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Femoral Hernia: Open and Laparoscopic Surgery Approaches

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Abstract

Femoral hernia comes out of abdominal cavity through the femoral canal and descends vertically to saphenous opening, and once escapes this opening it expands considerably, sometimes rising above the inguinal ligament. Due to its tortuous course, the hernia is usually irreducible and liable to strangulate. There are different open surgery choices. In low (Lockwood) operation, the sac is dissected out below the inguinal ligament via a groin-crease incision. In high (McEvedy) operation, the hernia is accessed via a horizontal (or vertical) incision made in lower abdomen at the lateral edge of rectus muscle. In Lotheissen's operation, the hernia is approached through the inguinal canal. The last one is my preferred approach, as it also helps in dealing if the contents are strangulated. The laparoscopic approaches include both transabdominal preperitoneal repair (TAPP) and total extraperitoneal repair (TEP). This chapter will give an account of the advantages and disadvantages of these different surgical techniques.

Keywords: Hernia, femoral, surgery approaches, surgical techniques

1. Introduction

Femoral hernia is protrusion of a part of abdominal viscus or preperitoneal fat through the femoral ring and canal. The canal forms the most medial compartment of femoral sheath, and extends from femoral ring above to saphenous opening below. The boundaries of femoral ring and canal consists of inguinal ligament (anteriorly), lacunar ligament (medially), thin septum (laterally), and iliopectineal ligament, pubic bone and pectineal fascia (posteriorly). Usually, the canal contains some fat, few lymphatics and lymph node of Cloquet.

The hernia first descends vertically down to saphenous opening, and once out of the opening, it expands considerably, sometimes rising above the inguinal ligament, assuming a retort-like shape. Because of its narrow course in the femoral canal and tortuous course after escaping saphenous opening, it is liable to become irreducible and strangulate. Sometimes, the neck of the sac become plugged with omentum or adhesions, and the empty sac filled with fluid resulting in hydrocele. Sometimes, instead of coming via femoral ring, it comes through a gap in lacunar ligament, and nearly always strangulate.

2. Clinical presentation

Femoral hernia accounts for less than 5% of all abdominal wall hernias and is more common in females than males (4:1) [1–3]. It usually develop after puberty,

with increased incidence between 20 and 40 years. The patients usually present with a groin lump with some pain and discomfort (due to narrow and tortuous course). Incarceration is more common in femoral hernia due to narrow neck of femoral canal, and omental/bowel strangulation is associated with higher morbidity and mortality [3–5]. Patients with obstruction/strangulation of small bowel usually presents with colicky abdominal pain, distension, vomiting and constipation. On examination, the hernia is found below and lateral to pubic tubercle but once it escapes from saphenous opening it can spread in any direction and may be found above the inguinal ligament. The cough impulse is usually absent, even in uncomplicated cases, due to narrow neck and adhesions. The sac is usually occupied by omentum (dull note and firm consistency), or it remains empty being surrounded by extra-peritoneal fat [4]. However, it may contain bowel as well (resonant note and soft consistency). The rare reported contents include appendix (De Garengeot's hernia), bladder, Meckle's diverticulum, ectopic testis, stomach and fallopian tube [6–8].

3. Diagnostic imaging

Clinical diagnosis requires a high index of suspicion but it usually remain inconclusive. The ultrasonography, computed tomography and magnetic resonance imaging help in identifying doubtful cases [6, 9]. It can help in preoperative diagnosis of complications like the presence of appendicitis within femoral hernial sac [2].

4. Treatment

Elective repair should be undertaken once the diagnosis is made because of the risk of strangulation (due to narrow neck, tortuous course and adhesions). The reported obstruction/strangulation rate in literature is 30–86%, with mortality rates of 10–14% [10–12]. Emergency surgery with intestinal resections may be required in 9.3–33.7%, with a high mortality rate of 4.9% [4, 13, 14]. The hernia repair can be done by different open or laparoscopic approaches, with some advantages and disadvantages of each method. The choice is also affected by surgeon's preference, patient condition and elective/emergency condition.

5. Open surgical repair

5.1 Femoral (low, Lockwood's) approach

This is a simple and quick approach [1, 15] to deal with a small uncomplicated femoral hernia, and can be performed under local anesthesia. A transverse groin-crease incision is made below the inguinal ligament to deal with the sac and its coverings. The content, usually omentum, is freed of adhesions and assessed for viability and either return back or excised. If necessary, a small incision can be made in lacunar ligament medially to ease reduction; however, abnormal branch of obturator artery can be injured. The neck is pulled down and ligated as high as possible. Finally, the canal is closed by suturing inguinal ligament to iliopectineal line using prolene 0 or 2/0 sutures; a mesh plug can also be used to close the defect.

5.2 Inguinal (Lotheissen's) approach

This is an easy approach as [1, 15] most of the steps are similar to that of open inguinal hernia repair. This should be the preferred approach in cases of complicated femoral hernia as it provides good exposure of femoral ring and facilitates in dealing with non-viable contents that necessitates resection. This approach also allows easy control of injured abnormal obturator artery. Inguinal canal is opened by giving an incision about 1.25 cm above the medial two-thirds of inguinal ligament, and incising external oblique aponeurosis in line of its fibers. The cord is mobilized and retracted upward, and blunt dissections are made to reach the transversalis fascia, which is opened medial to epigastric vessels from deep inguinal ring to pubic tubercle. The femoral hernia lies below this incision, which is reduced by both pulling from above and pushing from below. The peritoneum can be opened to help in reduction. The content is assessed for viability and dealt accordingly. In cases of obstruction at the narrow neck of the sac, the neck can be gently stretched with a hemostat. The neck is then closed with sutures or mesh plug. The defect is closed by suturing the conjoint tendon to ilio-pectineal line, so as to form a shutter. The layers of inguinal canal are then closed. The classical McVay repair (suturing conjoint tendon to Cooper's ligament) is strong but with high tension which eventually break resulting in recurrence [9].

5.3 Preperitoneal (high, McEvedy's) approach

This is the best approach [1, 15] in emergency setting to deal with bowel strangulation as it allows generous incision in peritoneum to give proper exposure for bowel resection [15]. A horizontal (or vertical) incision is made in lower abdomen at the lateral edge of rectus muscle. Anterior rectus sheath is incised and rectus muscle retracted medially. Dissection is carried out deep to this muscle in the preperitoneal space. The femoral hernia is delivered and its sac opened to assess the viability of contents, which is then dealt accordingly. The sac is first closed and the defect is then closed with sutures, mesh or plug. Placement of mesh in preperitoneal space is advantageous, as it avoids reoperating through scar tissue in cases of recurrence [16]. The mesh-plug repair offers tension free easy repairs, with low recurrence rate and less postoperative pain [3, 5].

6. Laparoscopic surgery

The laparoscopic surgery offers the advantages of minimal access surgery including excellent exposure, identification of occult hernia, reduce postoperative pain and faster recuperation [6]. The TEP laparoscopic approach is suitable for uncomplicated femoral hernia, while for incarcerated or strangulated hernia TAPP approach can be used.

6.1 Transabdominal preperitoneal (TAPP) approach

The theater setup, patient position and port placements are as described in chapter 3 (Laparoscopic inguinal hernia repair by Dr. Ploneda). The surgeon positions on the contralateral side. We usually create pneumoperitoneum using open first port technique. After insufflation, the patient is placed in Trendelenburg position to displace bowels up away from the dissection site. The key anatomical landmarks are identified (Figures 1–4, chapter 3) including femoral ring and deep inguinal ring,

as well as medial umbilical ligament, inguinal ligament, bony landmarks (pubic tubercle and anterior superior iliac spine), vessels (epigastric, spermatic and iliac) and vas deferens. The opposite inguino-femoral areas are also visualized to identify any undiagnosed hernia.

The peritoneum is incised transversely above the deep inguinal ring extending from anterior superior iliac spine to medial umbilical ligament. The lower peritoneal flap is dissected to expose the hernial defects, inguinal ligament and Cooper's ligament. The hernial sac is identified and dissected carefully, avoiding injury to inferior epigastric vessels, iliac vessels and cord. If present, inguinal hernia is dealt at the same time. The peritoneal incision can be extended circumferentially to incise the neck of the sac leaving the distal sac in place (of a large hernial sac). A small hernial sac is left intact and pulled into the peritoneal cavity.

A large mesh (12 x 15 cm) is placed covering the entire inguino-femoral hernial orifices, and fixed either with staples or sutures to the pubic tubercle, medial end of Cooper's ligament and rectus muscle. The peritoneum is then closed with sutures or staples. The port sites are then closed.

6.2 Total extra-peritoneal (TEP) approach

The inguino-femoral hernia orifices are approached by creating extraperitoneal space by CO₂, so as to decrease the morbidity associated with peritoneal approach. This gives wide access to both inguino-femoral regions at the same time; however, the approach is not suitable if patient have had some previous surgery in this area. A small (1–2 cm) incision is made just below the umbilicus and blunt dissection is carried out to rectus sheath, which is then incised longitudinally to expose peritoneum or posterior rectus sheath. Care is taken not to open the peritoneum. A working space is created with dissecting balloon. The hernial sac is identified which is dealt, followed by repair of the defect (as described for TAPP).

7. Postoperative complications

In addition to the general complications of surgery, anesthesia and pneumoperitoneum, the specific procedure related complication can happen. The complication rate of over 50% have been reported in patients with intestinal resection [17]. These include dissection or stapling injury to iliofemoral vessels, epigastric vessels, spermatic vessels, vas, lateral femoral cutaneous nerve and femoral nerve. Other complications include wound seroma or hematoma, inguino-scrotal edema, hematoma or emphysema, bladder injury and bowel adhesion to mesh [9, 18]. Most of these complications are avoided by gentle and careful dissection under vision. Femoral hernia repair is more liable for recurrence than inguinal hernia repair, and the recurrence is more with sutures repair than with the use of synthetic patch/mesh [9, 19]. Neurovascular and visceral injuries were reported more common with non-mesh repairs, whereas wound infection was more common with mesh repair [9].

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