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Case report

AMYAND'S HERNIA, AN UNKNOWN ENTITY THAT MAY CAUSE SURGEONS DIFFICULTY: OUR EXPERIENCE AND LITERATURE REVIEW.

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ABSTRACT

The aim of this case report is to present an uncommon disease, Amyand's hernia. It is an inguinal hernia containing the appendix in the hernial sac. The authors describe this condition analysing a clinical case and reporting a literal review which points out preoperative and intraoperative management.

1. Introduction

Amyand's hernia is an inguinal hernia, containing the appendix within the hernial sac. Claudius Amyand described the first clinical case in 1735 (1). Despite the high incidence of inguinal canal hernia disease in the population with approximately 20 million patients that undergo hernia repair annually (2), Amyand's hernia is a rare clinical condition. It is characterized by an incidence of 1% (0.19-1.7%), and in 0.13% of all cases, the appendix is inflamed (3).
In this article, we will present our experience related to the treatment of a complicated Amyand's hernia, occasionally found during an emergency surgery for the repair of an incarcerated inguinal hernia. In addition, we will conduct a medical review, focused on the preoperative and intraoperative management of this pathology that often represents an unpleasant surprise for the surgeon.

2. Case report

An 82-year-old woman presented to the emergency department at 4 PM with abdominal pain, nausea and vomiting, suggesting the presence of an incarcerated inguinal hernia. Her blood pressure was 125/70, her pulse 103 beats per minute and her temperature 36 °C. She reported the onset of symptoms about 4 days before. Abdominal Rx did not reveal the presence of hydro-air levels. Laboratory tests showed the presence of increased leukocyte count ($9.14 \bullet 10^3$ μL) and PCR (64 mg/L).
The physical examination revealed a reddened tumefaction in the right inguinal region, characterized by increased consistency; this appeared painful at the Taxis and irreducible. Nothing relevant was observed on the surrounding abdominal area during physical examination.
However, there were no signs of abdominal defence to suggest a peritoneal involvement. The patient also reported open alvus and peristalsis was present.
The surgical team discussed the clinical case promptly and made a diagnosis of Amyand's Hernia.

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The patient was taken to the surgical room to undergo surgery under general anaesthesia. The surgeon found a voluminous direct inguinal hernia. The opening of the hernial sac showed, surprisingly, leakage of abundant citrine liquid, the presence of the cecum and the vermiform appendix; this appeared frankly oedematous, covered with fibrin and gangrenous tissue in the distal extreme. We proceeded to perform a trans-inguinal appendectomy. We closed the posterior wall of the inguinal canal with continuous suture in Prolene 2/0 and plastic with mesh in polypropylene, resistant to infection and suitably shaped. After this we practiced repeated washing of the surgical site with saline and iodized solution (4).

Already on the first postoperative day, the patient appeared in good general condition, with normal blood pressure and cardiac frequency, as well as the bio-humoral indices in the range after laboratory tests. On the same day, the patient was also mobilized. The patient began an idric diet on the second postoperative day and a semisolid diet on the third. Laboratory tests (Leukocytes 5.86 • 10^3 μL, Neutrophil 64%) on the fourth postoperative day were normal. The patient was discharged with prescription of broad-spectrum oral antibiotic therapy for 5 days.

She returned for clinical control after 3 days from discharge, which was normal. The surgeon removed the sutures on the twelfth day. The check-up performed two months after surgery showed a total healing with a successfully prosthetic hernioplasty.

3. Discussion

Amyand's hernia is a rare pathology with an estimated incidence of 1% (0.19 – 1.7%). Even rarer is an Amyand's hernia with an acute inflammatory process affecting the appendix (0.13%) (3). This pathology occurs more often in childhood, but there are reported cases at every age, even in very elderly patients (5). Generally, it is prevalent in males, while in females it seems to have higher incidence in post-menopausal period.

Amyand's hernia is characterized by high mortality, due to the rapid evolution involving the structures of the inguinal region (6) to generalized sepsis, especially if complicated by acute appendicitis (15-30%). This type of hernia is an occasional finding often during inguinal hernioplasty, performed in election or in emergency surgery. The latest guidelines state that the clinical examination is sufficient to make a diagnosis. Use of imaging techniques, as US and CT, is reserved only in cases of diagnostic doubt or in selected cases where priority is early surgical treatment (2).

Patoulias et al. in 2017 stated the possibility of using diagnostic imaging methods, as US and CT, in patients with incarcerated or irreducible inguinal hernia to identify early Amyand's hernia (7). The US is a low-cost method, but it depends on the skill of the operator. It is considered positive when the presence of a non-compressible tubular structure inside the sac is detected. The presence of wall thickening, free fluid and hyperaemia is suggestive for acute appendicitis (8). CT with contrast is certainly the gold standard. With this method, it is possible to detect the vermiform appendix, which appears as a tubular structure coming from the cecum with a blind bottom.

In the case of a complicated Amyand's hernia, there is a thickening of the wall of the appendix, hyperaemia and congestion of periappendicular fat (8).

The optimal management of Amyand's hernia is controversial. In 2007, Losanoff and Basson proposed a classification and treatment scheme based on the local inflammatory state, age, septic stage and any peritoneal involvement (Table 1) (9).

In type 1, appendectomy is recommended only in children and young patients, with subsequent prosthetic hernioplasty. In types 2 and 3, it is necessary to perform appendectomy by inguinotomy or laparotomy, while prosthetic hernioplasty is not recommended. In type 4, the diagnostic procedures should be continued due to the presence of suspected abdominal disease. Singal et al. in 2012 implemented the classification of Losanoff and Basson. They added a fifth type of Amyand's hernia, which is the one that occurs in a recidive hernia and formulates the Rikki classification (Table 2). The fifth type has three subgroups (5a, 5b and 5c) (10).

Some authors recommend a conservative strategy, reserving the appendectomy only for cases with acute appendicitis. A combined treatment with appendectomy and prosthetic hernioplasty could cause contamination of the operating field (11). This increased risk of complications explains the change of approach to this pathology. However, the manipulation of the appendix during the reduction of the hernia may itself be the cause of the activation of the inflammatory process. This would lead to secondary acute appendicitis which could affect the post-operative progress. Nevertheless, most surgeons believe it is necessary to perform an appendectomy when the appendix is identified in the sac of a left inguinal hernia, even in the absence of signs of inflammation (7). Today, in addition to the classic open technique approach (inguinotomy and laparotomy access), minimally invasive surgery offers new therapeutic possibilities. Several cases of Amyand's hernia treated with the Da Vinci platform are described in literature (12). The minimally invasive approach also reduces the manipulation of the appendix, minimizing the risk of secondary appendectomy. Therefore, TAPP technique is not associated with appendectomy when the appendix does not present clear signs of inflammation (13). In the end, laparoscopic approach is also indicated both in elective inguinal hernia repair and in cases of complicated intraoperative findings (14).

Classification	Description	Management
Type 1	Normal appendix	Reduction (Appendicectomy depending on the age); mesh hernioplasty
Type 2	Acute appendicitis; no abdominal sepsis	Appendicectomy through hernia; hernioplasty with endogenous tissues
Type 3	Acute appendicitis; abdominal sepsis	Appendicectomy through laparotomy; hernioplasty with endogenous tissues
Type 4	Acute appendicitis; related or unrelated abdominal pathology	Appendicectomy through hernia or laparotomy as appropriate; diagnostic workup thereafter

Table 1. Losanoff e Basson: Classification and Management of Amyand's hernia.

Classification	Description	Management
Type 1	Normal appendix in an inguinal hernia	Hernia reduction, mesh replacement
Type 2	Acute appendicitis in an inguinal hernia with no abdominal sepsis	Appendicectomy, primary no prosthetics hernia repair
Type 3	Acute appendicitis in an inguinal hernia with peritoneal and/or abdominal wall sepsis	Laparotomy, appendicectomy, and primary no prosthetics hernia repair
Type 4	Acute appendicitis in an inguinal hernia with abdominal concomitant pathology	Same as type 3 plus management of concomitant disease
Type 5a	Normal appendix within an incisional hernia	Hernia reduction, primary repair of hernia including mesh replacement
Type 5b	Acute appendicitis within an incisional hernia without peritonitis	Appendectomy through hernia, primary closure of the aponeurotic gap, no prosthetics hernia repair
Type 5c	Acute appendicitis within an incisional hernia with peritonitis or abdominal wall sepsis or in relation to previous surgery	Management as type 4

Table 2. Classification of Amyand's hernia after Rikki modification.

4. Conclusion

Amyand's hernia is a pathology with a low incidence. In fact, a surgeon may never encounter it in his career. Although, it is necessary to know his classification and its treatment to reduce management mistakes that could lead to consequences as morbidity and mortality of the patient. Despite recent guidelines, we believe that patients with incarcerated and irreducible inguinal hernia should undergo a second level radiological test, such as CT with contrast, currently often available in emergency rooms. CT is a quick radiological test, essential for the diagnosis of a complicated Amyand's hernia. It has little influence on the surgical timing and is useful for identifying the presence of an incarcerated and suffering intestinal loop. Finally, CT is extremely helpful for guiding the choices of a surgical team.

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