

Case Report

The hernia's hidden passenger: strangulated epiploic appendages within a left inguinal hernia sac – a case report

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ABSTRACT

Epiploic appendagitis is a rare, self-limiting inflammatory condition involving fat-filled appendages attached to the colon. Its presentation can mimic other causes of acute abdomen, making diagnosis challenging. A 38-year-old man presented with a painful, irreducible left groin swelling clinically and ultrasonographically suggestive of an incarcerated inguinal hernia. Diagnostic laparoscopy revealed two sigmoid epiploic appendages within the hernia sac, one of which was necrotic; laparoscopic reduction, TAPP mesh repair, and appendage excision were performed successfully, with an uneventful recovery and no recurrence or mesh-related complications. Although conservative treatment is often sufficient for epiploic appendagitis, the use of mesh in cases associated with strangulated inguinal hernia remains debatable. Laparoscopic approaches provide effective management with favorable outcomes, but further research is required to establish standardized treatment protocols.

Keywords: Epiploic appendages, Inguinal hernia, Strangulation, Laparoscopy, Minimally invasive surgery

INTRODUCTION

Epiploic appendages (EA) are normal, pedunculated adipose structures attached to the serosal surface of the large bowel.¹ In contrast, Epiploic appendagitis (EA's) is a rare, self-limiting inflammatory condition involving these appendages.^{2,3} EA were first described by Vesalius in 1543, while Von Bruns and Schweinburg reported the first case of strangulation of EA within an inguinal hernia in 1906.⁴⁻⁶ Incarcerated inguinal hernias account for approximately 10% of all inguinal hernia, with the small intestine or omentum as the most common hernial content.⁷ The presence of an EA within an inguinal hernia is rare, and strangulation of the appendage makes this an even more unusual occurrence.⁶ Here we report a case of a strangulated EA presenting as the sole content of an incarcerated inguinal hernia.

CASE REPORT

A 38-year-old man presented to the outpatient clinic with complaints of left groin pain and swelling for 5 days and 3 days respectively. The pain had a gradual onset, with no preceding history of trauma. The onset of pain subsequently drew the patient's attention to a lump in the left groin. He also reported a single episode of fever on the first day of symptom onset. There was no history of generalized abdominal distension, diffuse abdominal pain, repeated vomiting, or obstipation. He denied any history of chronic cough, chronic constipation, or lower urinary tract symptoms. His occupation did not involve heavy lifting, and he did not engage in gym activities or other strenuous physical exercise. He had no significant past medical history, and his allergy history was unremarkable.

On examination, the patient was hemodynamically stable. Local examination revealed a 6 × 4 cm boggy swelling within the left inguinal canal, extending to the neck of the scrotum. The swelling was tender, non-mobile, irreducible, and associated with induration and overlying skin erythema. There was no cough impulse.

Ultrasonography demonstrated a left inguinal hernial defect measuring approximately 22 mm. The hernia contained fatty tissue with marked hyperechogenicity and showed no significant movement during the Valsalva maneuver, raising the possibility of an incarcerated/strangulated left inguinal hernia. CT revealed herniation of a fatty component through the deep inguinal ring, while the adjacent bowel remained at the level of the deep ring without entering the inguinal canal, suggestive of an incarcerated/strangulated epiploic appendage. Contrast study for further evaluation was denied by the insurance, and the patient declined the investigation because of financial constraints.

Laboratory investigations revealed a normal white blood cell count ($8.95 \times 10^9/l$), with relative neutrophilia (77.3%) and an elevated C-reactive protein (CRP) level of 34.10 mg/l.

After obtaining informed consent, the patient underwent diagnostic laparoscopy. Intraoperatively, two large epiploic appendages arising from the sigmoid colon were found to be sliding into the left inguinal canal (Figure 1). The large bowel appeared otherwise normal, and there was no evidence of peritoneal contamination or intra-abdominal collection.

Following careful laparoscopic reduction under direct vision, the proximal epiploic appendage was noted to be congested but viable, whereas the distal epiploic appendage was necrotic (Figure 2).

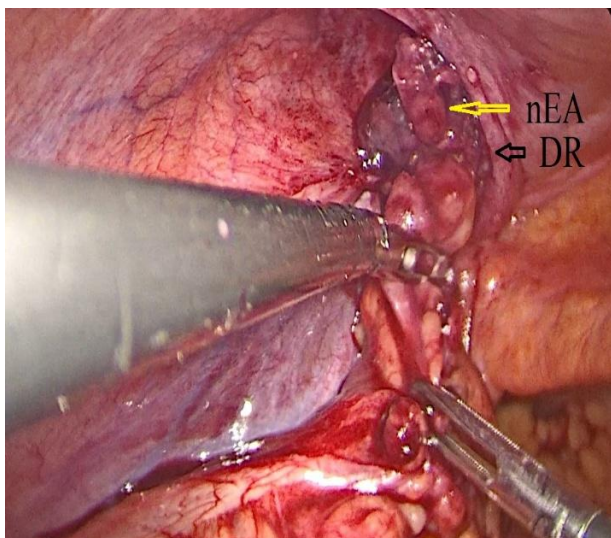


Figure 1: showing the necrotic epiploic appendage (nEA) protruding through the deep ring (DR).

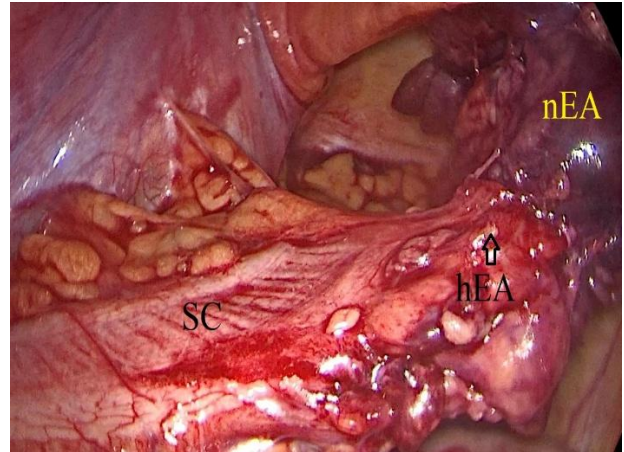


Figure 2: Showing the normal sigmoid colon (SC), healthy epiploic appendage base (hEA), and the necrotic epiploic appendage (nEA).

A transabdominal preperitoneal (TAPP) mesh repair was performed first in the standard fashion, followed by laparoscopic excision of the necrotic epiploic appendage. The specimen was retrieved using an endoscopic retrieval bag (Endobag) (Figure 3).

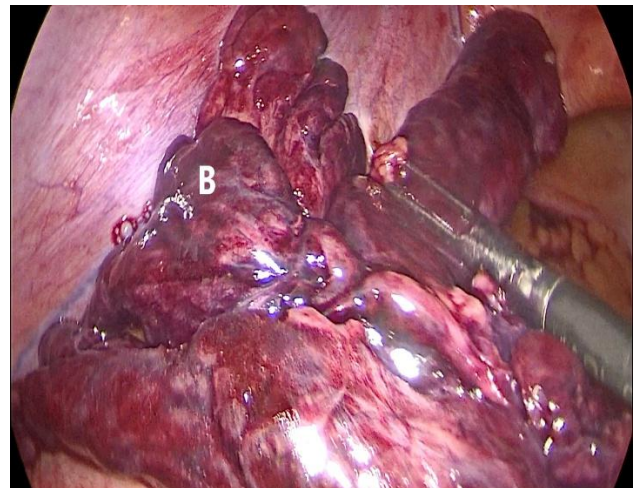


Figure 3: Showing the large, grossly distended necrotic epiploic appendage (nEA).

No wound infection, mesh-related infection, or hernia recurrence was observed from the immediate postoperative period through the most recent follow-up visit.

DISCUSSION

Anatomical description of EA was made for the first time by Andreas Vesalius in 1543, but its surgical significance as free intraperitoneal bodies after detachment was mentioned by Rudolf Virchow in 1853.^{8,9} Finally, it was the year 1956, when Lynn et al. coined the term EA's.⁵ The incidence of incarcerated inguinal hernia is about 10%, with the small intestine or omentum being the most

common contents.⁷ On the other hand, EA is one of the rarest contents.⁶ Strangulation of EA in the inguinal canal was first reported independently by Von Bruns and Schweinburg in 1906, whereas torsion of EA in the inguinal canal was also reported by Serve and Muscatello in 1906.⁶

EA is a pedunculated adipose protrusion arising from the colonic serosa and covered by visceral peritoneum.¹ EA are approximately 50-100 in number and are distributed throughout the large intestine, extending from the caecum to the rectosigmoid junction, with the highest prevalence in the sigmoid colon region (57%).^{1,8,9} EA in the sigmoid colon tend to be larger in size and more numerous.¹⁰ The attachment of EA is mainly seen over the taenia libera (anteriorly) and the taenia omentalis (posterolaterally), except in the transverse colon, where they are arranged in a single row due to the attachment of the greater omentum to the taenia omentalis.¹ Due to the distribution pattern, EA's are more common in the sigmoid or rectosigmoid colon (50%-57%) and least common in the transverse colon (2%-6%) and descending colon (2%).^{1,8,9} The dimensions of EA are approximately 0.5-5 cm in length and 1-2 cm in thickness; rarely, it can be as long as 15 cm.^{4,11,77} The vascular stalk of an EA comprises one or two small circular arteries originating from the vasa recta longa and a tortuous vein.^{1,8,13}

The precise function of EA remains unestablished. The hypotheses are: it may possess omentum-like immune functions.^{5,7-9} Acts as a cushion due to its fatty composition and provides mechanical protection during peristalsis.^{2,3,8} During starvation, the fat acts as an energy reserve.^{2,3} Contributes to colonic absorption helps maintain colonic vascularity during peristalsis and compression of colonic vessels.^{2,5,7-9,14}

The most commonly encountered condition associated with EA is EA's. It is a rare, self-limiting inflammatory condition involving these appendages.^{2,3} EA's is a rare condition with a frequency of 1.3% and an approximate incidence of 8.8 cases per million patients per year.^{2,4,8,13,15} Owing to the absence of pathognomonic clinical features, the diagnosis of EA's is arduous and is made by exclusion.^{1,8} The most common presenting feature of EA's is left lower quadrant pain (1, 7) due to the maximum concentration of EA in the rectosigmoid region.^{1,7,5}

Laboratory parameters in epiploic appendagitis are generally nonspecific and often remain within normal limits.^{2,3,7} On ultrasound, EA's appears as a hyperechoic, non-compressible oval lesion surrounded by a hypoechoic rim, along with cessation of blood flow on colour Doppler.^{1,7}

In contemporary practice, computed tomography (CT scan) has become the diagnostic modality of choice for EAs, demonstrating a sensitivity and specificity exceeding 90%.^{1,2,4,8} Normal EA are generally not

visualized on CT scan; however, the hallmark CT finding is the hyperattenuating ring sign, which appears as a 2-3 mm thick peripheral high-attenuation rim surrounding an ovoid fat-density lesion adjacent to the colon.^{3,5} This rim corresponds to inflammation of the visceral peritoneum enveloping the inflamed epiploic appendage.^{1,7,10} Additional CT findings include the central dot sign, reported with a variable incidence ranging from 30% to 78% across different studies, represents a central hyperattenuating focus within the inflamed EA corresponding to thrombosis of the central draining venous pedicle and, although considered pathognomonic, is not present in every case.^{1,7,10} On CT scan, involvement of the inguinal canal is demonstrated by the presence of an inflamed EA within the hernial sac, appearing as a lateral crescent-shaped fat-density lesion extending anteromedially and inferiorly relative to the inferior epigastric vessels.¹⁰ MRI is not routinely used; however, it may be a suitable imaging modality in paediatric and pregnant patients when clinically indicated.²

The management of uncomplicated EA's remains a matter of debate because the condition is generally self-limiting and resolves spontaneously.⁵

As EA's is a self-limiting condition, conservative management, with or without nonsteroidal anti-inflammatory drugs (NSAIDs), is considered the first-line treatment.^{1,4,5,7,8} This approach is supported by the low recurrence rate and the rarity of complications.¹ Symptoms typically resolve within a few days to two weeks although some reports have described recovery periods of up to four weeks.³ However, Sand et al observed that EA's has a recurrence rate of 40% in their study and advocated surgical intervention in selected patients. The authors preferred laparoscopic simple ligation and excision of the affected appendage, as it offers several advantages, including faster recovery, earlier return to work, and avoidance of repeated radiation exposure associated with follow-up CT scan.⁵

The indications for surgical intervention in EA's include failure of conservative management or the presence of complications such as an associated complicated inguinal hernia, adhesions, or intussusception.^{2,4,8,6,1} In the setting of strangulated EA's, surgical excision is justified. Similarly, in the presence of an inguinal hernia, hernia repair is also indicated. However, the key consideration lies in the choice of repair technique whether mesh should be used or avoided, and whether an open or laparoscopic approach is preferred largely due to concerns regarding potential mesh-related infection.

The role of laparoscopic surgery in the management of complicated inguinal hernias (CIH) remains controversial because of the technical challenges. Nevertheless, accumulating evidence suggests that laparoscopic repair is a safe and feasible option in appropriately selected patients. In a systematic review, Deeba et al concluded

that laparoscopic repair is feasible for CIH.¹⁶ Similarly, Matsuda et al in a retrospective comparison of laparoscopic and open repair, reported that the laparoscopic approach outcomes are equally comparable to those of open surgery. They further highlighted several advantages of the transabdominal preperitoneal (TAPP) approach for incarcerated inguinal hernias, including reduction of the hernia contents under direct vision, assessment of the viability of the incarcerated bowel, and the ability to perform bowel resection, when required, through an enlarged umbilical port-site incision after mesh placement and peritoneal closure. Importantly, they reported no cases of mesh infection, surgical site infection, or hernia recurrence.¹⁷

Liu et al also acknowledged the lack of a universal consensus but recommended TAPP repair in carefully selected patients with incarcerated or strangulated inguinal hernias. They further advocated the use of a lightweight, large-pore mesh in these patients.¹⁸ This recommendation is supported by the guidelines of the International Endohernia Society (IEHS), the International HerniaSurge Group, and the Eastern Association for the Surgery of Trauma, all of which state that laparoscopic repair of CIH is feasible when performed by experienced surgeons.¹⁹⁻²¹ These guidelines also support the use of mesh provided there is no gross contamination of the operative field.

Prosthetic mesh is contraindicated in contaminated (Class III) and dirty-infected (Class IV) surgical fields.¹⁷ Furthermore, the HerniaSurge guidelines emphasize that, owing to the limited available evidence, mesh placement should be undertaken with caution in the presence of bowel perforation, faecal contamination, or established intra-abdominal infection.²⁰

Based on these findings, we have decided to give our patient the advantage of the laparoscopic approach, and there has been no clinical evidence of mesh infection or hernia recurrence at the most recent follow-up. However, further well-designed randomized controlled trials are needed to establish the proposed benefits of the laparoscopic approach in CIH, as the current evidence is derived predominantly from retrospective studies.

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