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## A case report on left-sided appendicitis with intestinal malrotation

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### Abstract

Acute appendicitis is a mimicker of a wide range of gastrointestinal and genitourinary pathologies. The diagnosis becomes more challenging when it is associated with intestinal malrotation. A rare case of left-sided acute appendicitis with asymptomatic undiagnosed intestinal malrotation is reported. A 26-year-old male without known comorbidities presented with periumbilical and left-sided abdominal pain. Abdominal ultrasonography and computerized tomography scans showed intestinal malrotation with acute appendicitis. Exploratory laparotomy and appendectomy with midline incision were performed, and the patient had no issues on follow-up. Given the rarity of acute appendicitis associated with intestinal malrotation, an increase in awareness of this anatomical variant is essential among emergency physicians, radiologists, and surgeons for prompt diagnosis and timely intervention.

**Keywords:** Left sided appendicitis, intestinal malrotation

### Introduction

Abdominal pain is one of the most common complaints for emergency visits. Acute appendicitis is the most common surgical cause of acute abdominal pain with overall lifetime risks for males and females being 8.6% and 6.7%, respectively. The presentation of acute appendicitis mimics a wide range of gastrointestinal and genitourinary pathologies like gastritis, gastroenteritis, cholecystitis, pyelonephritis, and diverticulitis. Atypical presentation of acute appendicitis with a left sided pain could be misleading. As diverticulitis is most often considered as the differential diagnosis in patients with left-sided abdominal pain, it creates a diagnostic dilemma. Moreover, researchers have noticed an increasing prevalence of diverticulitis in younger adults than previously recognized.

Left lower quadrant pain caused by acute appendicitis can be due to a right-sided long appendix projecting into the left lower quadrant area and an abnormal left-sided location of the appendix. The abnormal left-sided location of the appendix results from two congenital anomalies: intestinal malrotation and situs inversus totalis.

We report a case presenting with progressive and constant pain in his left lower abdomen which we presumed to be due to diverticulitis. However, abdominal ultrasonography (USG) and computerized tomography (CT) scans revealed left-sided acute appendicitis with intestinal malrotation, which significantly changed clinical management. He did well postoperatively and was discharged after a successful recovery.

### Case Report

A 26 year old male patient rameshbhai solanki residing at limbdi, surendranagar presented with complain of left lower abdominal and periumbilical pain since 10 days which was sudden in onset, mild to moderate, dull aching, intermittent and non-radiating to back. It was associated with fever since 10 days which was low grade intermittent and without chills and rigors. It was also associated with nausea and multiple episodes of vomiting since 10 days which was gastric and non-projectile. It was not associated with constipation, diarrhoea, hematuria, pyuria, burning micturation and trauma. Patient had no prior history of any comorbidities, hospitalization and surgery. Patient had no addiction either. There was no any significant family history or similar episode in the past.

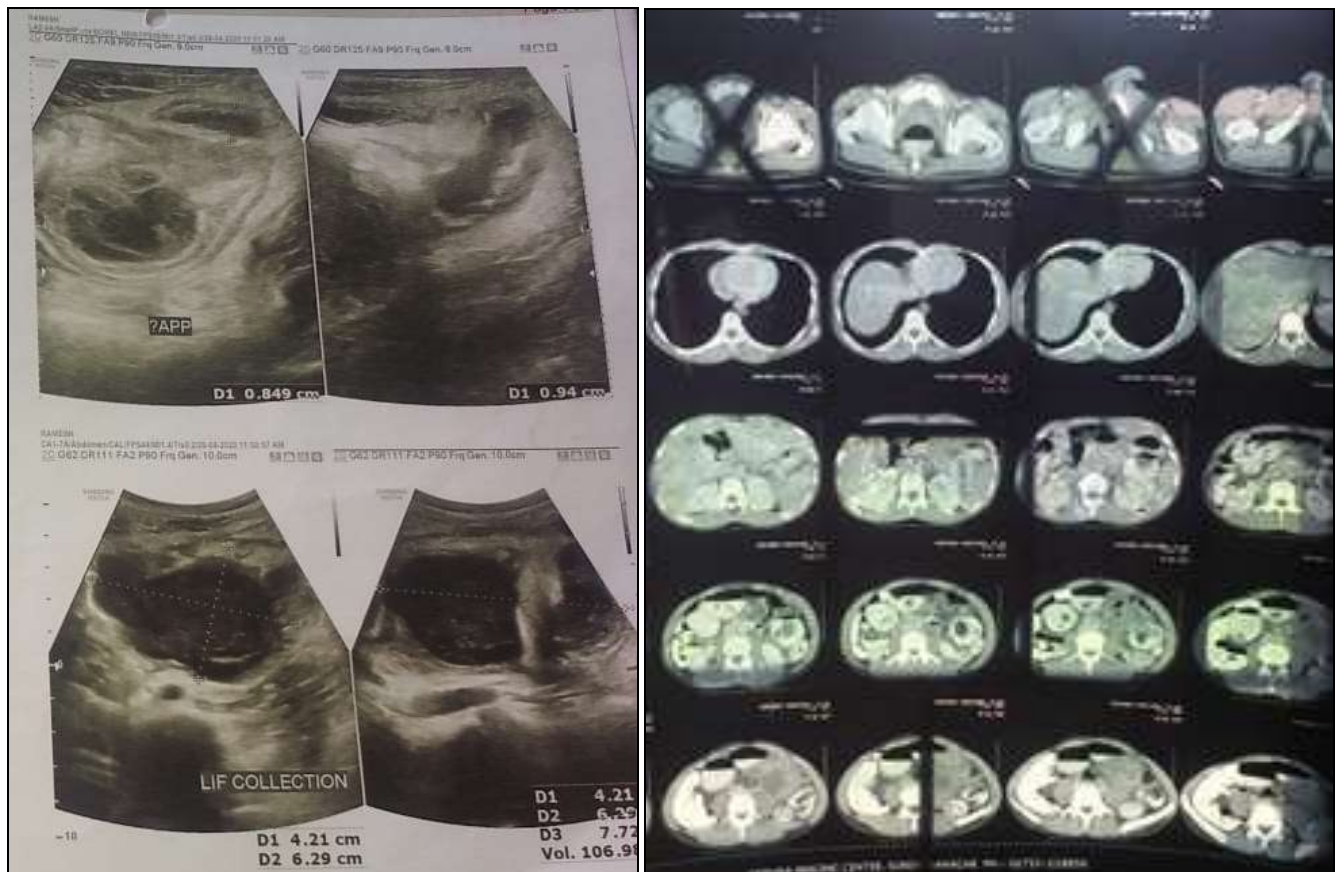
On clinical examination patient was in tachycardia (110/min), normal blood pressure (108/70 mmhg), oxygen saturation was normal, without pallor, icterus, pedal edema, lymphadenopathy. Perabdomen examination reveals mild tenderness in left hypochondrium and left lumbar region with normal pr examination.

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### Laboratory Investigations

On admission lab investigation showed leukocytosis (17300/cumm and 86% polymorphs) with normal HB and RFT. LFT showed slight elevation in SGPT 78.8 u/l with

normal total protein and slightly low albumin (3.01 gm/dl). Patient was nonreactive for HIV, HBSAG, HCV with normal electrolytes.



**Fig 1:** left sided figure showing USG images of left sided acute appendicitis and right sided image showing cect abdomen with same findings

### Discussion

A person with acute appendicitis typically presents with vague epigastric or periumbilical pain which later migrates to the right lower quadrant, anorexia, nausea, vomiting, and low-grade fever. While examining patients with such symptoms, we usually come across rigidity, positive psoas sign, fever, and rebound tenderness. These classic findings occur in only about 50% of the patients. There is a high chance of missed or delayed diagnosis when one presents atypically with left lower quadrant pain with the reported rate of misdiagnosis as high as 24%.

Differentials of left lower quadrant pain include colitis, diverticulitis, inflammatory bowel disease, intestinal obstruction (including volvulus) or perforation, nephrolithiasis, pyelonephritis, testicular torsion, epididymitis, atypical right-sided appendicitis, left-sided appendicitis, and left-sided primary epiploic appendagitis.

In the present case, we initially suspected diverticulitis. The underlying intestinal malrotation delayed the correct diagnosis of acute appendicitis. It was only after the CT scan was done malrotation was identified. Two previous case reports have similarly misdiagnosed left-sided acute appendicitis with intestinal malrotation as diverticulitis. In the latter case, misdiagnosis led to a delay in definitive management, with the patient subsequently undergoing emergency laparotomy. Thus, an accurate and timely diagnosis is critical to prevent these complications.

Intestinal malrotation occurs when there is either non-rotation or incomplete rotation of the primitive intestinal loop around the SMA axis during the first 10 weeks of fetal life. It is a rare anomaly with an approximate incidence of one in every 500 live births (0.2%; range, 0.03%-0.5%). Most cases (93%) of intestinal malrotation present in the first month of life with bilious vomiting. However, it is uncommon in adults (0.1%-0.5%) and usually remains asymptomatic. Symptomatic adults experience chronic abdominal pain (87%). Our patient had Stringer type 1a malrotation which is often asymptomatic and is the most common malrotation encountered in adults.

Acute appendicitis occurs even rarely in association with intestinal malrotation. This makes the diagnosis of left-sided acute appendicitis a clinical and radiological challenge. The average age of presentation with acute appendicitis in patients with intestinal malrotation was between 8 and 51 years, which indicates that a person with asymptomatic intestinal malrotation may develop symptoms even in advanced ages.

It is imperative to differentiate left-sided acute appendicitis associated with malrotation from that associated with situs inversus totalis, in which every organ, including duodenum, duodenojejunal junction, small and large bowel, cecum, and appendix, is located in a mirror position to situs solitus. In addition to these features, a left-sided liver and right-sided spleen and stomach serve as clues to the correct diagnosis of

situs inversus totalis. Chest X-ray is important to obtain at this point for ruling out situs inversus totalis which may be confused with intestinal malrotation. More than two-thirds of the left-sided appendicitis is due to situs inversus totalis rather than intestinal malrotation.

USG is considered to be the best initial imaging modality, especially for children. USG may show an inversion of SMA and SMV relationship with a blind noncompressible aperistaltic tube on the left side. CECT of the abdomen may also show an inversion of SMA and SMV, along with large bowel predominantly on the left side, small bowel predominantly on the right side, and concomitant feature of acute appendicitis. CT is useful both in the diagnosis of left-sided acute appendicitis and in detecting associated rotational anomalies and related complications.

Ladd's procedure is generally performed when intestinal malrotation presents as a volvulus by an open or laparoscopic approach. However, this procedure becomes optional when malrotation is found incidentally or with other intra-abdominal pathology like acute appendicitis. Laparoscopic appendectomy is considered to be the gold standard of treatment of left-sided appendicitis. But unlike open procedures, laparoscopic procedures have a steep learning curve and are not well established in low resource settings like ours.

### Conclusions

Given the rarity of acute appendicitis associated with intestinal malrotation, an increase in awareness of this anatomical variant is essential among emergency physicians, radiologists, and surgeons for prompt diagnosis and timely intervention. Although the clinical picture may be confusing, imaging modalities greatly help in diagnosing this condition. Appropriate and timely intervention could minimize the risk of detrimental consequences like intestinal perforation/abscess formation and prolonged hospital stay.

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