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## Amyand's hernia: a case report of prospective ct diagnosis in the emergency department

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**Abstract** The diagnosis of Amyand's hernia, the development of acute appendicitis within an inguinal hernia, is rarely made preoperatively and is often confused clinically with an incarcerated right inguinal hernia. The use of CT to prospectively diagnose Amyand's hernia and corresponding imaging findings are not well described in the literature. We report a case of Amyand's hernia, which was correctly diagnosed by CT in a female patient presented to the emergency department with right lower quadrant pain and clinical suspicion of a strangulated omentocele.

**Keywords** Appendicitis · Hernial appendicitis · Amyand's hernia · Computed tomography

### Introduction

Amyand's hernia (inflamed appendix in the inguinal canal) is a rare presentation of acute appendicitis, occurring in less than one percent of all cases [1–7]. Because of its unusual and infrequent clinical presentation, it is rarely diagnosed preoperatively and is often clinically confused with a strangulated hernia. Although this entity is well described in surgical literature [1–5, 7], the use of CT and its imaging findings in the radiological literature is minimal. To our knowledge, in only two other cases have the CT findings of Amyand's hernia been collectively described in a single case report [6]. The utility of CT to prospectively diagnose Amyand's hernia in the emergency department and allow timely surgical treatment is illustrated in the case we present.

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### Case report

A 77-year-old female presented to the emergency department of our institution with a 1-day history of right lower quadrant pain and fever. The patient denied diarrhea, nausea or vomiting. Physical examination revealed a palpable and tender nonreducible right inguinal hernia and moderate tenderness to palpation in the right lower quadrant. The patient had a mild fever of 38.7°C. Laboratory evaluation was remarkable only for a white blood cell count of 12,700. Acute abdominal series was negative for signs of obstruction or free intraperitoneal air. Due to the presence of the painful inguinal mass and lack of bowel dilatation, the leading clinical diagnosis by the emergency department staff was that of a strangulated omentocele. To confirm the diagnosis, a CT of the abdomen and pelvis was requested.

Spiral CT of the abdomen and pelvis was performed (Emotion Plus-4; Siemens Medical Systems) with 5-mm collimation and pitch of 1.5. Oral and rectal water-soluble contrast (Hypaque; Amersham Health; Princeton, NJ, USA) and 150 ml of 60% intravenous contrast material (Ultravist-300; Mallinckrodt, St. Louis, MO, USA) were administered. The CT scan demonstrated a dilated appendix and a moderate amount of adjacent fat stranding with extension into the right inguinal hernia (Fig. 1). Additionally, an appendicolith was present at the distal tip of the appendix (Fig. 2). This finding further validated that the structure protruding into the inguinal canal was indeed the appendix. No periappendiceal abscess or evidence of perforation or bowel obstruction was present. These findings led to the diagnosis of acute appendicitis extending into the right inguinal canal.

The patient was subsequently transferred to a different institution for surgical treatment, which consisted of appendectomy, cecal resection with ileocolonic anastomosis, and right inguinal hernia repair. The pathological report of the surgical specimen confirmed acute appendicitis. The patient did well following surgery without



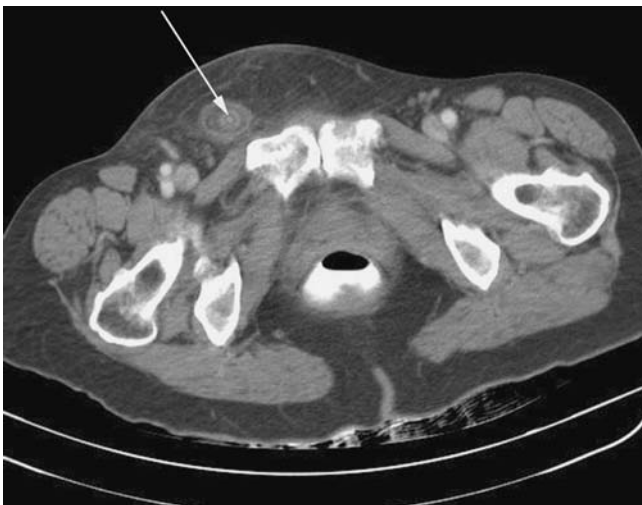
**Fig. 1** Inflamed appendix (*curved white arrow*) extends into the inguinal canal (*straight white arrow*) with a moderate amount of adjacent fat stranding. Femoral vessels are posterior to the appendix

complication and was discharged home on the fourth postoperative day.

## Discussion

Amyand's hernia is a rare form of appendicitis occurring in an inguinal hernia. While an uninfamed appendix within an inguinal hernia is estimated to be present in approximately one percent of adult inguinal hernia repairs, appendicitis is only found in 0.13% of all forms of external hernia sacs [5, 7]. In men, acute appendicitis is most commonly reported in a right inguinal hernia. In postmenopausal women, involvement of right femoral hernias is more common [2, 7]. This differs from our case report in which appendicitis in the inguinal canal was present in a postmenopausal female.

It has been suggested that there is a causal relationship between incarceration of the appendix in the



**Fig. 2** Appendicolith (*white arrow*) is present in the distal appendix

inguinal canal and the development of inflammation. When the appendix enters the inguinal canal, it is theorized that the appendix becomes more vulnerable to trauma and its blood supply may be reduced, resulting in inflammation and bacterial overgrowth. Contraction of the abdominal muscles and sudden increase in the intra-abdominal pressure can cause further compression of the appendix and more inflammation [5].

Amyand's hernia is often clinically misdiagnosed as a strangulated hernia. The correct preoperative diagnosis has only been reported in one case and requires awareness of this disease process by the clinician in combination with the physical finding of a tender hernia without radiological or clinical evidence of obstruction [5, 7]. Abdominal pain, fever, and leukocytosis are not helpful in the differential diagnosis, which includes a strangulated hernia or omentocele, Richter's hernia, and various testicular/scrotal conditions [5]. The treatment of choice in Amyand's hernia is appendectomy followed by hernia repair [2, 3, 5]

In the case presented, the emergency department staff was concerned for a strangulated omentocele due to the lack of obstructive signs and symptoms. The clinician in this case was partially correct in his clinical diagnosis, but without CT would have referred the patient to a general surgeon with the clinical diagnosis of an omental infarct. The diagnosis of Amyand's hernia by CT gave the surgeon the proper information to provide the surgical treatment of choice without delay.

Because it is not often clinically suspected, the diagnosis of Amyand's hernia is usually made intraoperatively and is often complicated by gangrene or perforation [1, 3]. However, CT has been shown to accurately make the diagnosis prospectively in at least two previously reported cases in addition to our own [6]. The early utilization of CT in these cases was felt to contribute to the benign clinical course of those patients and was a likely factor in the uncomplicated recovery of the patient in our report. Radiologists should be aware of the imaging findings in Amyand's hernia and the efficacy of CT in revealing clinically unsuspected diagnoses that may change patient management.

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