



Epiploic appendagitis: An overlooked cause of acute abdominal pain

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Abstract

BACKGROUND

Epiploic appendagitis is a rare, often underrecognized cause of acute abdominal pain. Misdiagnosis can lead to unnecessary hospitalization, antibiotic use, or surgical intervention. Advances in imaging have improved the recognition of this

self-limiting condition, but clinical awareness remains critical.

AIM

To provide a comprehensive update on the epidemiology, anatomy, pathogenesis, clinical presentation, diagnostic strategies, differential diagnosis, and management of epiploic appendagitis, emphasizing its distinguishing features from other causes of acute abdomen.

METHODS

A review of the literature was conducted, focusing on the clinical characteristics, imaging findings, differential diagnoses, and evidence-based management strategies for epiploic appendagitis.

RESULTS

Epiploic appendagitis typically presents with acute, localized, non-radiating abdominal pain without significant systemic symptoms. Diagnosis is heavily reliant on imaging, with computed tomography (CT) being the gold standard. Hallmark CT findings include a small, fat-density ovoid lesion adjacent to the colon, with the usual characteristic ring and dot signs. Differential diagnoses include mainly diverticulitis, appendicitis, omental infarction, and many other causes. Management is predominantly conservative with nonsteroidal anti-inflammatory drugs and observation, reserving surgical intervention for rare, complicated cases.

CONCLUSION

Recognizing the clinical and imaging features of epiploic appendagitis is essential to avoid unnecessary interventions. Increased clinician awareness, coupled with judicious use of imaging, facilitates timely diagnosis and appropriate management, ensuring optimal patient outcomes.

Key Words: Epiploic appendagitis; Epiploic appendicitis; Appendices epiploicae inflammation; Abdominal fat necrosis; Acute abdominal pain; Diverticulitis

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Core Tip: Epiploic appendagitis should be considered in patients presenting with acute, localized lower abdominal pain without systemic symptoms. It often mimics diverticulitis or appendicitis but typically lacks fever, leukocytosis, or migratory pain. Computed tomography (CT) remains the gold standard for diagnosis, revealing a small, fat-density ovoid lesion adjacent to the colon with a hyperattenuating rim and, sometimes, a central dot sign. Management is conservative with nonsteroidal anti-inflammatory drugs and observation, as the condition is self-limiting. Awareness of persistent residual CT findings is essential to avoid confusion during future imaging. Improving clinician awareness can prevent unnecessary antibiotics, hospitalizations, and surgeries.

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INTRODUCTION

Early in our residency training, a seasoned physician shared a piece of time-honoured wisdom while discussing a case of abdominal pain: “The abdomen is a mystery box. Always keep an open mind and consider all possible causes”. This advice remains profoundly relevant today, as abdominal pain continues to present a complex diagnostic challenge requiring a systematic and comprehensive approach.

Clinical vignette

A 45-year-old obese man presented to the emergency department with the sudden onset of localized left lower quadrant abdominal pain. He was afebrile, hemodynamically stable, and denied gastrointestinal symptoms such as vomiting or diarrhea. Physical examination revealed focal tenderness without peritoneal signs, and laboratory studies were unremarkable. A computed tomography (CT) scan of the abdomen revealed a small, fat-attenuation lesion adjacent to the sigmoid colon with a characteristic hyperattenuating rim, leading to the diagnosis of primary epiploic appendagitis.

Among the many causes of acute abdominal pain, epiploic appendagitis is an often-overlooked entity. Although rare, its clinical recognition is crucial, as misdiagnosis can lead to unnecessary hospital admissions, inappropriate antibiotic therapy, and unwarranted surgical interventions[1,2]. Accurate diagnosis relies on a careful patient history, focused physical examination, and the judicious use of imaging within a structured diagnostic framework.

Epiploic appendages, also known as appendices epiploicae, are fat-filled peritoneal outpouchings arranged along the anti-mesenteric border of the colon. Inflammation of these structures, termed epiploic appendagitis (or appendicitis epiploica), is a benign, self-limiting condition that results from ischemic infarction, typically due to torsion or spontaneous venous thrombosis (primary epiploic appendagitis)[3]. Less commonly, it may occur secondary to adjacent intra-abdominal inflammatory processes (secondary epiploic appendagitis)[4].

This review aims to provide a comprehensive overview of the epidemiology, pathogenesis, clinical presentation, diagnostic strategies, and management of epiploic appendagitis. The goal is to enhance clinical recognition and reduce unnecessary interventions for this condition, which is often misdiagnosed.

MATERIALS AND METHODS

This article presents a review of epiploic appendagitis, synthesizing current knowledge on its epidemiology, anatomy, pathogenesis, clinical features, diagnostic strategies, differential diagnoses, and management approaches. Relevant literature was identified through a comprehensive search of electronic databases, including PubMed, MEDLINE, Scopus, and Google Scholar, covering publications from their inception until April 2025.

The search strategy utilized a combination of keywords and medical subject headings terms, including: “Epiploic appendagitis”; “Epiploic appendicitis”; “Appendices epiploicae inflammation”; “Fat necrosis of the abdomen”; “Acute abdominal pain differential diagnosis”; “CT findings in epiploic appendagitis”; “Management of epiploic appendagitis”.

Articles were selected based on their relevance to the clinical presentation, diagnostic imaging, management, and differential diagnosis of epiploic appendagitis. Priority was given to original research articles, clinical case series, systematic reviews, radiologic studies, and major guidelines. Non-English language articles were excluded unless an English abstract provided sufficient information.

Additional references were identified through the manual review of bibliographies from selected articles. Preference was given to studies published in peer-reviewed journals. Information from authoritative textbooks and radiology handbooks was also incorporated where appropriate to provide a comprehensive background and context.

Given the rarity of epiploic appendagitis, no formal systematic review methodology, such as the preferred reporting items for systematic reviews and meta-analyses statement guidelines, was applied. Instead, a narrative approach was chosen to integrate existing clinical evidence with expert opinion and radiologic interpretation.

RESULTS

Our comprehensive review highlights the distinct clinical and radiological features of epiploic appendagitis, emphasizing its diagnostic challenges and the importance of awareness among clinicians. Epiploic appendagitis typically presents with sudden-onset, localized, non-radiating abdominal pain, most commonly in the left lower quadrant, often mimicking more common conditions such as diverticulitis or appendicitis. The absence of systemic symptoms and minimal laboratory abnormalities is an important clinical clue.

Diagnostic imaging plays a central role in identification. CT remains the gold standard, characterized by the presence of a small, fat-density ovoid lesion adjacent to the colon, often with the hallmark “ring sign” and central hyperdense focus (“dot sign”). Ultrasound is a valuable initial tool, particularly in non-obese patients, and may show a non-compressible, hyperechoic ovoid mass with no internal Doppler flow. Magnetic resonance imaging (MRI), though less commonly used, offers high-resolution, radiation-free imaging and is particularly useful in pregnant women and young adults. A comparative table has been added to clarify the diagnostic roles of computerized scan (CT), ultrasound, and MRI.

We also identified two key forms of the condition: Primary epiploic appendagitis, which occurs due to torsion or venous thrombosis, and secondary epiploic appendagitis, which occurs in association with adjacent inflammatory pathologies, such as diverticulitis or appendicitis. The latter requires careful radiological interpretation to avoid misdiagnosis.

Management is conservative in the majority of cases, with nonsteroidal anti-inflammatory drugs (NSAIDs) providing effective symptom relief. Surgery is reserved for complications or unclear diagnoses. Imaging abnormalities may persist even after clinical resolution, and awareness of these residual findings is crucial to prevent unnecessary interventions.

Additionally, a new ultrasound figure and a diagnostic comparison table have been included to aid in the visual recognition and differentiation of this underdiagnosed entity.

DISCUSSION

Epidemiology

The true incidence of epiploic appendagitis remains uncertain, mainly due to its frequent underdiagnosis and nonspecific presentation[5,6]. However, it has been identified in approximately 2% to 7% of patients initially suspected of having acute diverticulitis, and in 0.3% to 1% of those initially thought to have acute appendicitis[1,7]. Epiploic appendagitis most commonly affects individuals between their second and fifth decades of life, with a mean age around 40 years. A notable male predominance has been observed, with men affected up to four times more frequently than women[8-12].

While epiploic appendagitis can occur along any segment of the colon, surgical case series suggest the following distribution: 57% in the rectosigmoid region, 26% in the ileocecal area, 9% in the ascending colon, 6% in the transverse colon, and, and 2% in the descending colon[1,13]. Several risk factors have been implicated in the development of epiploic appendagitis, including obesity, excess visceral adiposity, and sudden increases in intra-abdominal pressure related to intense physical activity. Table 1 shows some of the risk factors for primary epiploic appendagitis[6,9,12,14].

Anatomy and physiology

The outer surface of the circular muscle layer in the ascending, transverse, and descending segments of the colon is covered by three distinct longitudinal muscle bands, each approximately 6 mm wide and evenly spaced around the colon's circumference. These bands, collectively known as the *taeniae coli*, are designated as the *taenia libera*, *taenia mesocolica*, and *taenia omentalis*. As they approach the rectosigmoid junction, the *taeniae* converge to form a continuous muscular layer that encircles the bowel[10,15].

Epiploic appendages (appendices epiploicae) are small, pedunculated, fat-filled structures that project from the external surface of the colon, primarily along the *taenia libera* and *taenia omentalis* in the cecum and sigmoid colon. Typically numbering between 50 and 100, they are arranged in two longitudinal rows along most of the colon, apart from the transverse colon, where the presence of the greater omentum restricts their distribution to a single row. Each epiploic appendage is covered by visceral peritoneum and supplied by one or two small arteries and a single draining vein. Their size varies from 0.5 cm to 5 cm[16,17].

Embryologically, epiploic appendages first appear during the second trimester of fetal development, around the 20th week of gestation, as serosa-covered protrusions of visceral fat. They remain small during infancy and early childhood but enlarge during adulthood, particularly in individuals with obesity. This factor may explain the higher incidence of epiploic appendagitis in adults with obesity[18,19].

Although the precise function of epiploic appendages remains uncertain, several hypotheses have been proposed. They may act as mechanical cushions to protect the colon, serve as blood reservoirs during colonic movements that compress local vessels, or function as fat stores mobilized during periods of starvation. Additionally, some researchers suggest that epiploic appendages may contribute to immune defense and inflammation modulation, like the immunological role attributed to the greater omentum[20].

Pathogenesis

Epiploic appendagitis can be classified into two distinct forms: Primary and secondary. Understanding the underlying pathophysiological mechanisms of each type is essential for accurate diagnosis and appropriate management.

Primary epiploic appendagitis: Primary epiploic appendagitis represents an isolated inflammatory process occurring in the absence of any underlying intra-abdominal pathology. It results from ischemic or hemorrhagic infarction of an epiploic appendage, typically triggered by torsion of its vascular pedicle or spontaneous thrombosis of its central draining vein. These events compromise the blood supply, leading to aseptic fat necrosis and localized inflammation. The precise cause of torsion is not fully understood, but it appears more likely when the appendage is unusually elongated or enlarged. Acute torsion produces a complete clinical picture of epiploic appendagitis, while gradual or partial torsion may lead to chronic inflammation with minimal or absent symptoms[18,21].

Although primary epiploic appendagitis is generally self-limited, it can occasionally lead to secondary complications. Adhesions to adjacent structures may result in localized abscess formation, peritonitis, bowel obstruction, or intussusception. Histopathological examination of excised appendages often reveals inflammatory infiltrates and, in some cases, the presence of colonic bacteria, suggesting a potential microbial contribution to rare complications[22].

Secondary epiploic appendagitis: Secondary epiploic appendagitis occurs as a consequence of adjacent inflammatory processes within the abdomen. In this setting, a normal epiploic appendage becomes inflamed due to its proximity to an inflamed organ, such as the colon (in diverticulitis), the appendix (in appendicitis), the gallbladder (in cholecystitis), or in association with inflammatory bowel disease. Among these, colonic diverticulitis is the most frequent cause. On imaging, secondary epiploic appendagitis often exhibits the typical features of primary disease but is accompanied by more extensive surrounding inflammation. Importantly, the inflamed appendage itself is not the primary driver of clinical symptoms and typically resolves with treatment of the underlying condition[4,23,24]. Tables 2 and 3 compares primary with secondary epiploic appendagitis. In a recent report by Sahoo *et al*[25], three cases of secondary epiploic appendagitis were described with distinguishing CT findings. These cases highlight the diagnostic challenges when epiploic appendagitis occurs adjacent to other inflammatory processes, such as diverticulitis or appendicitis. The imaging features can mimic more serious conditions and may lead to unnecessary interventions if not properly recognized.

Clinical findings and outcome

Diagnosing epiploic appendagitis remains clinically challenging, as the condition lacks pathognomonic signs and specific laboratory markers. Its clinical presentation is variable and often mimics more common causes of acute abdominal pain, leading to frequent misdiagnosis, especially in emergency settings. Most commonly, it is mistaken for acute diverticulitis (when presenting with left-sided pain) or acute appendicitis (when presenting with right-sided pain), both of which may necessitate urgent surgical intervention[11,26-28].

Symptoms: Localized abdominal pain is the hallmark symptom. Pain onset can be sudden or gradually progressive. It is typically constant, dull, and non-radiating, and the patients often localize the pain with a single finger, corresponding precisely to the inflamed appendage[28]. Although epiploic appendagitis can theoretically occur in any quadrant of the

Table 1 Risk factors for primary epiploic appendagitis

Risk factor	Explanation
Obesity	Increased visceral fat enlarges epiploic appendages, predisposing them to torsion
Large or elongated epiploic appendages	Anatomical variations can increase the risk of pedicle twisting
Sudden or vigorous physical activity	Rapid body movements may induce torsion of appendages
Male gender	A higher prevalence is reported in men, with a ratio of up to 4:1 compared to women
Middle age (30-50 years)	Most cases occur during the fourth and fifth decades of life
Increased intra-abdominal pressure	Includes straining during constipation, heavy lifting, chronic coughing, or other causes of pressure spikes

Table 2 Comparison of primary and secondary epiploic appendagitis

Feature	Primary epiploic appendagitis	Secondary epiploic appendagitis
Definition	Isolated inflammation of an epiploic appendage	Inflammation of an epiploic appendage secondary to adjacent organ inflammation
Etiology	Torsion or spontaneous venous thrombosis causing ischemic infarction	Extension of inflammation from nearby pathology (<i>e.g.</i> , diverticulitis, appendicitis, cholecystitis)
precipitating factors	Large, elongated appendages; obesity; sudden body movements	Underlying intra-abdominal infection or inflammation
clinical presentation	Localized, non-radiating abdominal pain; minimal systemic symptoms	Symptoms dominated by the underlying primary disease
imaging findings	Isolated inflamed epiploic appendage with minimal adjacent tissue involvement	Inflamed appendage plus significant adjacent inflammatory changes
Management	Conservative treatment (NSAIDs, observation)	Treatment of the underlying primary condition
Prognosis	Excellent; self-limiting within 1-2 weeks	Depends on resolution of the primary disease

NSAID: Nonsteroidal anti-inflammatory drug.

Table 3 Clinical pearls

Clinical pearls
Sudden, localized, non-radiating abdominal pain without significant systemic symptoms raises concern for epiploic appendagitis
Minimal laboratory abnormalities help differentiate it from more prominent inflammatory processes like diverticulitis or appendicitis
Imaging (especially CT) is critical for diagnosis; ultrasound can suggest the diagnosis, particularly in thin patients, but CT remains the gold standard, providing definitive findings to distinguish epiploic appendagitis from other causes of acute abdominal pain
Most cases resolve conservatively without the need for surgery

CT: Computed tomography.

abdomen, it most frequently affects the left lower quadrant (approximately 60%-80% of cases). Still, it may also present on the right side. Less common symptoms may include sensation of fullness after meals, early satiety, epigastric discomfort, vomiting, abdominal bloating, diarrhea (less commonly constipation), low-grade fever, and/or mild weight loss (in rare cases)[21,23].

On physical examination, the patients generally appear in good overall condition and are usually afebrile. Localized tenderness over the area of inflammation is typical. Rebound tenderness, guarding, and rigidity are usually absent or mild if present. In 10%-30% of cases, a palpable tender mass may be appreciated on examination[6,8,9]. Laboratory tests are typically normal, including erythrocyte sedimentation rate, liver transaminases, pancreatic amylase and lipase, stool, and urinalysis. Mild leukocytosis and elevated C-reactive protein may occasionally be observed but are non-specific and usually mild, reflecting localized ischemic fat necrosis[28].

Outcome: Epiploic appendagitis is a benign and self-limiting condition, with complete symptom resolution typically occurring within 3 to 14 days without surgical intervention[29,30]. The risk of recurrence appears to be very low, although it has not been systematically studied[6]. Rare complications include adhesions leading to intestinal obstruction

or intussusception, abscess formation following progressive inflammation and necrosis, and incarceration of an inflamed epiploic appendage within a femoral, umbilical, or inguinal hernia sac[31]. Calcification of necrotic appendages can result in peritoneal loose bodies (*corpora aliena*), which can migrate within the peritoneal cavity and may occasionally mimic a neoplastic process on imaging. Notably, epiploic appendages are considered one of the most common sources of intraperitoneal loose bodies, usually identified in the pelvis during incidental imaging or surgery[32,33].

Diagnosis

Diagnosing epiploic appendagitis based solely on clinical presentation is highly challenging. The condition lacks distinctive clinical signs or laboratory findings, remains relatively rare, and is often unfamiliar to many healthcare providers. Consequently, imaging techniques, particularly CT and ultrasound, are crucial for accurate diagnosis.

Abdominal ultrasound: Ultrasound offers a rapid, non-invasive, and radiation-free imaging option, beneficial for: Non-obese patients, pregnant women, and patients in whom radiation exposure is a concern. Typical sonographic features of epiploic appendagitis include a non-compressible, hyperechoic, solid ovoid lesion adjacent to the colonic wall, located at the site of maximal tenderness, a subtle hypoechoic rim surrounding the lesion, representing inflammation, absence of intralesional color Doppler flow, indicative of tissue necrosis, and increased peripheral vascularity in surrounding fat due to reactive hyperemia, which may be further enhanced with contrast-enhanced ultrasound[34-36].

An important ultrasonographic feature is the adherence of the inflamed appendage to the anterior abdominal wall, demonstrated by the lack of mobility during respiratory motion[37,38]. Kahveci *et al*[39] highlighted the diagnostic value of ultrasound in identifying primary epiploic appendagitis, particularly in non-obese patients. Their findings emphasize the need to consider this diagnosis even when CT is unavailable. In another rare presentation, Kahveci *et al*[40] described appendagitis localized to the vermiform appendix, mimicking appendicitis but revealed by sonography. However, ultrasound sensitivity may vary. When performed by a skilled and experienced radiologist, ultrasound examination can achieve sensitivity and specificity comparable to those of CT scanning. However, diagnostic abnormalities may not always be visualized. Consequently, CT remains the gold standard for confirming the diagnosis. **Figure 1** shows ultrasound evaluation of acute epiploic appendagitis in a 25-year-old man.

Abdominal CT scan: Normal epiploic appendages are generally not visualized on CT due to their fat attenuation, which renders them indistinguishable from surrounding adipose tissues, such as retroperitoneal fat. They become radiologically apparent only when outlined by a sufficient amount of intraperitoneal fluid, such as ascites or hemoperitoneum, or when inflammatory processes occur in the surrounding tissues, resulting in localized edema and increased soft tissue density that can create sufficient contrast to delineate the otherwise indistinct epiploic appendages[20,24,41].

Characteristic CT imaging features of epiploic appendagitis (**Figure 2**). Two hallmark features define the CT appearance: (1) Primary imaging appearance. The most characteristic CT finding is a solitary, oval-shaped, fat-attenuation lesion measuring approximately 2 cm-4 cm, located adjacent to the anterior aspect of the colonic wall. This paracolic mass is typically associated with thickening of the overlying visceral peritoneum and surrounding inflammatory fat stranding [9,11,12,42-46]; and (2) Ring and dot signs. A thin (2 mm-3 mm) hyperattenuating rim encircling the lesion, referred to as the ring sign, represents inflammation of the visceral peritoneum covering the epiploic appendage. Commonly, a central hyperdense focus the dot sign may be observed within the fatty lesion, corresponding to a thrombosed central draining vein. Although this imaging finding is considered pathognomonic, its reported prevalence varies widely, ranging from 30% to 78% of cases. Therefore, the absence of these signs does not exclude the diagnosis of epiploic appendagitis[2,7,47, 48].

Additional CT findings: Parietal peritoneal thickening (present in 30%-40% of cases) suggests that the inflammation has extended beyond the appendage itself[9,11]. Segmental colonic wall thickening may be present but is usually mild, asymmetric, and disproportionate compared to the more pronounced surrounding fat stranding, a key feature distinguishing primary epiploic appendagitis from secondary involvement due to underlying colonic pathology (*e.g.*, diverticulitis)[3,47]. Nugent *et al*[14] identified several common CT imaging features associated with primary epiploic appendagitis, reporting that a fat-density ovoid lesion with a hyperattenuating peripheral rim was present in 100% of cases. A central hyperdense focus (dot sign) was observed in 79%, while peritoneal thickening was noted in 76%. Bowel wall thickening was present in 47% of cases, followed by the presence of diverticula in 28% and free intraperitoneal fluid in a smaller proportion of patients[49]. Omental infarction shares several pathophysiological features with epiploic appendagitis. However, on CT, lesions associated with omental infarction are typically larger, exhibit a cake-like appearance, are centered within the omentum, and are most commonly situated medial to the cecum or ascending colon [14,50].

MRI: MRI, though less commonly employed than CT, can play a valuable role in the diagnosis of epiploic appendagitis, particularly in patient populations where radiation exposure is a concern, such as pregnant women or young adults[51]. MRI provides high-resolution imaging of soft tissues and can identify the characteristic features of epiploic appendagitis, including a small, well-defined, fat-intensity ovoid lesion adjacent to the colon, typically surrounded by a hyperintense rim on T2-weighted images. The lesion demonstrates no enhancement post-gadolinium, consistent with necrotic fat[52]. MRI can help differentiate epiploic appendagitis from other fat-containing lesions and inflammatory or neoplastic processes in the abdomen[51]. While not routinely used due to cost and availability, MRI serves as an effective alternative when CT is contraindicated, or equivocal findings require clarification. **Table 4** compares the three modalities in diagnosing epiploic appendagitis.

Table 4 Comparison of radiologic modalities in the diagnosis of epiploic appendagitis

Feature	Ultrasound	Computed tomography	Magnetic resonance imaging
Utility	First-line in young, thin patients; pregnancy; bedside availability	Gold standard; most widely used modality	Alternative when CT is contraindicated (e.g., pregnancy, allergy to contrast)
Key imaging features	Hyperechoic, non-compressible ovoid mass; no Doppler flow; mild surrounding edema	Oval fat-density lesion with hyperattenuating rim ("ring sign") and central dot sign	T1-hyperintense lesion with T2-hyperintense rim; no contrast enhancement
Sensitivity/specificity	Operator-dependent; moderate sensitivity and specificity	High sensitivity and specificity (> 90%)	Comparable to CT in skilled hands; limited data
Advantages	No radiation; portable; repeatable	High resolution; widely available; detailed fat and bowel wall visualization	Excellent soft tissue contrast; radiation-free
Limitations	May be limited by obesity or bowel gas; user expertise critical	Radiation exposure; contrast may be needed	High cost; limited availability; longer scan time
Preferred use	Initial screening in selected populations (e.g., pediatrics, pregnant women)	Routine evaluation of acute abdominal pain	Problem-solving tool or radiation-sensitive patients

CT: Computed tomography.

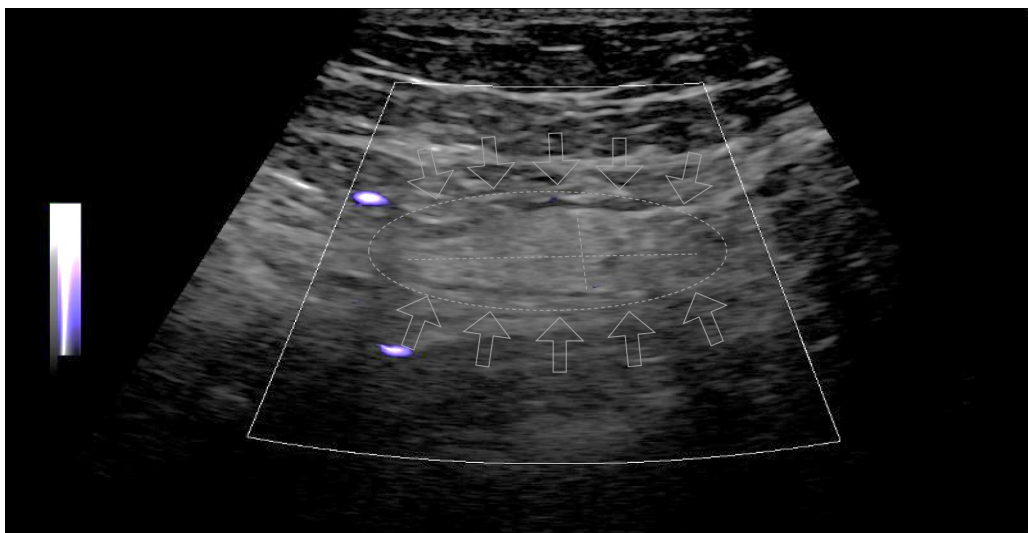


Figure 1 Acute epiploic appendagitis in a 25-year-old man. Ultrasound evaluation of the area of maximum tenderness in the left iliac fossa shows a partially defined hyperechoic nodule with hypoechoic rim measuring about 1.5 cm × 0.7 cm. The surrounding fat appears hyperechoic.

Differential diagnosis

The classic clinical presentation of epiploic appendagitis is characterized by three key features: Acute onset, localized lower abdominal pain, and focal tenderness. Given these features, epiploic appendagitis represents an important consideration in the differential diagnosis of patients presenting with localized abdominal pain, especially in the left lower quadrant (most common) or, less frequently, the right lower quadrant[53]. Demographic factors also provide diagnostic clues, as epiploic appendagitis typically affects obese males in their fourth or fifth decade of life. The two most important conditions to differentiate from epiploic appendagitis are acute diverticulitis and acute appendicitis. Figure 3 illustrates a flow chart outlining a diagnostic approach to localized lower abdominal pain suspected of being caused by epiploic appendagitis[54].

Acute diverticulitis: Acute diverticulitis typically presents with the abrupt onset of abdominal pain, most commonly localized to the left lower quadrant, reflecting the high prevalence of sigmoid colon involvement. Although the sigmoid colon is the most frequently affected region, diverticular inflammation can involve any part of the colon, including the descending, transverse, ascending segments, and the cecum[55,56]. Alterations in bowel habits are common, with constipation reported in up to 50% of cases, and diarrhea occurring in approximately 25%-35%[57]. Hematochezia is relatively rare. Additionally, 10%-15% of patients may present with urinary symptoms, such as urgency, frequency, or dysuria, typically due to bladder irritation from an adjacent inflamed sigmoid colon. Fever is also a frequent systemic manifestation[57]. In contrast to epiploic appendagitis, which rarely leads to significant complications, acute diverticulitis may be associated with serious sequelae, including colonic perforation, abscess formation, and fistula development[58]. Laboratory evaluation often reveals elevated leukocyte counts and inflammatory biomarkers, which are more

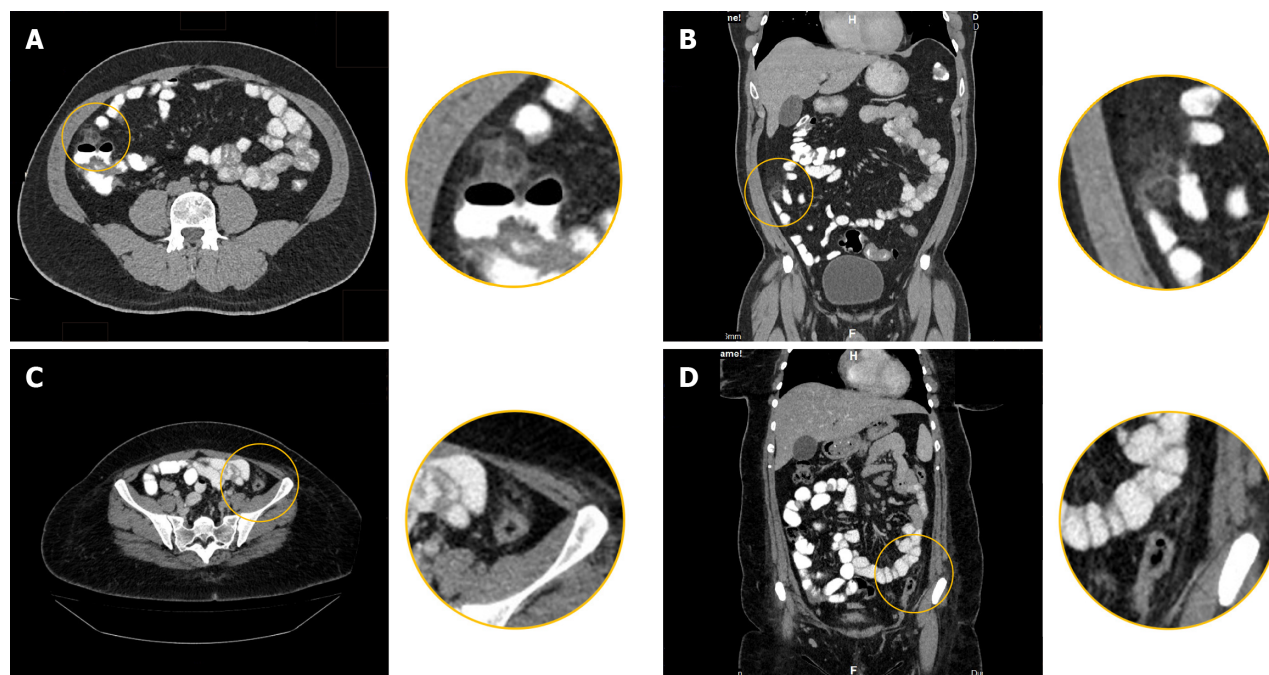


Figure 2 Computed tomography-scan findings of acute epiploic appendagitis. A and B: In a 43-year-old woman: Axial (A); Coronal contrast-enhanced computed tomography-scan (B). Acute epiploic appendagitis in a 43-year-old man. A well-defined, oval-shaped fat density nodule is seen adherent to the anterior wall of the cecum, measuring 24 cm × 1.6 cm. It has a thick rim and is surrounded by mild fat stranding. This is in keeping with epiploic appendagitis; C and D: In a 35-year-old woman: Axial (C); Coronal contrast-enhanced computed tomography-scan (D). Acute epiploic appendagitis in a 35-year-old woman. An oval-shaped fat-density nodule is noted in the left lower abdomen abutting the anterior wall of the distal descending colon with mild surrounding fat stranding.

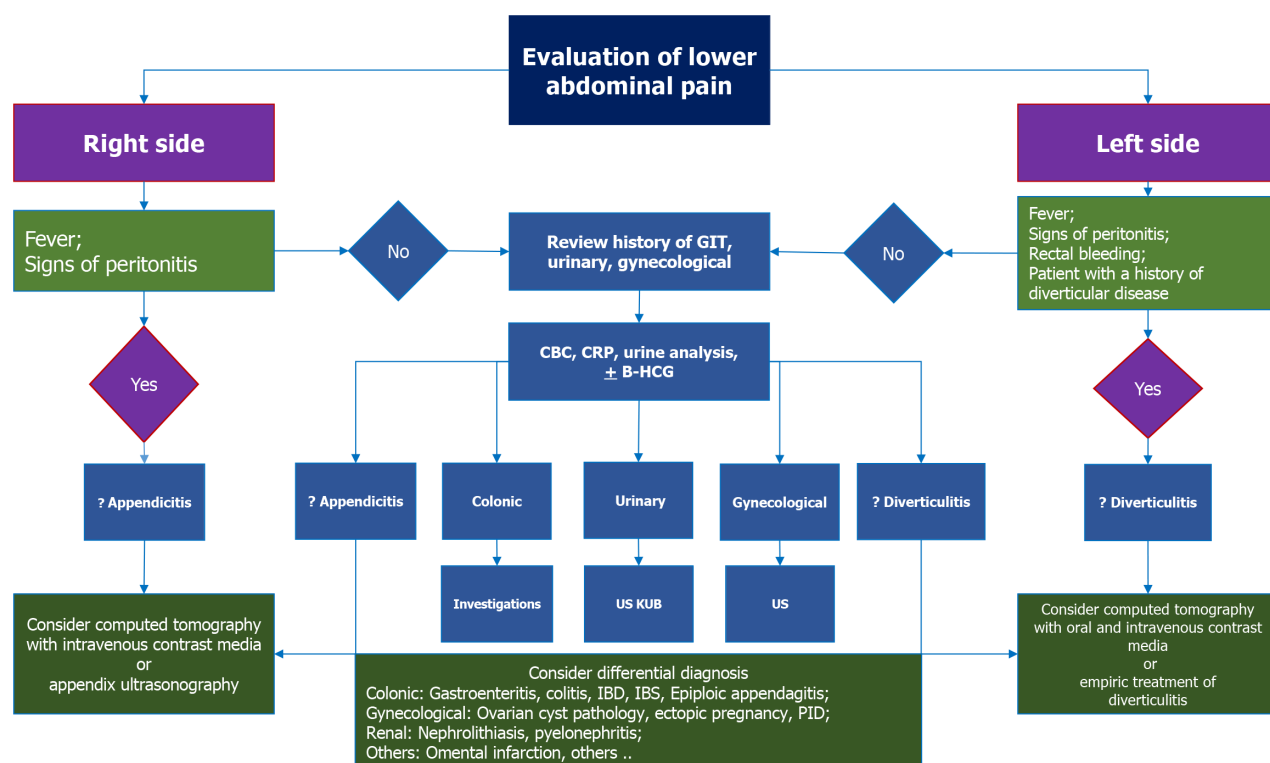


Figure 3 Diagnostic approach to localized lower abdominal pain suspected of epiploic appendagitis. GIT: Gastrointestinal tract; CBC: Complete blood count; CRP: C-reactive protein; B-HCG: Beta-human chorionic gonadotropin; US: Ultrasound; USKUB: Ultrasound of the kidneys, ureters and bladder; PID: Pelvic inflammatory disease; IBD: Inflammatory bowel disease; IBS: Irritable bowel syndrome.

pronounced than in cases of epiploic appendagitis[59-62]. On physical examination, a palpable tender mass indicative of pericolonic inflammation or a peridiverticular abscess is present in approximately 20% of patients. Localized peritoneal signs, including guarding, rebound tenderness, and abdominal wall rigidity, may be evident on physical examination. In cases involving a distal sigmoid abscess, digital rectal examination can reveal tenderness or a palpable mass[63-65]. Additionally, fecal occult blood testing may yield positive results, reflecting mucosal inflammation or localized bleeding. Hemodynamic instability, including hypotension or shock, is rare and typically signals advanced complications such as perforation with generalized peritonitis[63]. From an epidemiological perspective, individuals with sigmoid diverticulitis tend to be significantly older than those diagnosed with primary epiploic appendagitis in the same region, with mean ages of 69.7 and 41.4 years, respectively ($P < 0.001$)[30]. CT imaging of diverticulitis commonly reveals colonic wall thickening and pericolic fat stranding, especially in patients with underlying diverticulosis[66]. Notably, acute diverticulitis represents the most frequent etiology of secondary epiploic appendagitis. Imaging features consistent with secondary involvement include multiple inflamed epiploic appendages, increased lesion size, and widespread colonic wall thickening. In contrast, primary epiploic appendagitis may coexist with non-inflamed diverticulosis, and the presence of diverticula should not preclude its diagnosis when characteristic radiologic signs are present[23]. Therefore, thorough imaging assessment is essential to accurately differentiate diverticular inflammation from epiploic appendage involvement, particularly in cases where both pathologies may be present concurrently.

Acute appendicitis: As previously noted, epiploic appendagitis predominantly affects the lower left abdominal quadrant; however, it may occasionally present in the lower right quadrant, where it can mimic the clinical features of acute appendicitis and thus be considered in its differential diagnosis. Accurate incidence data for epiploic appendagitis are lacking; however, it is generally considered less common than acute appendicitis. When comparing the two conditions with respect to age distribution, acute appendicitis most frequently occurs during the second and third decades of life, whereas epiploic appendagitis tends to present more commonly in the fourth and fifth decades. Both conditions exhibit a higher prevalence in males[67]. The primary clinical presentation of both acute appendicitis and right-sided epiploic appendagitis is right lower quadrant abdominal pain. However, acute appendicitis can be distinguished from epiploic appendagitis by several characteristic features. In appendicitis, the pain often begins in the periumbilical region and migrates to the right lower quadrant as inflammation progresses a phenomenon observed in approximately 50%-60% of cases[68-70]. Additionally, systemic symptoms such as anorexia, fever, nausea, and vomiting are more commonly associated with acute appendicitis compared to epiploic appendagitis. On physical examination, both acute appendicitis and right-sided epiploic appendagitis typically present with localized tenderness in the right lower quadrant[71]. However, rebound tenderness is more commonly and markedly observed in acute appendicitis. Signs of peritoneal irritation, which are considered pathognomonic for acute peritonitis, are significantly more pronounced compared to epiploic appendagitis[72]. Several physical examination maneuvers are utilized to support the diagnosis of acute appendicitis, although none are definitively diagnostic. These signs are generally absent in cases of epiploic appendagitis. McBurney's point tenderness refers to maximal tenderness located approximately 1.5 to 2 inches from the anterior superior iliac spine along a line drawn to the umbilicus. This finding has a reported sensitivity ranging from 50% to 94% and a specificity between 75% and 86%[30].

Rovsing's sign is defined as the elicitation of right lower quadrant pain upon palpation of the left lower quadrant. This indirect tenderness suggests localized peritoneal irritation on the right side, with sensitivity ranging from 22% to 68% and specificity between 58% and 96%[73]. Mild leukocytosis (white blood cell count > 10000 cells/ μ L) is commonly observed in patients with acute appendicitis. Approximately 80% of cases present with leukocytosis accompanied by a left shift, characterized by an increased total white blood cell count, elevated neutrophil levels, and the presence of immature neutrophils (bands)[74]. The sensitivity and specificity of leukocytosis for diagnosing acute appendicitis are approximately 80% and 55%, respectively. A normal white blood cell count makes acute appendicitis less likely, although it may still be seen in the very early stages of the disease[75,76]. In contrast, epiploic appendagitis rarely presents with leukocytosis, and inflammatory markers such as C-reactive protein are typically within normal reference ranges. A non-contrast abdominal CT scan is highly effective in distinguishing between epiploic appendagitis and acute appendicitis. Characteristic CT findings of acute appendicitis include an enlarged appendix with a diameter greater than 6 mm and an occluded lumen, wall thickening exceeding 2 mm, and periappendiceal fat stranding. Additional features may include thickening of the adjacent cecal apex, intraluminal appendicoliths, and enhancement of the appendiceal wall[77-80].

Additional differential diagnoses: Based on the anatomical location of pain, a variety of other conditions must also be considered. Table 5 provides a comprehensive comparison of the key differential diagnoses of epiploic appendagitis, focusing on pain location, clinical symptoms, characteristic imaging findings, and distinguishing features. Recognizing these overlapping and divergent clinical patterns is essential for accurate diagnosis and management. In particular, careful attention to systemic signs, imaging characteristics, and patient demographics can assist clinicians in differentiating epiploic appendagitis from more serious conditions requiring surgical or urgent intervention[81].

Special considerations in female patients: In female patients, assessing lower abdominal pain presents a diagnostic challenge due to the potential involvement of multiple organ systems. The prioritization of differential diagnoses is shaped by several factors, including the patient's age, reproductive status, the possibility of atypical presentations of common conditions, the presence of concurrent pathologies, and scenarios in which clinical findings do not fully explain the patient's symptoms[82]. A thorough evaluation that integrates the patient's history, physical examination, and diagnostic investigations is essential to narrowing the differential diagnosis and identifying the underlying cause. When the initial clinical assessment does not clearly point to a specific origin, a parallel approach is typically employed to evaluate both gynecologic and intra-abdominal sources of pain. Lateral pelvic pain frequently suggests a gynecologic

Table 5 Expanded differential diagnoses of epiploic appendagitis

Condition	Typical pain location	Key symptoms	Imaging findings	Distinguishing features
Primary epiploic appendagitis	Left or right lower quadrant	Localized, constant, dull pain without systemic symptoms	Oval fat-density lesion adjacent to colon; “ring and dot” signs on CT	Minimal systemic signs; resolves spontaneously; no significant bowel wall thickening
Acute diverticulitis	Most often left lower quadrant (sigmoid colon)	Abdominal pain, fever, bowel habit changes (constipation or diarrhea), ± urinary symptoms	Colonic wall thickening, pericolic fat stranding, diverticula on CT	Older age, significant leukocytosis, risk of perforation, and abscess
Acute appendicitis	Right lower quadrant	Migratory pain (from periumbilical to RLQ), anorexia, nausea, vomiting, fever	Enlarged appendix (> 6 mm), wall thickening, periappendiceal fat stranding, appendicolith	Younger age; systemic signs; typical migratory pain pattern
Acute omental infarction	More or less central abdomen (medial to cecum or ascending colon)	Localized pain; less frequent systemic symptoms	Larger, cake-like fatty mass centered in omentum, medial to colon	Lesion size > 5 cm; central location in omentum
Mesenteric lymphadenitis	Right lower quadrant	Abdominal pain, often post-infectious; fever	Enlarged mesenteric lymph nodes clustered around mesenteric vessels	Often follows viral illness; affects children or young adults
Crohn’s ileitis	Right lower quadrant (terminal ileum)	Abdominal pain, weight loss, low-grade fever, less commonly Chronic diarrhea	Segmental bowel wall thickening, “skip lesions”, mesenteric fat wrapping	Chronic symptoms; associated with extraintestinal manifestations
Infectious ileitis	Right lower quadrant (terminal ileum)	Diarrhea, fever, abdominal pain	Bowel wall thickening, enlarged mesenteric nodes	Recent history of travel or foodborne illness; resolves with antibiotics
Ureteric colic	Flank pain radiating to groin (can mimic RLQ or LLQ pain)	Severe, colicky flank pain, hematuria	Ureteral stone, hydronephrosis on CT or ultrasound	Positive urinalysis for blood; severe intermittent pain
Pelvic inflammatory disease	Bilateral lower abdomen	Lower abdominal pain, fever, abnormal vaginal discharge	Thickened, fluid-filled fallopian tubes on pelvic ultrasound	Cervical motion tenderness; positive pelvic exam findings
Ovarian torsion	Lateral pelvic pain	Sudden-onset severe pelvic pain, nausea, vomiting	Enlarged ovary, peripheral follicles, absent Doppler flow	Surgical emergency; Doppler ultrasound critical for diagnosis
Ruptured or hemorrhagic ovarian cyst	Lateralized pelvic pain	Sudden unilateral lower abdominal pain, sometimes following exertion	Free pelvic fluid, complex adnexal mass on ultrasound	May self-resolve or cause hemoperitoneum depending on severity
Ectopic pregnancy	Any lower quadrant or pelvic pain	Amenorrhea, vaginal bleeding, abdominal pain	Empty uterus, adnexal mass on transvaginal ultrasound; positive 2-hCG	Suspected in reproductive-age women; obstetric emergency if ruptured

RLQ: Right lower quadrant; LLQ: Left lower quadrant; 2-hCG: 2-human chorionic gonadotropin; CT: Computed tomography.

etiology, such as ovarian or fallopian tube pathology, though other causes should also be considered in the differential diagnosis[83].

Management

Advances in imaging, particularly CT, have significantly improved the diagnosis of epiploic appendagitis, reducing the need for unnecessary surgical exploration. Today, epiploic appendagitis is recognized as a benign, self-limiting condition, and conservative management is the preferred approach in most cases.

Conservative management: First-line therapy consists of symptomatic management, primarily using NSAIDs for pain control[3,31,84]. Antibiotics have been suggested as adjunctive therapy in some cases, although there is no clear evidence to support their routine use in uncomplicated epiploic appendagitis[15,21,51]. Most patients experience symptomatic improvement within 3 to 14 days, and complete clinical resolution is expected within one to two weeks[1,37,52].

It is important to note that CT imaging abnormalities (*e.g.*, fat-density lesions, residual inflammatory changes) may persist for several months after clinical resolution. Pathognomonic CT features may remain visible for up to six months, potentially leading to diagnostic confusion if the patient presents later with unrelated abdominal symptoms. Therefore, clinicians should be aware of long-term residual imaging findings and carefully correlate them with the clinical picture to avoid unnecessary interventions[85].

Indications for surgical intervention: Surgical management is reserved for patients with persistent or worsening symptoms despite adequate conservative treatment, the development of complications, such as bowel obstruction, intussusception, or localized abscess formation, or when new symptoms arise, including high fever, intractable nausea or vomiting, or inability to tolerate oral intake[86]. The procedure involves ligation and excision of the inflamed and necrotic

epiploic appendage when surgery is indicated. However, most cases of epiploic appendagitis resolve with conservative therapy, requiring only supportive care and symptom monitoring[16,83]. Awareness of imaging persistence and careful follow-up is essential to avoid overtreatment. **Figure 4** shows a clinical management pathway for epiploic appendagitis. Conservative therapy is the mainstay in uncomplicated cases, while surgical intervention is reserved for patients with persistent symptoms or complications.

Clinical scenarios

Case 1: A 52-year-old overweight woman with a history of hypertension presented to the emergency department with a two-day history of progressively worsening, localized left lower quadrant abdominal pain. She denied nausea, vomiting, diarrhea, hematochezia, or urinary symptoms. Physical examination revealed localized tenderness over the left lower quadrant without rebound or guarding. She was afebrile, and her vital signs were stable. Laboratory investigations, including complete blood count, C-reactive protein, liver and pancreatic enzymes, and urinalysis, were unremarkable.

Given the clinical presentation, differential diagnoses included acute sigmoid diverticulitis, ureteric colic, and acute omental infarction. A non-contrast abdominal CT scan was performed, which revealed a 3 cm oval, fat-density lesion adjacent to the sigmoid colon with a hyperattenuating rim and surrounding minimal inflammatory fat stranding, without significant bowel wall thickening or diverticulosis. No ureteric stones or hydronephrosis were identified. These findings were consistent with a diagnosis of primary epiploic appendagitis. The patient was managed conservatively with NSAIDs and discharged home with symptom resolution over the following 10 days.

Case 2: A 34-year-old previously healthy woman presented to the emergency department with the sudden onset of sharp right lower quadrant abdominal pain that began six hours prior. She described the pain as constant and localized, without migration. She denied fever, nausea, vomiting, diarrhea, or urinary symptoms. Her last menstrual period was two weeks prior, and there was no history of abnormal vaginal bleeding.

On examination, she was afebrile and hemodynamically stable. The abdominal examination revealed localized tenderness at McBurney's point, but no rebound tenderness or guarding was noted. Pelvic examination was unremarkable, and urinalysis was normal. Laboratory investigations revealed a normal white blood cell count and a normal C-reactive protein level. Serum beta-human chorionic gonadotropin was negative.

Given the clinical presentation, differential diagnoses included acute appendicitis, ruptured ovarian cyst, ovarian torsion, and primary epiploic appendagitis.

A contrast-enhanced abdominal and pelvic CT scan was performed, which revealed a 2.5 cm oval fat-density lesion adjacent to the ascending colon with a hyperattenuating rim (ring sign) and minimal adjacent fat stranding. The appendix appeared normal, and no adnexal abnormalities were noted on imaging. These findings confirmed the diagnosis of primary epiploic appendagitis. The patient was managed conservatively with NSAIDs and experienced complete symptom resolution within one week.

Multiple choice questions: (1) The most common underlying pathology for primary epiploic appendagitis is: (a) Acute torsion causes ischemia and infarction with aseptic fat necrosis; (b) Drug-induced venous thrombosis; (c) Adjacent diverticulitis; (d) Translocation of colonic bacteria and abscess formation; and (e) Mesenteric panniculitis; (2) Regarding the age, comparing acute appendicitis, acute diverticulitis, and primary epiploic appendagitis: (a) Acute appendicitis is by far more common in young people, while acute diverticulitis and primary epiploic appendagitis in old people; (b) Epidemiologically, no significant difference regarding age between all; (c) Primary epiploic appendagitis usually occurs in older people in relation to acute appendicitis, and acute diverticulitis; (d) Usually acute appendicitis and primary epiploic appendagitis in young, and acute diverticulitis in old people; and (e) Patient with primary epiploic appendagitis usually younger than those with acute diverticulitis and older than those with acute appendicitis; (3) Anatomically, which of the following is the most correct: (a) Epiploic appendages are 100 to 200 small, pedunculated, fat-filled structures that project from the external surface of the colon, their size varies from 0.5 cm to 5 cm; (b) Epiploic appendages are 50 to 100 small, pedunculated, fibrous-filled structures that project from the external surface of the colon, their size varies from 0.5 cm to 5 cm; (c) Epiploic appendages are 50 to 100 small, pedunculated, fat-filled structures that project from the posterior surface of the colon, their size varies from 0.5 cm to 5 cm; (d) Epiploic appendages are 50 to 100 small, pedunculated, fat-filled structures that project from the external surface of the colon, their size varies from 0.5 cm to 20 cm; and (e) Epiploic appendages are 50 to 100 small, pedunculated, fat-filled structures that project from the external surface of the colon, their size varies from 0.5 cm to 5 cm; (4) Clinically, the most likely features of primary epiploic appendagitis are: (a) The classic clinical presentation of epiploic appendagitis is characterized by three key features: Acute onset, localized lower abdominal pain, and focal tenderness; (b) The classic clinical presentation of epiploic appendagitis is characterized by three key features: Insidious onset, localized upper abdominal pain, and focal tenderness; (c) The classic clinical presentation of epiploic appendagitis is characterized by three key features: Acute onset, diffuse lower abdominal pain, and focal tenderness; (d) The classic clinical presentation of epiploic appendagitis is characterized by three key features: Acute onset, localized lower abdominal pain, and generalized tenderness; and (e) The classic clinical presentation of epiploic appendagitis is characterized by three key features: Acute onset, localized lower abdominal pain, and focal palpable mass; (5) The most common differential diagnosis of primary epiploic appendagitis are: (a) Omental infarction; (b) Acute diverticulitis; (c) Acute appendicitis; (d) Mesenteric panniculitis; and (e) Ectopic pregnancy; (6) Which of the following CT scan findings is most characteristic of primary epiploic appendagitis? (a) Enlarged appendix with thickened wall and periappendiceal stranding; (b) Fat-density ovoid lesion adjacent to the colon with a hyperattenuating rim ("ring sign"); (c) Complex adnexal mass with absent blood flow; (d) Circumferential thickening of the sigmoid colon with pericolonic fat stranding; and (e) Larger, cake-like appearance, lesion centered within the omentum; and (7) The initial management for a confirmed case of primary epiploic appendagitis without

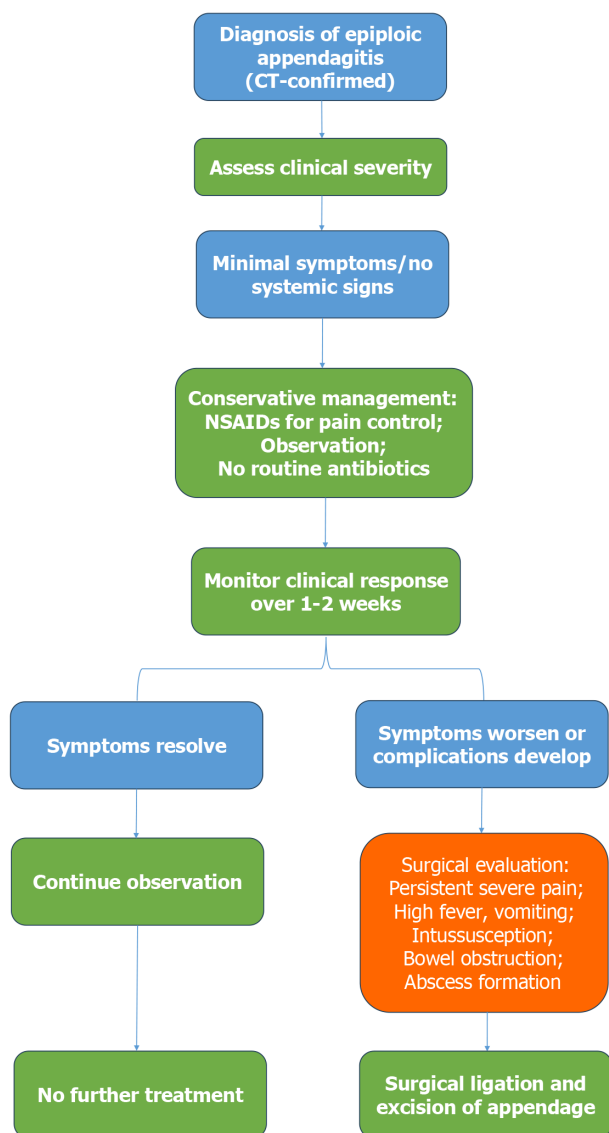


Figure 4 Clinical management pathway for epiploic appendagitis. Conservative therapy is the mainstay in uncomplicated cases, while surgical intervention is reserved for patients with persistent symptoms or complications. CT: Computed tomography; NSAID: Nonsteroidal anti-inflammatory drug.

complications typically includes: (a) Immediate surgical excision; (b) Broad-spectrum intravenous antibiotics; (c) Supportive care with NSAIDs and observation; (d) Exploratory laparotomy; and (e) Oral quinolones. The answer to these questions can be found in the [Supplementary material](#).

Future directions

Despite increased recognition of epiploic appendagitis in recent years, several critical gaps in knowledge and clinical practice remain. Future research is needed to address these areas and further optimize the diagnosis and management of this frequently misdiagnosed condition. First, epidemiological data on the true incidence and prevalence of epiploic appendagitis are limited, mainly due to underreporting and variability in clinical suspicion. Large-scale prospective studies are warranted to better understand its epidemiology, demographic distribution, risk factors, and natural history across diverse populations.

Second, diagnostic challenges persist, particularly in distinguishing primary epiploic appendagitis from secondary inflammation associated with other intra-abdominal conditions. Standardized imaging criteria and scoring systems could enhance diagnostic accuracy and reduce reliance on operator-dependent assessments, especially in resource-limited settings.

Third, while CT is currently considered the gold standard for diagnosis, there is growing interest in the role of contrast-enhanced ultrasound and MRI as radiation-free alternatives. Further studies are needed to validate the sensitivity, specificity, and clinical utility of these modalities, particularly in younger patients and pregnant women.

Fourth, long-term outcomes following conservative management have not been systematically studied. Although recurrence appears rare, formal studies evaluating recurrence rates, predictors of recurrence, and optimal follow-up strategies would help refine patient care protocols. Finally, there is a need for greater clinical education and awareness

among healthcare providers, particularly in emergency medicine and general surgery. Educational initiatives to increase recognition of the typical clinical and imaging features of epiploic appendagitis could reduce unnecessary hospital admissions, antibiotic use, and surgical interventions. Therefore, expanding research efforts and enhancing clinical awareness will be crucial to advancing the understanding, diagnosis, and management of epiploic appendagitis, as well as minimizing its impact on healthcare utilization.

Limitations

This review provides a comprehensive narrative summary of current knowledge regarding epiploic appendagitis; however, several limitations should be acknowledged. First, the review was not conducted as a meta-analysis; therefore, it may be subject to selection bias in the literature cited. Although an extensive search strategy was employed across multiple databases, it is possible that some relevant studies, particularly those in non-English languages or unpublished data, were not captured. Second, much of the available evidence regarding epiploic appendagitis is derived from small case series, retrospective analyses, and radiology-based studies. High-quality prospective studies and randomized trials are lacking, which limits the strength of evidence supporting many current diagnostic and management approaches. Third, variations in imaging interpretation, clinical presentation, and reporting standards across different institutions introduce a degree of heterogeneity that may affect the generalizability of the findings discussed. Finally, as this review focused predominantly on primary epiploic appendagitis, secondary forms of the disease, including those associated with other intra-abdominal inflammatory conditions, were addressed less extensively and may warrant separate dedicated review. Further research is needed to address these gaps and strengthen the evidence base for diagnosing and managing epiploic appendagitis.

CONCLUSION

Epiploic appendagitis, although rare and self-limiting, remains a frequently overlooked cause of acute abdominal pain. Its clinical presentation often mimics more common surgical conditions such as diverticulitis and appendicitis, posing a significant diagnostic challenge. Recognition of its characteristic imaging features, particularly on CT, is critical for establishing the correct diagnosis and avoiding unnecessary surgical interventions. Most cases respond well to conservative management with NSAIDs and observation. Awareness among healthcare providers, combined with an informed interpretation of imaging findings, is key to optimizing patient outcomes, minimizing healthcare costs, and reducing morbidity associated with misdiagnosis. Continued education and attention to this subtle yet crucial clinical entity are essential for improving diagnostic accuracy in patients with localized abdominal pain.

FOOTNOTES

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