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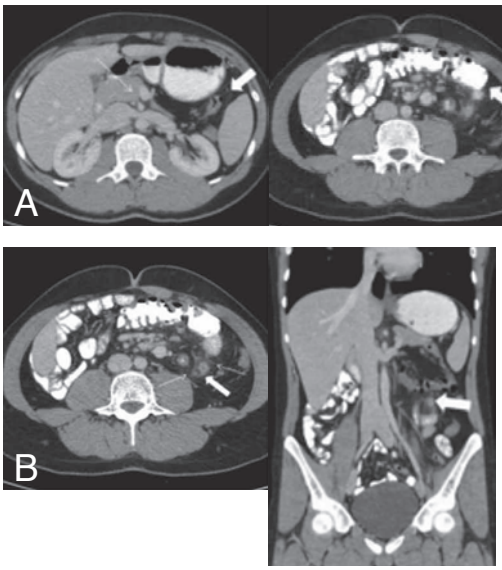
# IMAGES IN CLINICAL RADIOLOGY




## *A case of acute appendicitis at atypical localization*

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A 23-year-old male patient is admitted in the emergency unit with complaints of acute pain in the left lower quadrant of abdomen, nausea, vomiting and anorexia. Physical examination, shows tenderness in the left lower quadrant, defense and rebound. Laboratory examination reveals a white blood cell count at 18,000 cells/mm$^3$, with 73% neutrophils. His temperature is 38°c. The patient was referred to radiology unit and supine abdominal radiograph showed colonic gas distension in the left side of abdomen. Abdominal computed tomography (CT) examination showed that cecum was not at the normal localization in the left lower-middle part of abdomen. Similar to cecum, ascending colon was also located in the left side of abdomen. The superior mesenteric vein (SMV) was located anterior and to the left of the superior mesenteric artery (Fig. A, thick arrow cecum, thin arrow SMV). At the inferior-medial part of cecum, a tubular, enhancing structure compatible with inflamed appendix was seen. The diameter and wall thickness of appendix were increased additionally there were mesenteric heterogeneity and linear density increases at periappendiceal region (Fig. B, thick arrow appendix, thin arrow periappendiceal heterogeneity). The diameter of the appendix was 9 mm. In the light of these findings the patient was diagnosed as midgut malrotation and additionally left sided acute appendicitis.

The patient was referred to general surgery department for surgery and discharged shortly after.

*Comment*

The most common surgical reason of abdominal pain is acute appendicitis. Sometimes acute appendicitis may settle in atypical localization. Left lower sided appendix may be with intestinal malrotation and situs inversus totalis (1, 2). In adults, intestinal malrotation is an asymptomatic situation compatible with abnormal fixation of midgut on peritoneal wall during the turning around superior mesenteric artery (1). The incidence of situs inversus varies from 1 in 6,000 to 1 in 35,000. Midgut malrotation is rarer than situs inversus. Even rarer is the occurrence of acute appendicitis associated with midgut malrotation. CT in our patient showed that the liver, stomach, and duodenum were located in their normal position. This finding showed that there is no presence of situs inversus. However, the cecum and ascending colon were located in the left side of the abdomen. The SMV was located anterior and to the left of the superior mesenteric artery, indicating midgut malrotation.

Rarely as a result of malrotation, if midgut and cecum volvulus occurs, ischemia, obstruction or chronic abdominal pain may be seen. Other causes of acute abdominal pain are sigmoid diverticulitis, colitis, abdominal aortic aneurysm, renal colic, cystitis, epididymitis, prostatitis, testis torsion, incarcerated hernia, psoas abscess, tumor perforation, gynecologic reasons (ovarian tumors or cysts, adnexal torsion, ruptured ectopic pregnancy, pelvic inflammatory disease, endometriosis etc.) and acute appendicitis accompanying situs inversus (6). In the literature, it is reported that diverticular diseases may be misdiagnosed in acute appendicitis in the left sided cecum. Acute appendicitis with malrotation can be correctly diagnosed more than 90% success by CT examination. The CT findings of left-sided appendicitis are similar in appearance to those of right-sided appendicitis except for its opposite location. A tubular, enhancing structure surrounded by reactive changes in the adjacent fat suggests the diagnosis (2).

Accurate preoperative diagnosis is critical in the management of acute appendicitis to prevent delay in the treatment of a relatively common disease, especially when it appears in an unusual location. CT not only provides accurate diagnosis of left-sided appendicitis but also is particularly useful in detecting associated rotational anomalies and related complications that may require separate surgical correction.

*References*

1. Hou S.K., Chern C.H., How C.K., et al.: Diagnosis of appendicitis with left lower quadrant pain. *J Chin Med Assoc*, 2005, 68: 599-603.
2. Kamiyama T., Fujiyoshi F., Hamada H., et al.: Left -sided acute appendicitis with intestinal malrotation. *Radiation Medicine*, 2005, 23: 125-127.

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