

Initial outcomes laparoscopic transabdominal preperitoneal (TAPP) with a grip self-fixating mesh for inguinal hernia

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ABSTRACT

Objective: To assess the initial outcomes of the technical application and treatment of inguinal hernia (IH) using transabdominal preperitoneal laparoscopy (TAPP) with a grip self-fixating mesh at Hai Phong University Hospital from January 2022 to December 2023. **Patients and Methods:** This study included 30 patients diagnosed with IH who were treated with TAPP at the Hai Phong Medical University Hospital from January 2022 to December 2022. **Results:** The mean age was 54.5 ± 12.1 years. Of these, 58.4% were aged < 60 years. There were 19 (63.3%) had right-sided IH and 11 (36.7%) had left-sided IH. Indirect IH was observed in 23/30 patients. The mean operation time was 87.3 ± 12.7 minutes. The mean postoperative pain duration was 3.1 ± 1.5 days. The mean length of hospital stay was 5.76 ± 1.17 days, the shortest was 3 days, and the longest was 9 days. The mean time to return to normal activities was 1.3 ± 0.5 days. Four of the 30 patients experienced postoperative complications, including one patient with wound infection, one patient with urinary retention, and two patients with thigh numbness. **Conclusion:** TAPP with grip self-fixating mesh for IH yielded good outcomes and rapid postoperative recovery.

Keywords: Inguinal hernia, TAPP, grip self-fixating mesh.

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INTRODUCTION

Inguinal hernia (IH) is a condition in which organs in the abdominal cavity protrude through the inguinal canal or a weak point in the abdominal wall of the groin area, extending either under the skin or into the scrotum [1]. Globally, an estimated 20 million hernia repair surgeries are performed annually. Approximately 30% of inguinal hernias are asymptomatic, with only 3% leading to complications, such as incarceration, where abdominal organs (e.g., small intestine, large omentum) become trapped in the hernia sac, causing mechanical bowel obstruction and tissue necrosis. With the development of laparoscopic surgery in the early 1990s, Arregui et al. reported the first laparoscopic

inguinal hernia repair in 1992 using mesh placement in the preperitoneal space. Since then, surgeons have adopted laparoscopic techniques for inguinal hernia repair worldwide to reduce postoperative pain and promote early recovery. The two most common laparoscopic techniques for inguinal hernia repair are the total extraperitoneal (TEP) and transabdominal preperitoneal (TAPP) approaches [2].

Previously, mesh implants had to be secured using sutures or a Protack, which could potentially damage nerves and blood vessels. A self-fixating mesh, consisting of over 5000 small barbs that can adhere to the inguinal ligament and surrounding tissue, provides excellent fixation capability, less postoperative pain, and cost savings (by eliminating the need for Protack). This

technology has been used in several hospitals in Vietnam.

At Hai Phong Medical University Hospital, we initiated laparoscopic inguinal hernia repair using self-fixating mesh implants through the transabdominal preperitoneal approach. We assessed the initial outcomes of this technique and the results of inguinal hernia treatment using laparoscopic surgery with self-fixating mesh implants via the transabdominal preperitoneal approach at Hai Phong University Hospital.

PATIENTS AND METHODS

A prospective descriptive study was conducted. A total of 30 patients diagnosed with IH and treated with TAPP with self-fixating mesh placement at Hai Phong Medical University Hospital from January 2022 to December 2022 were recruited. The inclusion criteria were patients who were diagnosed with IH and treated with TAPP with self-fixating mesh placement with complete medical records. Additionally, patients were willing to participate in the study with written informed consent. Patients with contraindications to TAPP, systemic or local infections in the groin area bilaterally, ASA > III, coagulation disorders, and IH accompanied by prostate enlargement were excluded. The Progrid Self-fixating mesh manufactured by Convixen was used in this study. The study was conducted in accordance with the guidelines of the Declaration of Helsinki and was approved by the Institutional Review Board.

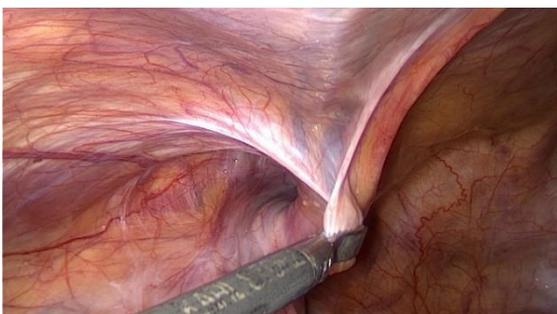


Figure 1. The image shows an indirect left

inguinal hernia in patient Le Van T., 59 years old

Surgical procedure

1. Placement of 3 trocars: one trocar below the navel, 10 mm in diameter, and two trocars, each 5 mm in diameter.
2. Dissection and separation of peritoneal space.



Figure 2. Dissection of peritoneal leaflet

3. Separation of the hernia sac from the spermatic cord.

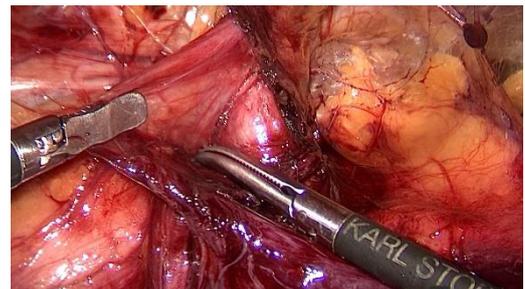


Figure 3. Separate of the hernia sac from the spermatic cord

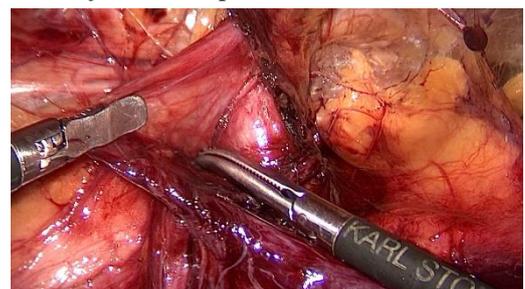


Figure 4. The preperitoneal space after dissection

4. Placement of mesh covering the entire hernia defect



Figure 5. Placement of mesh in the preperitoneal space

The study indicators included age, side of hernia, type of inguinal hernia, mean operative time, postoperative pain duration, postoperative intermediate care duration, intraoperative complications, early complications, and postoperative recovery time.

RESULTS

The mean age was 54.5 ± 12.1 years. Patients aged < 60 years accounted for 58.4% of the patients. Nineteen patients (63.3%) had right-sided inguinal hernias, and 11 patients (36.7%) had left-sided inguinal hernias. Among these, the majority were indirect inguinal hernias (23/30). (Table 1)

Table 1. Inguinal hernia classification

	Right	Left
Direct	4	3
Indirect	15	8
Total	19 (63,3%)	11(36,7%)

The mean operation time was 87.3 ± 12.7 minutes. The mean postoperative pain duration was 3.1 ± 1.5 days. The mean postoperative hospital stay was 5.76 ± 1.17 days, with the shortest being 3 days and the longest being 9 days. The mean time to pass gas was 1.3 ± 0.5 days.

Of the 30 patients, four experienced postoperative complications, including one patient with a surgical site infection, one with postoperative urinary retention, and two with numbness in the thigh area on the side of the hernia. All patients expressed satisfaction and high satisfaction with surgical outcomes. (Table 2)

Table 2. Complication

	Number	Percentage
Numbness in the outer thigh region	2	6,7
Urinary retention	1	3,3
Surgical site infection	1	3,3
Seroma formation around the surgical site	2	6,7
Total	4	13,3

DISCUSSIONS

TAPP surgery offers several advantages including wide access to the surgical field, clear anatomical landmarks, and relatively easy laparoscopic access. It can be indicated for challenging cases of inguinal hernia, such as incarcerated hernias without significant tissue necrosis, as surgeons can observe, assess, and manage herniated organs relatively easily, which may not be achievable with totally extraperitoneal (TEP) laparoscopic mesh placement [3]. Additionally, TAPP surgeons can detect contralateral hernias if present and address associated pathologies within the preperitoneal space, with a shorter learning curve.[4].

In our series of 30 cases, 19 (63.3%) had right-sided inguinal hernias, and 11 (36.7%) had left-sided hernias, consistent with findings by Ujiki and colleagues, where the majority were on the right side.[5]. The hernia contents of all our patients were identified via ultrasound, with one case involving the bladder and omentum, whereas in 16 cases, no hernia contents were observed during surgery. This could be explained by the ultrasound technique combined with the Valsalva maneuver, which increases intra-abdominal pressure to search for herniated organs but may not always detect them. During surgery under general anesthesia with endotracheal intubation and muscle relaxants, most herniated organs retract into the preperitoneal space, except in cases of incarcerated hernias.

Operation time

The mean operation time in our study was 87.3 ± 12.7 minutes. Analysis by Scheuermann et al. comparing inguinal hernia treatment using TAPP and Lichtenstein techniques confirmed previous studies[6], indicating that operation time in the Lichtenstein group was shorter than that in the TAPP group, although the difference was not significant. Hamza et al. showed significant differences in operation time

compared to other studies. Furthermore, in most studies included in Scheuermann's meta-analysis, both surgical methods were performed by the same surgical team, ensuring more consistent results. The laparoscopic method is technically more challenging, and conditions within the preperitoneal space, such as adhesions, may explain the prolonged surgical time for TAPP. However, in cases of bilateral hernias, the laparoscopic approach is advantageous in terms of surgical time [7].

Postoperative pain

Pain is one of the most common issues encountered during the postoperative period of inguinal hernia repair. The average postoperative pain duration in our study was 3.1 ± 1.5 days. In a study by Rodha et al., the TEP group experienced significantly more pain than the TAPP group[8]. The median VAS score was significantly higher in the TEP group until the seventh postoperative day, with no significant differences observed in the following three months. The additional pain relief requirements were higher in the TEP group than in the TAPP group. These findings are consistent with those of previous studies. The reason for the higher pain experienced by the TEP group may be the deeper and wider dissection from the groin to the hip joint. According to Sharma et al., indirect inguinal hernias have a higher postoperative pain level than direct inguinal hernias[9]. Varcus et al. found no significant difference in postoperative pain levels between the TAPP and TEP groups [10]. With the self-fixating mesh used in surgery, there was less pain compared to the traditional fixation methods. Additionally, self-fixating mesh causes less postoperative pain than Protack and promotes faster recovery in laparoscopic inguinal hernia repair. Furthermore, 40% of the mesh weight was absorbed over time, reducing the presence of foreign materials.

Complications

In our study, 4 of the 30 patients experienced postoperative complications.

Among them, one patient developed a wound infection, one experienced postoperative urinary retention, and two had thigh numbness on the side of the hernia after surgery. In a patient with postoperative urinary retention, preoperative ultrasound showed a prostate size of 25 g. After surgery, we placed a urinary catheter and intermittently clamped it before removal. Two days after catheterization, the patient was able to urinate and defecate normally upon catheter removal. For the two cases of thigh numbness after surgery, upon reevaluation one week later, no signs of numbness were observed in the patients.

Recurrence

A comparison between TAPP and Lichtenstein surgeries, analyzed by Uwe Scheuermann et al. in a meta-analysis, showed no significant difference in hernia recurrence ($P = 0.46$). The recurrence rate, particularly in laparoscopic surgery, depends on the surgeon's experience [11]. Most TAPP surgeons are reported to have high skill levels [12], explaining the low recurrence rates reported in these studies.

CONCLUSIONS

Treating IH with TAPP using self-fixating mesh placement yields good outcomes and promotes fast postoperative recovery.

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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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