

# Left-Sided Acute Appendicitis With Situs Inversus Totalis

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## Citation

A Ucar, E Ergul, R Aydin, Y Ozgun, B Korukluoglu. *Left-Sided Acute Appendicitis With Situs Inversus Totalis*. The Internet Journal of Surgery. 2006 Volume 12 Number 2.

## Abstract

Situs inversus totalis is an uncommon anatomic anomaly that complicates diagnosis and management of acute abdominal pain. Thus, awareness of the multiple etiologies, common and uncommon, and their unusual and sometimes confounding presentations is critical for the Emergency Physicians and surgeon alike. We present the case of a 22-year-old man with situs inversus totalis and left-sided acute appendicitis.

## INTRODUCTION

Abdominal pain is one of the most common chief complaints of patients presenting to the Emergency Department (ED), with estimates ranging from 4-8% of all adult ED visits<sub>1</sub>. Causes are multiple and diverse, with the patient's age, sex, and presence or absence of underlying disease all influencing the differential diagnosis. On ED disposition, the source of 24-41% of abdominal pain remains undiagnosed, up to 30% are misdiagnosed, and up to 12% are seen again by a surgeon<sub>1</sub>.

Left-sided appendicitis occurs in association with two types of congenital anomalies; situs inversus and intestinal malrotation. Because the appendix is located in an abnormal position, it is difficult to obtain an accurate diagnosis of left-sided appendicitis. Situs inversus totalis is a rare anatomic anomaly with an estimated incidence of 1:20,000 in the general population and an autosomal recessive mode of inheritance<sub>2</sub>. Visceral situs inversus can occur with or without dextrocardia.

Intestinal malrotation is a congenital anomaly referring to either non-rotation or incomplete rotation of the primitive intestinal loop around the axis of the superior mesenteric artery during fetal development. While most cases of intestinal malrotation present with bilious vomiting in the first month of life, rare cases present in adulthood<sub>3</sub>. It is important that physicians be aware of the possibility of this disease when treating adult patients with abdominal pain because diagnosis of intestinal malrotation can be difficult.

Thus, awareness of the multiple etiologies, common and uncommon, and their unusual and sometimes confounding

presentations is critical for the Emergency Physicians and surgeon alike. We present a case of a man with uncommon, but surgically significant cause of abdominal pain.

## CASE REPORT

A 22-year-old man came to our ED with a chief complaint of lower abdominal pain with a history of 8 hours. Physical examination showed tenderness sharply localized to the left lower quadrant, and marked rebound tenderness in an area corresponding to McBurney's point but on the left side. His temperature was 37°C.

Laboratory examinations showed a white blood cell count of  $14.7 \times 10^3/\mu\text{l}$  with 91.3% neutrophils. A chest radiograph demonstrated dextrocardia without other abnormalities (Figure.1). Abdominal ultrasonography showed a left-sided liver and gallbladder, and a right-sided spleen. The appendix was not visualized. An emergency operation was performed within 4 hours from his admission to the ED.

**Figure 1**



At operation, a left paramedian incision was made, and an acutely inflamed appendix was removed from the caecum located in the left iliac fossa. A quick exploration revealed the liver to be on the left side and the viscera to be completely transposed. Recovery was uneventful.

## DISCUSSION

Appendicitis, including both right-sided and left-sided, has an annual incidence of 1:1,000 population<sub>1</sub>. The classical presentation includes the gradual onset of vague peri-umbilical abdominal pain localizing to the right lower quadrant over approximately 24 h, associated with nausea, vomiting, anorexia, and diarrhea. This typical presentation occurs only in about 60% of patients<sub>1</sub>.

Situs inversus totalis is a rare anatomic anomaly with an estimated incidence of 1:20,000 in the general population and an autosomal recessive mode of inheritance<sub>2</sub>. Visceral situs inversus can occur with or without dextrocardia. Situs inversus is caused by a clockwise rotation of the viscera

during early embryonic life, resulting in a “mirror image” of the normal bowel<sub>4</sub>.

The diagnosis of acute appendicitis in situs inversus totalis can be difficult because of abnormal pain localization. Malrotation of the intraabdominal viscera is not accompanied by corresponding changes in the nervous system; and in about 31% of the patients the first signs of acute left-sided appendicitis are pain and rebound tenderness in the right lower quadrant of the abdomen<sub>4</sub>. This led to an incorrect incision in 45% of these cases; in 1/3 a second correct incision had to be made<sub>4</sub>. In our case, we first diagnosed situs inversus totalis and then diagnosed left-sided acute appendicitis.

Electrocardiogram, radiographic studies, computed tomography (CT) scan with oral and intravenous contrast, ultrasound, and barium studies can help to diagnose situs inversus<sub>1,5</sub>. In our case, we diagnosed it by a chest radiograph and an abdominal ultrasonography.

## CONCLUSION

Adverse outcomes with appendiceal rupture and abscess formation occurred due to inadvertent physical examinations and inadequate observation, especially in cases like ours. Early clinical suspicion and adequate observation are indicated in patients with uncertain clinical features. However, in patients with unresolved clinical symptoms and/or local peritonitis that develops during observation, imaging studies play a significant role in preoperative diagnosis and determination of proper treatment.

## References

1. Nelson MJ, Pesola GR. Left lower quadrant pain of unusual cause. *J Emerg Med* 2001;20(3):241-5
2. Djohan RS, Rodriguez HE, Wiesman IM, Unti JA, Podbielski FJ. Laparoscopic cholecystectomy and appendectomy in situs inversus totalis. *J S L S* 2000;4:251-4
3. Lee MR, Kim JH, Hwang Y, Kim YK. A left-sided periappendiceal abscess in an adult with intestinal malrotation. *World J Gastroenterol* 2006;12(33):5399-400
4. Van Steensel CJ, Wereldsma JC. Acute appendicitis in complete situs inversus. *Neth J Surg.* 1985;37(4):117-8
5. Ratani RS, Halter JO, Wang WY, Yang DC. Role of CT in left-sided acute appendicitis: case report. *Abdom Imaging* 2002;27:18-9

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