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CASE REPORT

Acute appendicitis within an Amyand's hernia: a case report and literature review

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Abstract

Background: We present a clinical case of Amyand's hernia complicated by acute appendicitis.
Material and methods: A 71-year-old male presented with an incarcerated right inguinal hernia. Intraoperatively, a gangrenous, perforated appendix with associated purulent collection was identified, consistent with a type three Amyand's hernia.
Results: This case highlights the diagnostic and therapeutic challenges of Amyand's hernia. Due to its rarity and nonspecific presentation, the diagnosis is often made intraoperatively. Timely intervention and appropriate surgical strategy are essential to prevent complications.
Conclusions: Amyand's hernia should be considered in the differential diagnosis of complicated inguinal hernias. Surgical management must be adapted to the intraoperative findings.
Keywords: appendicitis, inguinal hernia, appendectomy, Amyand's hernia

Introduction

Amyand's hernia is a rare type of inguinal hernia, accounting for approximately 1% of all cases. The presence of acute appendicitis within the hernia sac is even more uncommon, observed in about 0.1% of hernias [1:329–336,2]. The diagnosis of this condition is both difficult and complex [3]. The main differential diagnoses include incarcerated intestinal loops, testicular inflammation, and testicular torsion, all of which may present with similar clinical features [4]. Prompt surgical intervention is essential in each of these conditions to prevent serious complications [5].

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Case description

A 71-year-old patient was admitted on an emergency basis to the Department of General and Oncological Surgery due to an irreducible right inguinal hernia. Clinical examination revealed erythema of the inguinal region, along with swelling and redness of the right testicle. According to the patient's history, the hernia had been present for approximately two weeks, with increasing pain and swelling developing over the preceding two days.

The diagnostic tests performed in the Emergency Department included both laboratory and imaging tests. The laboratory results revealed significantly elevated inflammatory markers: the C-reactive protein (CRP) concentration was 279 mg/L (reference range <5 mg/L), the fibrinogen level was 9.94 g/L (reference range up to 4.0 g/L), and leukocytosis was present with a white blood cell (WBC) count of 16.41 × 10^3/μL (reference range <11.00 × 10^3/μL).

Abdominal radiography (X-ray) revealed the presence of single, short, nonspecific levels of fluid within the intestinal loops in the lower abdomen.

Abdominal ultrasonography demonstrated a right-sided inguinal hernia measuring approximately 50 × 35 × 96 mm, with a hernia orifice 20 mm in width. The hernia sac contained hyperechoic adipose tissue and a non-dilated intestinal loop with edematous and thickened walls, measuring up to 4.5 mm. A fluid collection of 22 × 10 mm was visualized in the anterior portion of the hernia sac. Additionally, small hyperechogenic foci consistent with the presence of gas were noted around the intestinal loop. The area was tender on palpation, clinically indicating signs of incarceration. On the left side, an inguinal hernia with a 14 mm orifice containing adipose tissue was also identified. During abdominal wall straining, transient protrusion of the intestinal loop into the hernia sac was observed. Due to the ultrasonographic confirmation of the intestinal loop within the hernia sac, along with clinical features suggestive of an incarcerated hernia, the decision was made to perform an urgent surgical intervention during the night. Computed tomography (CT) was not performed due to the urgency of surgical management aimed at preventing ischemic complications.

The emergency surgical procedure was performed under standard operating theatre conditions. After opening the anterior wall of the inguinal canal and carefully dissecting the incarcerated and inflamed hernia sac, the spermatic cord was isolated and the hernia orifice was exposed. Inside the hernia sac, an incarcerated, ischemic and gangrenous appendix was identified. Perforation was noted in both the body and the tip of the

organ. A purulent collection was also present. The intraoperative findings were consistent with an Amyand's hernia. The abscess was drained, and a specimen was collected for microbiological analysis. The appendix was removed retrogradely, with the stump secured using a ligature. Material was collected for histopathological examination. Furthermore, necrotic tissue surrounding the hernia sac up to its base was resected. Following this and after thorough irrigation of the surgical field, the inflammatory process remained localized within the hernia sac. As there were no indications for extending the surgical field, the peritoneal cavity was not explored to minimize the risk of spreading infection. In the subsequent stage of the procedure, the inguinal canal was reconstructed using the Bassini-Kirschner technique without synthetic materials. The spermatic cord was repositioned directly beneath the skin. Drainage was inserted using the Redon method. There were no indications for laparotomy or simultaneous repair of the left-sided inguinal hernia.

In the postoperative treatment, empirical combination antibiotic therapy, including clindamycin and metronidazole, was administered for two days until the microbiological culture results became available. Following identification of *Escherichia coli* in the culture, targeted antibiotic therapy with ciprofloxacin was initiated and continued for three days during hospitalization. After discharge, the patient was advised to continue taking ciprofloxacin, one tablet twice daily for seven days. Thromboprophylaxis was introduced early in the postoperative course. Follow-up laboratory results initially showed a slight increase in inflammatory markers, which significantly decreased after the initiation of targeted antibiotic therapy. Other laboratory parameters remained within normal limits. During hospitalization, the patient was evaluated by a cardiologist due to chronic coronary syndrome and a history of percutaneous coronary intervention (PCI). The postoperative course proceeded without complications.

The patient, in good general health, was discharged home after five days of hospitalization with recommendations for follow-up in the General Surgery Outpatient Clinic. As thromboprophylaxis, he received subcutaneous enoxaparin for five days following discharge. At follow-up visits, the postoperative wound demonstrated proper healing, with no abnormalities observed. He is currently awaiting elective repair of the left-sided inguinal hernia.

Discussion

Amyand's hernia is a rare condition defined by the presence of an appendix in the hernia sac. It was first described by Claudius Amyand in 1735,

when he performed an appendectomy on an 11-year-old boy, removing an inflamed appendix located in the inguinal hernia sac [1,5]. The incidence of this pathology is estimated at approximately 1% of all inguinal hernia cases, with only about 0.1% associated with appendicitis [2]. Amyand's hernia has been reported across a wide age range, from neonates to patients over 90 years old. Statistically, it occurs three times more frequently in children, which is thought to correlate with the persistence of a patent *processus vaginalis* in the pediatric population [6]. However, a more recent review, which includes publications from 2000 to 2019, demonstrated a reversal of this trend, with an observed increase among adults, who accounted for 57.5% of the group analyzed.

Moreover, the review confirmed a marked male predominance of the condition, accounting for 91% of those studied, and a higher prevalence of this type of hernia on the right side, observed in about 90.5% of cases [7].

The clinical manifestation of this disease is variable. The most common symptom is crampy, dull pain localized in the right lower quadrant, accompanied by an irreducible bulge of the abdominal wall in the inguinal or inguinoscrotal region. These symptoms typically suggest an incarcerated inguinal hernia, therefore appendicitis is rarely considered in the initial differential diagnosis [4]. In a case report presented by Chagam et al., it was emphasized that the coexistence of an incarcerated inguinal hernia with elevated inflammatory markers and decreased intestinal peristalsis should raise suspicion of the presence of an Amyand's hernia [8]. It confirms that these types of case pose a particular diagnostic and therapeutic challenge due to their nonspecific clinical presentation.

The imaging diagnosis of Amyand's hernia primarily relies on radiological investigations. Ultrasonography (USG) is the most commonly used method, although its effectiveness largely depends on the operator's experience. Diagnosis can be established by visualizing a blind-ended appendix within the hernia sac. However, in cases where inflammation is present, thickening of the appendix wall or obliteration of the surrounding fatty tissue may also be observed [3,9,10]. CT, with its higher sensitivity and specificity, allows direct visualization of the appendix in the inguinal canal and is therefore considered the diagnostic gold standard [3,11]. Both USG and CT are valuable diagnostic tools. However, in clinical practice, Amyand's hernia is often diagnosed only intraoperatively upon visualization of the appendix, whether normal or inflamed, within the hernia sac [12–14]. Furthermore, there are documented cases in which the condition was diagnosed incidentally during imaging performed for unrelated indications [15,16], as well as intraoperatively during routine inguinal hernia repair, despite preoperative ultrasonographic evaluation [17].

The current therapeutic approach to Amyand's hernia is primarily based on the evaluation of the condition of the appendix within the hernia sac. Losanoff and Basson devised a classification system that distinguishes four types of this pathology, depending on the severity of the inflammatory process and the presence of complications. Type one describes a hernia containing a normal, non-inflamed appendix. Type two involves a hernia with acute appendicitis, but without signs of sepsis. Type three includes cases with appendicitis accompanied by peritoneal or abdominal wall infection. The fourth type refers to the coexistence of appendicitis with other abdominal pathology [18].

The case presented here refers to a 71-year-old man with an incarcerated right inguinal hernia, in whom intraoperative findings revealed an ischemic, gangrenous appendix with perforation and a purulent focus. These findings confirmed the diagnosis of an Amyand's hernia, classified as type three according to the Losanoff and Basson's classification. Surgical management should be tailored to the condition of the appendix and intraoperative circumstances. In cases of appendicitis, a synthetic hernia mesh may be used if the surgical field is relatively clean. However, in the presence of abscesses, perforations, or extensive tissue infection, repair using the patient's tissues is recommended [7]. Following these recommendations, synthetic material was not used in the patient described, and hernia repair was performed with autologous tissues.

Conclusions

Amyand's hernia is a form of inguinal hernia rarely encountered in surgical practice, with preoperative diagnosis posing a significant clinical challenge. This case underscores the importance of maintaining diagnostic vigilance and considering a broad differential diagnosis in cases of incarcerated inguinal hernia, particularly when accompanied by signs of inflammation. Early surgical intervention, thorough assessment of anatomical conditions in the operative field, and accurate intraoperative diagnosis to guide optimal surgical technique, are crucial for improving prognosis and minimizing the risk of complications.

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