



A previously undescribed hernia containing an acutely inflamed appendix – case report and review of management on hernias containing the vermiform appendix

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Abstract: Hernias involving the appendix are unusual and are often found during surgical exploration. The rarity of these hernias makes it difficult to discuss standard of treatment. When an acutely inflamed appendix is encountered within a hernia, appendectomy should be performed with primary repair of the hernia. This case documents the unique finding of an appendix herniating through a previously undescribed region in the abdominal wall found in a patient presenting with acute appendicitis.

Keywords: Appendix; appendicitis; abdominal hernia; diagnostic laparoscopy; general surgery

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Introduction

Hernias involving the appendix are unusual and are often found during surgical exploration. Only approximately 1% of all hernias contain a portion of the vermiform appendix (1). The rarity of these hernias makes for a difficult discussion on standard of management and surgical approach.

The most commonly described type is the Amyand hernia, which occurs when the appendix has herniated through the inguinal canal (1-4). Another similar occurrence is De Garengeot's hernia, when the appendix is found within a femoral hernia sac (5,6). Other less commonly described hernias containing the appendix include ventral, incisional, and spigelian hernias (2,7). This case documents the unique finding of an appendix herniating through a previously undescribed region in the abdominal wall found in a patient presenting with acute appendicitis.

Case report

This is a 33-year-old male with no significant past medical or surgical history who presented to the emergency department with right lower quadrant abdominal pain for

10 days. Labs were significant for a white blood cell count of 14.6 k/ μ L, and a CT scan demonstrated acute perforated appendicitis (*Figure 1*). The patient was resuscitated with intravenous fluids and started on intravenous antibiotics in preparation for diagnostic laparoscopy.

During laparoscopic examination, it was noted that the appendix was herniated through a previously undescribed orifice in the lateral right iliac fossa (*Figure 2*). The orifice was lateral to the femoral triangle, in the so called "triangle of pain", which is a "V"-shaped area bounded by the iliopubic tract, testicular vessels, and peritoneal fold (8).

A right upper quadrant 5-mm port and a left lower quadrant 12-mm port were placed. Using laparoscopic technique, the appendix was easily reduced from the lateral wall orifice, and an endoscopic stapler was used to remove the appendix and meso-appendix. The hernia was primarily repaired, and surgery was completed in the usual manner. The patient was discharged home the same day.

Discussion

Ventral abdominal or inguinal hernias commonly contain omentum or bowel. It is a rare occurrence that these hernias contain the vermiform appendix, and is documented in



Figure 1 CT scan demonstrating perforated appendicitis, with a fluid collection in the right lower quadrant (blue arrow).

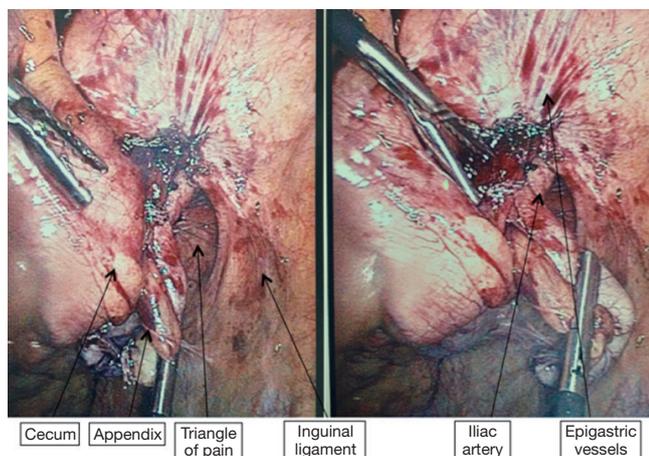


Figure 2 Laparoscopic view of the perforated appendix being reduced from an orifice in the lateral right iliac fossa, in the “triangle of pain”.

approximately 1% of all cases (1). In these instances, the hernia may contain either a portion of the appendix or the entire organ, and the appendix can either be healthy or acutely inflamed.

The most commonly described hernia which contains the appendix is the Amyand hernia. The incidence of this hernia ranges from 0.19% to 1.7% (1-3). This occurs when the appendix becomes trapped within an inguinal hernia sac. An Amyand hernia is three times more likely to be seen in childhood due to the anatomical feature of a persistently patent processus vaginalis (1,2). In our adult patient, we postulate that a unique congenital abnormality or inherent

anatomical weakness contributed to the development of his hernia.

The next most commonly described hernia which contains the appendix is De Garengeot’s hernia. This occurs when the appendix is trapped within a femoral hernia sac. De Garengeot’s hernia occurs in approximately 1% of all femoral hernia cases (6). It differs from the Amyand hernia in that it is more commonly found in females and follows a bimodal age distribution.

The exact mechanism by which appendicitis develops within these different hernias is not fully understood, with several theories supported in recent literature (1,2). The finding of a hernia containing an acutely inflamed appendix is most definitely rare, with Amyand hernia rates ranging from 0.07–0.13% and De Garengeot’s hernia rates ranging from 0.08–0.13% (1,3,6). In these instances, perforation only occurs in approximately 0.1% of the cases (1). When perforation does occur, there is a significantly increased mortality rate due to the spread of severe peritoneal sepsis (2,3). Our patient was unique in the sense that the presentation was clearly that of acute perforated appendicitis.

Therapeutic strategies for these hernias mainly depends on the condition of the appendix. The Losanoff and Basson classification is a management strategy for dealing with Amyand hernias. The Rikki modification adds to this classification strategy, in dealing with incisional hernias containing the appendix. The general principle shared between the two is that for a non-inflamed appendix, the patient should have hernia repair without appendectomy. When an acutely inflamed appendix is present within the hernia, appendectomy should be performed, and the hernia should be primarily repaired, with avoidance of using mesh (2). Although these hernias are rare, it is important for surgeons to understand these concepts. These principles should be applied to all hernias containing the appendix in order to avoid complications and improve patient outcomes.

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Footnote

Conflicts of Interest: The authors have completed the ICMJE uniform disclosure form (available at <http://dx.doi.org/10.21037/ls.2018.05.08>). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee(s) and with the Declaration of Helsinki (as revised in 2013). Written informed consent was obtained from the patient for publication of this Case Report and any accompanying images.

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