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A combined Richter's and de Garengeot's hernia



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ABSTRACT

INTRODUCTION: de Garengeot's hernia is very rare. Richter's hernia is responsible for 10% of acute strangulated hernias.

PRESENTATION OF CASE: A 91-year-old woman with three days of abdominal distention was found on computed tomogram to have an incarcerated femoral hernia. Operation revealed a de Garengeot's hernia combined with a Richter's hernia of small bowel. Primary repair was performed along with appendectomy.

DISCUSSION: We discuss these rare hernias, not previously reported in combination, and options for management.

CONCLUSION: Combined de Garengeot's and Richter's hernias are rare, represent a significant diagnostic challenge, and should be repaired urgently to prevent ischemic bowel, or limit contamination if ischemia is already present. Use of computed tomography will likely lead to increased pre-operative diagnosis of this rare entity.

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1. Introduction

The presence of the appendix within a femoral hernia was first described by Rene Jacques Croissant de Garengeot in 1731.¹ In 2005, Akopian and Alexander proposed naming this condition "de Garengeot's hernia".² There have been fewer than 90 reported cases of de Garengeot's hernia in the English literature. The incidence of de Garengeot's hernia is less than 1% of femoral hernias³ and it occurs predominately in females (13:1 female:male).⁴ In 1785, August Gottlieb Richter first comprehensively described a hernia in which only part of the circumference of the bowel is strangulated.⁵ This was later termed "Richter's hernia" by the famous London surgeon Sir Frederick Treves.⁶ Richter's hernias account for approximately 10% of all strangulated hernias.⁷ To date, there has not been a report in the literature of a femoral hernia that contained both the vermiform appendix and a part of the circumference of the bowel.

2. Presentation of case

A 91-year-old woman presented to the emergency department with three days of abdominal distention, nausea and vomiting. The patient had been in her usual state of health when she developed nausea with oral intake, distention of her abdomen and the inability to pass flatus. This was followed by emesis 24 h prior to admission. The patient denied fever or chills. Past medical history is significant

for diabetes mellitus type 2, hypertension, hypothyroidism, recurrent urinary tract infections, and chronic atrial fibrillation. She had no history of abdominal surgery. Pertinent medications included aspirin, levothyroxine, metformin, and warfarin.

At presentation, the patient had a temperature of 36.1 °C, heart rate of 72 beats per minute, blood pressure of 160/76 mmHg, respiratory rate of 16 per minute and oxygen saturation of 99% on room air. Her body mass index was 20.2 kg/m². Clinical examination revealed a distended but soft abdomen without tenderness or guarding. No bowel sounds were audible. Examination of the groins failed to reveal any evidence of hernia.

Laboratory findings revealed that the patient had pre-renal azotemia and a mild leukocytosis (WBC count 11.3 K/ μ L, 80% neutrophils, 8% bands). Serum sodium was 112 mEq/L and potassium was 5.2 mEq/L. Blood urea nitrogen was 20 mg/dL and creatinine was 0.9 mg/dL. International normalized ratio was 1.2. A non-contrast computed tomography (CT) demonstrated high-grade small bowel obstruction with dilated proximal loops, decompressed distal loops and a transition point at the site of a right femoral hernia. There was no other acute pathology.

The patient was admitted for resuscitation to include sodium repletion with plans for abdominal exploration under general anesthesia. A lower midline incision was made from the umbilicus to the pubis. Incarceration of the anti-mesenteric border of a loop of jejunum was found in the opening of a femoral hernia sac (Fig. 1a). This was reduced easily only to reveal that the vermiform appendix was also engaged in the femoral hernia (Fig. 1a). The appendix was reduced from the hernia, revealing that its tip was scarred into the sac. The appendix was delivered by completely inverting the femoral sac. The inverted femoral hernia sac was then ligated

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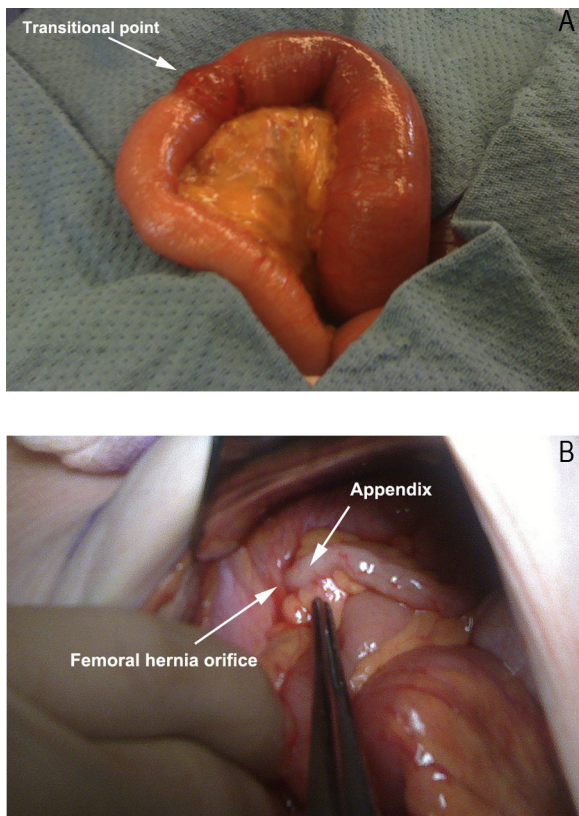


Fig. 1. (a) Loop of jejunum with a piece of bowel wall incarcerated in the femoral canal. (b) Femoral hernia orifice with an appendiceal tip after the jejunal wall (not seen) was reduced.

at its base, distracted from the femoral ring and sutured medially with 2-0 silk sutures. The incarcerated jejunal segment had a serosal defect and was imbricated transversely with interrupted 3-0 silk sutures. Appendectomy was performed uneventfully. The postoperative course was complicated by a prolonged ileus that eventually resolved with conservative management. The patient was discharged home on postoperative day 12. The histological examination showed ischemia of the appendiceal tip.

3. Discussion

Femoral hernias are more common in women than men but account for only 4% of all groin hernias.⁸ By chance, hernias can contain any of the mobile intra-abdominal structures. Hernias containing omentum, small bowel, colon, uterine tube, Meckel's diverticulum and the appendix have all been reported. There have been case reports of hernia sac containing more than one structure such as combined appendix and Meckel's diverticulum, or jejunum and uterus with ovaries.^{9,10} To our knowledge however, this is the first case report of a combined de Garengeot's and Richter's hernia, illustrated in Fig. 2. The diagnosis of de Garengeot's hernia can be based on the femoral hernia containing either a normal or an inflamed appendix.¹¹ An incarcerated femoral hernia containing the appendix is nonetheless a very rare finding and occurs in less than 1% of femoral hernias. Acute appendicitis is present in only 0.5% of those cases.^{3,12} Entry of the appendix into the femoral canal has been attributed to an abnormal anatomical position of the appendix in the pelvis as well as the presence of a large mobile cecum positioned low in the abdomen.¹³ Femoral hernias themselves carry a high risk of incarceration and strangulation, historically blamed on the narrowness and rigidity of the femoral

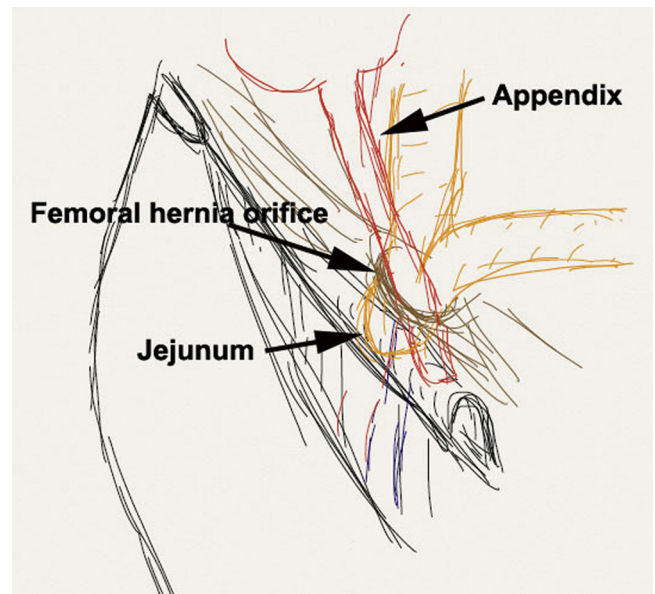


Fig. 2. Sketch of the combined Richter's and de Garengeot's hernias.

ring. The pathophysiology of appendicitis in the setting of this strangulated de Garengeot's hernia might involve luminal obstruction caused by the rigid femoral neck or by the presence of the Richter's hernia. Either could result in congestion, ischemia, and transmucosal inflammation distal to the site of constriction with subsequent development of necrosis.¹⁴ The finding of an inflamed appendix in a femoral hernia sac has also been described as a primary process in the presence of a wide femoral ring.²

Early diagnosis is important to reduce the risk of complications; however a de Garengeot's hernia presents a significant diagnostic challenge. Appendicitis in the hernia sac will often lack the clinical signs of acute appendicitis and is most commonly diagnosed at operation. Clinical signs of a de Garengeot's hernia are commonly indicative of an incarcerated femoral hernia and may include vague abdominal pain, painful swelling and erythema of the right groin.¹⁵ In addition, patients may only rarely develop signs of peritonitis since the inflamed appendix can be isolated from the peritoneal cavity by the hernia sac.¹⁶ There have only been occasional reports where the diagnosis of appendicitis in a hernia sac has been made pre-operatively. Currently, there are only three reports where de Garengeot's hernia was diagnosed pre-operatively by CT scan.¹⁷ With increasing CT use to evaluate vague abdominal complaints though, preoperative diagnosis may become more commonplace.

There is no standard surgical approach to the treatment of de Garengeot's hernia. Previous reports have described inguinal incisions, laparotomy or combined approaches. Minimally invasive repair via laparoscopy and trans-abdominal pre-peritoneal repair is also possible.¹⁸ If perforation or abscess formation is limited to the hernia sac, limiting the surgical approach to the groin has been recommended, thus avoiding peritoneal contamination.¹¹ But open drainage of the hernia sac followed by interval appendectomy with hernia repair has also been described.¹⁹ A trans-abdominal approach may be more appropriate if an abdominal sepsis is present.²⁰ Where advanced suppuration is present, drainage with delayed appendectomy may be wise.¹² The presence of suppuration is also often considered a contraindication to repairs using prosthetic mesh.

The most common reported complication of de Garengeot hernia repair is wound infection, reported to occur in up to 29% of patients.¹⁵ Factors contributing to the high wound complication rate likely related to delays in diagnosis, the multiple tissue planes

involved in repair, and the older age and often poor nutritional status of the patients.¹⁵ In this case, a lower midline incision was used because there was concern that the femoral hernia had reduced spontaneously with free spillage. This incision allowed the entire length of bowel to be evaluated for ischemic injury. Appendectomy and repair of the small bowel injury were performed without difficulty. Mesh was felt inappropriate, and in light of the patient's age, the ligated femoral hernia sac was simply distracted away from the femoral ring to decrease the risk of recurrence.

4. Conclusion

de Garengéot's hernia is a rare diagnosis. This is the first report to describe the presence of a jejunal Richter's hernia simultaneous with an appendix in a femoral hernia sac. This combination presents a diagnostic challenge but its recognition may be more frequent with the use of CT. Thus the clinician should be aware of its possibilities and the available therapeutic options.

Conflict of interest

The authors have no conflicts to declare.

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None.

Ethical approval

Written informed consent was obtained from the patient for publication of this case report and case series and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contributions

Hau D. Le: data gathering, writing; Stephen R. Odom: data gathering, writing; Albert Hsu: writing; Alok Gupta: writing; Carl J. Hauser: data gathering/interpretation, writing.

Key learning point

- de Garengéot's and Richter's hernias can occur in combination, present a diagnostic challenge and should be repaired expediently.

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