CT Appearance of Acute Appendagitis

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Purpose

Epiploic appendagitis is primary or secondary inflammation of epiploic appendages. Primary epiploic appendagitis (PEA), which is the subject of this study, is the result of torsion with subsequent ischemia, or is due to spontaneous venous thrombosis without torsion [1]. Secondary epiploic appendagitis is the inflammation of the epiploic appendages caused by nearby pathological processes, such as diverticulitis, appendicitis, or cholecystitis [1] and [2].

It is difficult to diagnose clinically due to the lack of pathognomonic clinical features, since it is characterized by a sudden onset of sharp localized pain either in the left or right iliac fossa with minimal gastrointestinal symptoms, which can simulate a surgical clinical picture.

Awareness of imaging findings of this entity is important to arrive at a correct diagnosis and to avoid unnecessary hospitalization and surgery. The purpose of this study is to describe the CT appearance of 16 cases of PEA and review the literature.
Methods and Materials

We reviewed the clinical records and CT images of 16 consecutive patients seen in Nejran armed forces hospital between July 2006 and November 2012.

All the patients were referred from the emergency department of our hospital and were examined with spiral CT scan, Siemens from July 2006 to 2009 and multidetector CT machine, 64 slices, GE Medical Systems from may 2010 to 2013. CT examinations were performed without contrast administration in 10 patients and in 6 patients CT was performed with oral, rectal and intravenous contrast media.

The CT scans of the epiploic appendagitis were evaluated for the presence of colon wall thickening, a focal fatty center, inflammatory changes, location in relationship to the colon, size, and presence or absence of central high density within the fat.

In 10 patients, the initial findings were compared with findings of follow-up CT performed between 3 days-21 months after the first CT.
Results

There were 16 patients, 75% (12/16) of them were males. The age range of the patients was 26-64 years old (mean age of 45 years). None of the patients was febrile at the time of presentation and 50% (8/16) had mild leucocytosis. All of them had abdominal pain, which correlated with the site of the radiological findings. The majority of the patients (9/16) had left flank pain and CT findings of PEA in the left lower quadrant. An ovoid fatty mass on the anti-mesenteric side of the colon with hyperattenuated ring and disproportionate adjacent fat stranding was seen on CT in all the patients (Fig, 1). In 75% (12/16) of patients, the fatty central core was between 1.5 and 3.5 cm in length. The most common part of the colon affected by acute epiploic appendagitis in decreasing order of frequency was the sigmoid colon (n = 6) (Fig, 2), descending colon (n = 4) (Fig, 3), cecum (n = 2) (Fig, 4), and ascending colon (n = 2) (Fig, 5). The most common positions of inflammatory changes in relationship to the colonic lumen, in descending order of frequency, were anterior (n = 9) (Fig, 5), lateral (n = 5) (Fig, 1), inferior (n = 1), and medial (n = 1) (Fig, 5). Associated thickening of the adjacent colonic wall was detected in 12.5% (2/16) of the patients (Fig, 5). The central high attenuation dot or line was seen in 62.5% (10/16) of the cases (Fig, 2, 4 and 5).

Evolutionary Changes in 10 patients, follow-up CT scans were available for comparison over a period of 3 days-21 months. In two patients in whom the second CT was performed within 2 weeks of the acute presentation, complete resolution was seen in one patient (Fig, 6) and increase in size and density in the second one (Fig, 7). In six patients in whom the follow-up CT scan was obtained within 6 months of the primary CT scan, no abnormality was detected in 4 patients and mild residual stranding density in the mesocolon for 2 patients. In 2 patients the follow up CT scan was performed at 16 and 21 months demonstrated no changes.

Discussion

Epiploic appendages are peritoneal outpouchings that arise from the serosal surface of the colon, contain adipose tissue and vessels, and can be up to 5 cm in length. The pedunculated shape, free range of movement and tortuous nature of their blood supply makes appendices epiploicae vulnerable to torsion or ischaemic changes [1]. Epiploic appendagitis is a rare, inflammatory process that results from a disturbance in the vasculature such as torsion or venous thrombosis of the epiploic appendage involved [1]. Appendagitis tends to be benign and self-limiting in nature; since most patients tend to present with localised abdominal pain, non-specific clinical symptoms and because of the infrequent incidence of this disease, there is a greater margin for misdiagnosis [2].
Patients as noted in our series, are typically obese people in the second to fifth decades of life complaining of motion-aggravated abdominal pain [3]. Depending on the location of the inflammatory process, the location of the pain varies but is mostly in the left or right lower quadrant [3]. Left lower quadrant pain is the more commonly encountered localization [3] and [4].

The pathognomonic CT features of acute appendagitis include a ‘target lesion’ with a central region of hyper attenuation in a fat density lesion of around 2-4 cm with an oval shape and a rim of hyper attenuation due to surrounding inflammation [1, 2].

In agreement with the study of Singh [4] the most common CT appearance of acute epiploic appendagitis, seen in our study, was the presence of 1.5- to 3.5-cm-diameter fat-density lesion with surrounding inflammatory changes usually abutting the anterior wall of the sigmoid and descending colon. Involvement of the proximal colon was less common. Although the presence of a central high-attenuation focus within the fat is a helpful finding in making the diagnosis, its absence does not exclude the diagnosis of acute epiploic appendagitis. The high density central focus within the fat was noted in only 50% (8/16) of the patients in our study which was concordant with largest study in the literature published by Singh [4].

The central high-density focus was believed to represent a thrombosed vessel within the inflamed appendix epiploica. In agreement with the study by Hiller and Singh et al. [4], we noted colon wall thickening in only 2 patients in our study (12.5%). This point is important in the differentiation of acute appendicitis from acute diverticulitis. The location of an acute appendix epiploica anterior to the colon is also useful in making a confident diagnosis [2, 4].

The CT changes of acute epiploic appendagitis in our study completely resolved in all patients who underwent follow-up CT 6 months after the acute presentation. However, the CT changes of acute epiploic appendagitis were present to a variable degree in majority of patients in whom CT was performed within 2 weeks or month. It is important to be aware of the evolutionary follow-up CT findings of acute appendagitis because these findings may persist for several months and mimic the diagnosis of acute epiploic appendagitis in the absence of a prior comparison study or suggestive clinical history.

The morphologic changes in the appearance of acute epiploic appendagitis on CT in our study are in agreement with the study by Singh [4] and Rao et al [5, 6].

The differential diagnosis of an inflammatory fatty lesion on CT includes acute epiploic appendagitis, mesenteric panniculitis, acute diverticulitis, trauma, or an omental neoplasm such as a liposarcoma. The diagnosis of this condition is based primarily on the CT features of inflammation centered over the epiploic appendage rather than the colon wall, lack of inflamed colonic diverticula, and, to a lesser extent, on the clinical features such as focal abdominal pain in the absence of fever and bloody stools [7, 8]. Although an omental infarction can have an appearance similar to that of epiploic appendagitis, it lacks the hyperdense ring that is seen in epiploic appendagitis [4].
Fig. 1: Axial CT scan section of the pelvis after rectal opacification showing an oval fat density lesion adjacent to the sigmoid colon on the anti-mesenteric side of the colon (arrow) with hyperattenuated ring and disproportionate adjacent fat stranding. No hyperattenuating center seen.

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**Fig. 2:** Oval-shaped, fat-density mass centred by hyperattenuating center adjacent to the sigmoid colon (arrow). The lesion has a thickened visceral peritoneal rim. Surrounding fat-stranding without significant adjacent colonic wall thickening.

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**Fig. 3:** Oval-shaped, fat-density mass (arrow) adjacent to the descending colon. The lesion has a thickened visceral peritoneal rim. Surrounding fat-stranding without hyperattenuating center.

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**Fig. 4:** Acute epiploic appendagitis near the cecum. Axial CT image shows fat lesion (arrow) with hyperattenuating center and surrounding inflammation that abut the cecum.
Fig. 5: Axial CT image shows the inflamed appendix epiploica (arrow) anterior to the ascending colon with hyperattenuating center surrounded by fat stranding. Wall thickening of the ascending colon noted adjacent to the inflamed epiploic appendix.

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Fig. 6: Follow up CT scan performed two weeks later shows complete resolution of the lesion.

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Fig. 7: Follow up CT scan done two weeks later demonstrates increased density and size of the lesion. Six months later CT scan shows complete resolution of the inflammation.

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Conclusion

As CT is often used nowadays to evaluate various acute abdominal complaints, it may be the first imaging modality by which acute epiploic appendagitis is diagnosed. The awareness of the CT features of acute appendagitis is important because this condition is medically managed but can mimic the surgical abdomen.
References

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