Acute Epiploic Appendagitis - a clinical and radiological challenge

Poster No.: C-1039
Congress: ECR 2016
Type: Educational Exhibit
Authors: D. Kaloyanova, E. Kalchev, K. Boikova, G. Valchev, S. Chakarov, B. Balev; Varna/BG
Keywords: Ischaemia / Infarction, Inflammation, Imaging sequences, Computer Applications-Detection, diagnosis, Ultrasound, CT, Colon, Abdomen
DOI: 10.1594/ECR2016/C-1039

Any information contained in this pdf file is automatically generated from digital material submitted to EPOS by third parties in the form of scientific presentations. References to any names, marks, products, or services of third parties or hypertext links to third-party sites or information are provided solely as a convenience to you and do not in any way constitute or imply ECR's endorsement, sponsorship or recommendation of the third party, information, product or service. ECR is not responsible for the content of these pages and does not make any representations regarding the content or accuracy of material in this file.

As per copyright regulations, any unauthorised use of the material or parts thereof as well as commercial reproduction or multiple distribution by any traditional or electronically based reproduction/publication method is strictly prohibited.

You agree to defend, indemnify, and hold ECR harmless from and against any and all claims, damages, costs, and expenses, including attorneys' fees, arising from or related to your use of these pages.

Please note: Links to movies, ppt slideshows and any other multimedia files are not available in the pdf version of presentations.

www.myESR.org
Learning objectives

Acute epiploic appendagitis is one of many different entities within the differential diagnosis of acute abdominal pain.

This educational exhibit present a comprehensive review of the following aspects:

- clinical symptoms and pathogenetic mechanism of acute epiploic appendagitis
- spectrum of imaging findings on US and CT examinations
- discussion of the possible mimickers of acute epiploic appendagitis
- "take home" reminder that acute epiploic appendagitis take place in the differential diagnosis of acute abdominal pain
Background

*Epiploic appendages*, also known as epiploicae appendices, are 50-100 pedunculated fatty structures arranged in two separate longitudinal rows next to the anterior and posterior tenia coli over the external aspect of the colon [1-4,10]. Epiploic appendages extend from the cecum to the rectosigmoid junction with greatest concentration in the cecum and sigmoid colon and are covered by the peritoneum [1,4-8]. Epiploic appendages spares the rectum [1,5,9,10]. Epiploic appendages are between 1-2 cm thick, 0.5-5 cm long, and larger on the left side of the colon than on the right side [1,3]. Each epiploic appendage is supplied by one or two small end arteries branching from the vasa recta longa of the colon and is drained by a tortuous vein passing through its narrow pedicle [1-4]. Their limited blood supply, together with their pedunculated shape and excessive mobility, make epiploic appendages prone to torsion and ischemic or hemorrhagic infarction [1,2,4,8,10].

*Appendagitis* is a term denoting primary or secondary inflammation (the epiploic appendage is inflamed because of as diverticulitis, appendicitis, pancreatitis, or cholecystitis) of the epiploic appendages [1,2,4,6,7].

Primary epiploic appendagitis is an ischemic infarction of an epiploic appendage and an uncommon cause of focal abdominal pain in otherwise healthy patients with mild or absent secondary signs of abdominal pathology. Primary epiploic appendagitis is caused by epiploic appendage torsion or spontaneous thrombosis of the epiploic appendage central draining vein resulting in vascular occlusion and focal inflammation [1,5-7,10,12,13]. The reported age range for primary epiploic appendagitis is 12-82 years, with a peak in incidence in the fifth decade. Primary epiploic appendagitis is more common in obese patients and women [1,3,4]. Primary epiploic appendagitis occurs more frequently in the sigmoid colon than in the cecum or ascending colon and is uncommon in the transverse colon [1,3,5,10,16].

*Primary epiploic appendagitis* usually presents as a sudden onset of focal abdominal pain in the lateral lower quadrants, is nonmigratory, and worsens with cough, sneezing and abdominal stretching [1,2,3,11]. Appetite and bowel function are usually unchanged; nausea and vomiting are rare [6,16]. On physical examination, the patient will present with localized tenderness without significant guarding or rigidity. The patient also may have a low-grade fever [1,3,18].

Primary epiploic appendagitis is difficult to diagnose due to its vague clinical presentation and the lack of pathognomonic clinical features and can simulate a case requiring surgery [1,3,4]. Right-sided primary epiploic appendagitis is often confused with acute appendicitis or right-sided diverticulitis; whereas left-sided primary epiploic appendagitis...
is often confused with sigmoid diverticulitis [3,4,18]. This condition is usually diagnosed by ultrasound or CT. Although ultrasound has the advantage of correlating the location of the lesion with the location of maximum tenderness, CT should be used to confirm the fatty nature of the lesion before making a definite diagnosis of primary epiploic appendagitis [10].

Primary epiploic appendagitis is **self-limited** in the majority of patients and spontaneously resolves within 5-7 days. Rarely, there can be complications such as adhesion, bowel obstruction, intussusception, intraperitoneal loose bodies, peritonitis, or abscess formation [1,3,5]. Primary epiploic appendagitis does not require surgery, and treatment is based on the patient's symptoms [4,5,7,13,15]. Misdiagnosis may lead to unwarranted surgery, medical treatment, and hospitalization [4].

**Differential diagnosis**

In epiploic appendagitis, there is much more fat stranding than bowel wall thickening. In patients with acute abdominal pain, the finding of fat stranding that is disproportionate suggests a relatively narrow differential diagnosis: diverticulitis; omental infarction; appendicitis; and, less commonly, mesenteric panniculitis and primary tumors and metastases to the omentum [1].
Findings and procedure details

The diagnosis of acute epiploic appendagitis primarily relies on cross-sectional CT, although ultrasound and MRI are occasionally used [11,18].

**CT**

In CT of a healthy patient, the epiploic appendages blend in with the surrounding pericolic fat but become apparent when surrounded by ascites or inflammation [3,5,8]. An infarcted or inflamed epiploic appendage on CT appears as a 1-4 cm ovoid pericolic lesion with fat density surrounded by inflammatory changes and abuts the anterior colonic wall [1,3,5,11,15]. Primary epiploic appendagitis may have a lobular appearance because of two or more affected, contiguous epiploic appendages with hyperattenuated rings lying in proximity.

Fig. 1: Axial CT images of 45-year-old man with acute epiploic appendagitis right next to the posterior-lateral margin of colon sigmoideum

**References:** Department of Radiology, Saint Marina Hospital, Varna, 2015
Fig. 2: Axial contrast-enhanced CT image of a 44-year-old man, admitted with clinical diagnosis of presumed colonic diverticulitis. CT scan shows pericolonic fatty lesion, surrounded by hyperattenuating ring and a "central dot sign".

References: Department of Radiology, Saint Marina Hospital, Varna, 2015
Fig. 3: Coronal reconstruction of contrast-enhanced CT image of a 44-year-old man, admitted with clinical diagnosis of presumed colonic diverticulitis. CT scan shows pericolonic fatty lesion, surrounded by hyperattenuating ring and a "central dot sign".

References: Department of Radiology, Saint Marina Hospital, Varna, 2015

There are some key signs that can lead the radiologist to the correct diagnosis:

- Hyperattenuating ring sign- A 2-3 mm hyperdense rim surrounding the ovoid mass on CT represents the inflamed visceral peritoneal covering of the epiploic appendage and is diagnostic of primary epiploic appendagitis [13,15]. The hyperdense rim surrounding the ovoid mass on CT corresponds to the hypoechoic halo on ultrasound [13,15,19]
• Fat stranding (Figs. 5-7)
• Thickening of the parietal peritoneum secondary to the spread of inflammation may be observed [1,3,5-7]. Wall thickening of the adjacent side of the colon is asymmetric [1,4,8]
• "Central dot sign"- A central, hyperattenuating, ill-defined round area or a longitudinal linear area corresponds to engorged or thrombosed central vessels or central areas of hemorrhage or fibrosis (Figs. 8-11). The central dot may have high attenuation because the infarcted tissue tends to calcify. Calcification may be eggshell in shape and may become detached and appear as a peritoneal loose body in the abdominal cavity [1,3,16]. The calcified tissue may reattach itself to a surface, such as the lower aspect of the spleen, in which case it is called a "parasitized epiploic appendage" [3]

**Ultrasound**

At the site of maximum tenderness, a noncompressible hyperechoic small ovoid or round solid mass of adipose tissue is seen between the colon and the abdominal wall in the anterior or anterolateral compartment of the abdomen [1,6,22].

**Fig. 12:** Ultrasonogram at site of maximum tenderness in 34-year old female with right lower quadrant abdominal pain. Images show small hyperechoic mass surrounded by hypoechoic border. No colonic wall involvement

**References:** Department of Radiology, Saint Marina Hospital, Varna, 2015
In most cases, a mass effect is seen either on the adjacent bowel or in the anterior parietal peritoneum. Changes to the colonic wall are not seen [12]. The lesion is adherent to the colonic wall, is frequently surrounded by a hypoechoic border (Fig. 13), and does not have central blood flow on Doppler ultrasound [4,12]. The absence of a Doppler signal because of a lack of blood flow as a result of torsion in epiploic appendagitis is a useful finding to differentiate epiploic appendagitis from acute diverticulitis [12].

**MRI**

The involved epiploic appendage is hyperintense on unenhanced T1-weighted imaging but is slightly less intense than normal peritoneal fat. Epiploic appendages show marked loss of signal on fat-suppressed T2-weighted images, confirming the fatty nature of the lesion [1]. In epiploic appendagitis, the thin peripheral rim and the perilesional inflammatory changes appear hypointense on T1-weighted imaging, appear hyperintense on T2-weighted imaging, and show marked enhancement on contrast-enhanced T1-weighted fat-suppressed images, whereas the central draining vein usually has low signal on both T1-weighted and T2-weighted imaging [1].
Fig. 5: Acute epiploic appendagitis in 44-year-old male with hyperattenuation center. CT image shows lesion that abuts sigmoid colon with surrounding inflammation.

© Department of Radiology, Saint Marina Hospital, Varna, 2015
**Fig. 6:** Coronal CT image of pericolonic inflammatory changes

© Department of Radiology, Saint Marina Hospital, Varna, 2015
Fig. 7: Sagital CT image of pericolonic inflammatory changes

© Department of Radiology, Saint Marina Hospital, Varna, 2015
Fig. 8: Hyperattenuating "central dot sign" in patient with primary epiploic appendagitis

© Department of Radiology, Saint Marina Hospital, Varna, 2015
Fig. 9: Coronal reconstruction CT image of hyperattenuating "central dot sign" corresponding to primary epiploic appendagitis laterally of sigmoid colon in a 56-year-old patient admitted with diagnosis diverticulitis.

© Department of Radiology, Saint Marina Hospital, Varna, 2015
Fig. 10: Sudden onset abdominal pain in male. Contrast-enhanced CT image corresponds to epiploic appendagitis.

© Department of Radiology, Saint Marina Hospital, Varna, 2015
**Fig. 11:** Fatty lesion with central hyperattenuating focus adjacent to colonic wall of sigmoid in 49-year-old patient. No significant colonic wall thickening is seen.

© Department of Radiology, Saint Marina Hospital, Varna, 2015
**Fig. 13:** US image shows small hyperechoic mass surrounded by hypoechoic border corresponding to the hyperattenuating ring sign in CT scans in 38-year-old male with acute epiplioc appendagitis

© Department of Radiology, Saint Marina Hospital, Varna, 2015
**Fig. 4:** Primary epiploic appendagitis in 57-year-old male with hyperattenuating ring sign, fat strand adjacent to sigmoid colon without significant involvement of colonic wall

© Department of Radiology, Saint Marina Hospital, Varna, 2015
Conclusion

Although acute epiploic appendagitis is relatively rare, self-healing and self-limiting condition, the misdiagnosed one can lead to unnecessary interventions, hospitalization and medical costs. During evaluation of the acute abdominal pain, it is essential that radiologist has a comprehensive knowledge of the often overlapping clinical manifestations and should be familiar with the presentation and the different imaging appearances of all the possible examination modalities in order to make the correct diagnosis.
Personal information

1. **D. Kaloyanova** - Department of Radiology, University Hospital Saint Marina, Varna, Bulgaria
2. **E. Kalchev** - Department of Radiology, University Hospital Saint Marina, Varna, Bulgaria
3. **G. Valchev** - Department of Radiology, University Hospital Saint Marina, Varna, Bulgaria
4. **K. Boikova** - Department of Radiology, University Hospital Saint Marina, Varna, Bulgaria
5. **S. Chakarov** - Department of Radiology, University Hospital Saint Marina, Varna, Bulgaria
6. **B. Balev** - Department of Radiology, University Hospital Saint Marina, Varna, Bulgaria
References


10. Radiopedia.org


