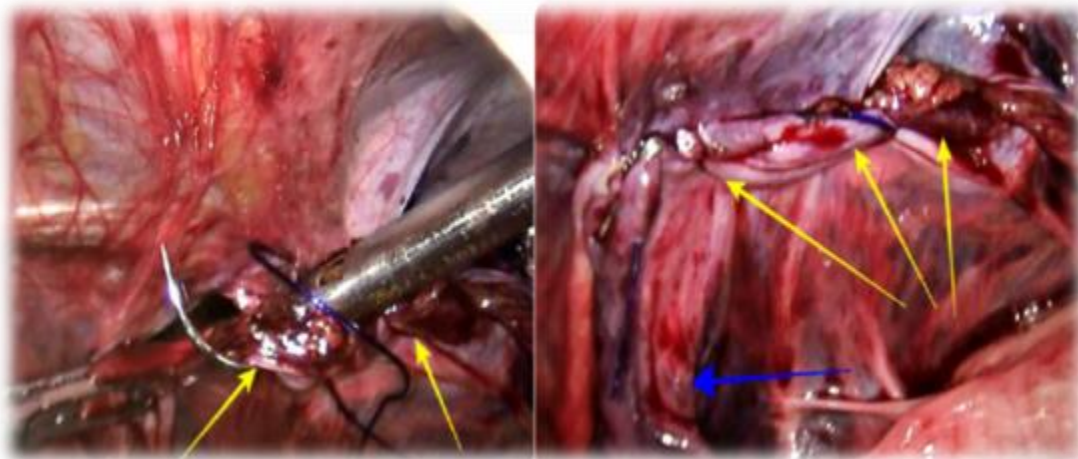


Figure (9):Closure of the peritoneum by sutures (yellow arrows). Hernia sac (blow arrow).

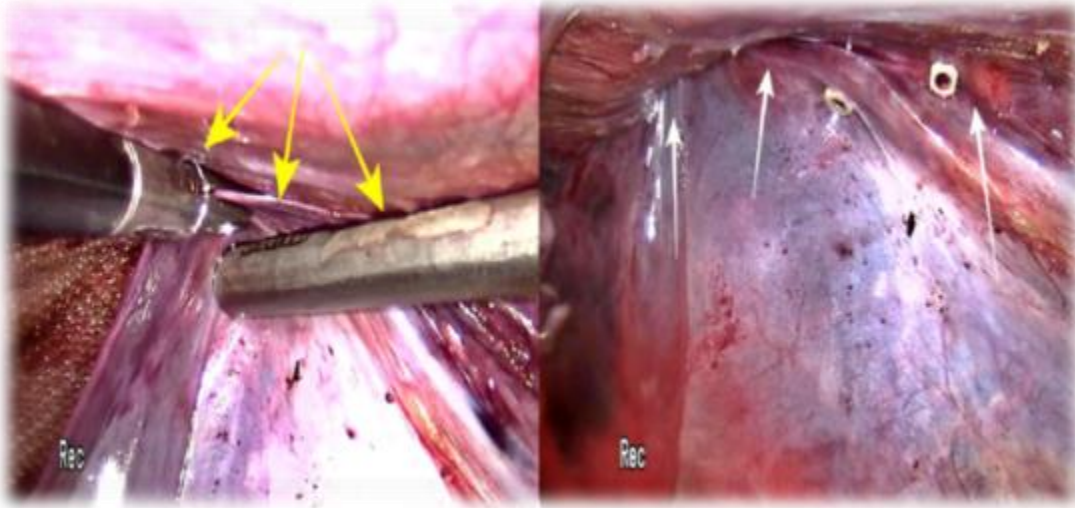


Figure (10):Closure of the peritoneum by tackers (arrows).

Step 7: Removal of ports and closure of the skin and dressing is done.

3. Postoperative management and follow up:

A liquid diet is indicated 4 hours after surgery and antibiotics coverage by third-generation cephalosporins after 12 hours from operation ,all patients received a single dose of pethidine hydrochloride 50 mg intramuscular during early postoperative period, Elastic compression stockings and low molecular weight heparin are added if necessary, after that analgesia was maintained by nonsteroidal anti-inflammatory drugs (Diclofenac sodium 50mg) orally upon discharge , the urinary catheter, if placed, is removed 6 hours after surgery and patients were discharged postoperatively with Abdominal and Scrotal Ultra Sound, careful follow up scheduled for all patients weekly for one month then every two weeks for two months to compare between the 2 groups regarding seroma formation at outpatient clinic. At home, patients continue taking oral analgesic as necessary (Paracetamol, Ketoprofen).

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