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De Garengeot hernia—Use of a novel surgical approach and literature review



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ABSTRACT

INTRODUCTION: De Garengeot hernia is a rare type of femoral hernia, defined as a sac containing a vermiform appendix. Due to its rare occurrence the information available on diagnosis and management is scarce. We report the use of a recently described technique for femoral hernia repair and appendicectomy. **PRESENTATION OF CASE:** A 67 year old female presented to the emergency department with features of incarcerated femoral hernia. CT imaging revealed an incarcerated appendix within a femoral hernia. The patient subsequently underwent surgery, where the femoral hernia was repaired and appendicectomy performed concurrently.

DISCUSSION: Clinical diagnosis is difficult, and there have only been a few documented cases of pre-operative CT diagnoses in the literature. The usual risk factors for developing a hernia would apply to this pathology, and other anatomical and embryological considerations are explored. The King's College technique for femoral hernia repair involves an incision that allows repair of the hernia and also the ability to enter the peritoneal cavity using the same incision. This approach was used in this case, where the abdominal cavity had to be entered to perform the appendicectomy, before the femoral hernia could be repaired.

CONCLUSION: Pre-operative diagnosis of De Garengeot hernia is difficult, as it may mimic an incarcerated femoral hernia containing other contents. The diagnosis becomes apparent intra-operatively. The clinical significance lies in that intra-abdominal access may be required to safely perform an appendicectomy before the repair of the hernia defect, and this article includes a description of a suitable technique for this particular pathology.

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1. Introduction

A femoral hernia is defined as a sac which projects through the femoral canal, and presents clinically as a groin hernia below and lateral to the pubic tubercle, or a finger breadth medial to the femoral artery below the inguinal ligament [1]. Femoral hernias are relatively uncommon, and have a high risk of strangulation [1,2].

This article presents a rare case of appendicitis within a De Garengeot hernia, which is described as an appendix which has migrated within the femoral hernia sac [3]. There has been fewer than 100 cases reported in the literature [2–4]. Pre-operative diagnosis of De Garengeot hernia is very difficult due to its rare occurrence, non-specific history and clinical findings, and a paucity of data on the utility of diagnostic imaging [5].

Due to its rare occurrence and lack of published guidelines on standard management [3], this report attempts to add fur-

ther insight into the disease entity, and highlights the use of a recently described surgical technique which has not previously been employed for use in repair of this hernia. Also included in this report is a descriptive computed tomography (CT) finding of femoral hernia appendicitis, which is one of a very few cases to be reported in the literature with a pre-operative CT diagnosis.

2. Case presentation

A 67 year old female presented to the emergency department with a 1 day history of increasing pain in a pre-existing lump in the right groin. This lump became apparent to the patient 4 days before the onset of pain. She describes having an upper respiratory tract infection for 2 weeks prior, and the persistence of a cough led to the development of this groin lump. There was no history of nausea or vomiting. She had regular bowel motions and was passing flatus. No other significant medical history or surgery in the past. On examination there were no documented fevers, and she was haemodynamically stable. Her abdomen was non-tender, soft and without distention. Below the inguinal ligament, identified by pal-

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Fig. 1. Tip of appendix within the femoral hernia sac (white arrow) with some surrounding fat stranding.

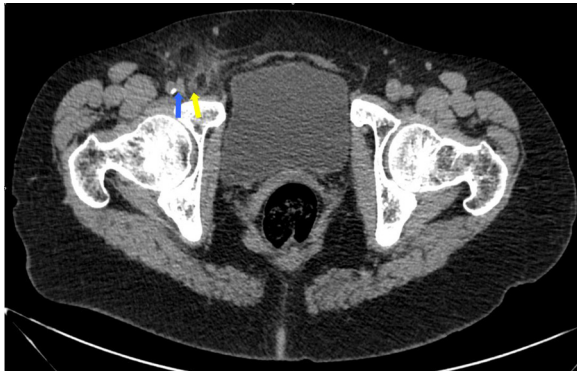


Fig. 2. Fluid-filled tubular structure representing the appendix (yellow arrow) lying medially to the femoral vein (blue arrow), just before entering the femoral canal.

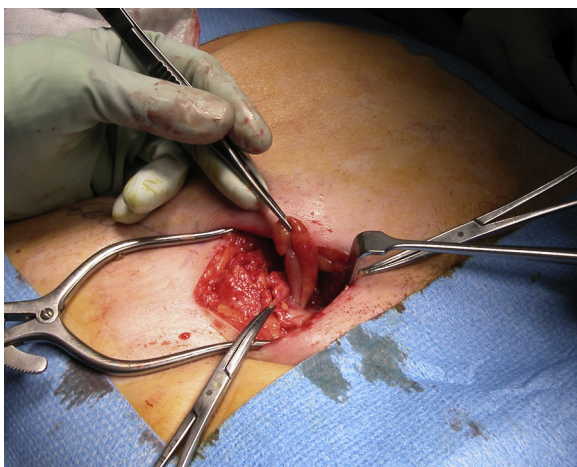


Fig. 3. Strangulated portion of appendix incarcerated in the femoral hernia. This represented approximately 30% of the total length of the appendix.

pating the pubic tubercle, was a 4 cm firm, tender, and irreducible lump. This was associated with erythema of the skin over the lump. The biochemical profile and inflammatory markers were normal. The primary care physician had organised a CT scan prior to presentation to hospital. This demonstrated a right sided femoral hernia containing an appendix, with the tip appearing thickened and surrounded by fat stranding, suggestive of inflammation (Figs. 1 and 2).

The patient was consented for emergency surgery the same day. The surgical method used was the King's College approach described by Sorelli et al., a recently published method described as a single skin incision which is made one centimeter above the medial half of the inguinal ligament [6]. A femoral hernia sac was identified. Within the sac contained a strangulated dusky appearing tip of appendix, surrounded by blood-stained fluid (Fig. 3). Given

the tightness of the hernia neck, the full length of the appendix could not be delivered. The nature of the surgical approach allowed entry into the peritoneum through the same skin incision, the caecum was identified and the appendix was safely delivered for routine open appendectomy. The hernia was repaired by approximating the pectineal ligament to the inguinal ligament with 2–0 prolene sutures. The patient was discharged on post-operative day 2 without complication. The surgical specimen was confirmed histologically to be appendicitis.

3. Discussion

3.1. Incidence

De Garengeot hernia is defined as a femoral hernia which contains a vermiform appendix. It was first described in 1731 by a Parisian surgeon Rene Jacques Croissant De Garengeot [7]. This entity is extremely rare—reported incidence ranges from 0.8 to 1.0%, with the finding of appendicitis even rarer still, at 0.08–0.5% of all femoral herniae [3]. There has been fewer than 100 cases reported [2–4]. It must be distinguished from Amyand hernia, which is the presence of an appendix within an inguinal hernia, and is reportedly more common than a De Garengeot hernia [3,5].

The importance of femoral hernias lies in the high strangulation risk, which is estimated to be 20% at 3 months and 45% at 21 months. This is in contrast to inguinal hernias, which have a risk of strangulation of 3% at 3 months, with a modest increase to 4.5% at 21 months [1]. This increased risk is thought to be due to the narrow and rigid ring attributed by the nature of the anatomy of the femoral canal [2]. A study examining a national hernia register in Sweden found that an emergency femoral hernia operation was associated with a 10 times increase in risk of mortality, with 63% of cases occurring in women [8].

3.2. Pathophysiology

There is a predisposition for postmenopausal females, being four times more common than males [3,5], reflecting the higher incidence of femoral hernias in females [1]. Contributing factors are thought to be secondary to pregnancy related changes, as well as general factors that increase risk of hernia formation such as increased intra-abdominal pressure, smoking, connective tissue disorders, and older age [3,5]. There have been several theories proposed to the pathogenesis of the migration of appendix into a femoral hernia. One hypothesis is the presence of a large or overriding caecum within the pelvis may push the appendix onto the femoral ring [5,9]. Another thought is that variable anatomic rotation of bowel during development may also play a role [5,10,11], as well as a variably mobile caecum which may also predispose to migration of appendix into the femoral canal [5,9].

Appendicitis may have arisen from intraluminal obstruction caused by the tight neck of the hernia that caused external compression of the appendix, with eventual strangulation and inflammation [12]. This is supported by the fact that the patient had an asymptomatic lump for 4 days before the onset of pain. However, not all De Garengeot hernia will have appendicitis [5], and it is unclear whether the true mechanism always occurs from external compression, or can also arise from intraluminal obstruction, as in cases of wider hernia necks [3,13].

3.3. Clinical features and diagnosis

The pre-operative diagnosis of De Garengeot hernia is very difficult, due to non-specific clinical findings and lack of comprehensive published data on diagnostic imaging. A recent article reviewing the literature found that most patients had a non-specific painful lump

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