Original research

Modified transabdominal external needle for mesh size estimation in laparoscopic hernia repair

Ahmed E. Lasheen*, Khaled Safwat, Mansour Morsy, Zaki Allam, Wael Awad

General and Laparoscopic Surgery Department, Faculty of Medicine, Zagazig University, 44519, Egypt

HIGHLIGHTS

- Suitable mesh size is essential for good laparoscopic hernia repair.
- Our technique offers easy, accurate, mini invasive way for mesh size estimation.
- Our study is very helpful for laparoscopic hernia surgeon especially less experience.

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ABSTRACT

Purpose: The obtaining on the accurate mesh size is the key for the good results and making the procedure easy during laparoscopic hernia repair. This study offers a modified transabdominal external needle technique to achieve this goal. Methods: During the period from February 2011 through October 2013, during laparoscopic inguinal hernia repair in 41 patients, the mesh dimensions were determined by novel technique. Where, the mesh size was calculated percutaneous transabdominal by using spinal needle No. 22 with thread inside it. The mean follow up period was 24 months. Results: The ages of this patients group were ranged from 21 to 65 years (mean, 49 years). The mean time needed to obtain the accurate mesh dimensions was 3 min. No recurrence or mesh bulging or mesh infection were recorded in this patients group during the period of follow up. Conclusion: Our technique for calculation of mesh dimensions during laparoscopic hernia repair is accurate, safe, and easy.

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1. Introduction

Endoscopic hernia repair has become widely used since 1990s. Currently, laparoscopic inguinal hernia repair is performed by using one of two so-called posterior approaches, namely, the totally extraperitoneal (TEP) and the transabdominal preperitoneal (TAPP) approaches [1,2]. The mesh size must be suitable to completely cover and sufficiently overlap the entire myopectineal orifices, the size of the implanted material gradually increased in course of time [3]. In this study, we try to find easy, effective, safe method to give us the optimal mesh size during laparoscopic inguinal hernia repair through modified transabdominal external needle technique.

2. Patients and methods

This study was done in the General and Laparoscopic Surgery Department, Zagazig University Hospital, Egypt, from February 2011 through October 2013. Forty one patients were included in this research (21 indirect inguinal hernia, 15 direct inguinal hernia, 5 both direct and indirect inguinal hernia on same side). This research was discussed and approved from the ethical committee of Zagazig University at January 2011. All information about the technique was discussed with all patients, and all patients gave writing consent for inclusion of their data in this study. The ages of the patients ranged from 21 to 65 years (mean, 49 years).

Surgical technique: Under general anesthesia, TAPP technique was used in this patients group. The patient asked to urinate, while in the surgical preparation room, to empty the bladder. Veress needle was inserted supra-umbilically to install the pneumoperitoneum of 14 mmHg has been achieved. A 0-degree, 10 mm laparoscopic was used for the whole procedure. Two additional
and go to preperitoneal space, where was mesh. Now, the accurate dimensions of the optimal mesh size were obtained by using spinal needle No. 22 with a thread inside it as follow: The spinal needle and a thread inside pierced the anterior abdominal wall to appear at the point of the lateral border of mesh position which needed. The inside end of the thread was taken by laparoscopic forcep to stretched until reach the medial border of mesh position which needed, then putted tissue forceps on the thread from outside the spinal needle. Then, the thread was withdrawal until the laparoscopic forcep with inside end came to the needle tip, and another tissue forceps was putted on the thread from outside the needle. The distance between the two tissues forceps represent the length of the mesh. The same previous step was redoing to obtain on another dimension of optimal mesh. Now, the accurate dimensions of the optimal mesh size were obtained. The suitable mesh (polypropylene mesh) was prepared and go to preperitoneal space, where was fixed in its position using Glubran 2 (Gem srl, Viareggio, Italy). Figs. 1a–c and 2a–c. The peritoneum was closed using Vicryl No. 2/0 through extraperitoneal pretied sutures. The pneumoperitoneum was empatied under direct viewing and external pressure was applied to theinguinal region. The trocars sites were closed and an elastic support for scrotal compression was placed. Follow up period ranged from 3 to 34 months (mean, 24 months).

3. Results

The mean surgical time was 40 min (ranged from 30 to 90 min). The mean time to obtain accurate mesh dimensions was 3 min (ranged from 2 to 5 min). Thirty five patients (85.4%) returned to their usual activities in one week and 6 patients (14.6%) required up two weeks. Hydroceles developed in 4 patients (9.8%) after correction of indirect inguinal hernias, which were solved with a single aspiration. Six patients (14.6%) experienced mild inguinal pain for three weeks. No chronic pain or recurrence or mesh bulging and infection were recorded in this patients group during the period of follow up.

4. Discussion

Inguinal hernia is a common condition with a lifetime risk of 27% in men and 3% in women, increasing in both sexes with age [4]. Laparoscopic inguinal hernia repair offers excellent results in experienced hands. The recognized reasons of recurrence with laparoscopic inguinal hernia repairs were lack of surgical experience, inadequate mesh size and its fixation and overlooked or missed hernias. The reported recurrence rate was lower with a large well anchored mesh; and among 19 recurrences, in 60% the mesh was too small, in 30% the fixation was found to be insufficient and in 20% the hernia was never repaired [5,6]. Proper mesh size is important in preventing recurrence in laparoscopic inguinal hernia repair. Intra-operative observations in recurrent hernia cases have revealed that the mesh slipped away. This happens more commonly where a mesh is too large or too small [7]. The mesh size must be adequate to completely cover the myopectineal orifices and sufficiently overlap the hernia defects at least 3–5 cm all around. The established mesh size for laparoscopic inguinal hernia repair is 7.5 × 15 cm per unilateral hernia [8]. This recommended mesh size may be unsuitable for some population as South East Asian due to regional variations in anatomical measurements [9]. Some studies reported, the hernia fascial defect is sized by passing a...
spinal needle transabdominally and marking the edge on the Ioban drape. It is easy to overestimate the size of the defect with pneumoperitoneum; thus, insufflation pressure should be reduced from 8 to 10 mm Hg for this step [10,11]. The technique in our study is considered modification of using transabdominal external needle to calculate the mesh size during laparoscopic hernia repair.

5. Conclusion

Our study, offers simple, easy and accurate technique to obtain suitable mesh size during laparoscopic inguinal hernia repair in each patient especially with lower experience surgeons.

Ethical approval

This research was discussed and approved from the ethical Committee of Zagazig University at January 2011.

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Author contribution

- Ahmed Lasheen: His idea and all steps for paper preparation under his supervision.
- Khaled Safwat and Mansour Morsy: Shared corresponding (first) author in clinical application for this idea.
- Zaki Allam and Wael Awad: Collected some papers about this idea and shared corresponding (first) author in writing the paper.

Conflicts of interest

No conflicts of interest to disclose.

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References