

Primary epiploic appendagitis: MRI findings

Mustafa Şirvanci^a, N. Cem Balci^a, Kutlay Karaman^a, Cihan Duran^a, Ercan Karakaş^b

^aDepartment of Radiology and ^bDepartment of Surgery of the Florence Nightingale Hospital, Kadir Has University, Istanbul, Turkey

Abstract

Primary epiploic appendagitis (PEA) occurs secondary to inflammation of an epiploic appendage, and is considered to be a rare cause of acute abdomen. In this case report, we describe the magnetic resonance imaging (MRI) findings of PEA correlated with computed tomographic (CT) findings. MRI findings included an oval shaped fat intensity mass with a central dot on T1- and T2-weighted images, which possessed an enhancing rim on postgadolinium T1-weighted fat saturated images. The lesion was best visualized on postcontrast T1-weighted fat saturated images. MRI findings of PEA should be considered in the differential diagnosis with the other causes of acute abdominal pain. © 2002 Elsevier Science Inc. All rights reserved.

Keywords: Epiploic Appendage; Colon; Magnetic Resonance

1. Introduction

PEA is defined as an acute inflammation of appendages epiploicae, often associated with infarction caused by torsion or spontaneous venous thrombosis. PEA is reported to be a relatively uncommon cause of acute abdomen. It is believed to occur more commonly than reported, since in many cases PEA is clinically misdiagnosed as diverticulitis or appendicitis [1,2]. With the use of cross-sectional imaging modalities, PEA is depicted in suspected cases and unnecessary surgical interventions are avoided. CT has been the method of choice to visualize PEA and the other acute abdominal diseases which are considered in the differential diagnosis [3–5].

Serial reports indicate a promising role of MRI in the detection and characterization of bowel diseases. [6,7]. We report a case of PEA, which was first diagnosed on CT images and correlated with MRI.

2. Case Report

26-year-old male was admitted to the emergency department of our hospital with acute abdominal pain in the left

lower quadrant, radiating to umbilical region. The pain persisted at its origin, and was exacerbated by deep breath and coughing. Laboratory findings revealed mild leukocytosis; other vital parameters were unremarkable. The patient underwent CT scan of the upper abdomen and pelvis. He was examined with helical CT (Sytec SRI, GE Medical Systems, Milwaukee, Wis). Oral and i.v. contrast agents were administered. Oral contrast solution 30 mL/1500 mL megluminamidotrizoat (Urovisit Angiografín, Schering, Germany) was ingested by the patients two hours prior to the CT examination. 1.5 mL/kg iopamidol %76 (Iopamiro 370, Bracco, Italy) was administered i.v. with an injection rate of 2.5 mL/sec. The scan delay time between the beginning of CT examination and the start of bolus IV infusion was 50 s.

The CT scan was performed with spiral technique using 10 mm slice thickness/10 mm table feed (pitch 1:1) and reconstruction with 8 mm interval, standard algorithm. The region of interest was then reexamined with 5 mm slice thickness/8 mm table feed (pitch 1.6:1) and reconstructed at 4 mm intervals using standard algorithm. The CT examination revealed a pericolonic fat density oval-shaped lesion anterolateral to the descending colon with a rim of soft tissue density and associated with periappendageal fat stranding. The adjacent colonic wall and nearby segments were unremarkable. These findings were consistent with PEA. The patient was treated conservatively with bed rest and analgesics. His symptoms relieved three days after the initial onset of symptoms. The patient refused to be exam-

* Corresponding author. Tel.: +1-90-212-224-2273; fax: +1-90-212-296-7210.

E-mail address: sirvanci@prizma.net.tr (M. Sirvanci).



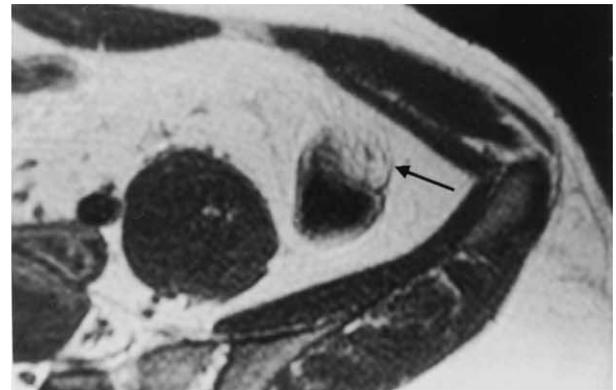
Fig. 1. Helical CT of the epiploic appendicitis. Pericolonic fat density oval shaped lesion anterolateral to the descending colon with a rim of soft tissue density is visualized (arrow). The adjacent colonic wall and nearby segments were unremarkable.

ined by CT as a follow-up examination. Therefore, the follow-up imaging was performed by MRI. MRI was performed using a 1.5 Tesla system (Signa Horizon, GE Medical Systems, Milwaukee, Wis) using a torso phased array coil. Axial T_1 -weighted breathhold spoiled gradient echo (SGE) images (TR/TE/FA, 190/4.2/80) with 6 mm section thickness, and axial respiratory gated T_2 -weighted fast spin echo images (TR/TE/ETL, 4800/90/8) were obtained before IV gadolinium injection. T_1 -weighted fat suppressed breathhold spoiled gradient echo images (TR/TE/FA, 195/4,2/80, section thickness 6 mm) were obtained in axial and coronal planes after IV injection of 0.1 mmol/kg gadopentetate dimeglumine (Magnevist, Schering, Germany).

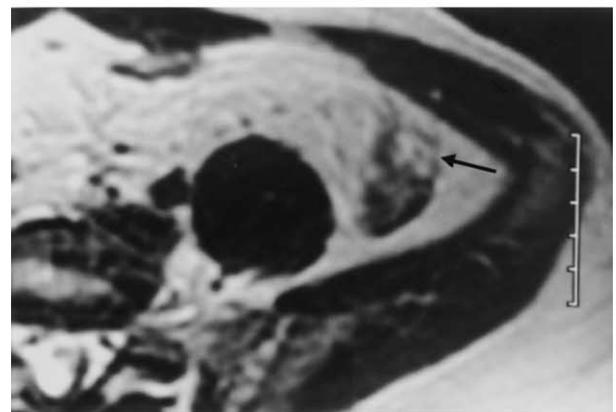
On precontrast T_1 -weighted images, a high signal lesion with a thin rim was visible at the same location as shown on CT images and a relatively low signal dot was present in the center. On T_2 -weighted images the lesion was high signal, and the centrally located dot was slightly hypointense. The lesion was best visualized on T_1 -weighted fat suppressed gradient echo images following gadolinium administration. The rim revealed increased enhancement. The patient was released with the cessation of his symptoms and on the follow-up CT, performed 3 weeks after his release, no evidence of epiploic appendagitis was visible.

3. Discussion

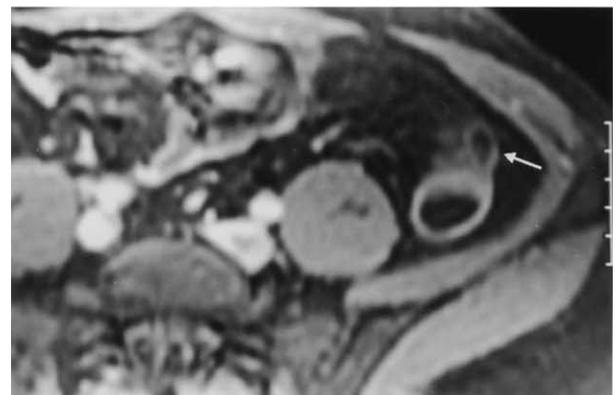
The epiploic appendages are small, fat-containing sacs of peritoneum that are arranged along the serosal surface of the colon. They are about 100 in number, 0.5 to 5 cm long and distributed in two rows along the free tenia and tenia omentalis, between the cecum and sigmoid colon [2–4]. They have no definite known function. Some authors also believe that they may act as a protective cushion during peristalsis or as a depot of blood when the colon and its intramural vessels are contracted [3,4]. Increased incidence of epiploic appendages in obese people, especially in those who have



(a)



(b)



(c)

Fig. 2. MRI of the same patient with epiploic appendicitis. T_1 -weighted breathhold spoiled gradient echo (SGE) images (TR/TE/FA, 190/4,2/80) with 6 mm section thickness in axial plane (a), reveals high signal lesion with a thin hypointense rim (arrow) and hypointense central dot, which has similar appearance on axial respiratory gated T_2 -weighted fast spin echo image (TR/TE/ETL, 4800/90/8) (section thickness 6 mm) (arrow) (b). T_1 -weighted fat suppressed breathhold spoiled gradient echo images (TR/TE/FA, 195/4,2/80) (section thickness 6 mm) after gadolinium application reveals enhancement of the rim (arrow) (c).

recently lost weight, has led to the notion that they may serve as fat deposits. Some investigators have postulated that epiploic appendages have a role as a vascular reservoir when the bowel is distended. Their precarious blood supply from colic arterial branches, their pediculated morphology,

and increased mobility are predisposing factors for torsion and infarction of epiploic appendages [3–5]. PEA is the inflammatory response of an appendage to infarction caused by torsion or spontaneous venous thrombosis. Secondary epiploic appendagitis is the inflammation of the epiploic appendages caused by nearby pathologic processes, such as diverticulitis, appendicitis or cholecystitis [5].

Patients with PEA are typically obese people in the second to fifth decades of life, complaining of motion-aggravated abdominal pain. Depending on the location of the inflammatory process, the location of the pain varies but is mostly in the left or right lower-quadrant. Left lower quadrant pain is the more commonly encountered localization. White blood-cell count is normal or slightly elevated in most cases. Physical examination shows localized tenderness and some guarding but no rigidity [1,3–5]. Symptoms usually subside within less than one week from onset. This entity is a self-limiting process with spontaneous resolution and conservative treatment with analgesics is sufficient [1,3,4].

The CT findings of PEA have been described in several series and case reports [3,5,8]. On contrast enhanced CT images, PEA is a pericolonic, oval shaped lesion with fat density center and a soft tissue density rim representing inflammation of the serosa and associated with periappendageal fat stranding. In some cases, a hyperdense dot or linear high density is seen in the center representing a thrombosed vessel or hemorrhagic necrosis. Other associated CT findings of epiploic appendagitis are nearby parietal peritoneal thickening and adjacent colonic wall thickening [2–5].

The MRI findings of a single case of PEA has been described in a series of PEA imaged with other cross sectional imaging modalities [4]. According to that report, epiploic appendagitis appeared as an oval-shaped lesion with high signal intensity center and low signal intensity rim on T₁-weighted images. T₂-weighted images without fat suppression revealed a high intensity center and low signal intensity rim. On postgadolinium T₁-weighted fat suppressed images, the rim revealed increased enhancement due to inflammatory response [4]. In our case a hypointense central dot was visible on both precontrast T₁- and T₂-weighted images. Hypointensity of the central dot on both sequences is in agreement with the belief that central dot/line corresponds to the histopathologic finding of fibrous septa which was detected in a few surgically confirmed cases in two previous reports [3,9]. PEA was best recognized on postcontrast fat suppressed images. Postcontrast T₁-weighted fat suppressed MR imaging of the bowel is the commonly accepted method to visualize inflammatory bowel disease [7]. Therefore, the rim, representing the inflammatory response of the visceral peritoneum was best seen on postcontrast T₁-fat saturated images in our case. It has been reported that the imaging findings resolve in one to

two months of duration after the initial onset of symptoms, although the symptoms usually subside earlier [10]. The imaging findings also disappeared about one month after the initial symptoms in our case.

Only a few pathologic processes are considered in the differential diagnosis of PEA based on the CT findings. These are omental infarction and secondary epiploic appendagitis. Infarction of the greater omentum may present with identical clinical signs of PEA of the transverse colon. However, considerably larger size (3–15 cm in diameter) of omental infarction and lack of peripheral thickened visceral peritoneum aid in the differential diagnosis. In addition, infarction of the omentum is localized medial to the colon unlike PEA which is located anterolaterally [11]. Secondary epiploic appendagitis (e.g., due to diverticulitis) presents with findings of luminal narrowing, diverticula, pericolonic fluid, air bubbles, phlegmon and/or abscess formation which are diagnostic for the original disease [3,4].

In conclusion, we have described the MRI findings of PEA in one case. MRI findings correlated well with the CT findings in our case. With the wider use of MRI in bowel disease and in abdominal emergencies, the MRI findings of epiploic appendagitis should be kept in mind for the differential diagnosis of other acute abdominal conditions.

References

- [1] Rao PM, Rhea JT, Wittenberg J, Warshaw, AL. Misdiagnosis of Primary Epiploic Appendagitis. *Am J Surg* 1998;176:81–5.
- [2] Torres GM, Abbitt PL, Weeks M. CT Manifestations of Infarcted Epiploic Appendages of the Colon. *Abdom Imaging* 1994;19:449–50.
- [3] Şirvancı M, Tekelioğlu TH, Duran C, Yardimci H, Onat L, Özer AK. Primary Epiploic Appendagitis: CT Manifestations. *Clin Imaging* 2000;24:357–61.
- [4] Barbier C, Denny P, Pradoura PB, et al. Primary Epiploic Appendagitis: US, CT and MR Findings. *J Radiol* 1998;79:1479–85.
- [5] Rioux M, Langis P. Primary Epiploic Appendagitis: Clinical, US, and CT Findings in 14 Cases. *Radiology* 1994;191:523–6.
- [6] Lee JK, Marcos HB, Semelka RC. MR imaging of the small bowel using the HASTE sequence. *AJR* 1998;170:1457–63.
- [7] Chung JJ, Semelka RC, Martin DR, Marcos HB. Colon diseases: MR evaluation using combined T₂-weighted single-shot echo train spin-echo and gadolinium-enhanced spoiled gradient-echo sequences. *J Magn Reson Imaging* 2000;12:297–305.
- [8] Danielson K, Chernin MM, Amberg JR, Goff S, Durham JR. Epiploic appendicitis: CT characteristics. *J Comput Assist Tomogr* 1986;10:142–3.
- [9] Molla E, Ripolles T, Martinez MJ, Morote V, Rosello-Sastre E. Primary epiploic appendagitis: US and CT findings. *Eur Radiol* 1998;8:435–8.
- [10] Rao PM, Wittenberg J, Lawrason JN. Primary Epiploic Appendagitis: Evolutionary Changes in CT Appearance. *Radiology* 1997;204:713–7.
- [11] Puylaert JBCM. Right-sided Segmental Infarction of the Omentum: Clinical US, and CT Findings. *Radiology* 1992;185:169–72.