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MESH PLUG FOR TREATMENT OF FEMORAL HERNIA

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ABSTRACT

Objective: evaluation of mesh plug for treatment of femoral hernia as regard recurrence and complications. **Study design**: prospective, observational study. **Patient and methods**: 23 patients; 15 females (65.2%) and 8 males (34.8 %) with a mean age of 42.7±6.4 (range 24–63) years who presented with femoral hernia. All patients underwent mesh plug technique for repair of femoral hernia.Patients with strangulated hernia and bowel obstruction were excluded from this study. **Results**: during the postoperative follow-up period; no recurrence was recorded (0%). One patient had wound infection treated successfully with antibiotics (4.3%). One patient complained of mild pain for 3 weeks postoperatively (4.3%). One patient developed seroma (4.3%). Patient satisfaction was very good. No other significant complications during the postoperative period were observed. **Conclusion**: repair of femoral hernia with polypropylene mesh plug through infra-inguinal (femoral) approach is the technique of choice in elective cases. It can be done quickly and easily with insignificant complications.

KEYWORDS: femoral hernia, mesh plug.

INTRODUCTION

Surgical management of femoral hernia has a long history. Bassini and Marcy in the nineteenth century were simply closing the femoral ring. However, a high percentage of recurrence was considered with that technique; require another approach for treatment of femoral hernia.[1]

A femoral hernia is rare condition; its incidence has been reported in less than 5% of all abdominal wall hernias, with a male to female ratio of 1:1.8. It is more common in parous than non-parous women. About 60% of femoral hernias are present on the right, 30% on the left, and 10% bilaterally.[2]

Differentiating the groin swelling is often difficult, especially in obese patients. Femoral hernia is commonly mistaken as inguinal hernia. Delay in diagnosis is common, because a strangulated hernia does not always typically present with inguinal pain.[3]

Femoral hernia is a common cause of intestinal obstruction and remains a frequent cause of strangulation, requiring immediate surgical intervention.[4] It has a 40% higher risk of inguinal strangulation, because of the tight walls of the femoral canal. Increased intra-abdominal pressure during constipation, pregnancy or obstructive lung disease can be a cause of the emergence of femoral hernia.[5]

Types of femoral hernias: femoral canal hernia is the commonest form (98.5%); the hernial sac extends to the upper thigh through the femoral canal. Prevascular femoral hernia (Narath); hernial sac is anterior to the femoral artery and vein. External femoral hernia (Hasselbach and Cloquet), hernial sac is lateral to the femoral vessels. Transpectineal femoral hernia (Laugier), the sac passes through the lacunar or pectineal (Cooper) ligament.[6]

There are three approaches described for open femoral hernia repair: infra-inguinal approach (Lockwood's), trans-inguinal approach (Lotheissen's) and high approach (McEvedy's).[7]

The infra-inguinal approach is the preferred method for elective repair, approaching the femoral canal from below through an oblique incision 1 cm below and parallel to the inguinal ligament. The trans-inguinal approach involves a skin incision 2 cm above the inguinal ligament, dissecting through the inguinal canal. The high approach involves skin incision 3 cm above the pubic tubercle running laterally to cross the lateral border of the rectus muscle that is divided allowing preperitoneal dissection of the sac.[8]

There appear to be only few reports in the literature that specifically describe mesh plug for treatment of femoral hernia.

The objective of this study is; evaluation of mesh plug for treatment of femoral hernia as regard recurrence and complications.

PATIENTS AND METHODS

Study design and population

This study was a prospective, observational study performed at the Department of Surgery, Al-Azhar University Hospitals during the period between June 2013 and December 2016. It was carried out on 23 patients; 15 females (65.2%) and 8 males (34.8%) with a mean age of 42.7±6.4 (range 24–63) years who presented with femoral hernia. All patients underwent mesh plug technique for repair of femoral hernia.Patients with strangulated hernia and bowel obstruction were excluded from this study. The following factors were noted: patient age and sex, presenting symptoms, operative time, complications and recurrence.

Study protocol

The study was approved by the Local Ethics Committee of Surgery Department. All patients were interviewed with a standardized questionnaire, which inquired about the history as regards symptoms, onset, course, duration, complications and previous treatment. Complete physical examination (general and local), complete laboratory tests, ECG and abdomino-pelvic ultrasound were carried out for all patients. All patients signed a detailed informed consent.

Diagnosis; we always determine a line on the skin over the inguinal ligament and then palpate the region below this line. Mostly a small irreducible soft mass is palpated. Usually incarceration of the hernia sac is present. Strangulation occurs more common in femoral hernia than the inguinal hernia. It causes acute abdominal pain and intestinal obstruction.

Technique; an intravenous antibiotic (1g of third-generation cephalosporin) is administered. The operation is done under spinal anesthesia.

An oblique incision 1cm below and parallel to the inguinal ligament over the hernia, dissection around the sac up to its neck, reduction of the contents, closure then excision of hernia sac (figure 1).

Preparation of a cone-shaped polypropylene mesh plug, its size 2cm×1cm, the shape preservation of the plug is held with two non-absorbable sutures.

The mesh plug is inserted into the femoral canal closing it (figure 2). The plug is maintained in its position by three non-absorbable sutures between the plug and pectineal and inguinal ligaments (figure 3). Lastly; subcutaneous tissue and skin are closed after good haemostasis. The patients were discharged in the same day after oral food intake. The follow up period was 2 years.

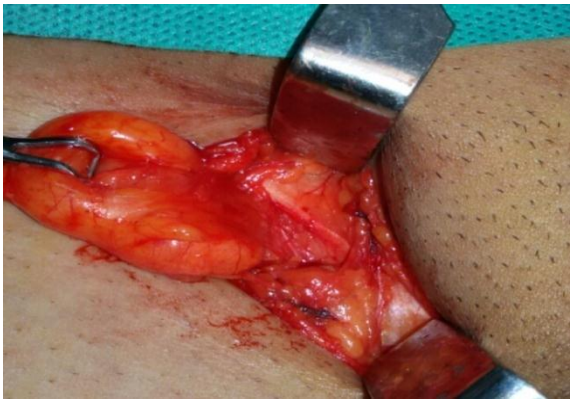

Figure (1): femoral hernia.

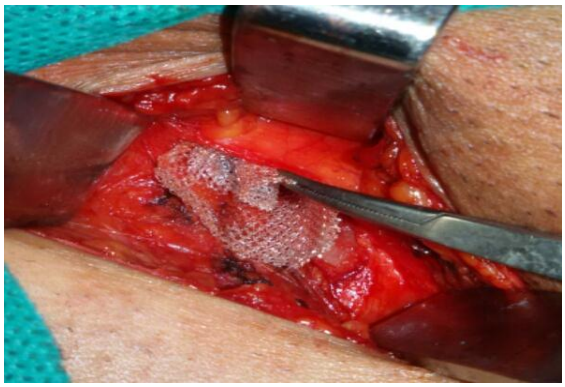

Figure (2): insertion of mesh plug.

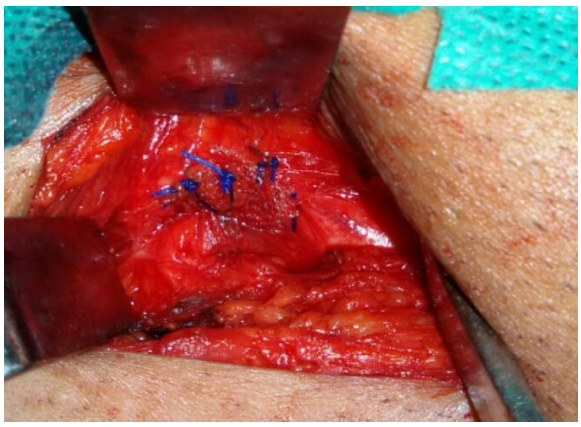

Figure (3): fixation of mesh plug.

RESULTS

Twenty three patients included in our study; 15 were females (65.2%) and 8 were males (34.8%); mean age was 42.7±6.4 (range 24–63) years. All patients were presented with femoral hernia as a small irreducible soft mass palpated at the upper part of the front of the thigh. The hernia was right-sided in 16 patients (69.5%) and left-sided in 7 patients (30.5%). Two cases were recurrent (8.6%). No cases of bilateral femoral hernia were encountered. Three patients had a history of bronchial asthma (13%) (table 1). All patients were of grade I or II of American Society of Anesthesiologists (ASA) grades, (ASA physical status classification system is a system for assessing the fitness of patients before surgery, the society adopted six categories; grade I – normal healthy patient, grade II – patient with mild

systemic disease). The median operative time was 40 minutes (range 25-55 min).

The follow up period was two years; first visit was after one week, then monthly for three months and then annually.

During the postoperative follow-up period; no recurrence was recorded (0%). One patient had wound infection treated successfully with antibiotics (4.3%). One patient complained of mild pain for 3 weeks postoperatively (4.3%). One patient developed seroma (4.3%). Patient satisfaction was very good. No other significant complications during the postoperative period were observed as migration of mesh plug, chronic postoperative pain, urinary retention, mesh infection, deep vein thrombosis, sinus tract development) (table 2).

Table. (1): Patient's characteristics.

Parameter	Value
Sample size	23
Sex:	
Females	15 (65.2%)
Males	8 (34.8%)
Age (year)	42.7±6.4 (range 24–63)
Side:	
Right	16 (69.5%)
Left	7 (30.5%)
Recurrent cases	2 (8.6%)
Bilateral cases	0 (0%)
History of bronchial asthma	3 (13%)

Table. (2): Postoperative data during the period of follow up.

Parameter	Value
Postoperative period (year)	2
Recurrence	0 (0%)
Wound infection	1 (4.3%)
Mild postoperative pain	1 (4.3%)
Chronic postoperative pain	0 (0%)
Seroma	1 (4.3%)
Other complications	0 (0%)

DISCUSSION

The idea of a ''tension-free'' femoral hernioplasty was introduced in 1974 by Irving Lichtenstein. He rolled a piece of polypropylene mesh into a cylindrical shape (plug) and inserted into the femoral ring from below.[9] Shulman et al (1992); observed the efficacy and low recurrence rate of this technique.[10] Also, Arthur Gilbert in the late 1980s designed a mesh plug that was rolled by hand into the shape of an umbrella or cone. He concluded this technique worked better than Lichtenstein's cylinder shape plug.[11]

Closure of the defect with mesh plug is operated without tissue tension and so gives a benefit over the conventional techniques (the defect is closed by approximation of the inguinal ligament to pectineal ligament). The plug can be done quickly and easily with satisfactory closure of the femoral canal.

Our study was on 23 patients presented with femoral hernia. The hernia was common in middle aged females. It frequently appeared unilaterally on the right side, mostly observed as a small irreducible soft mass palpated at the upper part of the front of the thigh. These data corresponds to the literature.

All patients underwent mesh plug technique for repair of femoral hernia. Postoperativly; no patients developed recurrence. Only one patient had wound infection, one patient complained of mild pain and one patient developed seroma. No other significant complications were observed. Patient satisfaction was very good.

In a study performed by Vukovic et al (2013)[(1)] on 86 patients, the incidence of femoral hernia was 6.9% of all abdominal wall hernias. It observed mostly in middle aged and older females, and commonly on right side. Postoperatively; there was not recorded recurrence, no wound infections, one patient had a seroma. Mild postoperative pain was identified only in one patient. There were no other complications.

Hachisuka (2003)[12] in his series on 67 femoral hernia repairs (4 patients were bilateral); fifty-six patients were female, whereas only 7 were male. In women; the percentage of femoral hernias among all groin hernias was 30%. Right-sided hernia was (70%) which was more common than left-sided (30%). The range of age was (30 – 80) years. All operations were repaired by the mesh plug technique. After surgery; the average operating time was 27 minutes. There were no major complications except only one case of recurrence, which occurred 2 months after repair.

Another study prepared by Rubbins and Rutkow (1998)[13] on 24 patients underwent femoral hernioplasty with plug repair, there was a female predominance. There was no recurrence or other significant complications.

CONCLUSION

Repair of femoral hernia with polypropylene mesh plug through infra-inguinal (femoral) approach is the technique of choice in elective cases. It can be done quickly and easily with insignificant complications. It provides satisfactory closure of the femoral canal.

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