CASE REPORT

The Duari hernia and recognition of the femoral vein compression sign

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SUMMARY

Femoral hernias can be difficult to diagnose and are at high risk of strangulation. This report is of a rare case of an irreducible femoral hernia containing caecum and appendix presenting as an emergency. To the authors' knowledge, there have only been three cases reported, the first described by Duari. This case was incorrectly diagnosed preoperatively as an inguinal hernia, so the CT diagnosis of femoral hernias is reviewed, in particular demonstrating the radiological use of the femoral vein compression sign.

BACKGROUND

Femoral hernias account for around 2.8%–4% of all groin hernias.^{1,2} Risk factors for developing femoral hernias include female gender, increasing age, large femoral canal, obesity and conditions that increase intra-abdominal pressure such as a chronic cough or constipation.³ Strangulation of a femoral hernia carries a mortality rate of 8%–10%.^{4,5}

The femoral canal is bounded by the inguinal ligament anteriorly, the lacunar ligament medially, the pectineal ligament posteriorly and the femoral vein laterally.⁶ These anatomical features explain the high risk of strangulation compared with inguinal hernias (35.9% vs <5%)² due to three rigid boundaries and also explain the mechanism of the femoral vein compression sign on CT.

Femoral hernias appear clinically as a swelling below the inguinal ligament, classically described as being located inferolateral to the pubic tubercle. However, the swelling may be located more superiorly in a position above the inguinal ligament. Differentiating between a femoral and inguinal hernia may therefore be difficult. Physical examination by surgeons has a sensitivity of only 50% and a positive predictive value of 37.5%.⁴ CT or ultrasonography are commonly used in the assessment of groin swelling; however, there are no formal diagnostic criteria for femoral hernias in the literature. Suggested radiological signs to aid in diagnosis includes femoral vein compression, hernia located below the inguinal ligament or inferior epigastric vessels and lateral to the pubic tubercle with inguinal canal preservation.⁷

Femoral hernias usually contain omentum or small bowel.⁸ Less commonly, they include Meckel's diverticulum, bladder or pelvic organs.^{8–10} The De Garengot's hernia is an eponym for a rare incarcerated femoral hernia containing the appendix

that occurs in about 1% of all femoral hernias.¹¹ An acutely inflamed appendix within the hernia occurs even less frequently (0.08%–0.013% of all patients).¹²

To date, there are only three cases reported in the literature of a femoral hernia containing appendix and caecum. We will refer to this as a Duari hernia after the author who first reported these contents in a femoral hernia.¹³ Two cases were Richter's type hernias, that is, only part of the intestinal wall herniated through the defect. The third case described ascending colon and small bowel in addition to the caecum and appendix within the sac.^{13–15}

The open surgical approaches are divided into low or high depending on the anticipated need to perform a bowel resection.¹⁶ Laparoscopic approaches offer the ability to differentiate inguinal from femoral hernias through the same port site location but may be contraindicated in patients with comorbid or coagulopathic conditions.

CASE PRESENTATION

A 64-year-old man presented to Nambour General Hospital (NGH) with the development of acute pain in his long-standing right groin swelling that became irreducible 1 week prior. He had no associated obstructive symptoms. He had no significant medical comorbidities. Clinical examination revealed a tender 5×4 cm right groin swelling with overlying erythema and an absent cough impulse. An abdominal and pelvic CT scan was reported as demonstrating a strangulated direct inguinal hernia containing both the caecum and appendix (figure 1).

TREATMENT

At operation, an inguinal incision was made and dissection revealed a femoral rather than an inguinal hernia with the sac containing oedematous but a viable lower pole of caecum and appendix in a Richter's type hernia. The hernia was reduced and the defect was repaired without mesh by successfully approximating the pectineal and inguinal ligaments. The patient had an uncomplicated postoperative course.

OUTCOME AND FOLLOW-UP

On reviewing the preoperative CT scan with the radiology service, it was concluded that the radiological signs of a femoral hernia were present

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Figure 1 Sagittal CT image showing the Duari hernia. The long arrow indicating the appendix. The short arrow indicating the caecum.

including femoral vein compression and a hernia sac located lateral to the pubic tubercle (figures 2 and 3).

DISCUSSION

This case describes the rare finding of an irreducible Duari hernia. The pathophysiology is thought to be abnormal mobility of the caecum and the ascending colon, due to failure of fusion of the right colonic mesentery to the lateral peritoneum during development.¹⁷ This occurs in 10%–20% of the population.

The preoperative CT interpretation of this case was incorrect, and it was identified that two additional patients had recently been diagnosed with an inguinal hernia on CT with intraoperative findings of a femoral hernia. Review of those images confirmed that the radiological signs of a femoral hernia were also present.

Femoral hernias can be challenging to diagnose even for experienced clinicians.¹⁸ However, with the development of multidetector CT with multiplanar reconstructions, it has been suggested

Figure 2 Axial CT image showing the femoral hernia. The long arrow indicating a positive femoral compression sign. The short arrow indicating a normal femoral vein.

that femoral hernias can be more accurately diagnosed from CT scans.^{19 20}

Suzuki *et al* described the compression of the femoral vein as a useful radiological diagnostic sign to aid in the differentiation

Figure 3 Coronal CT image showing the positive femoral compression vein sign (long arrow) compared with a normal femoral vein (short arrow).

of an inguinal versus a femoral hernia. The femoral vein was considered compressed when the femoral vein adjacent to the hernia sac was elliptic, the hernia sac lay in the direction of the minor diameter of the femoral vein and the minor diameter of the femoral vein was less than two-thirds the diameter of the femoral vein on the contralateral side in the symmetric direction. Suzuki *et al* noted that in both incarcerated and non-incarcerated femoral hernias, the compression of the femoral vein as well as the localisation of the sac lateral to the pubic tubercle were common to all 11 femoral hernias reviewed (100%).⁷ In our NGH experience, review of five CT scans with irreducible femoral hernias demonstrated that these radiological signs were present in all five, though not recognised preoperatively in three.

The correct diagnosis of a femoral hernia has surgical implications with respect to urgency of management and the surgical incision site. Through the diagnosis and management of this rare Duari hernia, the utility of the femoral vein compression sign was recognised and led to improvement in diagnosis of subsequent femoral hernias.

Learning points

- ▶ Differentiating between a femoral and an inguinal hernia can be difficult both clinically and radiologically.
- ▶ The femoral vein compression sign on a CT scan can be useful in differentiating a femoral from an inguinal hernia.
- ▶ Increased awareness of the femoral vein compression sign improves the subsequent diagnostic rate of femoral hernias.

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