

Epiploic Appendagitis: An Infrequent Offender in Abdominal Pain

Zacharia GS*, Jacob A**, Vadukoot M***, Ali M****

*Department of Gastroenterology, Ahalia Hospital, Abu Dhabi, UAE

**Department of Anesthesiology, Ahalia Hospital, Abu Dhabi, UAE

***Department of Gastroenterology, Lifecare Hospital, Abu Dhabi, UAE

****Department of Radiodiagnosis, Lifecare Hospital, Abu Dhabi, UAE

Corresponding author:

George Sarin Zacharia, Department of Gastroenterology, Ahalia Hospital, Abu Dhabi, UAE, Email: george.lenx@yahoo.com Phone: +971545750274

ABSTRACT

Epiploic appendages are fat-filled outpouchings arising from the serosal surface of the colon and have uncertain physiological functions. Epiploic appendagitis is characterized by inflammation of these appendages. Primary appendagitis often results from ischemic injury, while secondary appendagitis may arise from the contiguous spread of inflammation or infection from adjacent structures. Clinical features of epiploic appendagitis include acute or subacute abdominal pain, most commonly in the lower quadrants, without significant concurrent constitutional or other gastrointestinal symptoms. Diagnosis relies on imaging modalities, with Computed Tomography (CT) being the preferred method. Management of epiploic appendagitis is mainly conservative, with analgesic and anti-inflammatory agents being the mainstay of treatment. Surgical indications are poorly defined, but laparoscopic excision of the inflamed appendage may be considered in cases of recurrent or refractory symptoms. This review article explores the anatomy, pathophysiology, clinical features, diagnosis, and management of epiploic appendages and appendagitis.

Keywords: Acute Abdomen, appendagitis, epiploic Appendages

ABSTRAK

Apendiks epiploik adalah kantong berisi lemak yang muncul dari permukaan serosa kolon dan memiliki fungsi fisiologis yang tidak pasti. Apendagitis epiploik ditandai dengan peradangan pada apendiks ini. Apendagitis primer sering disebabkan oleh cedera iskemik, sementara apendagitis sekunder dapat terjadi akibat penyebaran inflamasi atau infeksi dari struktur di sekitarnya. Ciri klinis apendagitis epiploik meliputi nyeri perut akut atau subakut, yang paling sering terjadi di kuadran bawah, tanpa gejala konstitusional atau gejala gastrointestinal lainnya yang signifikan. Diagnosis mengandalkan teknik pencitraan, dengan Computed Tomography (CT) scan sebagai metode pilihan. Pengelolaan apendagitis epiploik sebagian besar bersifat konservatif dengan agen analgesik dan antiinflamasi sebagai andalan pengobatan. Indikasi pembedahan tidak jelas, tetapi eksisi laparoskopik pada apendiks yang meradang dapat dipertimbangkan pada kasus dengan gejala yang berulang atau sulit diatasi. Artikel tinjauan ini mengeksplorasi anatomi, patofisiologi, ciri klinis, diagnosis, dan penanganan apendiks epiploik dan apendagitis.

Kata Kunci: Abdomen akut, apendiks epiploik, radang apendiks epiploik

INTRODUCTION

Eiploic appendages, small fat-filled structures along the colon's serosal surface with unclear physiological functions, have recently garnered increasing attention in clinical practice due to their potential to cause acute abdominal pain and mimic other intra-abdominal pathologies. Eiploic appendagitis is an inflammatory condition involving these appendages, either primary resulting from ischemic injury or secondary, associated with adjacent inflammatory processes. Understanding the anatomy, pathophysiology, clinical presentation, and diagnostic approach to eiploic appendagitis is essential for accurate diagnosis and appropriate management of patients presenting with acute abdominal pain.

EIPILOIC APPENDAGES

Eiploic appendages are fat-filled outpouchings lined by the visceral peritoneum as shown in **Figure 1**. They arise from the serosal surface of the colon and are arranged linearly next to the tenia coli. Often, 50-100 in number, from the cecum to the rectosigmoid junction, each 1-2 centimeters thick and 0.5-5 centimeters long.¹ These fatty projections are distributed unevenly, most frequently in the sigmoid/rectosigmoid junction (57%) and ileocecal region (26%).^{2,3} The appendages on the left side are typically larger than their right-sided counterparts.¹ Each appendage is supplied with one or two end arterioles and drained by the venules and lymphatics into the corresponding segment of the colon vasculature. Their physiological function is unclear; postulated ones include cushioning the colon, protective role as omentum, and or role in nutrient absorption.⁴ Andreas Vesalius anatomically described appendages in 1543, while three decades later, in 1953, Virchow described them as a source of intraperitoneal free bodies.⁴

EIPILOIC APPENDAGITIS

Eiploic appendagitis or appendagitis eiploicae, refers to inflammation of the appendages and was first described by Lynn et al. in 1956.⁵ Depending on the pathogenesis, appendagitis may be primary or secondary. Primary Eiploic Appendagitis (PEA) typically results from aseptic inflammation secondary to ischemic injury to appendages. The pedunculated nature with free range of mobility, twinned with its limited vascular supply, predisposes appendages to torsion and subsequent ischemic necrosis and inflammation. Spontaneous thrombosis of the appendageal vein, without torsion, is also described in the literature as a cause of PEA.^{1,4,6} PEA is a relatively uncommon entity with an estimated incidence of 8.8 cases per million per year.⁶ Secondary Eiploic Appendagitis (SEA) results from the contiguous spread of inflammation or infection from adjacent structures, most frequently described with diverticulitis. SEA is also described with appendicitis and cholecystitis.^{3,6}

CLINICAL FEATURES

PEA is most often reported between the second and fifth decade of life, with a higher incidence in males.^{4,6,7} Published literature reports a higher incidence among obese individuals. A case-control study utilizing Computed Tomography (CT)-based measurements of adiposity revealed a 60% higher abdominal adipose volume with 117% and 35% higher visceral and subcutaneous adipose areas, respectively, in patients in PEA compared to alternate causes of acute abdomen, suggesting a link between PEA and visceral obesity.⁷ Rioux et al. reported the onset of symptoms after exercise or major stretching movements of the abdomen.⁸ PEA most commonly involves the sigmoid, followed by the descending colon, cecum, and descending colon.^{1,3} Nugent et al. reported 49% of cases in the sigmoid colon and 23% in the descending colon.⁷

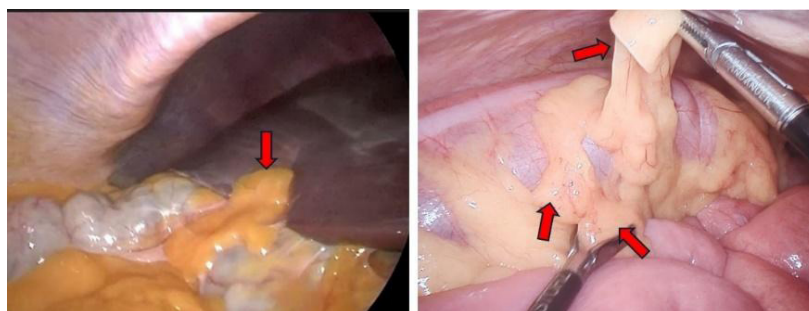


Figure 1. Laparoscopic images demonstrating normal appendages eiploicae (red arrows)

The typical presentation of PAE is acute or subacute abdominal pain, most frequently reported in the left lower quadrant of the abdomen, followed by the right lower quadrant. The pain tends to be dull, aching, constant, and non-migrating or localized. Pain may worsen with coughing, deep inspiration, or abdominal stretching. Physical examination may reveal localized tenderness, but rigidity or guarding is infrequent. Patients characteristically lack fever or gastrointestinal symptoms like nausea, vomiting, and altered bowel habits.^{1,3,4} Appendagitis is a great mimic, often clinically indistinguishable from diverticulitis and appendicitis.

LABORATORY AND IMAGING

Routine hemogram, biochemical parameters, and urinalysis are often within normal limits, though mild leucocytosis or elevated C-reactive protein may rarely be reported. Though neither sensitive nor specific, normal laboratory parameters might help differentiate PEA from appendicitis, diverticulitis, pancreatitis, cholecystitis, and renal/ureteric colic in resource-limited settings. Unlike labs, abdominal imaging allows a more accurate diagnosis of PEA. The improved availability, accessibility, and accuracy of modern imaging enable prompt diagnosis and mitigate the need for empiric antibiotic use and surgical interventions in patients with PEA.

Ultrasound at the point of tenderness reveals a round to oval, hyperechoic, non-compressible solid mass, typically located between the anterior abdominal wall and colon. The mass adheres to the colonic wall and exerts a mass effect on the colon. A mass effect on the abdominal wall can be noticed when compression is done with the probe. Doppler fails to reveal central vascularity in cases of PEA due to torsion. A hypoechoic halo, representing adjacent inflammation, may surround the hyperechoic mass.^{1,8}

Computed Tomography (CT) is the imaging modality of choice for diagnosing PEA. A normal epiploic appendix will not be visualized on CT images as its fat density blends with that of intraabdominal fat and remains indistinguishable. When inflamed, it appears as a 2-4 centimeters ovoid pericolic fat density lesion surrounded by a hyperattenuating zone as shown in **Figure 2**. The hyperintense zone is often 2-3 millimeters thick and represents the inflamed peritoneum. Sometimes, a hyperintense central dot may be identified within the fat-density core representing the thrombosed vessel, the “central dot sign.”^{1,8,9}

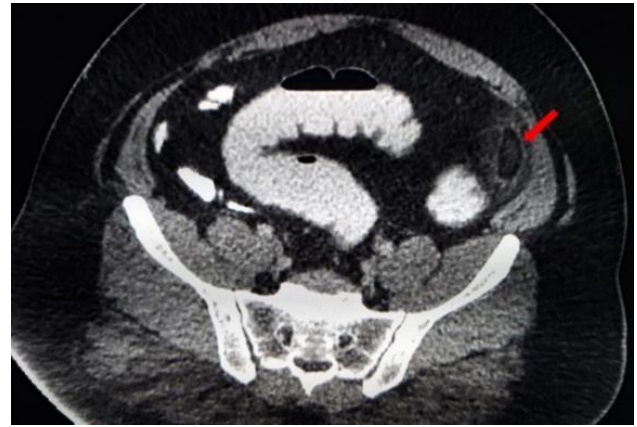


Figure 2. Contrast CT reveals the ovoid fat density with the hyperattenuating surrounding rim consistent with appendagitis adjacent to the left colon (red arrow)

Magnetic Resonance Imaging (MRI) reveals a relatively high intensity but less than usual fat intensity pericolic mass, with dramatic intensity loss on suppressed images. The mass appears surrounded by the inflammatory halo, which appears hypointense on T1 weighted and hyperintense on T2 weighted images.^{1,10} Laparoscopy is rarely performed for diagnostic purposes in abdominal pain nowadays as advanced imaging clinches accurate preoperative diagnosis in most cases. In an era when laparoscopy was performed in cases that failed to be diagnosed as PEA pre-operatively, it used to reveal congested or hemorrhagic, twisted epiploic appendages. Histology would reveal infarcted appendages with fat necrosis, hemorrhage, inflammatory infiltration, and thrombosed vessels.^{8,11}

TREATMENT

Epiploic appendagitis is a benign self-resolving disease and is managed conservatively. Unlike most other causes of acute abdomen, PEA doesn't require hospitalization, antibiotics, or interventional management. Moreover, a prompt diagnosis, typically with imaging, avoids surgical interventions in most patients. Analgesics are often indicated for pain relief. With oral anti-inflammatory agents, the symptoms frequently resolve within ten days in most cases.^{3,12,13} The role of antibiotics has been evaluated, but little evidence supports its use in PEA. A 10-year study from Australia failed to demonstrate any positive impact of antibiotics on the outcome of patients with PEA.¹⁴

Sand et al. suggested a possible 40% recurrence rate in PEA, based on symptoms, but not confirmed by imaging, voicing concerns regarding conservative treatment alone versus laparoscopic excision of the inflamed appendage.⁴ However, the reported recurrence

rates were much less in other studies. Overall, PEA is not considered a surgical illness but a benign self-resolving acute abdomen. The indications for surgery include failure to respond to medical management and the development of complications, including abscess formation, intestinal obstruction, and perforation.¹⁵ No evidence-based standardized thresholds exist to define the ideal approach or timing to surgical intervention.^{4,6}

DIFFERENTIAL DIAGNOSES

Appendicitis: Murphy's triad, right lower quadrant abdominal pain, fever, and nausea/vomiting suggest appendicitis over appendagitis.¹⁶ The Alvarado scoring system, which incorporates clinical and laboratory parameters, also helps differentiate appendicitis from appendagitis.¹⁷ Abdominal imaging allows accurate diagnosis of appendicitis in most cases.¹ Diverticulitis: unlike appendagitis, diverticulitis is often associated with concomitant constitutional and gastrointestinal symptoms. Inflammatory markers are typically elevated as well. Again, abdominal imaging helps in conclusively differentiating between these pathologies.^{1,18} Other differentials include omental infarction, mesenteric panniculitis, cholecystitis, pancreatitis, and peritoneal tumors. Again, abdominal imaging plays a crucial role in accurate diagnosis.¹

CONCLUSION

In conclusion, epiploic appendagitis is increasingly reported as a cause of acute abdomen pain, especially lower quadrant pain. Advanced imaging modalities, such as Computed Tomography (CT), are pivotal in accurate diagnosis, often obviating surgical intervention. Further research is needed to refine diagnostic criteria, elucidate optimal management strategies, and explore the long-term outcomes of epiploic appendagitis.

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