Situated Inversus Appendicitis with NO clear LLQ pain: not so surprising as you might think

Clinical History:

A 22-year-old man presents to the ER with abdominal pain since 20 hours, initially located at the belly-button area with further migration to the lower abdomen. No abdominal guarding was displayed. Blumberg manoeuvre was negative. Laboratory results revealed a leukocytosis count of 15,000 and neutrophilia. Low-grade fever was recorded.

Imaging Findings:

Chest x-ray revealed a right aortic arch, dextrocardia, and a right-sided stomach bubble, findings the patient was unaware of and that raised the suspicion of a situs inversus. US revealed an aperistaltic, noncompressible, dilated appendix with periappendiceal fluid and echogenic prominent pericaecal fat; those findings were identified at the left lower quadrant. CT confirmed a total transposition of abdominal and thoracic viscera and depicts an appendix with distended lumen and thickened and enhancing walls. Stranding of the adjacent fat was also noted.

Discussion:

Two main anatomic abnormalities result in left-sided acute appendicitis (LSAA), situs inversus being the most common followed by midgut malrotation [1, 2]. Midgut malrotation refers to a spectrum of congenital positional abnormalities of the intestine in the setting of a non-existing or incomplete rotation of the primitive loop around the axis of the superior mesenteric artery during fetal life. Situs inversus is a rare condition and occurs in 1 per 5000 to 1 per 10,000 births [2]; it might either be complete when both thoracic and abdominal organs are transposed or partial when only one of those cavities is affected [3]. The reported incidence of acute appendicitis associated with situs inversus is between 0.016% and 0.024% of the general population [4, 5]. Recent literature reports the mean age of patients with LSAA to be around 29 years and the male:female sex ratio as 3:2 [3].

Left-sided acute appendicitis poses a diagnostic challenge as the appendix is located in an abnormal position and because it often displays a lack of uniformity in the clinical signs [6, 7], presumably due to absent nervous system transposition even though the viscera are transposed. In fact, between 18.4% - 31% of patients with situs inversus and midgut malrotation suffering from left-sided acute appendicitis exhibit a right lower quadrant pain [3-6]; the diagnosis often being delayed. Accurate preoperative diagnosis is necessary to avoid incorrect incision in the above...
mentioned cases. Dextrocardia detection on chest X-ray is of considerable value in establishing the diagnosis of situs inversus. As with right appendicitis, CT remains the most accurate diagnosing modality and surgical options are identical for normal patients. Diagnostic laparoscopy is of utmost importance in cases with complicated differential diagnosis [3].

Our case illustrates the often misleading location of the pain, presumably due to incomplete or absent nervous system transposition, given that it was diffusely present at the lower abdomen with no clear left predominance.

In conclusion, LSAA should be considered in the differential diagnosis of young patients presenting with pain localized in the left lower quadrant, especially if chest x-ray raises suspicions on the presence of a dextrocardia. **Differential Diagnosis List:** Situs Inversus Totalis Appendicitis, Crohn disease, Terminal ileitis

**Final Diagnosis:** Situs Inversus Totalis Appendicitis

**References:**


Dextrocardia

Origin: Radiology Department, Hospital del Mar
Description: Liver silhouette depicted at the left side

Origin: Radiology Department, Hospital del Mar
Description: US revealed an aperistaltic, noncompressible, dilated appendix with periappendiceal fluid and echogenic prominent pericaecal fat.

Target appearance is clearly depicted. Origin: Radiology Department, Hospital del Mar
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Target appearance is clearly depicted. Origin: Radiology Department, Hospital del Mar
Figure 4

a

Description: CT confirmed a total transposition of abdominal and thoracic viscera and better depicts the situs inversus. **Origin:** Radiology Department, Hospital del Mar

b

Description: CT depicts an appendix with distended lumen and thickened and enhancing walls. Strandng of the adjacent fat is also present. **Origin:** Radiology Department, Hospital del Mar
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