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RESEARCH

Hernia defect closure with corresponding mesh site fixation only in laparoscopic inguinal hernia repair.

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CONFLICTS OF INTEREST
THERE ARE NO CONFLICTS OF INTEREST FOR ANY OF THE AUTHORS.

ABSTRACT:

Background: The role of the mesh is very important in hernia repair especially in the endoscopic technique. The fixation by penetrating techniques is associated with a significantly increased risk of developing a post-herniplasty pain syndrome. Tension free technique is associated with increased risk of mesh bulging or migration and recurrence. We have presented our technique in which the mesh is fixed by one suture at its centre and peripheral tension free.

Methods: This study included 75 males patients, suffering from inguinal hernias. Transabdominal preperitoneal (TAPP) technique was used in which the mesh was fixed by one suture at its centre and leaving peripheral mesh parts free. The intra and post-operative complications were recorded.

Results: The mean hospital stay was 1.2 days. The mean age was 41.3 years. The operative time ranged from 40 to 120 minutes. Mild bleeding was occurred in 9 patients (12%) during hernia sac dissection. Postoperative complications were mild inguinal pain in 5 patients (6.7%) for three weeks, and mild hydrocele in 10 (13.3%). No recurrence or mesh bulging or migration was noticed during the period of follow up (range 3 to 24 months).

Keywords: Central mesh fixation, peripheral tension free, laparoscopic hernia repair.

INTRODUCTION

Inguinal hernia repair is one of the most frequently performed surgical procedures worldwide in general surgery. There are approximately 700,000 hernia repairs performed in the whole world every year, which results in costs of approximately USD 500,000,000 in the United States plus the cost for medication, sickness leave, and missing work performance [1]. Laparoscopic surgery is commonly used for inguinal hernia repair. Transabdominal preperitoneal (TAPP) and totally extraperitoneal procedures are performed with excellent results [2,3]. TAPP approach in the therapy of inguinal hernia seems to be more common and suitable [4]. Although there are still recurrences of hernias, their numbers have decreased considerably over the years to a rate below 3% [5]. Decreased recurrence rates might be explained by enhanced surgical techniques, the general use of mesh, and novel mesh fixation methods [3,6]. Absorbable or not, most fixation devices that are provided by health care manufactures are tacks and sutures. This type of fixation ensures strong primary fixation of meshes, [7] but can be associated with pain and discomfort [8,9]. The total absence of fixation can be considered in selected cases. This can lead to reduced postoperative pain [10], but it might result in mesh migration. Less invasive means of fixation are now

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available, but it must be ensured that they provide the same fixation performance as commonly used devices [11,12]. This study offers novel technique for mesh fixation during TAPP procedure, where the mesh is fixed by suture at its centre corresponding to hernia defect and leaving other mesh parts free. At the same time, this suture will closed the hernia defect.

MATERIALS AND METHODS

This research was approved by the ethics Committee of Zagazig University. The study was included 75 males patients (47 indirect, 19 direct, 9 both types on same side) from January 2014 through December 2015 in the General Surgery Department, Zagazig University Hospital, Egypt. The procedure was explained to all patients, and all patients gave written consent for inclusion of their data in this study. The ages of the patients ranged from 18 to 61 years (mean, 41.3 years).

Surgical procedure:

Under general anesthesia, the laparoscopic transabdominal preperitoneal (TAPP) technique is used in this patients group. The patient asked to urinate, while in the surgical preparation room, in order to empty the bladder. The Veress needle is inserted supra-umbilically to install the pneumoperitoneum of 14 mmHg has been achieved. A 30-degree, 5 mm laparoscope is used for the whole procedure. Two additional trocars, one 10 mm on the right side of the patient, at the level of umbilicus, lateral to the rectus sheath, and another one 5 mm on the left side at the same level. As usually, the peritoneum is incised superiorly, 3 cm above the hernia defect. This incision extends from the medial umbilical ligament to the anterior superior iliac spine laterally. After dissection of hernia sac and complete exposure of the preperitoneal pace, the hernia defect was closed by external looped needle through the abdominal wall directly over hernia defect (figure 1 A - E). The looped needle passes through the skin over the hernia defect and under the inferior border of defect. One of prolene No.0 passed from the port 10 mm to put inside the loop of needle. The needle tip with prolene end inside it withdraws and redirected to pass under the floor of hernia defect, and superior border of hernia defect. The prolene end detached from the loop and bring from the same port by using laparoscopic forceps. Now, the two limbs of suture are present outside the abdomen through working port. The suitable prolene mesh is prepared and the two suture limbs pass through the mesh at corresponding site to hernia defect. The mesh is pushed for preperitoneal space using laparoscopic forceps through 10 mm port. The suture is tied extracorporeal and pushing by laparoscopic claw over mesh to close hernia defect and achieve central mesh fixation. Then, the other mesh parts were spread at preperitoneal space and leaving tension free. The peritoneal wound was closed well over mesh using Vicryl No. 2/0 (figure 2 A - E). The pneumoperitoneum is emptied under direct viewing with the laparoscope and external pressure is applied to the inguinal region. The trocar sites are closed. The follow up period ranged from 3 to 24 months (mean, 18 months) by clinical examination and abdominal ultrasonography if needed. The intra and postoperative complications were recorded.

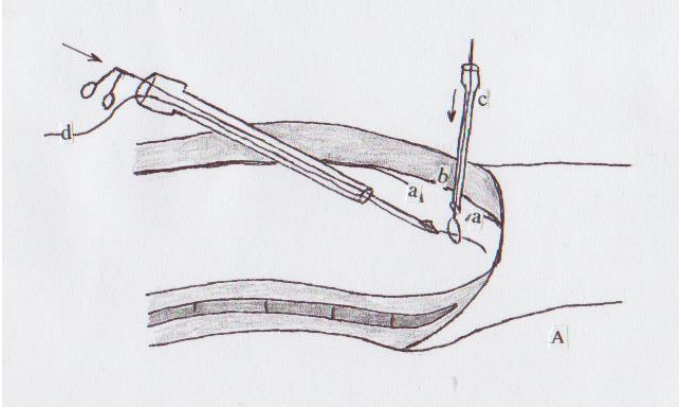


Figure 1A: a- peritoneal flaps. b- hernia defect. c- long looped needle. d- prolene No. 0. The looped needle passed through skin over the hernia defect and through the inferior edge of hernia defect. Then, loop appeared from needle, and prolene end through working port to put inside the loop using laparoscopic forceps.

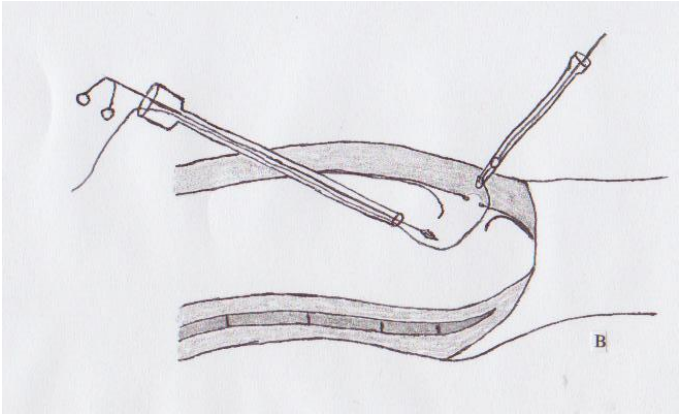


Figure 1B: The needle and prolene end inside it was withdraw for short distance, redirected to pass under the hernia defect floor and the superior hernia defect edge.

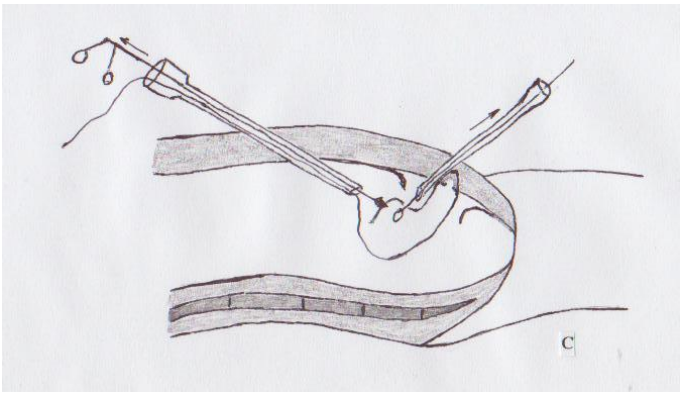


Figure 1C: The prolene end was detached from the loop and hold by laparoscopic forceps. Then, the forceps was withdrawn to bring the prolene end outside the abdomen through the working port.

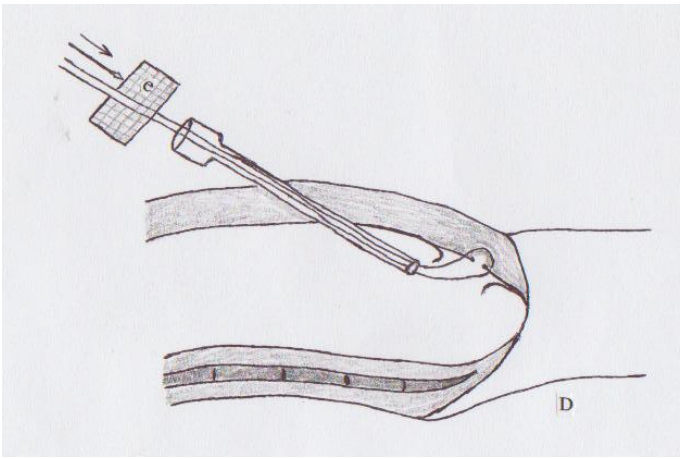


Figure 1D: e. Suitable prolene mesh. The two suture limbs passed through the mesh at corresponding area to hernia defect with the distance between two limbs 5 mm. Then, the mesh was pushed to go inside the abdomen through the working port using laparoscopic forceps.

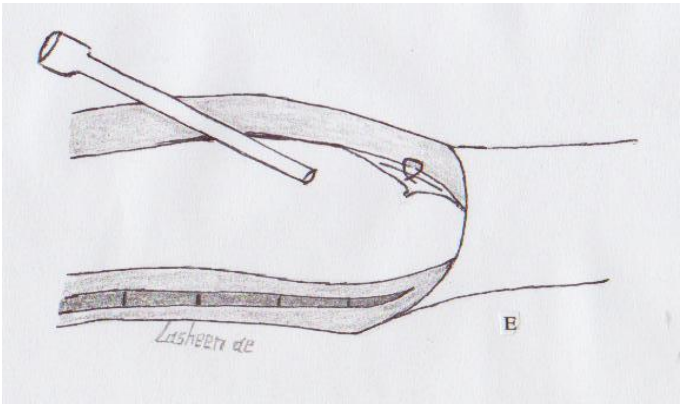


Figure 1 E: The mesh go to right preperitoneal space. The suture is tied (extracorporeal and pushed by laparoscopic claw) over mesh to close hernia defect and achieve central mesh

RESULTS

The mean operative time was 90 minutes (ranged from 40 to 120 minutes). Mild bleeding was occurred in 9 patients (12%) during hernia sac dissection which controlled by using diathermy. The mean hospital stay was 1.2 days (range, 1 to 2 days). The two limbs of suture must be passed at the prolene mesh at the corresponding site to hernia defect. The distance between two suture limbs must be short (5 mm). This suture when is tied leading to hernia defect closure and central mesh fixation. Also, suture ting will be directed the mesh to right position and helping mesh spreading. Postoperative complication were mild inguinal pain in 5 patients (6.7%) for three weeks, and mild hydrocele in 10 patients (13.3%). No recurrence or mesh bulging or migration was recorded during the follow up period.

Discussion: laparoscopic inguinal hernia repair become one of the standard methods to treat inguinal hernia, mainly in cases of recurrent hernias, bilateral hernia, and femoral hernia [14]. More than 70 different studies and meta-analysis comparing laparoscopic endoscopic and open inguinal hernia repairs stated comparable long term results focusing on recurrences, post-operative pain, and quality of life of patients [15,16]. Mild differences were reported in the occurrence of chronic post-operative pain [17]. Although there have been studies that found a higher recurrence rate in laparoscopic repairs than in open inguinal hernia repairs, it may be more a question of the experience of the operating surgeon than of a real failure of surgical technique [18]. One of the remaining problems in the field of laparoscopic inguinal hernia repair is the problem of fixation or non-fixation of prosthetic material. It has been shown that traumatic fixation of the mesh increases the possibility for the development of chronic post-operative inguinal pain. This is why atraumatic fixation of prosthetic material is recommended [19,20]. Some studies found that mesh fixed with tissue glue or absorbed tacks dislocated in some cases at intra-abdominal pressure. This mesh dislocation could occur very early postoperatively, before the mesh has integrated into the tissue [12,21,22]. Alternative to atraumatic fixation with tissue glues is usage of so called self-fixation mesh, which enables sufficient implant fixation to the tissue, provided by specially adjusted surface without the need of additional fixation [1,23]. Self-fixating meshes pose an increased risk of early postoperative mesh dislocation. As recommendation, some sutures were applied to secure

the mesh in both self-fixation mesh and mesh fixed by tissue glue [12,24]. In our technique, the mesh is fixed by one suture at corresponding area of mesh to the hernia defect and leaving other mesh parts tension free. At the same time, this suture will be produce secure for closure of hernia defect when ting over mesh. This suture directed the mesh for right position at preperitoneal space and helping in mesh spreading. The suture was put under direct view to pass through both hernia defect edges and floor. So no entrapping any nerve will be occurred leading no chronic inguinal pain.

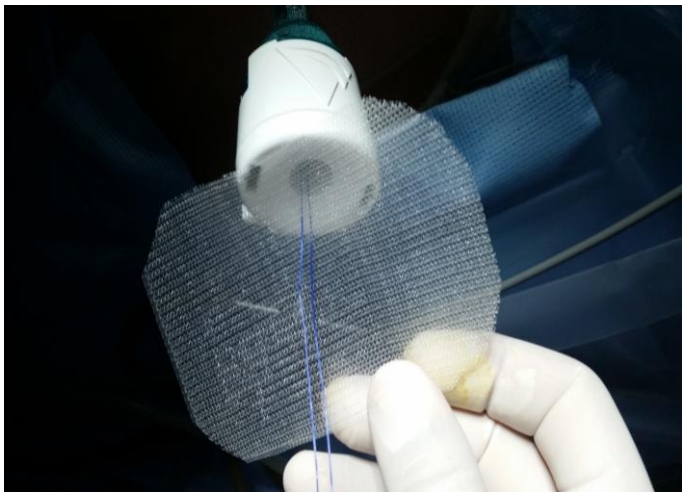


Figure 2 A: Two suture limbs passes through the suitable prolene mesh outside the abdomen.

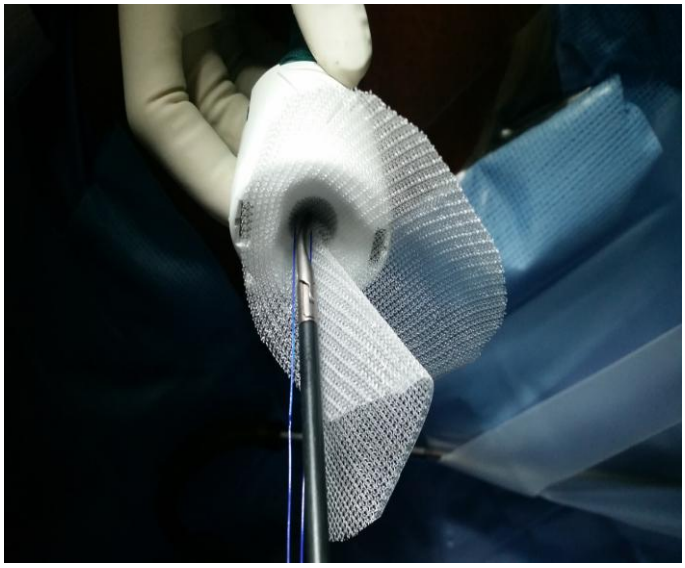


Figure 2 B: The mesh is pushed to go inside the abdomen through working port using laparoscopic forceps.

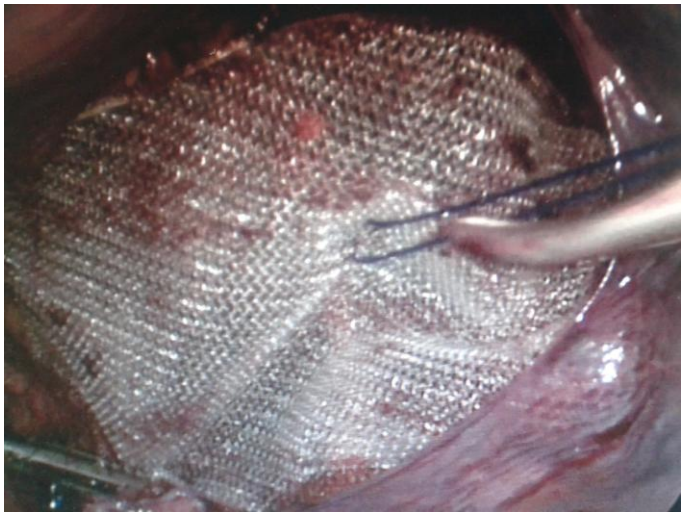


Figure 2 C: The two suture limbs directed the mesh to right position in preperitoneal space and before ting



Figure 2 D: The suture is tied (extracorporeal and pushing by laparoscopic claw) over mesh to close hernia defect and achieve central mesh



Figure 2 E: The peritoneal wound was closed well over the prolene mesh.

CONCLUSION

Our procedure for mesh fixation during transabdominal preperitoneal laparoscopic inguinal hernia repair is easy, cost effective, associated with good results and free of complications.

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