

Primary epiploic appendagitis: A retrospective analysis of clinical and tomographic findings in 14 patients

Belma Çevik¹  Benan Kasapoğlu² 

1 Lokman Hekim University, Faculty of Medicine, Department of Radiology, Ankara, Turkey

2 Lokman Hekim University, Faculty of Medicine, Department of Internal Medicine, Division of Gastroenterology, Ankara, Turkey

Abstract

Background: The aim of this study is to describe the clinical features and imaging findings of 14 patients diagnosed with primary epiploic appendagitis on computed tomography (CT).

Methods: Between January 2019 and August 2022, the hospital records of 14 patients were retrospectively reviewed. We recorded patients' age, gender, fever presence, blood leukocyte count (WBC), C-reactive protein (CRP) level, localization of abdominal pain, the presence of nausea or vomiting, the involved part of the colon on CT, whether they received treatment or not, and whether they underwent surgery.

Results: This study included 14 patients, 8 male and 6 female. Their ages ranged from 27 to 63. All patients presented with acute abdominal pain without an elevation in body temperature or a significant increase in inflammation markers. CT scan images showed a fat oval lesion corresponding to the inflamed epiploic appendix with a peripheral hyper-attenuated frame and a central "dot" in some cases referring to the thrombosed vessel. The patients were successfully treated with conservative methods.

Conclusions: Epiploic appendagitis can mimic surgical diseases such as appendicitis and diverticulitis due to its non-specific clinical presentation. CT scan is essential in diagnosing this disease, which can be managed with more conservative treatment methods.

Keywords: Primary Appendagitis Epiploica, Acute Abdomen, Computed Tomography.

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Corresponding Author:

Belma Çevik, Lokman Hekim University, Faculty of Medicine,
Department of Radiology, Ankara, Turkey
E-Mail: belma_cevik@yahoo.com



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INTRODUCTION

Appendices epiploica are pedicled formations rich in adipose tissue located on the colon wall. They are often found in the transverse and sigmoid colons. They can easily undergo torsion and infarction due to the weakness of their arterial supply and the freely movable pedicle (1).

Primary epiploic appendagitis (PEA) is an acute condition in which the surrounding tissues become inflamed after torsion or ischemia. Secondary epiploic appendagitis is defined as the inflammation that develops due to the spreading of infections from other intra-abdominal organs. PEA can mimic some surgical pathologies, such as appendicitis and diverticulitis, depending on its localization in the colon (2). PEA usually responds to conservative treatment. However, it may lead to unnecessary laparotomies in undiagnosed cases.

PEA is a rare disease, and the exact prevalence is unknown. However, the estimated frequency of PEA in patients with abdominal pain is reported as 1.1-1.3% (3). However, developments in imaging methods in recent years have facilitated the diagnosis of the disease and caused it to be recognized more frequently. Nowadays, the best diagnostic method for PEA is regarded as abdominal computed tomography. In general, computed tomography (CT) scans reveal an ovoid mass lesion with a fat-density appearance, encapsulated by a dense rim in all cases (4-6).

This study aimed to evaluate the clinical and tomographical findings in patients who presented to the emergency department with the complaint of abdominal pain and were diagnosed with PEA and to increase awareness about this disease, which is likely to be overlooked, especially in emergency services.

MATERIALS AND METHODS

In this study, it was retrospectively analyzed the CT scans of the patients who were admitted to the Lokman Hekim Akay Hospital emergency department with

abdominal pain between January 2019 and August 2022. The study was conducted in accordance with the Declaration of Helsinki. The ethical approval was obtained from the Lokman Hekim University Ethics Committee (Date: 08.08.2023, No: 2023/143).

Approximately 780 CT scans of the patients, admitted to the emergency department with abdominal pain were retrospectively analyzed. We assessed the reports and included the patients who had the diagnosis of appendagitis epiploicae in the study. All other patients, with the diagnosis of any other causes of abdominal pain and/or malignancy were excluded from the study. A total of 14 patients who were diagnosed with appendices epiploica by computed tomography were included in this study.

The medical records of the patients were evaluated, and their age, gender, presence of fever, localization of abdominal pain, presence of nausea or vomiting, blood leukocyte count (WBC), C-reactive protein (CRP) level, the affected colon segment on CT, whether they received treatment, and if they underwent surgery were recorded.

Statistical Analysis Statistical analysis was performed with SPSS (Windows version 21.0, SPSS Inc., Chicago, IL, USA), using descriptive statistics tests.

RESULTS

This study included 14 patients, 8 males and 6 females, ranging in age from 27 to 63. Two patients presented with high fever. The WBC counts in 3 patients and the CRP levels in 7 patients were higher than normal. Pain localization was in the right lower quadrant for 2 patients, in the left upper quadrant for 1 patient, and in the left lower quadrant for 11 patients. The pain was accompanied by vomiting in 2 patients and nausea in 4 patients. The most common site of involvement on CT was the sigmoid colon (n=6). Other sites of involvement were the descending colon (n=5), cecum (n=2), and splenic flexure (n=1) (Table 1).

Table 1. Clinical examination and radiologic findings

Patient (n=14)	Sex	Age	Temperature	Nausea or vomiting	Site of pain	Segment of colon	WBC (4490-12680) / μ L	CRP (0-5) mg/l	Clinical resolution delay (days)
1	M	32	37	nausea	left lower quadrant	sigmoid colon	7940	7.5	3
2	M	30	38.4	vomiting	left lower quadrant	sigmoid colon	12500	9.3	8
3	F	54	37.5	absent	right lower quadrant	caecum	9200	7.7	7
4	F	33	37.8	nausea	left lower quadrant	descending colon	13550	9.9	7
5	M	41	37	absent	left lower quadrant	descending colon	8470	8.58	5
6	M	51	37.4	absent	left lower quadrant	sigmoid colon	8860	20.03	10
7	M	27	36.8	absent	left lower quadrant	sigmoid colon	7770	3.31	4
8	M	43	37	nausea	right lower quadrant	caecum	7990	8.2	5
9	M	63	37	absent	left upper quadrant	splenic flexura	7580	5	3
10	F	43	36.9	absent	left lower quadrant	descending colon	7810	2.17	4
11	M	45	37.3	absent	left lower quadrant	sigmoid colon	7300	3.6	5
12	F	37	37	absent	left lower quadrant	descending colon	7900	6.2	3
13	F	41	37.8	nausea	left lower quadrant	sigmoid colon	8400	10.8	7
14	M	40	38.6	vomiting	left lower quadrant	descending colon	14700	13	11

CT scans consistently revealed an ovoid mass lesion with a fat-density appearance, encapsulated by a dense rim in all cases (Figure 1). Accompanying findings included a thickened lining of the peritoneum (Figure 2 A) and fat stranding around the appendage (Figure

1-2). In a subset of four cases, a prominently attenuated central dot was observed within the inflamed appendage (Figure 2 B). Table 1 presents a summary of the clinical examination and radiologic findings for each patient.



Figure 1. The contrast-enhanced CT image shows a central, heterogeneous, fat mass lesion with a peripheral hyperdense rim, situated anterior to the descending colon.

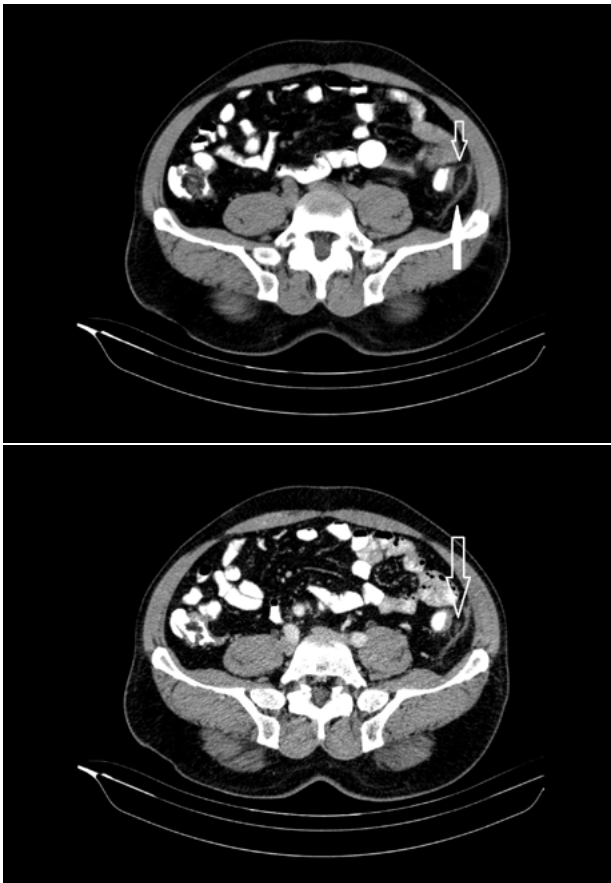


Figure 2 (A-B): The axial contrast-enhanced CT images show an oval fat lesion characterized by a hyperattenuated peripheral border (A), and an associated localized thickening of the peritoneum (A, white arrow). Additionally, the CT images depict severe fat stranding, along with a fatty ovoid mass featuring a hyperattenuated rim and a central dot (B).



Figure 3. The contrast-enhanced CT image shows a central, heterogeneous, fat mass lesion with a peripheral hyperdense rim, situated anterior to the cecum.

All patients recovered within 3-11 days with conservative treatment without complications. Surgery is not required for any of the patients.

DISCUSSION

Appendices epiploicae, rich in fat and with one or two small arteries and veins on its pedicle, was first described by the anatomist Vesalius in 1543. Torsion or vascular thrombosis from the pedicle of the appendices epiploicae can cause PEA due to inflammation (7). Lynn et al. first coined the term “epiploic appendagitis” in 1956, while CT characteristics of this condition were initially detailed by Danielson et al. in 1986 (8,9).

As a rare clinical pathology, PEA is most common in adults in their second to fifth decades and in obese individuals, and the incidence is four times higher in males than females (10,11). In our study, the mean age of the patients was 41.4 years. However, none of the patients were obese and, males outnumbered females. It often presents with acute-onset, non-migrating abdominal pain, with localized tenderness on abdominal palpation and rebound tenderness on some occasions. Fever, nausea, and vomiting may accompany abdominal pain.

With the more widespread use of imaging methods in recent years, PEA has been diagnosed more frequently. Although abdominal ultrasound is beneficial in diagnosing AE, it may not show any abnormality in some cases (12,13). In the abdominal ultrasound an oval or rounded, noncompressible, hyperechoic mass adjacent to the colonic surface, without internal vascularity surrounded by a hypoechoic line is the most common finding. Doppler images divulge the absence of central blood flow (14,15).

In a recent study, the diagnostic efficacy of ultrasound (US) was compared to CT in 92 patients with PEA and it was reported that the US was also highly sufficient for the diagnosis of PEA (16).

Ultrasound is a rapid, non-invasive imaging diagnostic test that may be helpful in the diagnosis of PEA in non-obese patients. However, CT is currently considered the gold standard for definitive diagnosis (17,18). The following CT findings can be observed in PEA: an oval mass with a hyperdense ring, thickening of the parietal peritoneum, a hyper-dense thrombosed drainage vessel (the "central point" sign), intestinal wall thickening, mass localization in front of the colon wall, and adjacent mesenteric inflammation, which appears on imaging as a characteristic "fat stranding" sign (19-22). In our study, CT scans consistently revealed an ovoid mass lesion with a fat-density appearance, encapsulated by a dense rim in all cases. Accompanying findings included a thickened lining of the peritoneum and fat stranding around the appendage. In a subset of four cases, a prominently attenuated central dot was observed within the inflamed appendage. The first and most important point in the diagnosis of PEA is the awareness and suspicion of the clinicians and radiologists. Since there is not a specific pathognomonic clinical or laboratory finding, imaging modalities gain more importance in the diagnosis.

Although PEA can occur in any segment of the colon, the sigmoid colon is most commonly affected (19). This was also the most common site of involvement in our cases, followed by the descending colon.

Appendagitis epiploica is typically a self-resolving condition with the majority of patients experiencing relief from symptoms within 1-14 days following treatment with analgesic drugs (23, 24). In the cases we examined, recovery was observed within a period of 3 to 11 days under conservative management. However, in instances where symptoms fail to improve, exacerbate, or when complications like abscesses or intestinal obstruction arise, consideration for antibiotics or surgical intervention might be necessary (23). The most common differential diagnoses of PEA include acute diverticulitis, acute appendicitis, ovarian torsion, acute cholecystitis, omental infarction, neoplasms, diverticulitis, and mesenteric panniculitis, depending on the site of involvement (24,25). Unfortunately, most of those diseases may require long-term treatments and surgery. To avoid unnecessary hospitalizations and invasive treatments, clinicians

should be aware of this more harmless condition in the differential diagnosis of acute abdominal pain.

There are some limitations of this study that should be mentioned. First, the number of patients included in the study is not large; but since this is a rare disease, we tried to include all cases diagnosed with PEA in the emergency department. Second, the follow-ups, or the ultrasound findings were not present in the hospital records of all patients.

In conclusion, epiploic appendagitis is a self-limiting disease that responds well to conservative treatment. In our experience, many clinicians can manage the disease with the support of a radiologist. It should be kept in mind in the differential diagnosis of patients with acute abdominal pain since recognizing PEA, which is a relatively rare cause of acute abdomen, can prevent unnecessary hospitalizations, treatments, and surgeries.

Declarations

The authors have no conflicts of interest to declare. The authors declared that this study has received no financial support.

The study was conducted in accordance with the Declaration of Helsinki. The ethical approval was obtained from the Lokman Hekim University Ethics Committee (Date: 08.08.2023, No: 2023/143).

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