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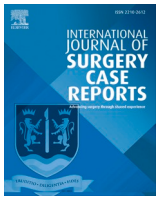

Case report

Fortuitous detection of adult malrotated ectopic kidney during acute appendicitis: A unique case report

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ABSTRACT

Introduction and importance: Renal ectopia, a rare congenital anomaly, can occur in various body regions and may be associated with other abnormalities. It is often asymptomatic, commonly found incidentally, as in our 70-year-old patient during appendicitis exploration.
This case highlights the importance of recognizing renal ectopia and associated anomalies, such as vascular abnormalities and renal malrotation, which may predispose patients to potential complications and require vigilant monitoring for urinary tract infections and lithiasis events, as well as potential challenges during laparoscopic surgical procedures, as in our appendectomy case.
Case presentation: A 70-year-old female presented with right iliac fossa pain and elevated inflammatory markers. Abdominopelvic CT scan confirmed uncomplicated appendicitis and revealed a right ectopic and malrotated kidney. Laparoscopic appendectomy was performed without complications. Postoperative recovery was uneventful, and discharge occurred one day post-procedure. A four-week follow-up was scheduled to monitor for urinary infection and stone formation, with initiation of hygienic and dietary measures.
Clinical discussion: Renal ectopia, a congenital anomaly, frequently positions the kidneys in the pelvic region. Iliac ectopias are often confused with pelvic or abdominal ectopias. Ectopic kidneys can result in complications like vesicoureteral reflux, urinary tract infections, or kidney stones. Despite being typically left-sided, our patient presented with right-sided renal ectopia with malrotation. Despite lacking urinary symptoms, a urological consultation was advised due to the potential risk of infection or kidney stones. Surgical intervention is reserved for complication management.
Conclusion: Renal ectopia, a rare congenital anomaly, can be asymptomatic but often coincides with other renal or vascular issues. Early detection and accurate imaging are essential, emphasizing clinical vigilance and interdisciplinary collaboration for better patient care.

1. Introduction

Renal ectopia is a rare congenital anomaly [1]. It can manifest in various parts of the body, including the abdomen, pelvis, iliac region, or thorax [2]. This condition may also be associated with other renal or extrarenal abnormalities [3]. Generally, patients with a pelvic kidney often remain asymptomatic, and this ectopy is typically discovered incidentally unless detected during neonatal renal ultrasound or if complications arise later in life. In this article, we report the case of a 70-year-old patient in whom an ectopic kidney, located in the pelvic region and exhibiting malrotation, was incidentally discovered during an exploratory procedure for acute appendicitis. This work has been reported in line with the SCARE 2023 criteria [4].

2. Case presentation

We present the case of a 70-year-old female patient with no prior medical or surgical history who presented to our emergency department with right iliac fossa pain accompanied by vomiting, without other associated symptoms, which had been ongoing for one day prior to her

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consultation. Upon examination, the patient was hemodynamically stable, afebrile, and exhibited tenderness in the right iliac fossa upon palpation. Laboratory tests revealed an elevated inflammatory marker profile, with a white blood cell count of 12,000 cells/mm^3 and a CRP of 90 mg/L. Renal function tests were within normal limits, and the bacteriological urine analysis also returned normal results.

Given the patient's age of 70 years, an abdominopelvic CT scan was performed to confirm the diagnosis of acute appendicitis and rule out other differential diagnoses, particularly colonic cancer. The CT scan confirmed the appearance of uncomplicated acute appendicitis and revealed the presence of a right ectopic and malrotated kidney in the pelvic area with a laterally placed hilum, preserving parenchyma measuring 91 mm in bipolar diameter with regular contours and an extrasinusal renal pelvis. There were no other associated abnormalities such as ureteral duplication or vascular anomaly (Fig. 1, Fig. 2, Fig. 3).

The patient underwent laparoscopic surgery, and during the exploration, the right kidney was indeed found to be positioned low in the pelvis, very close to the right ovary and the uterus (Fig. 4). An appendectomy was performed without complications, and the positions of the trocars were not altered, as the kidney's position did not hinder the procedure.

The histopathological examination of the appendectomy specimen revealed findings consistent with suppurative appendicitis with no signs of malignancy.

The postoperative course was uneventful, and the patient was discharged on the first postoperative day with a normal follow-up scheduled for four weeks. The patient was referred for a urology consultation due to the risk of urinary infection and stone formation. Hygienic and dietary rules were initiated, and a follow-up was arranged.

3. Discussion

We present a case involving the serendipitous detection of a right renal ectopia with malrotation in a 70-year-old patient during a CT scan conducted for acute appendicitis. The key merits of our case report encompass the preoperative identification of the ectopic kidney through CT imaging during an appendicitis procedure, underscoring the significance of comprehensive diagnostic imaging and a patient-centered proactive approach to care. Nevertheless, a notable constraint of our study pertains to the relatively brief duration of follow-up.

Renal ectopia, a congenital malformation, occurs during embryogenesis when the kidneys fail to migrate to their usual location, often placing them in the pelvic region [5]. It is worth noting that iliac ectopias are often diagnosed as pelvic or abdominal ectopias, even though they are situated between these two areas, at the front of the iliac vessels

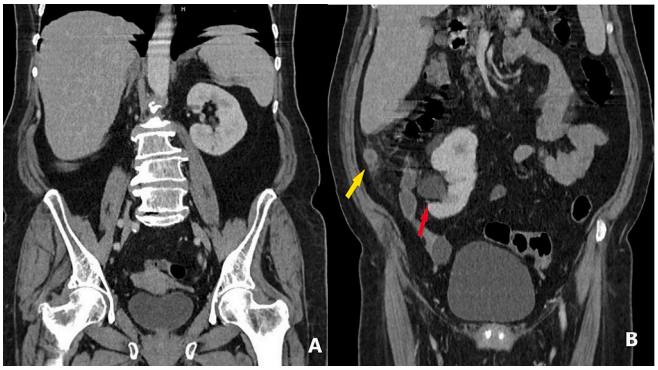

Fig. 1. Abdominal CT scan with contrast in coronal view. (A) Left kidney in its normal position with an empty left renal compartment. (B) Right kidney in an ectopic and malrotated position (red arrow), swollen appendix in a retrocecal position with subhepatic tip (yellow arrow). (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

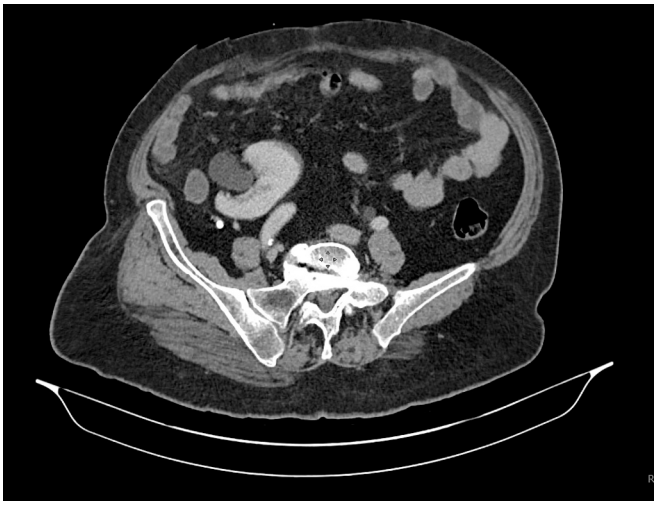

Fig. 2. Axial CT scan section showing a malrotated right ectopic kidney in a pelvic position.

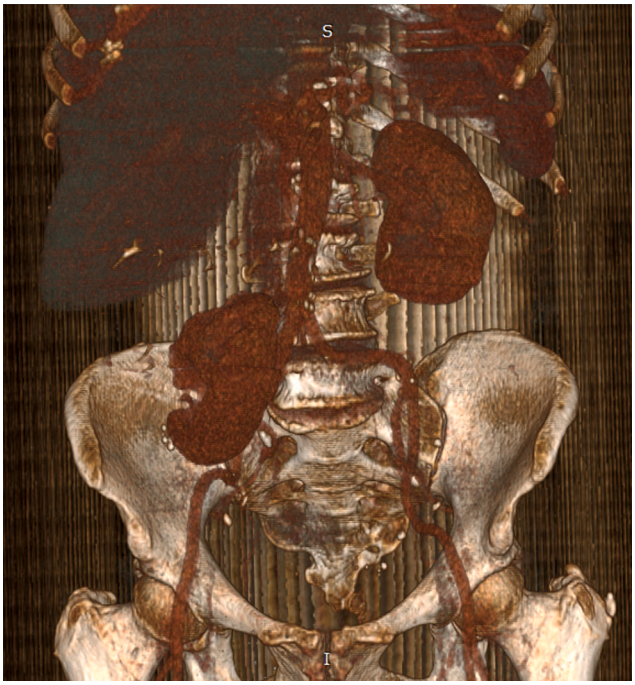

Fig. 3. Abdominal CT scan in 3D reconstruction, anterior view, showing malrotation of an ectopic kidney.

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Pelvic kidney is estimated to occur at a prevalence of approximately 1 in 500 to 1 in 3000, with a greater frequency noted on the left side [6]. However, contrary to this general trend, our patient exhibited renal ectopia on the non-typical side.

Furthermore, our patient also presented with renal malrotation, a commonly associated anomaly with renal ectopia, as both conditions typically develop simultaneously during embryogenesis [7,8].

While numerous individuals with ectopic kidneys, like our patient, may remain asymptomatic, they face an elevated susceptibility to complications including vesicoureteral reflux, urinary tract infections, or nephrolithiasis. This highlights the imperative of identifying these potential complications linked with this anomaly [1].

In our patient's case, given the absence of urinary symptoms, a simple urological consultation was recommended due to the potential

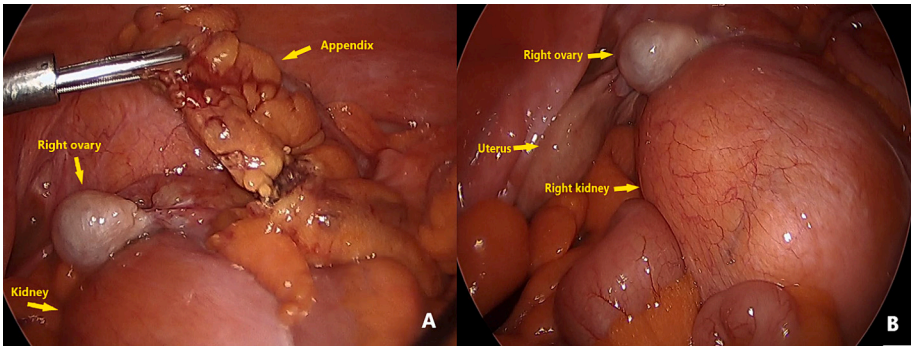

Fig. 4. Intraoperative laparoscopic photo: A: right kidney next to the appendix and the right ovary, B: right kidney in a pelvic position next to the uterus and the right ovary.

risk of infection or the development of kidney stones. Surgical treatment is not indicated unless complications arise [9].

The presence of an ectopic kidney can obscure the diagnosis of acute appendicitis. However, advancements in diagnostic radiology technology now enable a reliable diagnosis of acute appendicitis even in the presence of a right ectopic kidney.

Ultrasonography and computed tomography play pivotal roles in the differential diagnosis of abdominal pain in emergency situations. While ultrasonography can confirm the presence of an ectopic kidney, its ability to exclude acute appendicitis is limited and dependent on operator skill. A meta-analysis by Doria et al. [10] found that computed tomography offers significantly higher sensitivity than ultrasonography, particularly in adults, making it highly accurate for diagnosing acute appendicitis, even when a right ectopic kidney is present in the lower right quadrant of the abdomen with pyuria [6].

With the widespread adoption of laparoscopy, it has become evident that managing such cases has become more streamlined and safer, given the thorough exploration of the entire abdominal cavity. Conversely, when utilizing a McBurney incision, the identification of the appendix may pose challenges due to renal ectopia occasionally obscuring it.

4. Conclusion

Renal ectopia is a rare congenital anomaly that can manifest in various ways, often going unnoticed by patients. It is frequently associated with other renal or vascular abnormalities. It is crucial for healthcare professionals to be aware of renal ectopia and its implications, as early detection and appropriate management can improve the quality of life for patients and prevent serious complications. Ongoing advancements in the field of medical imaging allow for more precise assessment of these anomalies, facilitating informed decision-making regarding treatment.

Patient consent

Written informed consent was obtained from the patient for the publication of this case report and its accompanying images. A copy of the written consent is available for the Editor-in-Chief of this journal to review upon request.

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Author contribution

Med dheker Touati, Mohamed raouf ben othmane contributed to conceptualization and writing – original draft. Fahd khefacha, anis belhadj contributed to data curation. Ahmed saidani contributed to writing, review, editing. Faouzi chebbi contributed to supervision and validation.

Guarantor

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3.Hyperlink to your specific registration (must be publicly accessible and will be checked): N/A.

Conflict of interest statement

No conflicts of interest.

Data availability

The data supporting this case report are available upon request from the corresponding author.

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Not applicable.

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