

Acute Epiploic Appendagitis: Tissue Harmonic Ultrasonography and Computed Tomography Imaging Features in Two Cases

Akut Epiploik Apendisit: İki Olgunun Doku Harmonik Ultrasonografi ve Bilgisayarlı Tomografi Görüntüleme Özellikleri

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ABSTRACT Epiploic appendagitis is a relatively rare and self-limiting disease that can occur either from appendageal torsion or from spontaneous venous thrombosis of an appendageal draining vein. It is important to correctly diagnose cases of epiploic appendagitis since its treatment is conservative. Historically this condition was discovered via laparotomy following a misdiagnosis of the patient. This is because primary epiploic appendagitis often clinically mimics acute abdomen such as acute appendicitis or acute diverticulitis. However, with improved radiologic imaging techniques, the ability to detect this condition before surgery has greatly increased. Like computed tomography (CT), tissue harmonic ultrasonography (THUS) can demonstrate this entity and provides a convenient, noninvasive, relatively low-cost imaging. In this report, we aimed to present THUS and CT imaging findings of two patients with epiploic appendagitis, and to review of the literature regarding this phenomenon.

Key Words: Tomography, spiral computed; ultrasonography; abdominal pain

ÖZET Epiploik apandisit appendiksin torsiyonu ya da appendisyal drene edici venin spontan torsiyonu sonucu oluşabilen, relatif olarak nadir ve kendi kendini sınırlayan bir hastalıktır. Epiploik apandisit olgularının tedavisinin konservatif olması nedeni ile tanılarının doğru konulması oldukça önemlidir. Tarihsel olarak bu durum yanlış tanı almış hastalara uygulanan laparatomiler sonrasında keşfedildi. Bunun sebebi ise primer akut epiploik apandisit olgularının klinik olarak sıklıkla akut apandisit ya da akut divertikülit gibi akut abdomen nedenlerini taklit etmesidir. Ancak radyolojik görüntüleme yöntemlerindeki gelişmeler sayesinde cerrahisiz olarak bu hastalığın tespit edilebilme kabiliyeti büyük oranda artmıştır. Doku harmonik ultrasonografi incelemesi, bilgisayarlı tomografi gibi bu antiteyi görüntüleyebilir ve uygun, non-invaziv ve göreceli olarak düşük maliyetli bir görüntüleme sağlar. Bu yazıda biz, epiploik apandisitli iki hastanın doku harmonik ultrasonografi ve bilgisayarlı tomografi görüntüleme bulgularını sunmayı ve bu nadir durum ile ilgili literatürü yorumlamayı amaçladık.

Anahtar Kelimeler: Bilgisayarlı tomografi; ultrasonografi; abdominal ağrı

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Epiploic appendagitis is a rare inflammatory and ischemic condition that results from torsion or spontaneous venous thrombosis of one of the epiploic appendices.¹ Epiploic appendagitis can cause severe pain and mimic other acute abdominal conditions. It is important to correctly diagnose epiploic appendagitis, since its treatment is conservative.² We present computerized tomography (CT) and tissue harmonic ultrasonography (THUS) features of two patients with acute epiploic appendagitis and discuss

the role of THUS in the diagnosis of acute epiploic appendagitis and review the pertinent radiology literature.

CASE REPORT

This case report presents of one man and one woman, 69 and 25 years old respectively, both of whom admitted to the emergency department with acute left lower quadrant abdominal pain. Other symptoms such as nausea, vomiting, diarrhea, or fever were absent in both patients. WBC counts were within the normal range in one patient. There was a mild leukocytosis in the other patient. We obtained informed consents of both patients before the radiologic examination. An ultrasound (US) and CT evaluation of the abdomen were obtained in both patients. Sonographic examinations of both patients were performed on the same ultrasound unit (9- to 12-MHz multifrequency linear transducer and 4-MHz convex transducer, LOGIQ 9, GE Medical Systems, Milwaukee, Wis). The patients were scanned with a 16-detector CT scanner (Philips Medical Systems MX 8000 IDT Multislice CT System-V 2.5). Scan parameters were 120 kV; 200 mAs; rotation time, 750 msec; slice thickness, 5 mm; detector collimation, 16 x 1.5 mm; and pitch, 1.2. One and a half liters of water with 50 cc contrast agent (Urografin®) was given to each patient as the oral

contrast before their CT examination. A hundred milliliters of non-ionic, iodinated, low-osmolar contrast medium (Omnipaque® 300 mgI/ml) was injected through antecubital vein at a rate of 3 ml/sec.

Sonographically at the spot of maximum tenderness, in both patients, a localized area of inflamed, hyperechoic, noncompressible fat was detected adjacent to the neighboring colonic segment. Harmonic imaging was used for gaining further contrast between inflamed and normal fat tissue (Figures 1 and 2). There was an increase in color encoding around the inflamed tissue. The images were interpreted as acute epiploic appendagitis. To investigate the diagnostic value of THUS, a subsequent CT scan was performed which showed the appearance, characteristic of an infarcted epiploic appendage (Figure 1 and 2). The diagnosis of acute epiploic appendagitis was established on the basis of characteristic radiologic findings. Both patients were followed sonographically and treated conservatively. None of the patients underwent surgical procedure and the symptoms gradually resolved within 2-4 days in both patients.

DISCUSSION

Epiploic appendages are peritoneal pouches that originate from the serosal surface of the colon, to which they are attached by a vascular stalk. Com-

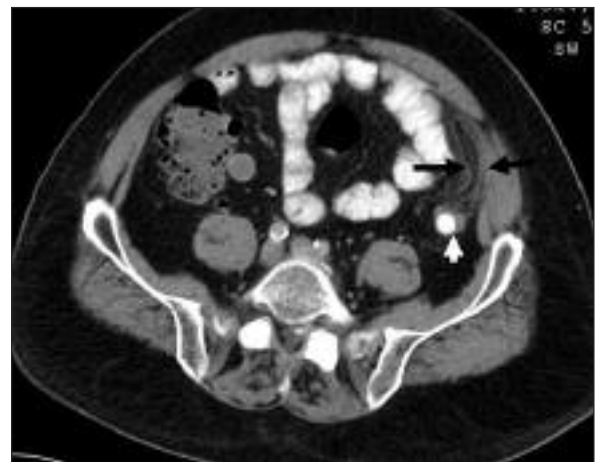


FIGURE 1: A 69-year-old male patient with left lower flank pain of two days duration. (a) THUS image shows a hyperechogenic mass (white long arrows), delineated by a hypoechoic band, localized below the abdominal wall near the sigmoid colon (SC). (b) Oral and IV contrast-enhanced axial CT image shows a mass with a hyperdense rim (black arrows), fatty content and a subtle central hyperattenuation. The adjacent fat tissue is stratified secondary to inflammation (white short arrow= Sigmoid colon).

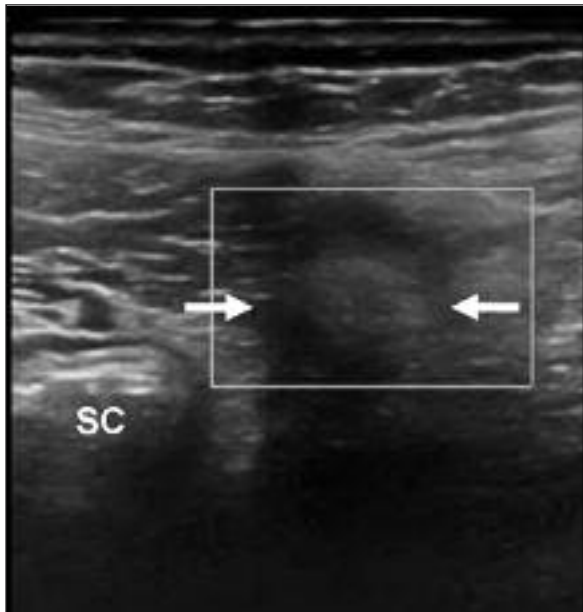


FIGURE 2: A 25-year-old female patient with left lower flank pain. (a) THUS image shows an echogenic mass with a hypoechoic halo (white long arrows). (b) Oral and IV contrast-enhanced axial CT image demonstrates a fat containing mass in contact with the sigmoid colon (SC). Adjacent fat tissue is stratified and the parietal peritoneum is thickened (black arrowhead) (white short arrow= Sigmoid colon).

posed of adipose tissue and blood vessels, the appendages typically have a length of 0.5-5 cm. The ones located near the sigmoid colon are the largest, and they may occur in multiples of approximately 100. Epiploic appendages are absent near the rectum. The appendages are arranged in two rows: one row medial to the tenia libera, and the other lateral to the tenia omentalis. Typically, the epiploic appendages are visible on CT images only when they are inflamed and/or surrounded by fluid.^{3,4}

The term epiploic appendagitis was introduced by Lynn et al. in 1956. Epiploic appendagitis is thought to occur as a result of spontaneous torsion, ischemia, or inflammation of an epiploic appendage of the colon.⁵ Acute epiploic appendagitis is a self-limited inflammation of the epiploic appendices, a condition that used to be diagnosed at surgery.⁶ Recent reports about this condition are primarily based on diagnosis with US and CT.

The differential diagnosis of inflammatory fatty lesion in a patient with acute abdomen includes acute epiploic appendagitis, acute omental infarction, acute inflammatory process such as diverticulitis and primary tumor or metastasis that involves the mesocolon.³ When acute epiploic ap-

pendagitis involves the cecum or ascending colon, it may be mistaken clinically for acute appendicitis. Most patients with acute epiploic appendagitis frequently have normal white blood cell count and body temperature.

A 1-4-cm, oval, fatty pericolic lesion with surrounding mesenteric inflammation is considered to be diagnostic of epiploic appendagitis.^{4,7} Adjacent colon wall thickening and compression may occur. Rarely, a central high-attenuation “dot” can be identified on CT scan, corresponding to the thrombosed vein within the inflamed appendage.⁸ US has been used to show epiploic appendagitis. It shows hyperechoic noncompressible mass adjacent the colonic wall at the site of maximum tenderness on physical examination.⁹ With color Doppler, no vascularity is demonstrated within the mass, and this finding distinguishes it from other inflammatory processes such as diverticulitis or appendicitis.⁹ Color Doppler US can also be used to assess inflammatory changes in mesenteric tissue, such as increased color encoding around the lesion.

Tissue harmonic imaging (THI) is a new sonographic technique that can potentially provide images of higher quality than the conventional so-

nographic techniques.¹⁰ Harmonics are frequencies that occur at multiples of the fundamental or transmitted sonographic frequency. In conventional gray-scale US, the same frequency spectrum that is transmitted into the patient is subsequently received to produce the sonographic image. In THUS, higher harmonic frequencies generated by propagation of the ultrasound beam through tissue are used for producing the sonogram.¹¹ Imaging with harmonic frequencies offers several potential advantages, including improved lateral resolution, reduced side-lobe artifacts, and improved signal-to-noise ratio.¹⁰ Recent advances in sonographic imaging such as harmonic imaging may facilitate the diagnosis of the epiploic appendagitis. We observed

that THI increases the tissue contrast and visibility of epiploic appendagitis. Especially, mesenteric inflammation, seen as fat stranding on CT scan, can be readily shown by harmonic imaging.

The relative rarity of this pathologic entity, its common omission from differential diagnosis, its unique imaging appearance, and issues of its medical management make its recognition important for emergency radiologists.³ As a conclusion, in patients with acute abdominal pain, radiologist must be aware of this entity and familiar with its radiologic findings to prevent an unnecessary surgical procedure. THUS is an alternative, convenient, noninvasive and low-cost imaging modality in the diagnosis of epiploic appendagitis.

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