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Case report
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A rare acute abdomen case: Acute appendicitis in a patient with situs inversus totalis

Nadir görülen bir akut batın olgusu: Situs inversus totalisli hastada akut apandisit

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Abstract

Acute appendicitis is the most frequent disease requiring urgent surgery in the world. It may sometimes occur in atypical locations, such as the lower left quadrant of the abdomen. If previously unknown, some conditions such as situs inversus totalis make diagnosing acute appendicitis difficult. In those cases, surgeons primarily consider diverticulitis, gynecological diseases, or urinary pathologies, which present with lower left quadrant pain. Direct abdominal radiography, ultrasonography and computed tomography are the auxiliary imaging methods in the diagnosis of the disease. Dextrocardia and the observation of the gastric fundus gas in the right quadrant in direct abdominal radiograph are key features of situs inversus totalis. Considering the anatomical variation, laparoscopic exploration is recommended in these patients. We hereby present a forty-eight-year-old female patient with situs inversus totalis who was diagnosed with acute appendicitis.

Keywords: Acute appendicitis, Situs inversus totalis, Left lower quadrant pain, Computed tomography

Öz

Akut apandisit dünyada acil cerrahi gerektiren en sık hastalıktır. Akut apandisit bazen karnın sol tarafı gibi atipik yerlerde karşımıza çıkabilir. Situs inversus totalisde akut apandisit tanısını koymada zorluk oluşturabilecek durumlardan biridir. Situs inversuslu hastalarda eğer daha önce hastalığın tanısı bilinmiyorsa apendiks normal pozisyonda yerleşmediğinden apandisitin tanısı zordur. Cerrahlar öncelikle sol alt kadran ağrısı yapan divertikülit, jinekolojik hastalıklar veya üriner patolojileri düşünürler. Direk grafi, ultrasonografi, bilgisayarlı tomografi hastalık tanısında yardımcı radyolojik yöntemlerdir. Direkt grafilerde dekstrokardi ve mide fundus gazının sağda izlendiği durumlarda hastalıktan şüphelenilmelidir. Situs inversuslu hastalarda daha iyi eksplorasyon sağlayarak ayırıcı tanıyı yapmak ve anatomik varyasyon olabileceği de göz önünde tutularak laparoskopik cerrahi yapılması önerilmektedir. Bu olgu sunumunda tetkik edildikten sonra akut apandisit tanısı konulan sitüs inversus totalisli kırk sekiz yaşında kadın hastanın tanı ve tedavi süreci literatür eşliğinde tartışıldı.

Anahtar kelimeler: Akut apandisit, Situs inversus totalis, Sol alt kadran ağrısı, Bilgisayarlı tomografi

Introduction

Acute appendicitis is the most frequent disease requiring urgent surgery in the world [1]. Despite a usually typical anamnesis and physical examination findings, it may be wrongly or tardily diagnosed [2]. If previously unknown, some conditions such as situs inversus totalis (SIT) make diagnosing acute appendicitis difficult. SIT occurs when intraabdominal organs turn 270º clockwise during embryonic development [3]. The prevalence of acute appendicitis in SIT patients is similar to that in the general population, which is between 0.001% and 0.01% [4,5].

In patients with SIT, the diagnosis of other diseases, such as acute myocardial infarction, may also be delayed due to the reverse placement of the organs, which increases morbidity and mortality. Previous knowledge about the condition is critical to take measures against undesired clinical and surgical complications [6].

This case presentation discusses the diagnosis and treatment process of the forty-eight-year-old female patient with SIT who was diagnosed with acute appendicitis.

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Case presentation

The forty-eight-year-old female patient arrived at the emergency department with complaints of abdominal pain in the lower left quadrant and appetite loss that began 12 hours ago. Physical examination revealed slight abdominal distention, pain and rebound in the lower left abdominal quadrant. There was no defense. She was incidentally diagnosed with SIT 2 years ago during her follow-ups for pregnancy. Her white blood cell count was $13.01x10^3/mm^3$. Computerized tomographic imaging of the abdomen revealed an edematous tubular structure, with a wall-thickness of 8 mm, extending from the cecum to the pelvis (Figure 1d), which was consistent with acute appendicitis. The liver was observed on the left while the spleen and the stomach were located on the right (Figure 1b, 1c). Electrocardiogram (ECG) and posteroanterior lung x-ray findings of the patient were compatible with dextrocardia: Right axis deviation, global negativity in D1 AVL and AVR, positive QRS complex, positive P, T waves with poor R progression and deep S loss in precordial derivations. All findings pointed to Situs Inversus Totalis. Laparoscopic exploration was planned, however, open appendectomy under spinal anesthesia was preferred due to the patient's Mallampati Class IV airway, which may have caused intubation difficulty. Abdomen was accessed via the paramedian incision made in the left lower quadrant. The appendix was hyperemic and edematous with a thickened wall as it extended into the pelvis (Figure 2). Appendectomy was performed. The patient was discharged uneventfully on the 3rd postoperative day. A written informed consent form was obtained prior to the operation.

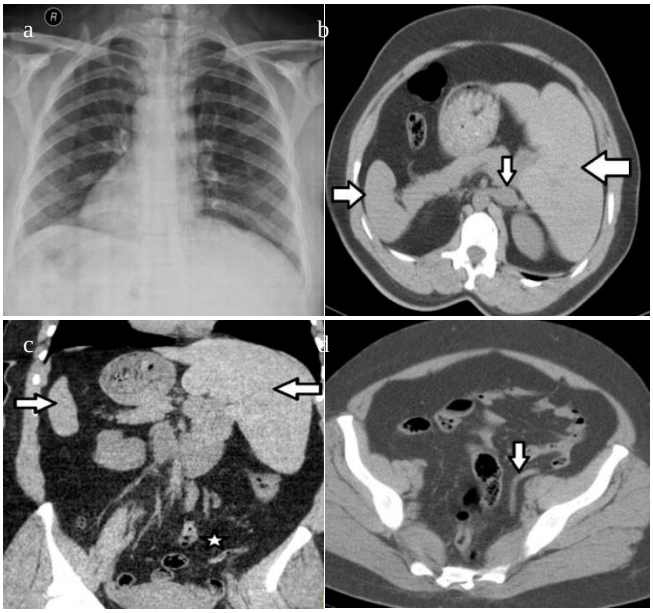

Figure 1: a: Dextrocardia in PA lung x-ray, b: Liver located on the left (right arrow), VCI located on the left (downward arrow), spleen (left arrow) located on the right, c: Liver located on the left (right arrow) and spleen located on the right (left arrow), inflamed appendix (star) in the lower left quadrant, d: Blind-ending of the inflamed appendix on the left lower quadrant

Figure 2: The appendix as visualized during the operation

Discussion

Sixty percent of patients with appendicitis present with pain originating from the umbilical region, which later migrates to the lower right quadrant, loss of appetite, nausea, vomiting, constipation, and sometimes diarrhea [7]. Although the appendix is usually located in the right lower quadrant, in rare cases such as SIT or intestinal malrotation, it may be found in the lower left abdominal quadrant [8]. Various other conditions may cause lower left abdominal pain, i.e., sigmoid diverticulitis, abdominal aortic dissection, cystitis, renal colic, prostatitis, testicular torsion, intestinal obstruction, incarcerated hernia, and psoas abscess.

In SIT, which is usually incidentally diagnosed, the organs are arranged in the mirror image of their normal locations [10]. Direct abdominal radiography, ultrasonography and computed tomography are the auxiliary diagnostic imaging methods [11]. In direct x-ray imaging, dextrocardia and observation of the gastric fundus gas on the right side of the patient lead to the diagnosis of SIT. In our patient, we cross-checked the direct abdominal x-ray findings with computerized tomographic images. Dextrocardia has specific electrocardiogram findings: Reverse P and T waves in D1, and poor R progression between V1-V6 [12]. The ECG findings of our patient were typical for dextrocardia.

In patients with Situs Inversus Totalis, loss of appetite, nausea, diarrhea, pain originating from the umbilical region, leukocytosis, defense and/or rebound in the lower left abdominal quadrant may be associated with acute appendicitis [13]. In our case, acute appendicitis was diagnosed with physical examination and radiological evaluation, after which it was verified with surgery. Considering anatomical variations, laparoscopic exploration is the preferred surgical treatment in SIT patients [14]. Open appendectomy was obligatory in our patient due to difficult intubation.

Conclusion

In evaluating pain in the lower left quadrant, physicians should be mindful of acute appendicitis in patients with rare conditions such as Situs Inversus Totalis and always bear in mind the possibility of an atypically placed appendix.

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