Unusual centrally located abdominal abscess: anatomy as key to the diagnosis!

The patient presented with acute abdominal pain and a history of episodes of diarrhoea. A left iliac fossa mass with transmitted pulsation was identified. Blood tests disclosed CRP 174 mg/L, White Blood Cells 17.3 x10^9/liter, Neutrophils 14.5 x10^9/liter (SI units). A CT examination was performed to rule out perforated diverticulitis.

**Imaging Findings:**

Portal venous contrast-enhanced CT images (Fig. 1) depicted a 6x5x13 cm, multiloculated, central abdominal mass with heterogeneous peripheral enhancement and central fluid-attenuation area. Prominent mesenteric lymph nodes and intra-abdominal free fluid were noted. In close proximity a dilated small bowel loop with no signs of obstruction or perforation was noted. Findings were attributed to an intra-abdominal abscess.

At 1 month CT (Fig. 2) after conservative management with antibiotics, the mass had decreased in size and free fluid had resolved. Oral contrast administration allowed depiction of opacified small bowel loops on the right side of the abdomen and left-sided large bowel. Inversion of SMA/SMV relationship was also noted.

Five months follow-up CT (Fig. 3) demonstrated complete regression of the lesion with residual minor fat stranding and a normal air-filled appendix crossing the site, not discernible previously. Absence of normal midline crossing of the duodenum confirmed bowel nonrotation.

**Discussion:**

Rotation anomalies of the primitive intestine occur in 1 of 500 live-births and include a wide range of anomalies. About 85% of cases are diagnosed in the first two weeks of life because of intestinal obstruction. In adults, malrotation is a rare cause of chronic abdominal pain or obstruction, being asymptomatic in most cases and incidentally diagnosed with imaging or at laparotomy. Stringer classified malrotation into type Ia (nonrotation), type II (duodenal malrotation) and type III (duodenal and caecal malrotation) according to the embryological stage at which normal development failed. It is, however, useful to simplify categorization into nonrotation and incomplete rotation: nonrotation represents most cases identified in the adult population, in which the small bowel is located predominantly on the right side and the colon is on the left side; incomplete rotation refers to a wide spectrum of anomalies involving either the duodenum of the right colon. In patients with rotation anomalies abnormal attachment of mesentery, insufficient fixation of the bowel and mesenteric fibrous bands (bands of Ladd) are present,
predisposing to internal hernias, volvulus, obstruction and ischaemia [1-3]. Although appendicitis is the most common acute surgical condition of the abdomen, it represents a diagnostic challenge when it develops in the setting of malrotation, since the altered anatomy results in atypical presentation. CT is a reliable diagnostic modality in acute abdomen and its sensitivity in acute appendicitis is 94% [4, 5]: the pathognomonic sign being a distended fluid-filled tubular structure measuring more than 6 mm in diameter in the expected location of the appendix, usually the right lower quadrant; presence of pericolic fat stranding and appendicolith facilitate the diagnosis. Appendicitis can be complicated by phlegmon, abscess or perforation [6]. In rotation anomalies with malposition of the caecum, the CT signs of acute appendicitis will be at a location other than the expected: left-sided appendicitis is associated with nonrotation. Deviation from the normal relationship between SMA and SMV is a useful indicator of bowel malrotation: these can assume a vertical relationship or show left–right inversion [7]. A left-sided abdominal pain associated with CT signs of inflammation in the left lower abdomen, especially in the elderly, might lead to a misdiagnosis of acute diverticulitis. Differential diagnosis is important because, in contrast to uncomplicated diverticulitis, acute appendicitis might require urgent surgical treatment. MPR images help avoid misdiagnosis, demonstrating the anatomy of caecum, ileocaecal valve and appendiceal base [1, 4, 5].

**Differential Diagnosis List:** Left-sided acute appendicitis with periappendicular abscess in bowel nonrotation, Extra-pancreatic pseudocyst, Intra-abdominal mycobacterial abscess, Diverticular abscess, Desmoid tumour, Lymphoma, GIST

**Final Diagnosis:** Left-sided acute appendicitis with periappendicular abscess in bowel nonrotation

**References:**


Kim HC et al. (2008) Added diagnostic value of multiplanar reformation of multidetector CT data in patients with suspected appendicitis. Radiographics 28(2):393-405 (PMID: [18349447])


**Description:** 6x5x13 cm multiloculated central abdominal mass with heterogeneous peripheral enhancement and central hypoattenuating fluid-like areas. Right iliac fossa and pelvic free fluid (arrowhead). **Origin:** Radiology Department, Guy's and St. Thomas NHS Foundation Trust, London, UK
Description: Prominent mesenteric and ileocolic lymph nodes measuring up to 16 mm in diameter (arrowheads). Note also inversion of the normal relationship of superior mesenteric vessels. **Origin:** Radiology Department, Guy's and St. Thomas NHS Foundation Trust, London, UK

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Description: Dilated small bowel loops (arrowhead) in close proximity to the mass, with no signs of bowel obstruction or perforation. **Origin:** Radiology Department, Guy's and St. Thomas NHS Foundation Trust, London, UK
Description: Pelvic free fluid and sigmoid uncomplicated diverticulosis. Origin: Radiology Department, Guy’s and St. Thomas NHS Foundation Trust, London, UK
**Figure 2**

*Description:* The lesion has decreased in size and has a less prominent fluid-attenuating centre. It is now surrounded by mesenteric fat stranding. *Origin:* Radiology Department, Guy's and St. Thomas NHS Foundation Trust, London, UK
Description: Enlarged lymph nodes are again seen. Abdominal free fluid is no longer present. Orally opacified small bowel loops are situated on the right side and the large bowel is left-sided. Origin: Radiology Department, Guy's and St. Thomas NHS Foundation Trust, London, UK
Description: Enlarged lymph nodes are again seen. Abdominal free fluid is no longer present. Orally opacified small bowel loops are situated on the right side and the large bowel is left-sided. Origin: Radiology Department, Guy's and St. Thomas NHS Foundation Trust, London, UK
Description: Inversion of the normal relationship of superior mesenteric vessels, with SMA lying to the right of SMV. This finding was already noticeable on the first CT examination. Origin: Radiology Department, Guy's and St. Thomas NHS Foundation Trust, London, UK
Description: Disappearance of the central-abdominal abscess, with resulting mesenteric fat stranding. Associated mesenteric lymph nodes are smaller. Origin: Radiology Department, Guy's and St. Thomas NHS Foundation Trust, London, UK
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**Description:** Disappearance of the central-abdominal abscess, with resulting mesenteric fat stranding. Associated mesenteric lymph nodes are smaller (arrowhead).

**Origin:** Radiology Department, Guy's and St. Thomas NHS Foundation Trust, London, UK
Description: Oral contrast administration allows for depiction of absence of normal retroperitoneal midline crossing of the duodenum, which has corkscrew appearance. Origin: Radiology Department, Guy's and St. Thomas NHS Foundation Trust, London, UK
Description: MPR image demonstrates terminal ileum better, and depicts the left sided caecal pole as well. Origin: Radiology Department, Guy's and St. Thomas NHS Foundation Trust, London, UK
**Description:** A gas-filled tubular structure extending from the tip of the caecum, consistent with the appendix, is now demonstrated in the site of the resolved lesion. **Origin:** Radiology Department, Guy\'s and St. Thomas NHS Foundation Trust, London, UK