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Case Report

# Amyand's Hernia Complicated by Acute Appendicitis, A Rare Condition: Case Report and Review of the Literature

**Sophie Schoenen[1*], Vlad-Adrian Alexandrescu[1], Basile Essola[2], Christian Ngongang[1]**

[1]Department of General, Abdominal, Thoracic and Vascular Surgery, Princess Paola Hospital, Vivalia, Marche-en-Famenne, Belgium

[2]Department of Emergency, Princess Paola Hospital, Vivalia, Marche-en-Famenne, Belgium

[*]**Corresponding author:** Sophie Schoenen, Department of General, Abdominal, Thoracic and Vascular Surgery, Princess Paola Hospital, Vivalia, Marche-en-Famenne, Belgium

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## Abstract

Amyand's hernia is defined by the presence of the appendix in a concomitant inguinal hernia. This condition is deemed to favour appendix inflammation by a mechanism that is not fully understood. We report the case of a 64-year-old man admitted for an incarcerated right inguino-scrotal hernia. The CT-scan revealed the presence of an inflamed appendix in the hernia. An appendectomy with stapling of the lower caecum was performed. Based on a review of the literature, we confront our surgical management to the scarce available guidelines published for this rare condition.

**Keywords:** Amyand's hernia; Incarcerated hernia; Acute appendicitis; Laparoscopic surgery

## Introduction

The presence of the vermiform appendix, inflamed or not, in a hernial sac is a rare condition (0,1 to 1%) known as Amyand's hernia (AH) [1]. Although concomitant acute appendicitis is rather exceptional (0,13%) [2], it can occur at any age from neonates to the elderly [3]. Claudius Amyand, a French surgeon, reported the first appendectomy in 1735 at St George's hospital in London in an 11-year-old boy; the inflamed appendix was perforated in that case by a pin and contained within an inguinal hernia sac [4].

Inguinal hernia repair and appendectomy are frequent separate interventions in the daily practice of general surgeons. However, the association of these two conditions is rare and should not be overlooked. Due to the scarcity of this syndrome, to date, clear recommendations concerning its management are not yet available. We report our approach in a case of incarcerated hernia complicated by appendicitis and a review of the relevant literature.

## Clinical case

A 64-year-old man was admitted to the emergency ward for recent abdominal pain in the hypogastrium and the right inguinal area, that started two days before. The patient was apyretic with normal hemodynamic parameters. Physical examination was abnormal because of the presence of an irreducible right inguino-scrotal tumefaction with local cellulitis extending up to the pubis (Figure 1). Blood biochemistry showed a significant inflammatory syndrome (C-reactive protein 267mg/L, white blood cells 24460/mm3 of which 79% neutrophils) and concomitant renal insufficiency (creatinine 2.37mg/dL, urea 67mg/L). The nasopharyngeal swab was negative for Sars-CoV-2. An abdominal computed tomography (CT) scan disclosed a right inguinal hernia containing omental fat and a tubular digestive structure, possibly corresponding to the appendix, with an inflammatory aspect and thickened walls (Figure 2).

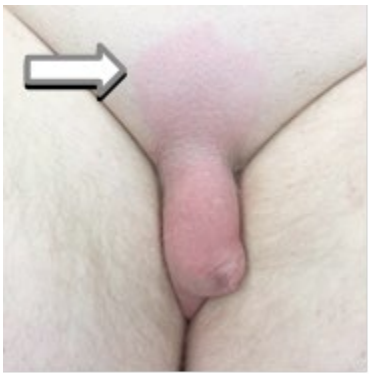

**Figure 1:** Clinical presentation: irreducible right inguino-scrotal tumefaction with an important cellulitis extending over the pubis (arrowhead).

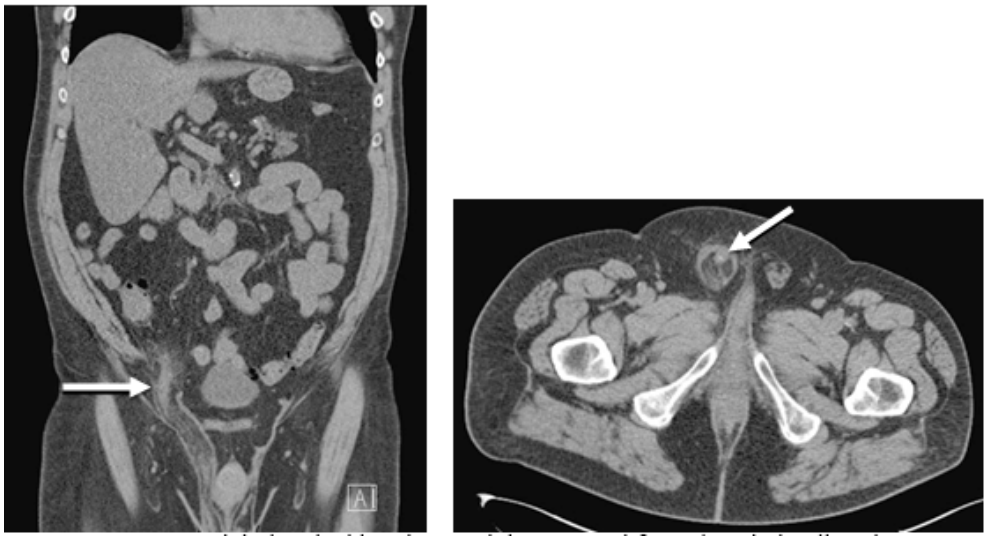

**Figure 2:** CT-scan: right inguinal hernia containing omental fat and a tubular digestive structure (arrowhead) that could correspond to the appendix.

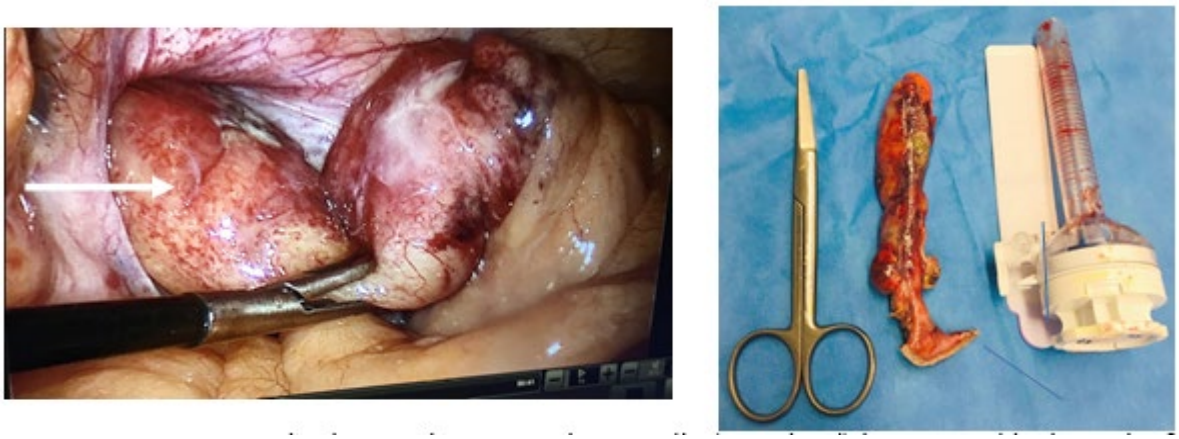

Figure 3: Per-operative images: huge necrotic appendix (arrowhead) incarcerated in the neck of a right inguinal hernia. The right image shows the size of the appendix compared to an 11mm trocart.

We decided to undertake an exploratory laparoscopy and found an enlarged necrotic appendix incarcerated in the neck of a right inguinal hernia (Figure 3). Careful traction on the appendix and external inguinal pressure, succeeded in reducing the hernia. An appendectomy with stapling of the lower caecum was then performed. A drainage system was placed in the hernial orifice that was not initially closed given the local inflammatory state. Intravenous antibiotic therapy associating amikacin (an aminoglycoside), cefazolin (a first-generation cephalosporin) and metronidazole (a nitroimidazole) was administered. The patient had an uneventful postoperative course. The anatomopathological analysis of the tissue sample confirmed the diagnosis of acute and gangrenous appendicitis.

Ten weeks later, a laparoscopic cure of the remnant inguinal hernia was performed with parietal reinforcement by a prosthetic plate.

## Discussion

Acute appendicitis within an inguinal hernia is a rare pathological condition, presumably facilitated by predisposing location and constant compression of the appendix in the neck of the abdominal wall hernia. Secondary venous congestion in the appendix wall impairs local microcirculation, favouring bacterial growth [3]. It appears that CT-scan may afford a better imaging diagnostic imaging tool than echography, with respectively 96% and 47% sensitivity [5]. Contrast-enhanced CT is the gold standard

for this pathology [6], but it was contraindicated in our patient because of the concomitant renal dysfunction.

In 2008, Losanoff & Basson classified Amyand's hernias according to the inflammatory status of the appendix and surrounding tissues, based on which they recommended the surgical management [7]. (Table 1) Singal et al's added to this classification a fifth class defined by the presence of the appendix within an incisional hernia [8].

| Classification | Description | Surgical management |
|---|---|---|
| Type I | Normal appendix within inguinal hernia. | Hernia reduction, mesh repair, appendectomy only in young patients. |
| Type II | Acute appendicitis within inguinal hernia, no abdominal sepsis. | Appendectomy through hernia, hernia repair without mesh. |
| Type III | Acute appendicitis within inguinal hernia, abdominal wall or peritoneal sepsis. | Laparotomy, appendectomy, hernia repair without mesh. |
| Type IV | Acute appendicitis within inguinal hernia, related or unrelated abdominal pathology. | Laparotomy, investigate and treat second pathology. |
| Singal et al's modification: Type V | Appendix within incisional hernia.<br>- Va: normal appendix<br>- Vb: acute appendicitis without peritonitis<br>- Vc: acute appendicitis with peritonitis or abdominal wall sepsis. | -Management as type I<br>- Management as type II<br>- Management as type IV |

**Table 1:** Amyand's hernia classification by Losanoff and Basson [7], with Singal et al's [8] modification.

According to this stratification, for inflammatory presentations (type II, III, IV in Table 1), the appendix should be removed and the hernia should be repaired. Since simultaneously performed, the hernia treatment should avoid synthetic mesh placement due to the risk of local infection [7,8]. Bassini's or Shouldice's techniques can be privileged in that case. Matching the mentioned classification, in case of abdominal sepsis (type II, III in Table 1), laparotomy is the recommended approach. However, more recent studies highlight the superiority of a laparoscopic strategy for the diagnosis, reduction and management of appendicitis incarcerated in an inguinal hernia [9,10]. Laparoscopy additionally allows exploring the whole abdominal cavity, including in particular assessment of the bowel's viability and detection of an eventual contralateral hernia [11]. Laparoscopic techniques are also reputed to decrease postoperative pain and major wound complications [12].

According to Losanoff & Basson's classification, our case can be classified as a type III AH presentation. Nonetheless, we decided not to repair the hernia in the first stage of the treatment, because of the prominent inflammation of the tissues and the risk to injure these frail surrounding structures. Concordantly, the World Society of Emergency Surgery recommends that the strategic choice of hernia repair should depend on the contamination of the surgical field, in addition to the hernia's size and the surgeon's expertise [11].

Previously prohibited in strangulated hernia, meshes could be acceptable because of placement of the material in different anatomical planes: transabdominal preperitoneal or totally extra-peritoneal. Up to now, guidelines for the use of meshes in contaminated hernia are lacking. A recent meta-analysis, however, indicates that mesh repair in complicated contaminated hernia doesn't increase the incidence of infection of the surgical site, compared to suture repair [13].

## Conclusion

Amyand's hernia can be complicated by an acute appendicitis. Confronted with an incarcerated inguinal hernia, in particular if right-sided, the surgeon should not neglect that the appendix could be trapped in the sac. The surgical treatment depends on the inflammatory condition of the appendix and the general condition of the patient. The hernia can be repaired either immediately during the first approach, or in a second operatory stage.

**Disclosure of interest**

The authors report no conflict of interest.

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