Surgical outcomes of TransAbdominal PrePeritoneal laparoscopic surgery (TAPP) for inguinal hernia at Viet Tiep Hospital

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ABSTRACT

Objective: To assess the outcomes of TransAbdominal PrePeritoneal (TAPP)surgery for inguinal hernia (IH). **Patients and Methods:** This study included 52 patients diagnosed with IH who were treated with TAPP at Viet Tiep Hospital between March 2021 and September 2023. **Results:** The mean age was 56.8 ± 10.3 years. Right-sided hernias accounted for 31 patients (59.6 %), while left-sided hernias accounted for 21 patients (40.4%). The majority of patients with indirect IH accounted for 65.4%, while those with direct IH accounted for 34.6%. No mixed hernias were observed. Mean operation time was 79.1 ± 14.8 minutes; postoperative hospital stay was 6.12 ± 1.25 days. The mean pain duration was 3.3 ± 1.2 days. Postoperative complications were mild and infrequent. Regarding the early surgical outcomes, most patients (82.7%) showed excellent results. No poor results were observed. **Conclusion:** TAPP for IH resulted in good surgical outcomes and a short recovery time. Comparative studies and randomized controlled trials are required to verify the effectiveness of this technique.

Keywords: Inguinal hernia, TransAbdominal PrePeritoneal (TAPP), complication

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INTRODUCTION

Inguinal hernia (IH) is a common surgical condition for which surgery is the definitive treatment method. Inguinal hernia repair has been performed since the 16th century [1]. Since Bassini introduced the surgical technique bearing his name in 1887, there have been over 100 different surgical methods by various authors aiming to achieve the best treatment outcomes. Each year, an estimated 20 million IH surgeries are performed. Along with the development of laparoscopic surgery, Arregui et al. reported the first laparoscopic IH surgery in 1992, in which a mesh was placed in the preperitoneal space. Since then, surgeons worldwide have adopted laparoscopic surgery in the treatment of IH to reduce postoperative pain and facilitate early recovery. The two most common laparoscopic techniques for IH are total extraperitoneal (TEP) and transabdominal preperitoneal (TAPP) [2].

The TAPP method has been used by many authors for its safety, efficacy, ease of execution, and low prevalence of complications owing to its ability to identify injuries immediately after inserting the camera. It offers a wide working space, direct access, and stabilization of the posterior inguinal wall; therefore, this

technique can also be used for incarcerated IH [3].

In our country, laparoscopic techniques for IH treatment have been applied in many large hospitals, along with many studies evaluating treatment effectiveness. At Viet Tiep Hospital, we implemented laparoscopic IH repair by placing a preperitoneal mesh via an abdominal approach. This study aimed to evaluate the surgical outcomes of this technique for IH at our hospital.

PATIENTS AND METHODS

We retrospectively recruited 52 patients with IH who underwent TAPP at Viet Tiep Hospital between March 2021 and September 2023. The inclusion criteria were patients aged ≥ 18 years with unilateral IH and complete medical records. Patients with benign prostatic hyperplasia, ASA > III, coagulopathy, or complex medical conditions, such as heart failure, coronary artery disease, or chronic obstructive pulmonary disease, were excluded from the study.

The study was conducted in accordance with the guidelines of the Declaration of Helsinki and approved by the Institutional Review Board.

The study variables were age, sex, side of hernia, hernia classification (direct, indirect, or mixed), and early surgical outcomes such as intra- and postoperative complications, operation time, duration of postoperative pain relief, length of hospital stay, and early outcomes.

Evaluation of early results: This was based on Sinha's criteria [3], which includes four grades:

Excellent: Without early postoperative complications.

Good: Complications arising but not requiring intervention, such as thigh numbness, hematoma, and self-absorbing seroma, effectively managed with conservative treatment.

Fair: Complications necessitating intervention but not surgical revision, such as urinary retention requiring catheterization, hematoma or seroma requiring aspiration, and superficial wound infection necessitating wound debridement.

Poor: Requires surgical revision or death during hospital stay

RESULTS

The study included 52 patients with a mean age of 56.8 ± 10.3 years (61.5% were younger than 60 years). Right-sided hernias accounted for 31 patients (59.6 %), while left-sided hernias accounted for 21 patients (40.4%). The majority of patients with indirect inguinal hernia accounted for 65.4%, while those with direct inguinal hernia accounted for 34.6%. No mixed hernias were observed (Table 1). Mean operation time was 79.1 ± 14.8 minutes; postoperative hospital stay was 6.12 ± 1.25 days (Table 2). The mean pain duration was 3.3 ± 1.2 days. Postoperative complications were mild and rare (Table 3). Regarding the early surgical outcomes, most patients (82.7%) showed excellent results. No poor results were observed.

Table 1. *Hernia classification*

Hernia classification	Right	Left	Total
Direct	12	6	18 (34.6%)

Indirect	19	15	34 (65.4%)
Total	**31 (56.9%)**	**21 (40.4%)**	**52(100%)**

Table 2. *Postoperative complications*

Complications	**Number**	**Percentage**
Wound infection	1	1.9
Scrotal seroma	2	3.8
Thigh numbness	4	7.7
Urinary retention	3	5.8

Table 3. *Evaluation of results*

Result evaluation	**Number**	**Percentage**
Excellent	43	82.7
Good	5	9.6
Fair	4	7.7

DISCUSSIONS

TAPP surgery also offers distinct advantages, such as a wide laparoscopic surgical field, clear anatomical landmarks, and relatively easy laparoscopic access. TAPP may be indicated for difficult cases such as early incarcerated inguinal hernias before necrotic damage to the herniated organs occurs. Surgeons can easily observe, assess, and manage herniated organs. This cannot be achieved with TEP surgery [4]. Additionally, when performing TAPP surgery, the surgeon can identify any contralateral inguinal hernias and, if present, manage certain accompanying conditions in the peritoneal cavity, and experience a shorter learning curve [3].

In our series of 52 cases, 31 (59.6%) had right-sided inguinal hernias, while 21 (40.4%) had left-sided hernias. Among these, most were indirect inguinal hernias (34 of 52). The average age in our study was 56.8 ± 10.3 years, and 61.5% of the patients were under 60 years old. In the TAPP study by Nguyen Thanh Xuan and colleagues in 2019 at Hue Central Hospital, the average age was 60.4 ± 11.8, and 96.8% were male [5]. In the study by Do Manh Toan et al. in 2019, the average age was 50.6 ± 20.0, with the oldest patient being 86 years old and the youngest 19[6]. Other authors around the world have reported similar results to ours: Jacob et al. reviewed 15,176 TAPP procedures from 2009 to 2013, finding an average age of 55.4 ± 15.7, with 86.7% being male and representing 92.8% of bilateral hernias [7]. Age is a risk factor for inguinal hernias, with increasing age leading to the deterioration of the elastic fibers in the deep inguinal ring. The incidence rate is lower among younger individuals than among older adults, particularly in the 70–80 age group.

The mean operation time in our study was 79.1 ± 14.8 minutes. The mean postoperative pain duration was 3.3 ± 1.2 days; the mean length of hospital stay was 6.12 ± 1.25 days (ranging from 3 to 9 days), and the average time to return to bowel movements was 1.6 ± 0.5 days. Elmessiry et al. conducted a

prospective study of 180 patients with bilateral IH who were randomly assigned to the Lichtenstein method, open preperitoneal mesh placement, or TAPP. The corresponding surgical times were 84.22 ± 3.73 minutes for Lichtenstein bilateral, 90.89 ± 8.13 minutes for open preperitoneal mesh placement, and 94.3 ± 10.19 minutes for bilateral TAPP ($p < 0.001$); postoperative pain at 24 hours was 5.12 ± 1.69, 4.81 ± 0.74, and 3.37 ± 0.71 ($p < 0.001$); and pain at 7 days postoperatively was 3.18 ± 0.71, 4.13 ± 0.88, and 1.81 ± 1.21 ($p < 0.001$). Early complications occurred in 21.6%, 20.8%, and 5.6% of the patients, respectively. The average length of hospital stay (in days) was 1.41 ± 0.50, 1.77 ± 0.42, and 1.11 ± 0.32 ($p < 0.001$), and the average time to return to normal activities (in days) was 12.1 ± 1.02, 10.64 ± 0.96, and 5.87 ± 0.97, respectively ($p < 0.001$) [8]. Yang et al. compared four years (from January 2007 to January 2011) of laparoscopic and open surgery for incarcerated IH, including 188 patients: 57 laparoscopic and 131 open surgeries. The average surgery times were 79.82 ± 29.57 minutes for laparoscopic and 80.75 ± 35.16 minutes for open surgery. Infection rates were significantly higher in the open surgery group, and the length of hospital stay was 4.39 days versus 7.34 days [9]. Laparoscopic surgery may be technically more challenging owing to conditions such as adhesions within the peritoneum, which may explain the longer surgery times in TAPP. However, in cases of bilateral hernias, laparoscopic transabdominal approaches are advantageous in terms of the surgery duration.

Pain is one of the most common issues encountered during the postoperative period after IH repair. The average duration of postoperative pain in our study was 3.3 ± 1.2 days. Mahaveer et al. found that the TEP group experienced significantly more pain than the TAPP group [9]. The median VAS scores were statistically higher in the TEP group until the seventh postoperative day; thereafter, no significant differences were observed over the next three months. The need for supplemental analgesia was greater in the TEP group than in the TAPP group. The TEP group experienced more pain due to extensive dissection from the navel to the pubic joint. According to Sharma, indirect inguinal hernias result in higher postoperative pain levels than direct inguinal hernias [10]. The study by Varcus et al. did not find significant differences in postoperative pain levels between the TAPP and TEP groups [11]. With the self-fixating mesh used in our surgery, there was less pain than with the traditional fixation methods. Additionally, self-fixating mesh causes less postoperative pain than Protack and allows for faster recovery in laparoscopic inguinal hernia surgery, while 40% of the mesh's weight is absorbed, reducing the presence of foreign material in the patient over time.

In our study, there was one case of wound infection, three cases of postoperative urinary retention, and four cases of numbness in the thigh on the hernia side. In cases of postoperative urinary retention, we inserted a urinary catheter and intermittently clamped it before its removal. After 2 days, the catheter was removed, and the patient was able to urinate normally. In cases of postoperative thigh numbness, patients were re-evaluated one week later and no longer had signs of numbness. According to Bittner, scrotal edema complications are more common in TAPP surgery than in TEP, whereas abdominal wall effusion is less common in TAPP [4]. In the study by Do Manh Toan et al. (2019), involving 95 TAPP procedures, two cases (2.2%) experienced intraoperative

complications (one bladder injury during dissection of the Retzius space and one epigastric vessel injury during dissection of the Bogros space), and 12 cases (12.6%) experienced early complications (surgical site infection, 1.1%; subcutaneous emphysema, 1.1%; inguinal effusion, 4.2%; inguinal hematoma, 3.1%; testicular pain, 3.1%) [6]. Muschalla evaluated the outcomes of 1184 TAPP procedures in 928 patients, noting 2.8% intraoperative complications and early complications: intestinal injury 0.4%, bladder injury 0.1%, epigastric vessel injury less than 0.1%, testicular vessel injury 0.1%, conversion to open surgery 0.3%, mesh infection 0.2%, and effusion 0.2% [12].

Limitations of current study should be mentioned. First, it had biases inherent to retrospective aspects. Second, the lack of a control group led to weak recommendations. A randomized controlled trial is needed to confirm the effects of TAPP on IH repair.

CONCLUSIONS

TAPP for IH gained good surgical outcomes and a short recovery time. Comparative studies and randomized controlled trials are needed to verify the effectiveness of this technique.

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CONFLICT OF INTERESTS

The authors declare that there is no conflict of interest regarding the publication of this article.

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None.

CONSENT

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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