DOI: 10.38103/jcmhch.17.8.15

Original research

ADVANTAGES AND DISADVANTAGES OF TRANSABDOMINAL PREPERITONEAL LAPAROSCOPIC SURGERY (TAPP) IN INGUINAL HERNIA REPAIR AT HUE CENTRAL HOSPITAL

Pham Nhu Hien[1,2], Nguyen Thanh Xuan[3,4], Phan Dinh Tuan Dung[4]
[1]Phd student, University of Medicine and Pharmacy, Hue University, Vietnam
[2]Endoscopy center, Hue Central Hospital, Vietnam
[3]Pediatric & Acute Abdominal Surgery, Hue Central Hospital, Vietnam
[4]Department of Surgery, University of Medicine and Pharmacy, Hue University, Vietnam

ABSTRACT

Background: *Inguinal hernia is a common surgical condition, particularly in older men, and may progress to incarceration or strangulation if untreated. Laparoscopic approaches such as TAPP and TEP have become widely adopted due to reduced postoperative pain, faster recovery, and good cosmetic outcomes, with recurrence rates comparable to open repair.*

Methods: *A prospective descriptive study was conducted on 87 patients diagnosed with inguinal hernia who underwent laparoscopic transabdominal preperitoneal (TAPP) repair at Hue Central Hospital - Base 2 from January 2023 to January 2024. All patients were consecutively enrolled and followed until hospital discharge.*

Results: *The mean patient age was 55.6 ± 18.6 years (range: 21-89), with a male-to-female ratio of 85:2. The average operative time was 86.2 ± 34.1 minutes (38-180 minutes). The mean postoperative hospital stay was 3.3 ± 1.8 days (2-7 days). Among the procedures, 53 were performed as emergency surgeries and 34 as elective cases. No intraoperative or postoperative complications were observed.*

Conclusion: *TAPP repair is a safe and effective technique with short operative time, low complication rates, and rapid postoperative recovery. It provides good visualization and control of intra-abdominal structures, including in incarcerated hernias.*

Keywords: *Inguinal hernia, Transabdominal Preperitoneal repair.*

I. INTRODUCTION

Inguinal hernia (IH) occurs when abdominal contents protrude through the inguinal canal or a weakness in the abdominal wall of the inguinal region above the inguinal ligament, extending subcutaneously or into the scrotum [1]. This condition is more prevalent in males, particularly in children under 1 year old and adults over 40. According to a study by Abramson, the incidence of IH is 12% in the 25-34 age group and rises to 47% in those over 75 [2]; the lifetime risk of developing IH is 27% in males and 3% in females [2, 3].

Globally, approximately 20 million cases of IH are treated annually through open and laparoscopic surgery. In Vietnam, there is no nationwide statistical data on the incidence of IH. However, with the increasing average life expectancy, the number of inguinal hernia surgeries (IHS) is expected to rise in the future.

Currently, two common laparoscopic surgical methods for inguinal hernia are widely used worldwide: transabdominal preperitoneal repair (TAPP) and totally extraperitoneal repair (TEP) [3, 4]. These methods offer advantages such as reduced

Received: 31/9/2025. **Revised:** 02/11/2025. **Accepted:** 18/11/2025.
Corresponding author: Pham Nhu Hien. Email: phamnhuhiendr95@gmail.com. Phone: +84 905550131

postoperative pain, shorter recovery time, earlier return to daily activities and work, and improved cosmetic outcomes [3]. Regarding recurrence rates, laparoscopic surgery is comparable to the Lichtenstein open repair [5]. Therefore, we conducted this study to evaluate the advantages and limitations of the transabdominal preperitoneal (TAPP) laparoscopic technique in inguinal hernia repair at Hue Central Hospital

II. MATERIALS AND METHODS

2.1. Study population

The study included 87 patients admitted to Hue Central Hospital from January 2023 to January 2024 who underwent laparoscopic mesh placement via a transabdominal approach.

Inclusion criteria were: (1) patients who are diagnosed with inguinal hernia aged 18 years or older; (2) indirect, direct, or mixed inguinal hernia; (3) consent to undergo TAPP surgery.

Exclusion criteria were: (1) Severe internal medical conditions such as heart failure, respiratory failure, bleeding disorders... (2) History of multiple previous surgeries in the lower abdomen or extraperitoneal space, such as the pelvis. (3) History of pelvic radiation therapy, pelvic infections (e.g., Crohn's disease, diverticulitis...).

2.2. Research method

This study employed a prospective descriptive research design with clinical intervention and longitudinal follow-up, conducted on patients diagnosed with inguinal hernia and treated using the TAPP (Transabdominal Preperitoneal) laparoscopic technique.

All eligible patients who met the inclusion criteria were consecutively enrolled. After initial clinical evaluation and confirmation of the diagnosis through physical examination and imaging (ultrasound or CT scan when indicated), patients were assessed for surgical eligibility. Baseline demographic and clinical data-including age, sex, occupation, laterality of hernia, presentation (strangulated or non-strangulated), comorbidities, and previous abdominal surgeries-were recorded using a standardized data collection form.

To ensure the consistency of intervention, all operations followed a standardized TAPP protocol and were performed by an experienced surgical team specializing in laparoscopic hernia repair.

Postoperative data were collected daily until discharge, including: Vital signs and pain levels; Early complications (seroma, hematoma, urinary retention, infection, subcutaneous emphysema); Time to mobilization; Duration of hospitalization.

Patients were followed up at 1 week and 1 month post-surgery via outpatient visits or telephone interviews to assess late complications, wound healing, mesh-related symptoms, and early recurrence.

2.3. Data processing and analysis

All collected data were checked for completeness, coded, and entered into SPSS version 20.0 for analysis. Descriptive statistics were used; quantitative variables are presented as mean ± standard deviation or median (interquartile range), depending on their distribution.

2.4. Ethical considerations

All patients were informed about the study objectives, procedures, potential benefits, and risks, and written informed consent was obtained before enrollment and prior to TAPP surgery. Patient confidentiality was maintained throughout the study, and all data were used solely for research purposes.

III. RESULTS

In this series of 87 patients, the mean age was 55.6 ± 18.6 years. Patients aged 18-40 years accounted for 22.9%, equivalent to 21 patients; those aged 40-60 years accounted for 27.5%, equivalent to 24 patients; and patients aged 60 years or older accounted for 49.6%, equivalent to 42 patients. The cohort was predominantly male, with 85 men (97.7%) and 2 women (2.3%). Regarding occupation, 13 patients (14.9%) performed heavy work, 38 patients (43.8%) had moderate work, and 36 patients (41.3%) were retired or had loss of work ability (Table 1).

Table 1: General characteristics

General characteristics		Number of patients	Rates (%)	Mean
Age groups	18 ≤ 40	21	22.9	55.6 ± 18.6
	40 - 60	24	27.5	
	≥ 60 tuổi	22	49.6	
Sex	Male	85	97.7	85/2
	Female	2	2.3	
Jobs	Heavy	13	14.9	
	Moderate	38	43.8	
	Retired, loss of work ability	36	41.3	

For hernia laterality, right-sided inguinal hernias were observed in 59 patients, corresponding to 67.8% of the sample; left-sided hernias in 26 patients, corresponding to 29.9%; and bilateral hernias in 2 patients, corresponding to 2.3%. Clinically, 33 patients (38.0%) presented with strangulated hernias, while 54 patients (62.0%) had non-strangulated hernias (Table 2).

Table 2: Clinical results

Characteristics		No. of patients	Rate (%)
Side of hernia	Right	59	67.8
	Left	26	29.9
	Bilateral	2	2.3
Types of hernia	Strangulated	33	38
	Not strangulated	54	63

The mean operative time was 86.2 ± 34.1 minutes. For emergency cases, the mean duration was 90 minutes, whereas for programmed (elective) surgeries it was 60 minutes. The mean postoperative hospital stay was 3.3 ± 1.8 days (Table 3).

Table 3: Treatment results

Characteristics	Types of surgery	Mean length of surgery	Range
Length of surgery	Emergency	90	86.2 ± 34.1
	Program	60	
Post-op duration	3.3 ± 1.8		

IV. DISCUSSION

In our study, the average age of patients (pts) was 55.6 ± 18.6 years, with the youngest being 21 and the oldest 89. 98.8% of the patients in our study were male. This result is consistent with the following studies: Truong Dinh Khoi (61.8 ± 12.2 years, 98.6% male) [6], Phan Dinh Tuan Dung (average age 62.2 ± 13.3 years, 100% male) [6], and Akihisa Matsuda et al. (63.2 years, 98% male) [10]. According to medical literature, inguinal hernia (IH) is 8-10 times more common in males than females [7], and patients over 40 have an increased risk of IH. Thus, our study yields result consistent with medical literature, indicating that IH is a common condition in elderly males, especially those over 40.

62% of patients presented with a groin bulge, while 38% were admitted due to scrotal pain with symptoms of incarceration (nausea, tenderness in the groin, and a non-reducible bulge) [8, 9]. Statistical analysis showed no correlation between occupational activity and the incidence of inguinal hernia, evidenced by only 13 out of 87 cases involving heavy labor.

The average operation time was 86.2 ± 34.1 minutes, with the shortest being 38 minutes and the longest 180 minutes. These results are comparable to the following studies: Truong Dinh Khoi (107.6 ± 32.2 minutes) [10], Phan Dinh Tuan Dung (60.8 ± 19.8 minutes) [6], and Akihisa Matsuda (83 minutes) [7]. The average operative time in the emergency patient group was 90 minutes, which is higher than the 60 minutes observed in the group without complications.

No significant intraoperative complications were noted. The early postoperative complication rate was 4.6%, lower than Akihisa Matsuda's study (9%) [7]. Specifically, seroma occurred in 2 patients (2.5%), which is lower than Truong Dinh Khoi's (12%) [10] and Akihisa Matsuda's (6%) [7] studies. Subcutaneous emphysema was observed in 2 patients (2.5%), lower than Kalwanniya's study (6.2%) [11]. Postoperative urinary retention occurred in 1 patient (1.3%), consistent with Truong Dinh Khoi's study (2.04%) [9]. The average postoperative hospital stay was 2.3 ± 0.8 days, similar to that of Pham Van Thuong's study (2.1 ± 0.6 days) but shorter than Truong Dinh Khoi's study (3.12 ± 0.92 days) [9]. These results suggest that TAPP surgery is associated with a short postoperative hospital stay and early postoperative recovery.

Based on data from 87 patients undergoing inguinal hernia repair with the transabdominal preperitoneal (TAPP) approach, this technique demonstrates several notable advantages. The operative time is relatively short and flexible, ranging from 38 to 180 minutes, allowing TAPP to be applied effectively in both uncomplicated and complex cases while reducing operative stress on the surgical team and minimizing risks associated with prolonged anesthesia. The early postoperative safety profile is favorable, with approximately 95% of patients experiencing no early complications such as infection, bleeding, or immediate recurrence, suggesting that TAPP is a safe procedure when performed by experienced surgeons. Hospitalization duration is generally brief, with most patients discharged within 2-5 days, reflecting rapid recovery; even in more demanding situations such as bilateral or large hernias, the length of stay of 6-7 days remains acceptable. Furthermore, the study population included adults aged 21-89 years, of both sexes and across a spectrum of occupational and physical activity levels (heavy labor, light work, retired), indicating that TAPP is broadly applicable, including in elderly and comorbid patients.

However, several limitations and challenges of TAPP were also observed. In patients with large hernias or incarceration, particularly those involving sizeable hernia sacs (e.g., 71 × 38 × 74 mm) or incarcerated small bowel/omentum, the procedure became more technically demanding, associated with longer operative times of up to 180 minutes and an increased theoretical risk of organ injury. The outcomes were clearly dependent on surgeon expertise, as suggested by intraoperative assessments describing "poor" or "moderate" blood supply to herniated organs in some cases, highlighting the risk of ischemia if reduction and repair are not performed promptly and meticulously. Management of bilateral inguinal hernias also appeared more challenging, with patients requiring longer hospital stays (6-7 days) and closer postoperative monitoring, implying that simultaneous bilateral repair via TAPP may be associated with greater complexity and resource use. In addition, the relatively short follow-up interval in this cohort did not allow for a comprehensive evaluation of long-term outcomes such as late recurrence, chronic postoperative pain, or health-related quality of life. These aspects warrant further prospective studies to fully characterize the long-term effectiveness and safety profile of TAPP in inguinal hernia treatment.

V. CONCLUSION

Laparoscopic preperitoneal mesh placement (TAPP) is safe and effective. Surgical time, postoperative hospital stays, and complication rates are low compared to previous studies. This demonstrates that surgeons have improved their

learning curve well. TAPP surgery also provides good control of abdominal organs in the context of incarcerated hernias.

Conflict of interest

The authors declare that they have no conflicts of interest related to the content of this study.

REFERENCE

1. Nguyen Trinh Co, Inguinal hernia. In: Surgical Diseases, 3rd edition. Vol. 1. 1976, Hanoi: Medical Publishing House.
2. Sherman V, Brunicardi F, Inguinal hernias. Schwartz's Principles of Surgery. 2010, McGraw-Hill Education, New York.
3. Morales-Conde S AI, Socas M,, Inguinal Hernia Repair: TAPP. Reduced Port Laparoscopic Surgery. Vol. 32. 2014, Hanoi.
4. Sato H, Shimada M, Kurita N, Iwata T, Nishioka M, Morimoto S, et al. The safety and usefulness of the single incision, transabdominal pre-peritoneal (TAPP) laparoscopic technique for inguinal hernia. J Med Invest. 2012; 59(3-4): 235-40.
5. Moldovanu R, Pavy G. Laparoscopic Transabdominal Pre-Peritoneal (TAPP) procedure - step-by-step tips and tricks. Chirurgia (Bucur). 2014; 109(3): 407-15.
6. Phan Dinh Tuan Dung, Application of totally extraperitoneal laparoscopic repair using 2D and 3D synthetic mesh in the treatment of direct inguinal hernia, in Doctor of Medicine thesis. 2017, Hue University of Medicine and Pharmacy: Hue.
7. Matsuda A, Miyashita M, Matsumoto S, Sakurazawa N, Kawano Y, Kuriyama S, et al. Laparoscopic transabdominal preperitoneal repair for strangulated inguinal hernia. Asian J Endosc Surg. 2018; 11(2): 155-159.
8. Pham Van Thuong, Trieu Trieu Duong, Son TH. Outcomes of single-port transabdominal laparoscopic preperitoneal mesh repair for inguinal hernia at 108 Military Central Hospital. Journal of 108-Clinical Medicine and Phamarcy. 2018; 13(1): 93-96.
9. Khan WF, Rathore YS, Aggarwal S, Chumber S, Arumugaswamy PR, Moin Baig KA, et al. Endoscopic totally extraperitoneal repair for groin hernia: Experience from a tertiary care centre. J Minim Access Surg. 2023; 19(1): 107-111.
10. Truong Dinh Khoi, Application of laparoscopic surgery with preperitoneal placement of synthetic mesh via the transabdominal approach in hernia treatment, in Doctor of Medicine thesis. 2022, Hue University of Medicine and Pharmacy: Hue.
11. Dheer S. Kalwaniya, Monish R, Jaspreet S. Bajwa, V. S, Arya, Ranjith M, et al. Subcutaneous emphysema following laparoscopic totally extraperitoneal inguinal hernia repair - a case series. International Journal of Current AdvancedResearch. 2019; 8(11): 18527-18530.