

Therapeutical and Pharmaco-Chemical Conduct for Amyand Hernia

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One of the rare findings regarding the hernial sac is the vermiform appendix. This pathology, defined as Amyand's hernia, occurs in almost 1% of all inguinal hernia cases (0.19-1.7%). Usually, it is diagnosed intraoperatively, because the preoperative diagnosis is very difficult. We report the case of a 56-year-old man with a voluminous mass in the right inguinal-scrotal region. During the surgical procedure, an Amyand's hernia was identified and we performed reduction of the hernia, herniorrhaphy and Lichtenstein Tension-Free Repair with polypropylene mesh. The case that we presented was type 1 according to Losanoff and Basson's classification, but also to Rikki modified classification, with a very controversial management. Clinical evaluation and surgeon's experience are the base of the surgical treatment.

Keywords: vermiform appendix, inguinal hernia, surgical treatment

Evidence of surgical repairs of inguinal hernias dates as far back as the ancient civilizations of Egypt and Greece. While they preferred a conservative approach in terms of management of inguinal hernias and surgical management was only applied in case of complications, nowadays inguinal hernia is one of the most common surgical pathology.

The incidence of inguinal hernias is of approximately 75% of all abdominal wall hernias. Concerning inguinal hernia repairs, men are more frequently affected than women [1,2] - 90% are performed in men and 10% in women.

Numerous organs have been described as contents of inguinal hernia. The primary content of the hernial sac may be composed of segments of large or small bowel, portions of great omentum, but also rare and uncommon components, such as bladder, fallopian tube and ovaries. In very rare cases it may contain vermiform appendix and this particular case is known as Amyand's hernia [3,4].

We report a case of a 56-year-old man with a voluminous mass in the right inguinal-scrotal region. During inguinal hernia repair procedure, an Amyand's hernia was identified.

This paper is consistent with the SCARE criteria [5].

Experimental part

A 56-year-old man, diagnosed with right inguinal hernia, came to our clinic, being scheduled for an election surgery for right inguinal hernia. The inguinal mass increased on standing and walking. He had a history of reducible right inguinal hernia for the last 10 years and his medical history included hypertension and benign prostatic hypertrophy. As a comorbidity factor, we need to mention that our patient was obese.

Abdominal examination performed on admission revealed a soft and painless abdomen, increased by volume due to fatty panicle, a voluminous and consistent mass in the right inguinal-scrotal region and no features of intestinal obstruction. The patient had no fever and the laboratory tests were within the normal range. Due to his clinical history of inguinal hernia, we decided not to perform imagistic investigations and to proceed with the surgery the next day. The patient was taken to the operating room and underwent a spinal anaesthesia.

While performing the surgical procedure, after entering the inguinal canal, a voluminous direct hernia sac was found. It was difficult to separate it from the spermatic cord, because of the chronic process of hernia and multiple adhesions, but we managed to dissect it free of the cord structures. The sac was opened and it revealed a massive hernial lipoma, cecum and vermiform appendix (Figure 1), but there were no signs of inflammation, obstruction or vascular suffering. All these findings led us to the intraoperative diagnosis of Amyand's hernia type 1. We performed herniorrhaphy and Lichtenstein Tension-Free Repair using a composite polypropylene mesh.

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Preoperatively, disinfection was done using povidone-iodine (figure 2). Intraoperatively, a dose of metronidazole was administered. Postoperatively, antibiotics were administered (Ampicillin 2g / day (figure 3) with Gentamicin 240mg / day (figure 4), for 5 days), anti-inflammatory drugs (Perfalgan 1 vial / day (figure 5), for 3 days) and gastric protection (Arnetin 100 mg / day, for 5 days).

The postoperative course of the patient's evolution was uneventful and the patient was discharged on the third postoperative day, without any complications. He has remained comfortable over last 3 months of follow-up.

Results and discussions

The presence of the vermiform appendix, which can be normal, inflamed or perforated, incarcerated or simply contained in the hernial sac of an inguinal hernia, is named Amyand's hernia [6,7] and it is a rare finding, often misdiagnosed.

Claudius Amyand describes on 5 December 1735 the very first case of a 11-year-old boy who presented with a right incarcerated inguinal hernia with vermiform appendix as the content. Amyand performed appendectomy as surgical treatment, using the groin approach. Since then, very few cases were described by the international medical literature about a rare and incidental finding of the vermiform appendix contained by the hernial sac, at the level of the right wall groin.

This pathology is three times more likely to appear in children because of the permeability of the processus vaginalis. Male patients develop this rare condition, but we might also find it in female patients that are postmenopausal. Mostly were seen on the right side of the groin, while very few cases of Amyand's hernia were described in the international medical literature on the left side, associated with mobile cecum or situs inversus.

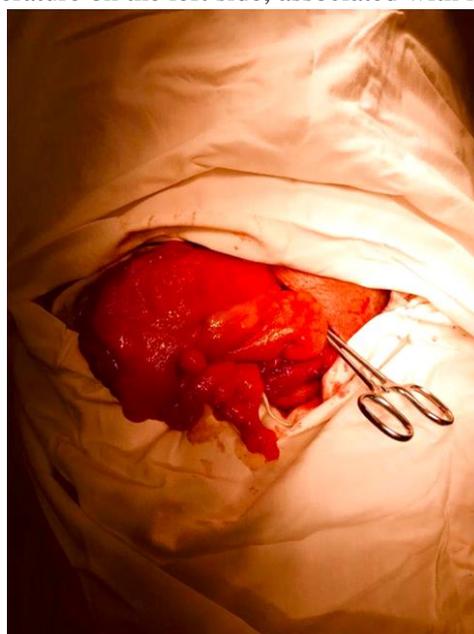


Fig. 1. Hernial sac components

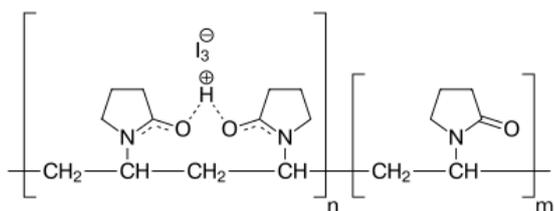


Fig. 2. Chemical formula of povidone-iodine

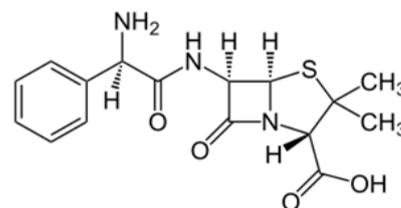


Fig. 3. Chemical formula of ampicillin

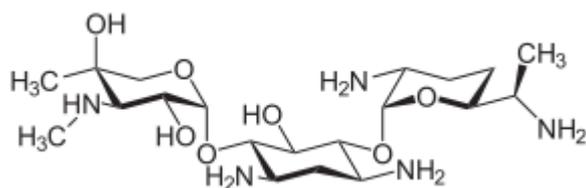


Fig. 4. Chemical formula of gentamicin

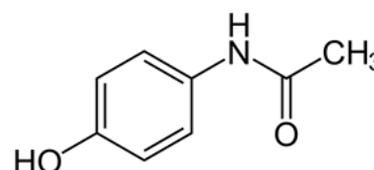


Fig. 5. Chemical formula of perfalgan

Men are the ones which typically develop this type of hernia on the right side of the groin, and we can link this to the fact that men usually develop inguinal hernias, while femoral hernias are more likely to be found in women. The presence of the vermiform appendix in the sac of a femoral hernia goes by the name of De Garengeot Hernia [2,8].

The original classification used to standardize different types and also the common approach of Amyand's hernia [9] appeared in 2007 and it was provided by Losanoff and Basson (table 1). Lossanoff and Basson's classification was modified by Rikki [10], as shown in the table below (table 2).

Table 1
CLASSIFICATION OF AMYAND'S HERNIA ACCORDING TO LOSANOFF AND BASSON

Classification	Description	Management
Type 1	Normal vermiform appendix contained by an inguinal hernia	Reduction of the hernia, herniorrhaphy, mesh replacement
Type 2	Acute appendicitis contained by an inguinal hernia free of abdominal sepsis	Primary appendicectomy and hernia repair with no prosthetics
Type 3	Acute appendicitis contained by an inguinal hernia accompanied by abdominal wall and abdominal sepsis	Exploratory laparotomy, appendicectomy and primary hernia repair with no prosthetic
Type 4	Acute appendicitis contained by an inguinal hernia accompanied with abdominal pathology	Exploratory laparotomy, appendicectomy, primary hernia repair with no prosthetic and the management of the abdominal pathology

Table 2
CLASSIFICATION OF HERNIA AMYAND. MODIFIED BY RIKKI.

Classification	Description
Type 1	Normal vermiform appendix contained by an inguinal hernia
Type 2	Acute appendicitis contained by an inguinal hernia free of abdominal sepsis
Type 3	Acute appendicitis contained by an inguinal hernia accompanied by peritoneal and/or abdominal wall sepsis
Type 4	Acute appendicitis contained by an inguinal hernia accompanied with abdominal pathology
Type 5a	Normal vermiform appendix contained by an incisional hernia
Type 5b	Acute appendicitis contained by an incisional hernia without peritonitis
Type 5c	Acute appendicitis contained by an incisional hernia accompanied by peritonitis or abdominal wall sepsis or in relation to a previous surgery

Painful groin swelling is the most common symptom, but an Amyand's hernia can also be totally asymptomatic. Other symptoms are due to an incarcerated or strangulated hernia, which can result in acute inflammation of the vermiform appendix, perforated appendix with periappendicular or intra-abdominal abscesses, necrotizing fasciitis of the anterior abdominal wall, orchitis, epididymitis, testicular abscess or very rare in situ arterial thrombosis. The mortality percentage ranges between 15-30% [11].

The appendicitis associated with Amyand's hernia has a controversial and interesting pathophysiology, due to the fact that the appendix reaches the hernia and gets struck in the hernial sac. The contraction of the abdominal muscles or the sudden increase of intra-abdominal pressure results in the narrowing of the inguinal ring, which leads to oedema, inflammation and bacterial overgrowth [12] of the vermiform appendix. If this process continues, it may

cause strangulation and incarceration of the components. Another key role can be that of the intraluminal obstruction of the appendix, but this is a less likely theory.

Our clinical case had no features of intestinal obstruction, and we did not consider it necessary to perform further imagistic investigations. In case of children and young patients, the imagistic diagnosis of acute appendicitis is achieved through ultrasound, which can identify a tubular structure of over 6 mm diameter that is non-peristaltic and non-compressible. Early diagnosis can be obtained by performing a CT, which is highly specific and sensitive in diagnosing acute appendicitis.

If diagnosed preoperatively by imagistic means it is recommended to perform a diagnostic laparoscopy [12,13]. When a direct hernial sac is identified and it contains an inflamed appendix, a laparoscopic appendicectomy with open mesh repair is recommended, as it reduces the need for an elective appendicectomy later [14].

The best surgical treatment remains surrounded by controversy because it mostly depends of the experience of the surgeon. We also benefit from a variety of techniques that involve hernioplasty [15].

Rikki et al. advise the management of Amyand's hernia with appendicectomy in all cases except type 1 and 5a that includes mesh repair of the hernia. The case we presented involved a normal appendix that was anatomically repositioned in the peritoneal cavity without performing appendicectomy.

Our patient's pathology is classified as an Amyand's hernia type 1 and the surgical conduct requires hernia mesh repair. Whether to perform appendicectomy remains controversial. It is considered that an appendicectomy performed at the first operation decreases the risk of a future appendicitis and hence further common medication (with their previously described adverse reactions) anaesthesia and surgery [16-27]. We did not perform an appendicectomy.

Our approach consisted in performing herniorrhaphy and Lichtenstein Tension-Free Repair using a composite polypropylene mesh. It is our preferred surgical treatment because it provides excellent outcomes.

The surgeon's dilemma is whether to leave behind or remove a normal appendix because no evidence-based information exists in the international medical literature. Based on common sense and taking into account all the clinical and anatomical variables of the patient, the surgeon must take a decision.

Conclusions

We conclude that Amyand's hernia defines a rare pathology that involves the presence of the vermiform appendix in the hernial sac, which can be often misdiagnosed preoperatively. Usually, an Amyand's hernia is diagnosed intraoperatively. Appendicitis within the hernial sac is even less frequently encountered.

The case we presented was type 1 according to Losanoff and Basson's classification [1], but also to Rikki's modified classification, with a very controversial management.

Clinical evaluation and surgeon experience are the base of the surgical treatment, as many individual factors may increase morbidity and mortality. Surgeons should be aware of this pathology and its recommended line of action in order to provide the most accurate treatment. The surgical conduct must provide a resolution of the patient's complaint and its best postoperative results.

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