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A rare case report of incarcerated Amy and hernia

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Abstract
Background: *Amyand hernia is an uncommon condition where the appendix is trapped inside an inguinal hernia sac. Appendix within the hernia sac is exceptionally unusual (fewer than 1% of inguinal hernia patients), and when complications such as inflammation, perforation, or abscess development occur, the rate drops to less than 0.1 %.*
Case presentation: *A 75-year-old man presented with abdominal pain and fever (38 C) to the Emergency Department. The physical examination revealed a right incarcerated inguinal hernia, painful at the palpation. The Computed Tomography showed herniated bowel loops inside the inguinal hernia with signs of inflammation and fluid in the peritoneal cavity. An exploratory laparotomy, appendectomy, and hernia repair without mesh were performed on the patient.*
Conclusion: *The treatment protocol for Amyand's hernia is dependent mainly on the appendix condition. The use of mesh is a controversial issue, and therefore more research is needed for a better approach.*
Keywords: *Amy and hernia; appendix; incarceration; classification; treatment.*

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I. Introduction

The English surgeon Dr Claudius Amyand (1973), named this unusual pathology of an appendix (with or without inflammation) within the hernia sac (1). Inguinal hernias are the most common procedures performed by general surgeons, with over 20 million inguinal hernia repairs performed each year around the world. Amyand hernia is highly unusual, occurring in fewer than 1% of inguinal hernias, and the complications (inflammation, perforation, or abscess) are much rarer, around 0,1% (2).

The appropriate surgical treatment depends on the intraoperative findings, such as appendix condition, hernia characteristics, and patient co-morbidities. Additionally, there is a discussion about whether an appendectomy should be undertaken for a normal-appearing appendix or if mesh should be applied for hernia repair if an appendectomy is done.

There are no evidence-based standardized techniques for dealing with this distinct entity due to the rarity of the condition and the lack of randomized controlled studies.

II. Case Presentation

A 75-year-old male visited the emergency department with a one-day history of acute abdominal pain, nausea, and vomiting. The physical examination revealed a painful incarcerated inguinal hernia worsening with movements and abdominal distension with signs of peritonitis. The inguinal hernia was reducible according to the patient's history. The patient was hemodynamically stable with fever (38 C) and increased white blood cells (17.500) with a left shift. The imaging studies, ultrasound, and computed tomography (CT) confirmed a right inguinal hernia with herniated bowel loops within the right inguinal canal and signs of inflammation and fluid in the peritoneal cavity. The patient was taken to the operating room for an emergent laparotomy for suspected bowel perforation. Intraoperatively, purulent peritonitis was found, without bowel perforation, and in the hernia

sac was the appendix, which was gangrenous. Due to the appearance of the appendix and the patient's clinical picture, appendectomy and hernia repair without mesh was performed.

The patient stayed in the hospital for seven days, received intravenous antibiotics, and was discharged on postoperative day 7. The histopathology was consistent with a gangrenous appendix. The follow up of the patient showed no signs of SSIs or hernia recurrence.

III. Discussion

The most widely recognized treatment algorithm for Amyand's hernia is determined by the condition of the appendix within the hernia sac. There is controversy about the etiology of appendiceal herniation and the development of appendicitis within the sac regarding the pathophysiology of Amyand's hernias. A previously blocked appendix, such as a fecalith or lymphoid hyperplasia, being entrapped within a hernia sac and inflamed due to the initial blockage rather than the entrapment, is one reason for the development of appendicitis within an Amyand's hernia. However, there are just a few reports of Amyand's appendicitis linked with fecaliths or villous adenoma in the literature [3]. Adhesions cause irreducibility of the hernia, and compression of the appendix in the external ring due to increased intra-abdominal pressure are two more mechanisms that can cause acute appendicitis [4].

A classification system was created by Losanoff and Basson (table 1). This system distinguishes four different hernia types: 1) Normal appendix in an inguinal hernia, 2) Acute appendicitis in an inguinal hernia, without abdominal sepsis, 3) Acute appendicitis in an inguinal hernia, with abdominal wall or peritoneal sepsis, and 4) Acute appendicitis in an inguinal hernia, with other abdominal pathology [5].

The surgical treatment for types 3–4, which involves an appendectomy with primary hernia repair and avoidance of mesh, has a lot of support [6]. On the other hand, for types 1-2, the mesh should not be utilized if an appendectomy is performed due to the danger of infection [6]. Kose et al. insist that in the case of a healthy-appearing appendix that cannot be reduced (incarcerated) and no signs of inflammation, an appendectomy should be performed, and the surgeon should then perform a tension-free repair with mesh because the risk of infection is low compared to the risk of hernia recurrence with a primary repair alone [7].

In our case report, the symptoms of incarcerated hernia led to the surgery. The clinical diagnosis of Amyand hernia is difficult, but as the standard treatment is surgery, they are diagnosed intraoperatively during the hernia sac exploration. Imaging studies preoperatively, such as ultrasound and CT, can diagnose Amyand hernia successfully but only a small number of cases have been reported [8]. Following the identification of an Amyand's hernia during surgery, the management might be guided by the pathological features present. In our case, a gangrene appendix with pus leads us to exploratory laparotomy to explore the peritoneal cavity for other pathology and peritoneal washing.

IV. Conclusion

We present an Amyand's hernia case that appeared as an incarcerated hernia and was identified intraoperatively with an inflamed appendix (type 3), which was treated with an exploratory laparotomy with appendectomy and tension-free hernia repair without mesh. However, more research is needed to equip surgeons with evidence-based, standardized techniques for dealing with this rare condition to assure the best possible outcomes for patients.

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Table 1. Classification of Amyand's hernia by Losanoff and Basson.

Classification	Description	Surgical management
Type 1	Normal appendix in an inguinal hernia	Hernia reduction, mesh repair
Type 2	Acute appendicitis in an inguinal hernia, without abdominal sepsis	Appendectomy, primary repair of hernia without mesh
Type 3	Acute appendicitis in an inguinal hernia, with abdominal wall or peritoneal sepsis	Laparotomy, appendectomy, primary repair without mesh
Type 4	Acute appendicitis in an inguinal hernia, with abdominal pathology	Manage as Type 1–3, investigate pathology as needed

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