REUE | Brief Report

Acute epiploic appendagitis: a rare cause of acute abdominal pain

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BACKGROUND. Epiploic appendagitis (EA) is an uncommon condition that typically presents with acute abdominal pain in the lower half of the abdomen. The differential diagnosis of the cause of pain requires urgent consideration of multiple conditions. Computed tomography is usually required for diagnosis.

MATERIAL AND METHODS. This is a retrospective case series of patients diagnosed with epiploic appendagitis. All were diagnosed in the emergency department after suspicion of acute abdomen.

RESULTS. Seventeen patients were included in the series. The mean (SD) age at presentation was 56.53 (18.39) years. Symptoms were present for less than 24 hours in 5 patients (29.4%) and more than 48 hours in 9 (52.9%). Abdominal pain as the presenting symptom was in the left lower quadrant (6 patients), the right lower quadrant (8 patients); mesogastric in 1 patient, and epigastric in 2 patients. EA was diagnosed based on imaging in all cases. The location was the sigmoid colon in 5 cases (29.4%), the descending colon in 4 (23.5%), the ascending colon in 2 (11.7%), the cecum in 5 (29.4%), and the transverse colon in 1 (5.8%). Three patients (17.6%) were treated surgically. Outpatient treatment with an oral analgesic was prescribed for 8 patients (47.1%), and 5 patients (29.3%) were admitted to receive IV analgesia. Symptoms resolved without surgery after 1 week. Recurrence within 2 years has not been reported in any of the cases.

CONCLUSIONS. EA is a self limited condition that normally resolves within 2 weeks with treatment of symptoms. Physicians should consider EA as a possible cause of abdominal pain given that a late or erroneous diagnosis can lead to prolonged hospitalization, unnecessary prescription of antibiotics, unnecessary surgery, and higher health care costs.

Keywords: Epiploic appendagitis. Abdominal pain. Emergency department.

Apendagitis epiploica aguda como causa de dolor abdominal agudo

INTRODUCTION. La apendagitis epiploica (AE) es una patología infrecuente que suele presentarse con dolor abdominal agudo en cuadrantes inferiores del abdomen. Su presentación conlleva la realización de un diagnóstico diferencial con múltiples patologías urgentes.

MATERIAL Y MÉTODO. Estudio retrospectivo de serie de casos diagnosticados de AE. Todos los pacientes fueron atendidos en el servicio de urgencias, de un hospital terciario, con seguimiento a 2 años.

RESULTADOS. Se incluyeron 17 pacientes, con una edad media de 56,53 ± 18,39 años. El tiempo de evolución de la clínica fue de < 24 horas en 5 casos (29,4%) y > 48 horas en 9 casos (52,9%). La localización de la AE fue en el colon sigmoide en el (29,4%), colon descendente (23,5%), colon ascendente (11,7%), ciego (29,4%), y colon transverso (5,8%). Tres pacientes (17,6%) fueron tratados quirúrgicamente, 8 (47,1%) recibieron tratamiento ambulatorio con analgesia oral y 5 (29,3%) fueron hospitalizados para tratamiento analgésico endovenoso. Ningún caso presentó recidiva en los 2 años de seguimiento.

DISCUSIÓN. La AE es un cuadro autolimitado que se resuelve habitualmente con tratamiento sintomático. Es importante tenerla en cuenta como causa de dolor abdominal por la posibilidad de realizar intervenciones quirúrgicas innecesarias.

Palabras clave: Apendagitis epiploica. Dolor abdominal. Servicio de Urgencias.

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Introduction

Epiploic appendagitis (EA) is a relatively rare disease characterized by inflammation of the epiploic appendages. These appendages, first described by Vesalius in 1543, range in length from 5 mm to 5 cm, and are distributed over the external surface of the colon—from the cecum to the rectosigmoid junction—in a variable number of 50 to 100.[1,2] Although their exact function remains unknown, studies suggest they contribute to absorption and play an immunologic role.[3] These structures are vascularized by 1 or 2 arteries and a single venule. The limited vascular supply, combined with their pedunculated morphology and high mobility, increases the risk of torsion.[4]

The term epiploic appendagitis was introduced in 1956 by Lynn *et al*.[5]. EA may develop primarily, due to spontaneous torsion of an epiploic appendage causing vascular obstruction, leading to ischemia and possible gangrenous necrosis, or due to primary thrombosis of the venous drainage, resulting in inflammation of the appendage.[5] Alternatively, EA can develop secondarily to other inflammatory processes in adjacent abdominopelvic organs such as appendicitis, diverticulitis, cholecystitis, pancreatitis, or salpingitis.[4,6] Other factors associated with the development of EA include strenuous exercise and the presence of an abdominal hernia.[7] The most common locations of this condition are the rectosigmoid region (57%) and the ileocecal region (26%), while it is less frequent in the ascending colon (9%), transverse colon (6%), and descending colon (2%).[5]

The objective of this study is to describe the clinical presentation of this condition in a series of cases treated in the emergency surgery department of a referral hospital.

Material and methods

We conducted this retrospective study with cases of EA treated in the emergency department of a teaching hospital between 2010 and 2019. A total of 17 patients were diagnosed with EA based on imaging modalities.

Data were collected from the health records, including demographics, additional tests, drug use, surgical procedures, and a 2-year follow-up. The study was conducted in full compliance with the principles outline in the Declaration of Helsinki and was approved by the center ethics committee.

Statistical analysis

Results were expressed as mean (SD) and percentages. The Student's t-test was used for comparison of means, and the Pearson chi-square test (with Fisher's correction when necessary) for comparison of proportions. All analyses were performed using the SPSS statistical package (SPSS Inc., Chicago, IL, USA).

Results

Seventeen patients were diagnosed with EA: 10 men and 7 women, with a mean age of 56.53 ± 18.39 years. Five patients (29.4%) had a body mass index (BMI) > 30. The duration of symptoms was less than 24 hours in 5 cases (29.4%) and more than 48 hours in 9 cases (52.9%). The presenting symptom was abdominal pain located in the left lower quadrant (6 cases), right lower quadrant (8 cases), mesogastrium (1 case), and epigastrium (2 cases). In 5 cases, the pain was associated with low-grade fever, and in 3 cases, with nausea and vomiting. Diagnosis of EA was established by imaging in all cases: computed tomography (CT) was performed directly in 9 cases (52.9%); in 7 cases (41.2%), abdominal ultrasound (US) was performed initially, followed by confirmatory CT as determined by the radiologist; and in 1 case, the diagnosis was established by ultrasound alone (Figures 1 and 2). EA was located in the sigmoid colon (5 cases; 29.4%), descending colon (4; 23.5%), ascending colon (2; 11.7%), cecum (5; 29.4%), and transverse colon (1; 5.8%).

Laboratory tests showed a mean leukocyte count of 15.62 ± 0.51. Other elevated acute-phase reactants included C-reactive protein in 11 patients (64.7%) and fibrinogen in 10 patients (58.8%) (Table 1).

Treatment and outcomes of epiploic appendagitis

A total of 3 patients (17.6%) underwent surgery, 9 (52.9%) were treated outpatiently with oral analgesia, and 5 (29.3%) were hospitalized for IV analgesic therapy. Surgery was indicated in 2 cases due to right lower quadrant pain and adjacent fat stranding, which raised suspicion of acute appendicopathy despite prior CT imaging. In another case, surgery was performed due to persistent abdominal pain.

Symptoms of EA resolved in 5.23 (1.85) days on average: 7 (0.86) days in patients managed conservatively at home: 4 (0.63) days in those hospitalized for conservative treatment (with IV therapy); and 3 days in patients who underwent surgery ($P < .001$). Patients treated on an outpatient basis were followed up in general surgery outpatient clinics at 7–10 days after diagnosis and subsequently every 6 months for a 2-year period. For hospitalized patients, the first follow-up visit took place 1 month after discharge, followed by biannual visits over 2 years.

Discussion

EA is a rare condition with an incidence ratw of 8.8 cases per 1 million people and is usually a diagnosis of ex-

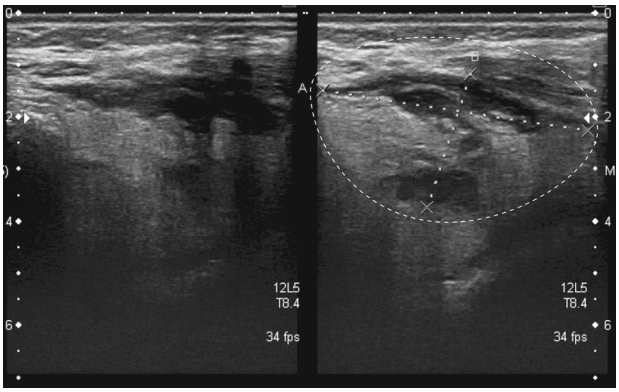

Figure 1. Ultrasound: Heterogeneous image adjacent to the splenic flexure of the colon, measuring 2.5 cm × 5 cm.

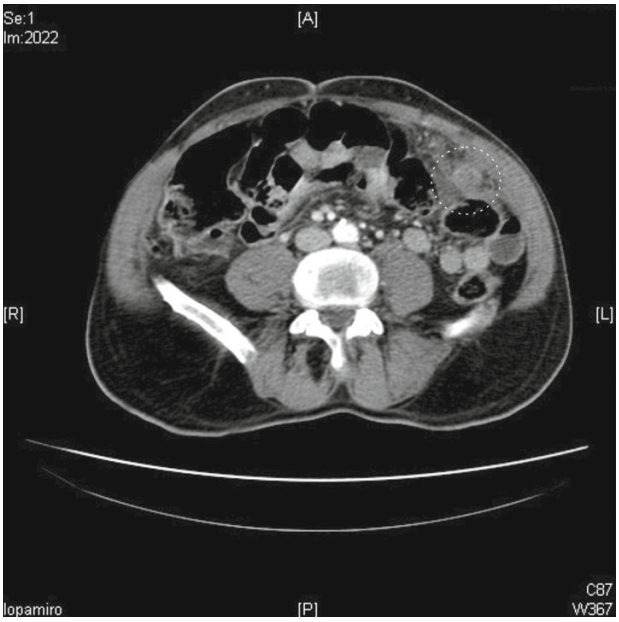

Figure 2. Computed tomography (axial view): Ovoid lesion 1.7 cmm × 1.5 cm lesion with contrast enhancement after intravenous administration at the splenic flexure of the colon.

clusion.[8] Although it accounts for 1.3% of abdominal pain cases presenting to emergency departments, this rate may be underestimated due to diagnostic challenges.[6] The rarity of the disease, along with limited clinical awareness, contributes to a high rate of diagnostic errors by both clinicians and radiologists.[1,9] In a retrospective study, Rao *et al.* found that 64% of EA cases were missed on CT examination.[9] EA can occur at any age, but most cases appear between 26 and 75 years, with a higher prevalence in men (70%), which is consistent with our series. Presentation in children is rare due to poor development of EA.[1,6,10]

Several studies have linked EA to other conditions such as hernia incarceration and bowel obstruction, as well as to intense physical activity.[7] Furthermore, it has been associated with obesity, as obese individuals may have larger EAs, and visceral fat can impair vascular supply or cause venous thrombosis within these appendages.[11] However, other studies have found no such association.[10,12-14] In our series, 29.4% of patients had a BMI > 30.

The typical clinical presentation involves acute or subacute, sudden, non-migratory abdominal pain, most often localized in the left lower quadrant (69–89%) or right lower quadrant (8–16%). In approximately 6% of cases, the pain is diffuse.[10,15] Pain often begins after a specific physical movement, such as postprandial exercise or coughing.[3] Less common symptoms include postprandial fullness, early satiety, epigastric discomfort, vomiting, abdominal distension, diarrhea, constipation, intermittent fever, and moderate weight loss.[1,16] In our series, right lower quadrant pain was present in nearly half of the patients, raising an initial diagnostic suspicion of acute appendicitis.[18]

Because of the lack of pathognomonic clinical signs, EA remains a diagnostic challenge and must always be considered a possible diagnosis of exclusion. Before the advent of advanced imaging modalities, EA was typically diagnosed intraoperatively.[17] Nowadays, due to the widespread use of US and CT in the evaluation of acute abdominal pain, many cases of EA are diagnosed noninvasively.[5] In both CT and US, normal EAs are not visible unless surrounded by intraperitoneal fluid.[18] Ultrasound is operator-dependent, and primary EA is not always detectable.[19] When it is, US typically shows in the area of maximum tenderness a small, round or oval, non-compressible, hyperechoic mass (2–4 cm in diameter) adjacent to the colon wall, lacking internal blood flow, and surrounded by a thin hypoechoic rim.[5] Contrast-enhanced CT is considered the gold standard for EA diagnosis.[20] CT findings were first described in 1986 by Danielson *et al.*, showing a sensitivity and specificity > 90%.[21] Typical findings include a fat-density, ovoid or round lesion adjacent to the colon wall (usually < 5 cm in diameter), a "hyperattenuating ring sign" (a 1–3 mm hyperdense rim surrounding the lesion), and perilesional fat stranding. The colonic wall may show reactive thickening.[22] A pathognomonic CT feature of EA is the "central dot sign" or "central vessel sign", characterized by a central high-attenuation focus within the fatty lesion, corresponding to a thrombosed or congested vessel inside the inflamed appendage.[5] This sign, however, is seen in only 42% of cases,[5,23] and its absence does not rule out EA. Although symptoms usually resolve within a few days, CT abnormalities may persist for up to 6 months.[3]

Over time, calcification may develop within the infarcted epiploic appendage, detaching to form a free intraperitoneal body, known as a "peritoneal mouse".[24] Rarely, EA may occur within a hernia sac or involve the vermiform appendix, mimicking acute appendicitis.[25]

Although other imaging modalities such as the MRI are seldom used, when performed shows a small oval fatty mass with signal intensity similar to fat on T1-weighted images.[5]

Differential diagnosis includes other acute inflammato-

Table 1. Epidemiological, analytical, and localization variables

	N (%)
Male	10 (58.8)
Age (years) [Mean (SD)]	56.53 (18.39)
BMI (> 30)	5 (29.4)
Findings on physical examination	
Pain in left lower quadrant	6 (35.3)
Pain in right lower quadrant	8 (47.1)
Pain in mesogastrium	1 (5.8)
Pain in epigastrium	2 (11.7)
Analytical parameters [Mean (SD)]	
Leukocytes	15.62 (0.51)
C-reactive protein	55.63 (35.82)
Fibrinogen	572.71 (195.79)
Localization	
Sigmoid colon	5 (29.4)
Descending colon	4 (23.5)
Ascending colon	2 (11.7)
Cecum	5 (29.4)
Transverse colon	1 (5.8)

SD: standard deviation; BMI: body mass index.

ry diseases (acute appendicitis, diverticulitis, cholecystitis, gastritis, sclerosing mesenteritis), fat-containing tumors or metastases, acute omental infarction,[5] and gynecologic conditions (ectopic pregnancy, ruptured ovarian cyst, ovarian torsion).[3] In omental infarction, the lesion is typically larger, cake-like, located in the omentum, and medial to the cecum or ascending colon.[26]

Current literature describes EA as a self-limiting disorder, managed conservatively in most patients—with or without nonsteroidal anti-inflammatory drugs (NSAIDs)—with symptom resolution within 1–2 weeks.[3,5] Although antibiotics are not indicated, they are widely prescribed[3,19]. The first conservative management was introduced by Epstein and Lempke in 1968.[27] Laparoscopic resection of the inflamed appendage is indicated if conservative management fails, if complications arise, or if the diagnosis remains uncertain.[3,19] It is recommended to perform laparoscopic excision of the affected appendage, sometimes accompanied by prophylactic appendectomy.[10,19]

Potential complications of conservative management include adhesions, peritonitis, intestinal obstruction, local abscess formation, and intussusception.[10] In our series, 82.3% of patients were treated conservatively—five required hospital admission for pain control, and no complications were observed during the 2-year follow-up.

Although EA frequently causes abdominal pain, it generally has an excellent prognosis, with no reported mortality. The recurrence rate in the limited literature ranges from 5% to 17%, though Sand *et al.* suggested that surgery may be needed to prevent recurrence, as 40% of patients experienced recurrent pain similar to prior episodes.[10,15,28,29]

Conclusions

EA is an underdiagnosed cause of acute abdominal pain. Increased use of imaging modalities has improved diagnostic accuracy. Health care professionals should consider EA in the differential diagnosis of abdominal pain, as delayed or incorrect diagnosis can lead to prolonged hospitalization, unnecessary antibiotic use, increased health care costs, and avoidable surgical procedures. Clinical management should be conservative, reserving surgical intervention for recurrent or complicated cases.

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