Amyand's Hernia: A Rare Case of Obstructed Right Inguinal Hernia: Case Report and Literature Review

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ABSTRACT

Background: Amyand's hernia (AH) is the presence of a vermiform appendix (inflamed or not inflamed) in the inguinal hernia sac. It is a rare condition, commonly seen in males, and very difficult to clinically diagnose preoperatively. Clinically, it may be asymptomatic or present with complications of either the hernia, the appendix or both. Imaging may be a valuable tool, and management depends on the patient's presentation.
Case Summary: We report a case of type II AH in a 28-year-old male who presented with a right irreducible indirect inguinal hernia, with an operative finding of an inflamed appendix in the sac. The patient had both an appendectomy and an open right herniorrhaphy. We discussed the rarity of AH, the difficulty in pre-operative diagnosis, a literature review on sensitization, and various treatment options available.

Key words: Amyand's Hernia, Vermiform Appendix, Appendectomy, Herniorrhaphy, Rare

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Introduction

On December 6th, 1735, a French, English born surgeon to King George II called Claudius Amyand was the first to describe an inflamed appendix in an inguinal hernia sac of an 11 year old boy following hernia repair done at St George Hospital, London, UK, from where, in homage to him, the clinical condition is called "Amyand's Hernia."[1,2] Hernia and appendicitis are the two most common surgical conditions seen worldwide; however, the occurrence of an appendix in the hernia sac (Amyand's hernia) is infrequent. Other literature observed even rarer conditions where an inflamed Appendix was found in an incisional hernia, umbilical hernia, obturator hernia, etc.[3,4]

The incidence of AH is rare worldwide, occurring in various studies at a rate of 0.19 to 1.7% of inguinal hernia cases, and is more commonly seen in the young and males, with an age range of 3 to 93 years. [5,6]. Appendicitis and Hernia are typically diagnosed based on clinical evaluation, although AH poses significant challenges for preoperative diagnosis. The clinical presentation of an AH may mimic an incarcerated or strangulated hernia, making preoperative diagnosis difficult; hence, the preoperative Ultrasound diagnosis of AH is also rarely reported in the literature. AH is often diagnosed during surgery by a vigilant surgeon, as was the case in our experience; however, are there any preoperative diagnostic clues to AH?

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Case Presentation

We report a 28-year-old man who presented with a year-long history of right reducible inguinal protrusion. Two days before the presentation, it became irreducible, with colicky pain and low-grade fever. No vomiting. He is a professional footballer and an athlete. Physical examination revealed a young man in painful distress with right irreducible inguinal swelling that was markedly tender, warm to touch,

and with guarding, no abdominal distension. A pre-operative diagnosis of an obstructed right inguinal hernia to rule out strangulation was made. An abdominal ultrasound scan affirmed a right inguinal mass of mixed echogenic pattern with probe tenderness, but couldn't visualize the appendix.

An emergency right inguinal herniorrhaphy was done. Within the hernia sac (Fig. 1), a highly inflamed (20 cm long) appendix (Fig. 1-2) was seen.

Appendectomy was performed via a 5 cm incision for the herniorrhaphy (Fig. 3). The postoperative recovery was uneventful, and he was discharged on the 2nd postoperative day.

The histopathological examination of the appendix revealed an acute appendicitis, with luminal fecoliths, and lymphoid hyperplasia. (Fig. 4-6). The patient was followed up for 1year with a good outcome.

Discussion

Inguinal hernias are the most common type of anterior abdominal wall hernia, accounting for more than 75% of cases worldwide. Males have a higher risk (25%) than females (3%).[7, 8]

An inguinal hernia will commonly contain peritoneal fluid, omentum, and small bowel; however, sliding in of the appendix into the inguinal hernia sac (Amyand's hernia) does rarely occur, accounting for 0.19-1.70 % of all inguinal hernias.[6] Amyand's hernia is commonly associated with right inguinal hernias, and in very few cases, occurs as left AH; as seen associated with situs inversus, or in some patients with a mobile cecum.[9]

The presence of the vermiform appendix in a femoral hernia sac was first reported by De Garengeot in 1731, while an inflamed appendix in an inguinal hernia sac (AH) was reported in 1736 in the Philosophical Transactions of the Royal Society Journals, and subsequently named after Claudius Amyand [3, 5]

Amyand's hernia is common at extremes of ages and is three times more common in children than adults, owing to the patency of the processus vaginalis. It is seen more commonly in males (as reported by much of the literature; our case also agrees with that). When seen in females, it usually occurs in the postmenopausal age group.[3]

The etiopathogenesis of AH is not fully known; however, many authors have proposed theories for its occurrence. [9] The theories include its occurrence due to a long appendix pointing towards the groin or due to loose peritoneal reflections and redundant cecum; the appendix may reach the hernia and get stuck in the sac.

Also, during the sixteenth week of development, the cecum descends to the right iliac fossa. When adhesions between the cecum, appendix, and posterior peritoneum cover develop with the testis, subsequent descent of the processus vaginalis and testis into the inguinal canal will draw the appendix into the inguinal canal.[9,10]

Others associated the cause of AH with the round widened deep inguinal ring status, poorly developed inguinal canal in children, error in rotation of the bowel, abundant retroperitoneal fat, and rise in intra-abdominal pressure, leading to extra luminal compression of the appendix, impairing the blood flow, oedema of the appendix or just the descending testis drags the processus vaginalis alongside with the appendix, all these construed to be the causes of it.[9,10]

In the elderly, laxity of muscles, widening of the internal ring, and of the intermesenteric space, an increase in the retroperitoneal fat deposition, and also an increased risk of cough-related diseases, constipation, or bladder outlet obstructions causing an increased intra-abdominal pressure, increase the risk of AH. However, our patient is a young athlete.

The appendix inside AH is subjected to adhesions, kinking at the deep ring level, and may be vulnerable to trauma, which also reduces blood supply to the appendix and increases the risk for gangrene. Later, secondary appendicitis, ulcerations, perforations, appendicular abscess, or mass may ensue and are found more likely to occur in AH than in anatomically normally positioned appendicitis.

The clinical manifestation of AH depends on its presentation. An un-inflamed appendix may slide into the inguinal hernia, in which case the patient may be asymptomatic except for the hernia, or an inflamed appendix may slide in; presenting with nausea, vomiting, pains, etc., or may present with complications, e.g., with features of strangulated appendix, gangrenous or ruptured appendix/peritonitis, or as an appendicular abscess/faecal fistula. Other complications may include necrotizing fasciitis of the anterior abdominal wall, epididymo-orchitis, testicular abscess, and in situ arterial thrombosis.[11]

Depending on the severity, the patient may present in shock, as seen in a study by Weber *et al*. [9] in 1999, where a 2-year-old had right AH misdiagnosed as a strangulated right inguinal hernia. Thus, AH can be an

emergent case requiring resuscitation or an elective case. The mortality rate in most literature stands at 6-15%.[12]

Okur *et al*.[13] and Singal *et al.*[14] reported the usefulness of proper clinical evaluation and an abdominal ultrasound scan in diagnosing AH pre-operatively, in which there is a non-compressible, dilated, blind-ending tubular structure (bowel loop) with a luminal diameter of > 7.2 mm within the inguinal canal with or without surrounding inflammation. This application can increase the frequency of not only sonographic diagnosis of AH, but may also help to facilitate pre-operative diagnosis of AH.

Although a preoperative CT of the abdomen may help secure the correct diagnosis, this is not a routine practice after the clinical diagnosis of a complicated hernia is made, owing to the high cost of a CT scan, especially in low-socio-economic nations like Nigeria. [6] Hence, a high index of suspicion should be advocated as key in making a diagnosis of AH.

Differential diagnoses that must be distinguished from AH include inguinal hernia with strangulation or incarceration, Richter's hernia (when it contains part of the bowel circumference), or inguinal lymphadenitis. Other unusual contents of the hernia sac may be encountered, such as the bladder, a Meckel's diverticulum (Littre's hernia), and in females, the ovary, uterus, and fallopian tube may be seen in it (as a sliding hernia). This underscores the importance of evaluating and carefully opening the hernia sac to inspect its content during herniorrhaphy before ligating and cutting the hernia sac at its neck.

Like in other studies, our case was that of a missed clinical diagnosis of AH, which was intraoperatively diagnosed.

In a 12-year study conducted by Weber et al.[9], 14 out of 60 patients with hernia were identified as having AH, with only one case that was correctly diagnosed preoperatively (1 in 60).

However, in a retrospective review of unpublished herniorrhaphy cases managed at the University of Maiduguri Teaching Hospital (UMTH) over the past ten years (based on Theatre records), this was the first of such cases encountered, and it was diagnosed intraoperatively, underscoring its rarity.

Several studies have referenced the Losanoff and Basson classification of Amyand's hernia (AH), which categorizes them into Types I to V based on factors such as the presence of an inflamed appendix within the hernial sac, peritonitis, or other associated abdominal complications. The current surgical treatment of AH is guided by this classification, which was later modified by Rikki and summarized in Table I.[1, 3, 4]

The gold standard of treatment for AH from many studies is reported to be trans-herniotomy appendectomy, even when the appendix is (or is not) inflamed. Those against appendectomy in AH when the appendix is inflamed owe that to the reasons of avoiding converting a clean wound (herniorrhaphy) to clean-contaminated or contaminated surgical wounds,[1] and considering the usefulness of the appendix in the future for the patient in other surgical procedures, e.g. for biliary tract reconstruction, urinary diversion, anterograde bowel enemas, etc.[13]

Some studies advocate laparoscopic appendectomy with Mesh hernioplasty as a form of treatment of AH, while others believe it's an infected wound, so Mesh should not be used. Incidence of conversion was seen to be higher with the laparoscopic approach; hence, open surgery is advocated, mainly via Trans-herniotomy (inguinal incision) approach, as is the case with our patient, Fig. IV or via Laparotomy incision.

The treatment scale for Amyand's hernia was more clearly defined by Losanoff and Basson, as shown in Table II. [1, 2, 4]

The patient we presented falls into Type 2 AH with acute appendicitis and had trans-herniotomy appendectomy with Nylon darning hernia repair; mesh was not used.

Most Literature reports an incidence of mortality varying between 14 and 30% and is closely linked to severe sepsis from peritoneal spread. [14, 15, 16]

In conclusion, AH is rare and remains a surgical enigma. We reported a very rare case of AH, diagnosed during herniorrhaphy for an initial diagnosis of obstructed right inguinal hernia to rule out strangulation in a 28-year-old male. From many reviewed studies, this condition is difficult to clinically diagnose pre-operatively; however, a high index of suspicion, abdominal Ultrasound scan, and/or CT scan with the use of a knowledge of Losanoff & Basson modification (Rikki's) classification of the possible presentations are valuable tools in the preoperative diagnosis of AH. The need to open any hernia sac whenever a tubular structure is palpated within the hernia sac is crucial for intraoperative diagnosis. Treatment is individualized based on the state of the appendix: if inflamed, appendectomy is advocated, while if normal, appendectomy is

controversial. Most authors prefer doing only herniorrhaphy without appendectomy. Additionally, as described in the literature, the Losanoff and Basoda classification provides a clinical guide for treating different types of AH.

References

1. Okur MH, Arslan MS, Zeytun H, Otcu S. Amyand's hernia complicated with acute appendicitis: A case report and literature review. Ped Urol Case Rep. 2015; 2 (4):7-12.
2. Lippolis PV, Barlettai M, Filidei F, Seccia M. The Amyand's hernia. Case report and review of the literature. Ann Ital Cir. 2007;78(2):153-7.
3. Green L, Gutwein LG. Amyand's hernia: a rare inguinal hernia. J Surg Case Rep. 2013(9) rjt043.
4. S Ikram, A Kaleem, SM Ahmad. Amyand Hernia: A Literature Review of the Diagnosis and Management of the Rare Presentation of the Wandering Appendix. J Rare Disord Diagn Ther. 2018. 4 (1): 1.
5. Ivashchuk G, Cesmebasi A, Sorenson EP, Blaak C, Tubbs SR, et al. (2014) Amyand's hernia: A review. Med Sci Monit 20: 140-146.
6. Ibrahim A.G, Aliyu S., Mohammed B.S. Giant Inguinal Hernia: Our Experience in Maiduguri, North Eastern Nigeria. International Journal of Sci.and Research (IJSR). 2012; 3 (12): 2319-7064.
7. Abebe MS, Tareke AA, Alem A, Debebe W, Beyene A. Worldwide magnitude of inguinal hernia: systematic review and meta-analysis of population-based studies. SAGE Open Med. 2022 Nov 22; 10:20503121221139150.
8. Kingsnorth A, LeBlanc K. Hernias: inguinal and incisional. Lancet 2003; 362(9395): 1561–1571
9. Weber RV, Hunt ZC, Kral JC. Amyand's hernia. Etiologic and therapeutic implications of two complications. Surg Rounds 1999; 22:552-6.
10. Monib S, Bassem A, Ahmed H, Fiaz H, Ahmed F. Amyand's hernia as a sliding component of inguinal hernia: A case report. IJCRI 2012; 3(8): 24-26.
11. Abu-Dalu J, Urca I: Incarcerated inguinal hernia with a perforated appendix and periappendicular abscess: report of a case. Dis Colon Rectum 1972; 15:464–465.
12. Ahmed G, Ashraf I, Muazzam MA, Shoaib M, Shahid MF, Bukhari US. Amyand Hernia: A Rare Surgical Variation. Pak Armed Forces Med J. 2021;71(1):367–9.
13. Okur MH, Karaçay S, Uygun I, Topçu K, Öztürk H. Amyand's hernias in childhood (a report on 21 patients): a single-centre experience. Pediatr Surg Int. 2013;29(6):571-4.
14. Singal R, Mittal A, Gupta A, Gupta S, Sahu P, Sekhon MS. An incarcerated appendix: report of three cases and a review of the literature. Hernia. 2012;16(1):91-7.
15. Liu K, Liu S, Zhang M, Zhang R. Amyand's hernia: a 10-year experience with 6 cases. BMC Surg. 2021 Jul 23;21(1):331.
16. Misiakos EP, Stirmanidou E, Filippou I, Bettini I, Banelli E, Papaspirou I, et al. Amyand's hernia: which oncologic risk can be hidden in the sac? Gland Surg. 2023 Sep 25;12(9):1152-8.

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