

## Case report

## Amyand hernia: Case report and review of the literature



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## HIGHLIGHTS

- A rare case of inguinal hernia.
- We document the new approach of this pathology.
- Increasing information reveals that prospective studies are needed.
- The knowledge and ability of a tension technique for hernia repair that this pathology may need.

## ARTICLE INFO

## Article history:

Received 6 November 2014

Received in revised form

31 January 2015

Accepted 25 March 2015

## Keywords:

Amyand's hernia  
Garengot's hernia  
Inguinal hernia  
Acute appendicitis  
Cecal appendix

## ABSTRACT

**Introduction:** Amyand Hernia is a rare disease seen in approximately 1% of all hernias, complications of it, like acute appendicitis, or perforated appendicitis are even more rare, about 0.1%. Its diagnosis is very difficult in the pre-operative period; it is usually an incidental finding.

**Presentation of case:** This paper describes the case of a forty-year-old male patient, which was presented to the outpatient clinic of surgery with an incarcerated right side inguinal hernia without any signs of ischemic complications. He was admitted, and an hernioplasty was performed, as an incidental finding we encountered an Amyand hernia treated without appendectomy and placement of a prosthetic mesh without any complications.

**Discussion:** This disease represents a very challenging diagnosis, seven years ago the standardization of management had already been established; in this case we encountered a type 1 Amyand's Hernia so we performed a standard tension free hernioplasty without complications.

**Conclusion:** Amyand hernia is a rare condition, which represents two of the most common diseases a general surgeon has to face. Standardization of treatment is still ongoing and more prospective studies need to be done. This case demonstrates that this pathology must remain in the mind of the surgeons especially in the event of a strangulated hernia and offer a comprehensive review.

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## 1. Introduction

Inguinal hernia defined as the protrusion of an organ or fascia through the wall of the containing cavity is one of the most frequent surgical procedures that a surgeon faces [15]. It is not infrequent to encounter an incarcerated hernia (defined as the inability to reduce the hernia content); typically the hernia content is the omentum or

small bowel. In a very low frequency one can find the cecal appendix inside the hernia sac; this condition is denominated as "Amyand Hernia" whether it is inflamed or not [1–3].

Case reports in the literature indicate that about 1% of the inguinal hernias contain a portion of the vermiform appendix, which can get inflamed, infected or perforated [1–3]. In 1731, René Jacques Croissant de Garengot described a non-inflamed cecal appendix as an incidental finding inside a peritoneal sac of a femoral hernia [12,13]. On December 6th, 1735, English surgeon Claudius Amyand performed an appendectomy on an eleven-year-

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old boy with a perforated appendix inside an inguinal incarcerated sac; hence, this condition is now named after him [1,11].

Inguinal hernia has no preference for age group or sex; there are cases of Amyand hernia reported in the range from a neonatal period to 92 years old [3]. It has an incidence that varies from 0.19 to 1.7% [3,14] and is diagnosed during hernioplasty, more commonly in children because of a patent vaginal process [3].

Appendicitis in this condition has an incidence of 0.07–0.13%, regardless of the stage of presentation. Literature review reports a perforated appendix in 0.1%, with mortality range from 15 to 30% because of severe abdominal sepsis [3,7,14].

## 2. Presentation of case

Forty-year-old male patient who denies chronic conditions, with a 7-year history of actively smoking and an intense alcoholism, with multiple and chronic drugs consumptions.

He presented to the outpatient surgical clinic with a history of a right inguinal mass that progressively grew over six years, with associated acute pain that worsened with physical effort without disrupting his work activity. At physical examination, he presented a bulge in the right inguinal region. At Valsalva maneuver we noticed a protrusion through the inguinal canal, this mass is more evident at standing position; the contralateral inguinal region has no pathological findings.

Without any previous medical management, he was diagnosed with an incarcerated right inguinal hernia and was scheduled for an elective surgery. The patient was admitted to the surgical floor; preoperative laboratory tests were normal.

Surgical management planned an inguinal repair on the right side with a prosthetic polypropylene micropore mesh placement in a Lichtenstein manner modified by Parviz Amid. We made a standard approach, when we opened the hernia sac, encountered the vermiform appendix with no signs of inflammation (Fig. 1), so we reduced it to the peritoneal cavity and continued to perform a standard approach, without complications. No immediate post-operative complications were seen, so the patient was discharged after a 24 h and returned for follow-up at day ten as well as one month after with no complications.

## 3. Discussion

Amyand hernia is most frequently reported in men, and almost exclusively on the right side [1,3,14]. There is, however, an exception where the appendix is on the left side: situs inversus, intestinal malrotation, a very loose cecum or a large appendix [1–3,10,14]. In some cases, it can be accompanied by the cecum, bladder, ovarian, fallopian tube, omentum or a Meckel diverticulum [8,9].

Appendicitis in this condition remains the same, although the triggering factor can vary from, obstruction to direct trauma over the hernia, both causing a reduced vascular flow, ischemia and infection [2,3,14].

Pre-operative clinical diagnosis is practically impossible [1–4,14], but has been reported via trans-abdominal ultrasound or computed tomography [14]. The later, a tubular blind-ended structure originated from the cecum wall is observed and extends to the hernia sac [14,16] and the former reveals similar findings, a blind-ended noncompressible tubular structure and increased vascularity. There are no sensitivity or specificity reports in the international literature to this particular clinical entity [1,2,8,14,16]. Our patient had no clinical, or biochemical data of compromised bowel, so we did not take any radiological image.

In 2007, Losanoff and Basson proposed a classification when facing this rare condition (See table 1). Our patient presented a Nyhus II Amyand type 1 hernia, hence, no resection of cecal

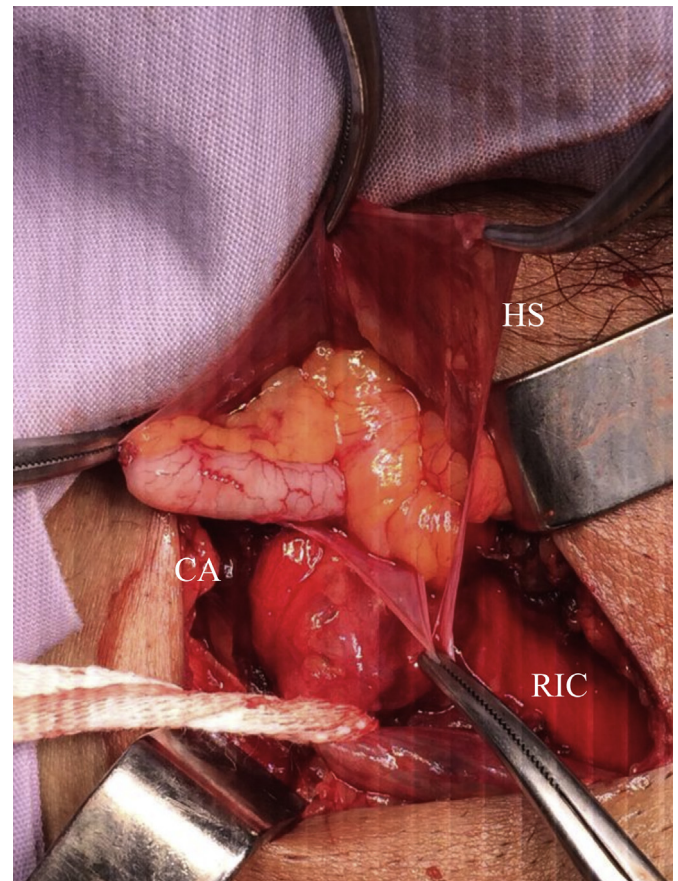


Fig. 1. Amyand Hernia RIC Right inguinal canal, CA Cecal appendix, HS Hernia sac.

appendix was performed and opted for a micro pore prosthetic polypropylene mesh (Parviz Amid class II) [4–6,10,14,17].

International literature recommends reducing the hernia content and perform no tension hernia repair [3,5,6,14,17]. If appendectomy is performed, a clean surgery is combined with a clean-contaminated surgery, raising the infection rate and possible infection of prosthetic material [3,14]. This statement changes in the pediatric population, and in a left side Amyand hernia, in which appendectomy does not difficult inguinal repair [4–6,10].

In the cases where an inflamed, suppurative or perforated appendicitis were encountered, no prosthetics material should be used because of the increased risk of surgical site infection as well as possible fistulae formation from the appendicular stump. In these cases, in addition to appendectomy, a Shouldice technique should be consider because of its lower recurrence rate [7,8], this will depend on the surgeon's decision, experience and domain over tension inguinal hernia repair techniques.

With the new prosthetic materials such as biological mesh, current surgical approach in Amyand type 2 hernias suggests its use to prevent recurrence. There are very few cases reports in the international literature so future research will focus on proving its efficacy; a disadvantage is that it is not available in all hospital settings [11].

## 4. Conclusions

Amyand hernia is a rare condition and represents two of the most common diseases a general surgeon has to face (hernia and appendicitis). Management involves a laborious surgical technique,

**Table 1**  
Losanoff and Basson classification of Amyand Hernia.

Classification	Description	Management
Type 1	Normal appendix in an inguinal hernia	Hernia reduction, mesh placement
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

and its definitive treatment will depend on the surgeon's experience and clinical scenario. Seven years ago, standardization of treatment for this clinical entity began with Losanoff and Basson, although more prospective trials are needed to validate their classification [6] and the modified version of Rikki [17].

In the clinical setting of an incarcerated complicated or strangulated inguinal hernia, the initial approach should consider imaging studies; USG or CT can guide the surgical plan, and enables the possibility of identifying involved intra-abdominal organs. More studies are required about preoperative diagnosis utility of both. It is important to emphasize that no delay in definitive treatment is allowed because consequences can be disastrous.

#### Ethical approval

None required.

#### Funding

Nothing to declare.

#### Author contribution

Adrian Morales Cardenas.- Resident in charge of the patient at the moment of the surgery, had the idea of publishing.

Victor Hugo Sainz Escarrega.- Editor.

César Felipe Ploneda Valencia Editor.

Alvaro Cuahutemoc Hernández Campos writing.

Carlos Rene López Lizarraga writing.

Eliseo Navarro Muñoz data collection and analysis.

Carlos Alfredo Bautista Lopez data collection and analysis.

#### Conflicts of interest

Nothing to declare.

#### Consent

“Written informed consent was obtained from the patient for the publication of this case report and accompanying images.

A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.”

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