



Acute Left Upper Quadrant Appendicitis Associated with Intestinal Malrotation: A Case Report

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ABSTRACT

Introduction: Acute appendicitis is the most common reason for undergoing emergency abdominal surgery and must be distinguished from other causes of abdominal pain. Pain due to acute appendicitis is usually localized at the right lower quadrant but may rarely be present in other locations such as the inguinal canal, femoral canal, or left upper quadrant due to congenital anatomical abnormalities of the bowels.

Case Report: We report the case of a 33-year-old male presenting with abdominal pain. A computed tomography scan identified acute appendicitis associated with a malrotated cecum and ascending colon, located in the left upper quadrant.

Conclusion: Left upper quadrant appendicitis should be considered in the differential diagnosis of young patients presenting with left upper quadrant pain.

Keywords: Appendicitis, malrotation, left upper quadrant, abdominal pain

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Introduction

Intestinal malrotation is a congenital abnormality of the small and large bowels; it occurs if the midgut fails to complete the normal 270° counter clockwise rotation in utero. Malrotation is usually diagnosed in children presenting with vomiting with or without abdominal distension associated with duodenal obstructive bands or volvulus. Symptomatic cases occur in newborns within the first year of life. Abnormally positioned intestinal segments can cause atypical presentations and pathologies such as left-sided appendicitis (1).

Case report

A 33-year-old man with left upper quadrant pain was admitted to the emergency department. The patient was well until 6 h ago. The patient was well until six hours ago. There was a history of nonspecific generalized abdominal pain localized to left upper quadrant. He had never experienced abdominal pain of this severity. He had anorexia and nausea without fever and vomiting. During his physical examination, tenderness without guarding and rebound tenderness were localized in the left upper quadrant. The rest of the examination was normal. The patient's oral temperature was 38°C, and his other vital signs were unremarkable. There was no surgery or trauma in his past medical history. His white blood count was 21700/mm³ with 94.9% neutrophils. Other blood chemistry values were within normal limits. The patient underwent abdominopelvic computed tomography (CT) because he was suspected of having acute abdomen. The CT scan was performed using 64-slice CT scanner (Aquilion 64; Toshiba Medical Systems Corporation, Otawara, Japan) in the portal venous phase after intravenous gadolinium contrast administration (Omnipaque 350; Nycomed Amersham, Princeton, NJ, USA). The abdominopelvic CT scan revealed a malrotated cecum and ascending colon in the left upper quadrant with a large, inflamed, thick-walled (8.5 mm caliber) appen-

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FIGURE 1. a-c. Axial (a), coronal (b), and sagittal (c) contrast-enhanced abdominopelvic CT images showing acute appendicitis (arrow) associated with a malrotated cecum (star) and ascending colon in the left upper quadrant

dix surrounding periappendiceal inflammation. The jejunum was positioned at the right side of the abdomen.

CT demonstrated acute appendicitis that was associated with the malrotated cecum and ascending colon and that was located in the left upper quadrant. The patient underwent laparotomy. The radiological diagnosis was surgically and histopathologically proven. The patient was discharged 2 days later without any complication. Informed consent was obtained from the patient.

Discussion

Acute appendicitis is one of the most common abdominal emergencies that will be experienced by approximately 11 in 10000 people in their life time. It is slightly *more common* in *males* than in females. Although appendicitis occurs at any age, the highest incidence has been reported in those who are between 10 and 19 years of age (2). In most patients with acute appendicitis, the primary pathology is luminal obstruction secondary to various causes such as fecaliths, foreign bodies, lymphoid hyperplasia, and

primary (carcinoid, adenocarcinoma, and lymphoma) and metastatic tumors (3).

The diagnosis of acute appendicitis is usually based on the clinical history and the results of physical examinations and laboratory studies. The classic presentation of appendicitis is most likely the presence of typical symptoms such as initial periumbilical pain followed by vomiting and nausea and the subsequent migration of pain to the right lower quadrant. This classic clinical manifestation occurs in only 50–60% of patients. Atypical presentations most likely occur when the appendix is in an atypical location and the diagnosis may be missed or delayed. In atypical cases, imaging may help lower the rate of false-negative appendicitis diagnoses and prevent complications such as perforation, peritonitis, or abscess (3). Ultrasound (US) is a widely available and low-cost modality with the potential for being highly accurate in patients suspected of having acute appendicitis. CT is complementary to US and is the most sensitive modality to detect appendicitis (2).

Usually located in the right lower abdomen, the appendix may rarely be found in other locations, such as the inguinal canal (Amyand's hernia) or femoral canal (De Garengeot hernia). Further, left-sided appendicitis may occur in patients with congenital anomalies such as intestinal malrotation or situs inversus (4). A few cases have been reported on left-sided appendicitis associated with intestinal malrotation (5, 6). Adults with malrotation are usually asymptomatic and generally have incidental findings when imaged for other indications. Imaging techniques may identify the typical characteristics of malrotation, including the anatomic location of right-sided intestinal segments, left-sided colonic segments, and an abnormal relationship of the superior mesenteric vessels (7). Imaging findings of left-sided appendicitis are similar between US and CT and include an inflamed appendix characterized by circumferential wall thickening, intramural edema, distended lumen, and periappendiceal inflammation and associated with intestinal malrotation. Diagnostic laparoscopy is the gold standard for treating appendicitis patients with intestinal malrotation. Surgical options are the same as those for normal patients (6).

Conclusion

Left upper quadrant appendicitis should be considered in the differential diagnosis of young patients presenting with left upper quadrant pain. Radiological imaging has a significant role in the accurate diagnosis of appendicitis associated with intestinal malrotation.

Informed Consent: Written informed consent was obtained from parents of the patient who participated in this study.

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