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Incarcerated Amyand's Hernia

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ABSTRACT

A 66-year-old male patient went to the emergency room, he presented with abdominal pain in the right inguinal region. He was diagnosed with an incarcerated inguinal hernia and underwent elective surgery the day after. He had an acute appendicitis which was observed to have adhered to the right indirect hernia sac. An appendectomy and hernia repair without mesh were performed. We discuss the surgical management of this rare case and the relevant literature.

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Background

Amyand's hernia is defined as an inguinal hernia, containing the appendix within the hernia sac. In 1735 C. Amyand described the first case of incarcerated inguinal hernia, containing a perforated appendix, in an 11-year-old boy [1]. The patient underwent simultaneous ligation of the hernia sac and appendectomy. Amyand's hernia cases have been recorded in every age, from neonates to elderly [2]. Amyand's hernia corresponds to 2% of all appendectomies, during neonatal period and infancy [3,4]. The incidence of acute appendicitis in the general population is 8 % [5,6]. Incidence of this rare condition rises up to 1% (0.19–1.7%) of all inguinal hernia cases. Inflammation of the appendix within the inguinal sac is even rarer, as it corresponds to 0.1% (0.07–0.13%) of all Amyand's hernia cases. Mortality of Amyand's hernia has been reported to range from 14–30% and was linked to peritoneal spread of sepsis [7]. Sharma et al. reported a postoperative wound infection rate of only 5.5% following their surgeries [8]. This entity is usually asymptomatic, presenting with the typical symptoms of inguinal irreducible or incarcerated inguinal hernia or, occasionally, of an acute scrotum ipsilaterally with the inguinal hernia, with accompaning symptoms such as pain in the right lower quadrant of the abdomen, anorexia, nausea and vomiting [9-11]. In most cases, Amyand's hernia is diagnosed intra-operatively [12-14]. Cases of definitive preoperative diagnosis are rare, and diagnosis is generally made during surgery. Abdominal exam, physical signs, lab results, and imaging are not always helpful in differential diagnosis [15-17].

Clinical symptoms can be misleading and more often resemble those of a (strangulated) inguinal hernia than the classic signs and symptoms of appendicitis. Sometimes a palpable inguinal mass may be present [18]. In certain cases, the performance of imaging -such as ultrasound or computed tomography (CT) could provide useful information substantial for preoperative diagnosis. Ultrasound is an excellent technique to evaluate the inguinal region and can be used to detect all types of inguinal hernias, including Amyand's hernia. US is safe and cheap, but remains operator-dependent. Computed tomography (CT) can be used to confirm the diagnosis if necessary. At the same time, possible intra-abdominal complications like perforation and abscess can be ruled out, especially in a preoperative setting [18]. The most common choice of treatment for Amyand's hernia is appendectomy via herniotomy, with primary hernia repair [17,19,20]. Losanoff and Basson proposed a classification for Amyand's hernia, setting a therapeutic framework (Table 1) [9, 21-23]. Singal et al. refer to the modification of the Losanoff and Basson classification of Amyand's hernia, also known as Rikki modification. A fifth type of Amyand's hernia is added on the latter classification. This type is divided into three subtypes, 5a, 5b and 5c (Table 2) [22]. We report a rare case in which an incarcerated inguinal hernia contained an acute appendicitis.

Table1: Losanoff and Basson classification of Amyand's hernia

Classification	Description	Description
Type 1	Normal appendix in an inguinal hernia	Hernia reduction, mesh replacement
Type 2	Acute appendicitis in an inguinal hernia with no abdominal sepsis	Appendectomy, primary no prosthetics hernia repair
Type 3	Acute appendicitis in an inguinal hernia with abdominal and abdominal wall sepsis	Laparotomy, appendectomy, and primary no prosthetic hernia repair
Type 4	Acute appendicitis in an inguinal hernia with abdominal concomitant pathology	Same as type 3 plus management of concomitant disease

Table 2: Classification of Amyand hernia after Rikki modification

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	Appendectomy, primary no prosthetics hernia repair
Type 3	Acute appendicitis in an inguinal hernia with peritoneal and/or abdominal wall sepsis	Laparotomy, appendectomy, and primary no prosthetic 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

Case Report

A 66-year-old male patient went to the emergency room of our hospital after 4 days of abdominal pain in the right inguinal region, nausea and fever. After the specialist visit the patient was diagnosed with an irreducibile, incarcerated inguinal hernia. During his permanence in emergency room the patient was subjected to the following tests: - preoperative laboratory examination demonstrated a white blood cell count of 16,500/Ml, PCR 11mg/l - An abdominal CT scan revealed a right inguinal hernia that contained the appendix within the hernia sac (Fig. 1). In the CT images appendicitis appeared inside the hernial sac as an elongated structure, adhered to the right indirect hernia sac, thickening with hyperdensity and signs of imibition of the fat adipose and elements contained in the hernial canal as from acute inflammation of appendicitis. The CT images were fundamental for the preoperative diagnosis. Subsequently the patient was admitted to the general surgery department and underwent elective surgery the next day. Right inguinotomy and an intraoperative examination showed acute appendicitis gangrenous at the distal part without evidence of free enteric material and the cecum located in and adhered to the right indirect hernia sac (Fig. 2) (TYPE 2 as Losanoff and Basson or Rikki modification classification). When the hernia sac was opened, a fibrous connection between the appendix and the hernia orifice was observed, and it was dissected carefully. An appendectomy was performed, and hernia repair without mesh according to Bassini method, accurate haemostasis, placement of drainage in the Douglas cavity and application of gentalyn ampoules in the fascial plane and subcutis. The patient was hospitalized for 4 days, during the hospitalization the post-operative course was regular, there was a progressive improvement of the clinical signs and laboratory test control. The drainage was removed in 2 postoperative day and the patient began feeding. Antibiotic therapy was continued even at discharge for other 5 days. The patient was re-evaluated on outpatient basis after 1 week, the stitiches were removed and surgical wound was in order.

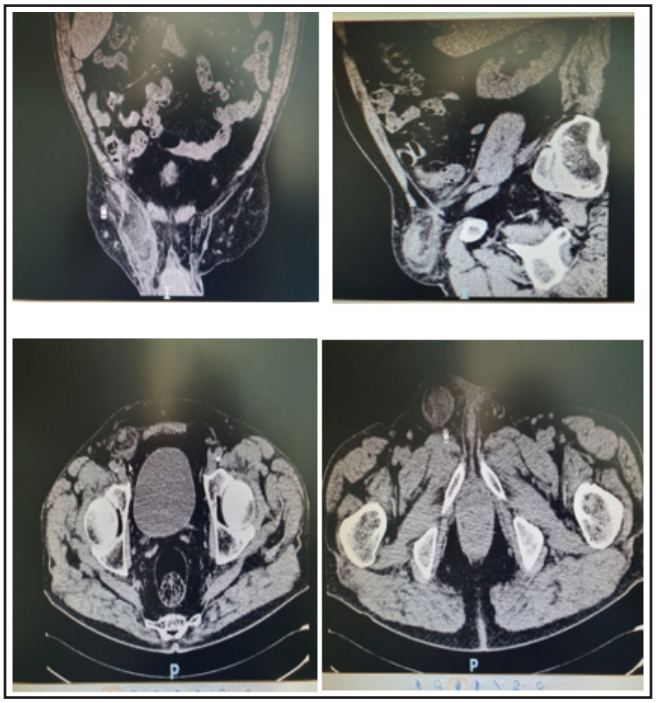

Figure 1: CT Scan Image

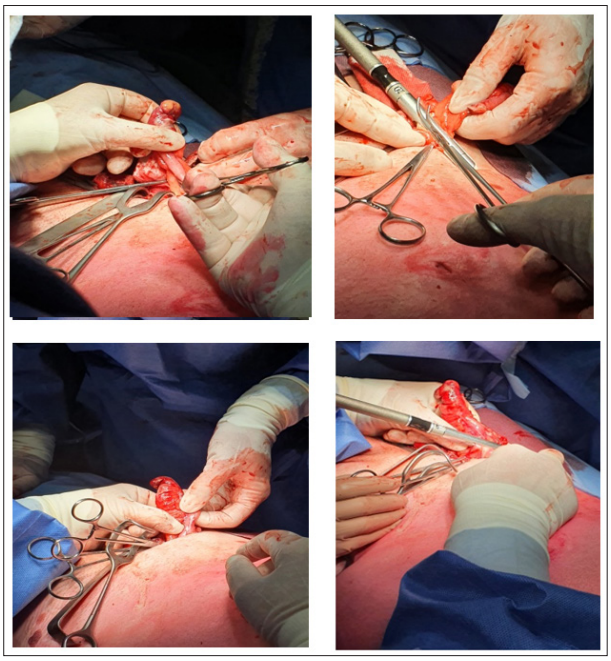

Figure 2: Operation Image

Discussion

Amyand's hernia is usually asymptomatic in uncomplicated forms. However in complicated forms, given that the inflamed appendix is contained within the hernia sac, it could manifests with acute scrotum, pain, nausea, vomiting and an irreducible or incarcerated mass in the groin area. McBurney sign is tipically absent in those patients. Differential diagnosis should include hydrocele, testicular torsion, inguinal lymphadenitis and epidydimo-orchitis [9, 10, 24].

In most of uncomplicated cases, Amyand's hernia is diagnosed intraoperatively. However in complicated cases, the performance of imaging such as Ultrasound or Computed Tomography could be useful for ruling out more serious pathology [13, 24].

While there is considerable agreement regarding the surgical treatments for type 3-4 (Losanoff and Basson) of Amyand's hernia, wich entails an appendectomy with primary hernia repair and avoidance of mesh, the current treatments for type 1-2 still remains subject of controversy [23,25]. There are documented reports of successful outcomes for type 2 hernia treated with appendectomy and tension free hernia repair with mesh [24, 26]. In our case, of a type 2 hernia, we performed an appendectomy + Bassini repair of the hernia. The surgical course was regular and uneventful. Our treatment is in accordance with the Losanoff classification, however, since there are conflicting data on the use of meshes even in cases with acute appendicitis, further studies are needed to establish the correct treatment algorithm.

Conclusion

Amyand's hernia is defined as an inguinal hernia, containing the appendix within the hernia sac. Amyand's hernia is a diagnostic challenge due to its low incidence, indistinct clinical presentation, and ambiguous appearance on imaging such as CT. Surgery is therefore frequently diagnostic as well as therapeutic [27]. Due to the rarity of this condition and the lack of a randomized controlled study or an evidence-based standardized approach to treatment, there is some debate as to whether prosthetic mesh use and a prophylactic appendectomy should be routinely performed to treat Amyand's hernias [4,28-40].

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