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Results of femoral hernia treatment with mesh plug at Hanoi medical university hospital

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Abstract

Introduction: Femoral hernia is a relatively rare acquired condition worldwide. Currently, surgery is considered the primary treatment method for femoral hernia. The aim of this study is to present the technique and evaluate the results of treating femoral hernia using mesh plug at Ha Noi medical university hospital.

Materials and methods: A retrospective descriptive study of 10 patients who underwent surgical treatment of femoral hernia using a synthetic mesh plug at Hanoi Medical University Hospital from January 2019 to June 2024.

Results: All 10 patients (100%) were female, with an average age of 64.2 ± 14.7 (range: 46 – 85) years. The main symptom prompting medical consultation was the appearance of a mass in the groin area, with 3 patients experiencing complications of strangulation. The average surgical time was 42.0 ± 5.87 (range: 30-50) minutes, and no intraoperative complications were recorded. The average hospital stay post-surgery was 2.3 ± 1.16 (range: 1 – 4) days. No cases of chronic pain or recurrence were reported during an average follow-up period of 18 months.

Conclusions and recommendations: The surgical treatment of femoral hernia using mesh plug is an easy-to-perform, safe, and effective method with low complication and recurrence rates, which can be implemented in most surgical facilities worldwide.

Keywords: Femoral hernia; Mesh plug; Femoral hernia repair; Femoral hernia treatment; Pectineal ligament.

1. Introduction

Femoral hernia is a benign and relatively rare condition, accounting for about 7% of abdominal hernias.(1,2) It primarily occurs in middle-aged and older women. femoral hernia is characterized by the weakness of the Scarpa triangle, leading to herniation of abdominal organs through the femoral canal into the anterior thigh.(1–3) Due to the narrow size of the femoral canal, femoral hernia is highly susceptible to complications such as incarceration or strangulation (occurring in approximately 50-60% of cases).(4) This highlights the necessity for prompt diagnosis and treatment to mitigate potentially dangerous complications. In 1990, McVay introduced a surgical technique for treating femoral hernia, which has since been widely adopted.(5) With the emergence of newer generations of mesh plug, many improved techniques have been developed that yield high effectiveness. At Hanoi Medical University Hospital, the use of mesh plug for femoral hernia repair has been routinely performed since 2019, yielding promising initial results. This study aims to present the technique and evaluate the treatment results of this method.

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2. Material and methods

2.1. Research Subject

2.1.1. Selection Criteria

All patients who underwent surgical treatment of femoral hernia using a synthetic mesh plug at Hanoi Medical University Hospital from January 2019 to June 2024.

2.1.2. Exclusion criteria

Patients with incomplete Medical Record.

2.2. Research Site

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2.2.1. Research Methods

A retrospective descriptive All patients were operated on based on a common protocol

- **Anesthesia Method:** Spinal anesthesia was preferred in most cases, with the possibility of using a laryngeal mask or endotracheal tube in specific cases.

2.2.2. Position: Supine

Surgical Technique:

- **Step 1:** Expose the femoral hernia sac.
- **Step 2:** Push the hernia contents back into the abdomen and expose the femoral ring.
- **Step 3:** Create mesh plug from non-absorbable mesh
- **Step 4:** Secure the plug to the femoral hernia opening (We sutured a locking knot using a Prolene thread onto the inguinal ligament and the pectineal ligament)

2.3. Data Processing

Qualitative variables are presented as frequencies and percentages. Quantitative variables are presented as mean ± standard deviation. Differences in qualitative variables were assessed using the $\chi 2$ test or Fisher's test. Differences in quantitative variables were assessed using the T-test. A p-value < 0.05 was considered statistically significant. Data were processed using SPSS 20.0 software**.**

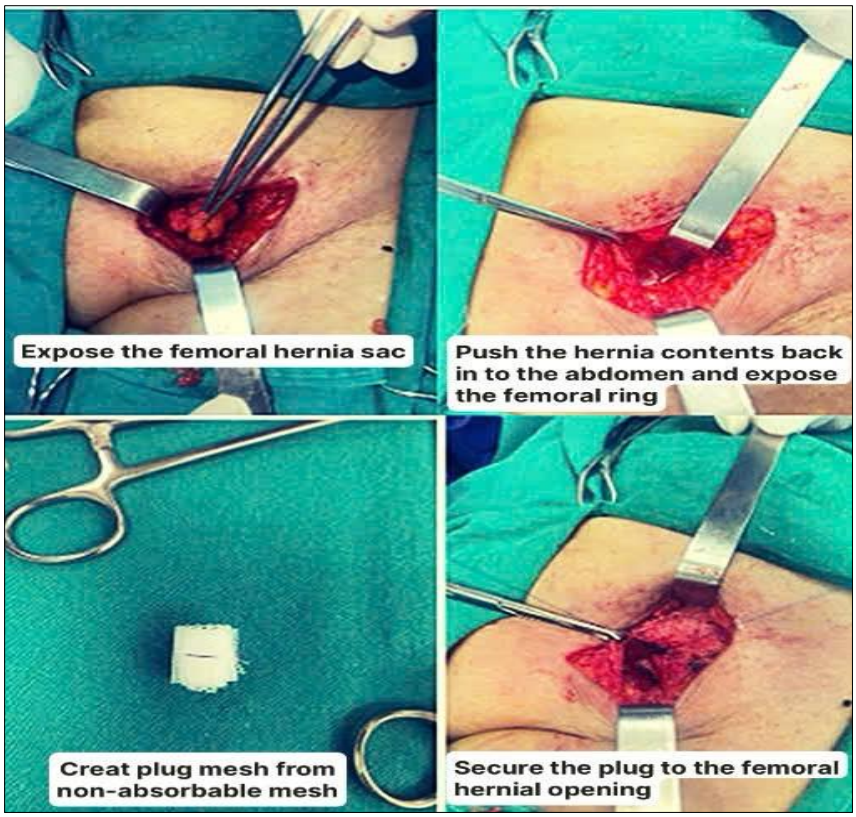

Figure 1 Patient Tran Thi T 85 years old – Left femoral hernia

3. Results

3.1. General Characteristics of the Study Group

In our study, all 10 patients were female, with an average age of 64.2 ± 14.7 years (youngest: 46, oldest: 85). Four out of ten patients had significant systemic diseases, and 2 had a history of previous surgery in the groin area. The most common symptom was the presence of a mass in the groin corresponding to the side of the hernia, with 3 patients presenting with strangulated femoral hernia. The majority of hernias occurred on the left side, with 6 out of 10 patients affected.

Table 1 General Characteristics of the Study Group

Patient Characteristics	**Results**
Average Age (years)	64.2 ± 14.7 (46 – 85)
Gender	Male: 0 (0%) : Female: 10 (100%)
Medical History	
Previous Surgery in the Groin Area	2
Chronic Diseases (cardiovascular, respiratory, etc.)	4
Average BMI	20.94 kg/m^2
Symptoms	
Groin and Thigh Mass	10 (100%)
Strangulated Hernia	3 (30%)
Hernia Location	

Right Side	4
Left Side	6
Both Sides	0

3.2. Intraoperative and Postoperative Results

Regarding anesthesia methods, 6 out of 10 patients only required spinal anesthesia, while 4 required endotracheal general anesthesia, including 3 cases of strangulated hernia and 1 case of recurrent hernia. The average surgical time was 42.0 ± 5.87 minutes, with the quickest being 30 minutes and the longest 50 minutes. No intraoperative complications were reported. Postoperative pain assessment revealed that 6 out of 10 patients had a VAS score < 4 and required only one type of analgesic (paracetamol), while 4 patients had a VAS score between 4 and 7 and required a combination of paracetamol and NSAIDs. No patients had a VAS score > 7. The average hospital stay after surgery was 2.3 ± 1.16 (1 – 4) days.

Table 2 Intraoperative and Postoperative Outcomes of the Study Subjects

Patient Characteristics	**Results**
Anesthesia Method	
Spinal Anesthesia	7 (70%)
General Anesthesia	3 (30%)
Surgery Duration	42.0 ± 5.87 minutes
Intraoperative Complications	0 patients
Postoperative Pain Relief	
Use of One Pain Relief (Level 1) with VAS < 4	6 patients
Use of Two Pain Reliefs (Level 1) with VAS ≥ 4	4 patients
Postoperative Hospital Stay	2.3 ± 1.16 (1 – 4) days
Time to Return to Normal Activities	7 days
Postoperative Complications	0 patients
Chronic Pain Postoperatively	0 patients
Recurrence Postoperatively	0 patients

4. Discussion

4.1. Characteristics of the Research Subject

Our results indicate that femoral hernia is a common pathological condition among older women (average age 64.2 ± 14.7 years). This finding corresponds with the study by Pangeni et al. (2017) involving 31 patients with an average age of 60 years, where women accounted for 94%. The study by Milivoje Vukovic et al. (2013) on 83 patients reported that 84.34% were female, with an average age of 63 years (range 24-86). Yinghan's research (2015) involving 121 patients found that 86.78% were women, with an average age of 57.6 years.(1,2,6) This can be explained by the anatomical structure of the femoral canal in women, which tends to be larger and oval-shaped, particularly in postmenopausal women with a history of multiple childbirths and associated conditions like COPD and constipation—factors that favor the formation of femoral hernias.(1) Furthermore, we can see that surgery for femoral hernia using a mesh plug can be safely performed on elderly patients with complex comorbidities.

Most patients in our study presented at the hospital due to the emergence of a mass in the groin area below the inguinal ligament, with varying levels of pain. Due to the anatomical characteristics of the femoral canal, which is small and narrow, femoral hernia is prone to complications such as incarceration or strangulation. Our study showed that 3 out of 10 patients presented with signs of strangulated femoral hernia at the time of examination. Milivoje Vukovic's study (2013) reported this rate at 83% (including incarcerated and strangulated hernias), while Andrea Goethals (2023)

found it to be 15-20%.(2,3) Femoral hernias can occur on both sides, with the right side being more common; bilateral occurrences are rare.(3) Some agree that the anatomical position of the sigmoid colon in the abdominal cavity exerts pressure on the left femoral canal, reducing the likelihood of left-sided femoral hernias compared to the right.(3) Milivoje Vukovic's study (2013) supports this notion, showing a right-to-left ratio of 3.4:1, while Yinghan (2015) reported a ratio of 1.6:1. In contrast, the study by Pangeni et al. (2017) involving 32 patients indicated a predominance of primary left-sided femoral hernias at 81%.(1) In our study, there were 6 out of 10 patients with left-sided femoral hernia and 4 out of 10 with right-sided femoral hernia. The differences in these studies may be attributed to insufficient sample sizes to yield accurate ratios.

4.2. Characteristics of the Surgical Method for Femoral hernia using Mesh Plug

Regarding anesthesia, the technique for treating femoral hernia with mesh plug is relatively simple and not overly complex. Most patients over 60 years old typically have significant systemic comorbidities. Therefore, spinal anesthesia is often preferred. Our study found that 6 out of 10 patients only required spinal anesthesia for a smooth surgical procedure. This demonstrates that the technique for treating femoral hernia with mesh plug is safe and suitable for most elderly patients with associated comorbidities.

The average surgery time for this method was 42.0 ± 5.87 minutes, which is longer than Yinghan's (2015) report of 14.7 minutes. This difference stems from the preparation of the mesh plug; in Yinghan's study, the surgeon used pre-made ULTRAPRO plugs, thus shortening the time for mesh preparation compared to our surgery. D Wang's (2020) study comparing two methods of treating femoral hernias—Lichtenstein and mini-mesh using the modified Kugel technique—showed that the surgery times for the Lichtenstein and mini-mesh methods were 68.6 ± 13.4 minutes, shorter than the Kugel technique's 80.6 ± 10.1 minutes.(7) Another multi-center study by Kathleen Lockhart (2018) indicated that the surgery time for femoral hernia using mesh was longer than that for the non-mesh group by an average of 4 minutes and 22 seconds.(8) Thus, surgery for treating femoral hernia with mesh plug has a relatively short duration suitable for elderly patients with significant comorbidities.

Regarding intraoperative complications, our study recorded no cases of vascular, nerve, or organ injury during surgery. Kathleen Lockhart's (2018) study also indicated that treating femoral hernias with mesh reduced the rates of intra-abdominal organ, nerve, and vascular injury compared to methods without mesh.(8)

Regarding postoperative pain, most patients who underwent femoral hernia treatment using mesh plug in our study had a VAS score < 4 and required only one type of simple analgesic (paracetamol) (6/10 patients). The remaining 4 patients had a VAS score ≥ 4 and used two types of level 1 analgesics (paracetamol + NSAIDs), with no patients requiring level 2 analgesics. The average hospital stay after surgery was 2.3 ± 1.16 (1 – 4) days, and the average time for patients to return to normal activity was 7 days. Kathleen Lockhart's (2018) study found that the hospital stay and time to return to normal life in the mesh group were shorter than in the non-mesh group by an average of 0.6 days and 2.87 days, respectively.(8) This may be explained by the fact that patients who underwent mesh placement had less soft tissue injury, better postoperative pain management, and could quickly return to normal activities. Rapid resumption of daily activities, especially in elderly patients, significantly reduces the rate of postoperative complications related to prolonged immobility, such as pneumonia and thrombosis. This is one of the advantages of using mesh plug that surgeons should consider when choosing treatment for specific patients.

During a follow-up of patients post-surgery for an average of over 18 months, we did not observe any cases of recurrence through regular examinations. A multi-center study by Lucia Romano (2024) indicated that the recurrence rate after open surgery for treating femoral hernias is 4%, which is higher in patients not using mesh. Lucia Romano also recommended surgical treatment of femoral hernias using mesh techniques.(9) In her 2018 study, Kathleen Lockhart also noted that treating femoral hernia with mesh significantly reduced the recurrence rate after surgery compared to methods without mesh.(8) However, Clyde's study (2020) on 297 patients evaluating recurrence rates after surgery found a 5-year recurrence rate of 18% (of which 60% recurred within the first year). Clyde also found no difference in the recurrence rate or timing of recurrence among patient groups (sutures only, sutures and mesh, and mesh only).(10) Thus, overall, the early postoperative results in the group treated for femoral hernia using mesh show a lower recurrence rate compared to the non-mesh method. However, long-term results have not shown a difference between these methods.

5. Conclusion

Femoral hernia is a rare condition in older women. Surgery is the primary treatment method for femoral hernia. The method of treating femoral hernia with mesh plug is a safe and effective technique that shortens hospital stays, reduces complication and recurrence rates, and can be easily performed in surgical facilities in the world.

Compliance with ethical standards

Acknowledgments

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Disclosure of conflict of interest

The authors declare that they have no conflict of interest.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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