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Case report

Pyelonephritis of an ectopic right kidney pretending as acute appendicitis: An unusual case

Ayant Manglik, Lakhsit Tomar, Akash Akash *

Department of Surgery, Atal Bihari Vajpayee Institute of Medical Sciences & Dr. Ram Manohar Lohia Hospital New Delhi, India

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ABSTRACT

Introduction: Acute appendicitis is a common condition presenting in emergency department. A patient presenting with pain associated with fever, and tenderness in the right iliac fossa will be suspected to have Acute Appendicitis. However a variety of other clinical conditions may have similar features and may be required to be excluded. Acute pyelonephritis in an ectopic right kidney is a rare clinical condition which may mimic Acute Appendicitis.

Case presentation: We present a middle-age male with complaints of pain in the right lower quadrant of the abdomen with high grade fever for one week. Clinical suspicion and initial ultrasonography (USG) of abdomen supported the diagnosis of acute appendicitis. The patient was initially managed conservatively and later non-contrast computed tomography (NCCT) scan was done that revealed right ectopic kidney with acute pyelonephritis. The appendix was within normal limits on NCCT scan.

Discussion: Ectopic kidneys result from anomalies of ascend which can result in several complications depending upon its position. Acute appendicitis can also cause pyuria and may mimic urosepsis amounting to its close anatomical proximity to urinary bladder. An un-ascended ectopic kidney with pyelonephritis mimicking acute appendicitis is a rare occurrence. USG and CT scan are important tools in the differential diagnosis but however, USG is greatly operator dependent; CT scan provides excellent diagnostic accuracy.

Conclusion: This case report signifies importance of NCCT abdomen in accurate diagnosis of conditions featuring as right lower abdominal pain and fever. Also emphasizing significance of NCCT prior to any surgical intervention, if any conflict of diagnosis occurs.

1. Introduction

Abdominal pain associated with fever is common complaint of patients presenting in surgical emergency. Initially one can get hint of diagnosis clinically based on patient's history, examination and lab parameters but the differential diagnosis for this clinical presentation however, is extensive and might change depending on the patient's age and gender. Most clinicians associate right lower quadrant abdominal pain and fever with acute appendicitis. Acute appendicitis is rare in infants and elderly but very common in early adult life with male to female ratio of 3:2 [1]. Patients of pyelonephritis will usually present with dull-aching flank pain and fever.

As reported previously in literature, diagnostic dilemma could be there during treatment of cases with right lower abdominal pain and fever, if clinical deterioration occurs. Incorrect diagnosis can cause delay in management of disease. Undue delays in treatment of acute appendicitis can lead to appendicular abscess, perforation peritonitis which in turn is life-endangering; whereas cases with pyelonephritis could end up with renal scarring and failure. In such cases there comes need for better imaging modalities with more specificity and sensitivity for prompt diagnosis, treatment and preventing catastrophic consequences.

A NCCT abdomen could be the need of an hour. Thus, we report a case of pyelonephritis of an ectopic right kidney in a middle-age male who was diagnosed clinically as acute appendicitis.

Our work has been reported in line with the SCARE 2020 criteria [2].

2. Case presentation

A 42 year old gentleman presented to emergency department with complaints of pain abdomen and fever for 1 week. The pain was felt in right lower quadrant of the abdomen, the onset of pain was acute and its

* Corresponding author at: S5 unit, ECS-2nd floor, Dr. Ram Manohar Lohia Hospital, baba kharak singh marg, New Delhi 110001, India.
E-mail address: akash30056@gmail.com (A. Akash).

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intensity was mild to moderate. It was not referred to nor radiating to another area, and was relieved on taking medication. Fever was continuous, intermediate grade and associated with chills and rigors which was not relieved on taking medications. There was a history of an episode of urinary retention following which patient had hematuria requiring immense effort. He now suffered from burning micturition. Patient was taking treatment from local clinic on outpatient basis.

On Examination, the patient's general condition appeared sick, and was febrile with temperature of 101′F at presentation with tachycardia of 102 bpm with normal blood pressure. His abdomen was non-distended, tenderness and guarding were present in right iliac fossa. Rebound tenderness was absent and no palpable lump/swelling was felt in right iliac fossa. Patient's laboratory reports revealed leukocytosis (WBC count of 13.1 $\times$ 10^3) with thrombocytopenia (platelet count of 28 $\times$ 10^3). The Kidney Function Test were deranged (creatinine of 4.6 mg/dl and urea of 203 mg/dl) and he had mild hyponatremia (serum sodium = 131 mEq). Urine routine showed large number of White Blood Cells with Red Blood Cells. Subsequently urine culture came out positive for E.coli and Enterococcus with $>10^5$ CFU (colony forming unit)/ml and $>10^4$ CFU (colony forming unit)/ml respectively. Patient was initially suspected to have perforated appendix with Urinary Tract Infection with sepsis. Patient's ALVARADO score was 7.

Patient's clinical examination and ultrasound suggested a diagnosis of Acute Appendicitis. However owing to the presence of atypical features like urinary symptoms a Non Contrast Computed Tomography was done to avoid confusion and confirm the diagnosis. NCCT scan revealed ectopic kidney with acute pyelonephritis (Figs. A and B). The patient was already on treatment for sepsis in the urinary tract and this was continued.

3. Discussion

Ectopic kidneys result from anomalies of ascend and can be found in the pelvis, iliac, abdominal, thoracic or contralateral positions. Problems in ureteral bud and metanephric tissue as well as genetic abnormalities have been implicated in renal ectopia. The prevalence of pelvic kidney is probably between 1/500 and 1/3000 with the left side more commonly affected [3].

Several complications may occur with pelvic kidney. The affected kidney is usually hypoplastic and the collecting system is placed anteriorly as a result of incomplete rotation. Vesico-Uretic Reflux (VUR), may also occur in up to 30 % of pelvic kidneys [4]. Over half of ectopic kidneys have a dilated collecting system with hydronephrosis as a result of the malrotation alone, high grade VUR or obstruction at the level of the uretero-pelvic or uretero-vesical junction. Most individuals with ectopic kidneys are asymptomatic; however, the most common complications occur from obstruction, infection, and urolithiasis.

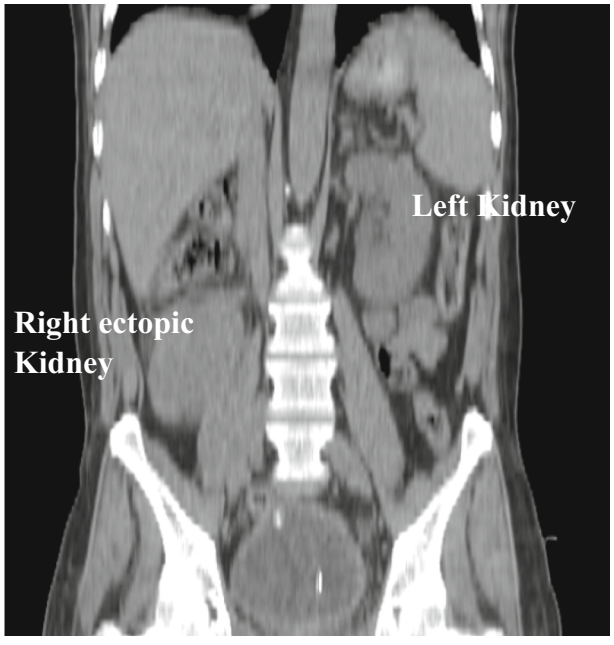

Fig. A. Illustrates coronal section of NCCT scan demonstrating Right ectopic kidney and Left normally positioned kidney.

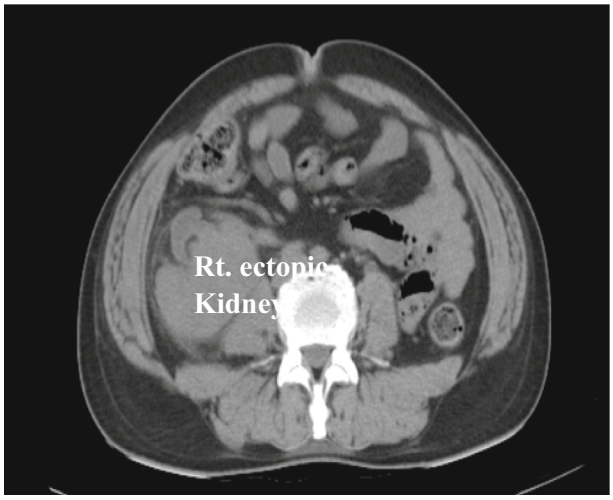

Fig. B. Illustrates transverse section of NCCT scan demonstrating ectopic eight sided kidney.

Appendicitis can also cause pyuria and may mimic Urosepsis. Arnbjornsson E. [5] suggested that there might be a direct spread of bacteria from the inflamed appendix to the urinary tract because of their close anatomic relationship and the severity of the inflammatory changes. Puskar et al. concluded that inflammation is the major cause of abnormal urine analysis and transitory pyelocaliceal dilation in some patients with pyuria should not mislead the surgeon when diagnosing acute appendicitis [6]. An un-ascended ectopic kidney with pyelonephritis mimicking acute appendicitis is a rare occurrence. Cheng et al. reported two female patients of 19 year and 22 year old with ectopic kidney with an initial diagnosis of acute appendicitis [7]. A similar case was reported by Lossius et al. [8] in a sixteen year old female. In both the above reports patient affected were female and young, but we report a 42 year old male patient however clinical symptoms and signs were similar.

Sonography and computed tomography are important tools in the differential diagnosis of abdominal pain in emergency department. Ultrasonography is useful as a means of confirming the presence of an ectopic kidney. However, ultrasonography is not effective enough to exclude the possibility of acute appendicitis and is operator dependent. Doria et al. [9] performed a meta-analysis and concluded that computed tomography had a significantly higher sensitivity than ultrasonography in studies of children and adults. For ultrasonographic studies, the pooled sensitivity and specificity for diagnosis in adults were 83 % and 93 %, respectively. Using computed tomography, the pooled sensitivity and specificity for diagnosis in adults were 94 % and 94 % respectively [10,11].

If there is an ectopic kidney in the right lower abdomen and if pyuria is present, then exclusion or diagnosis of acute appendicitis may be difficult but can be achieved with a high degree of accuracy with a C.T.

4. Conclusion

Acute pyelonephritis of an ectopic kidney mimicking acute appendicitis is an uncommon but possible differential diagnosis, as such cases have been reported in the past. The patient reported was initially

diagnosed with acute appendicitis on USG. Later, on computed tomography the patient was found to have ectopic kidney with acute pyelonephritis. It signifies the importance of computed tomography in patients with right lower abdominal pain, fever and suspected to have acute appendicitis. This case study also emphasizes that although rare, an ectopic kidney with acute pyelonephritis could feature in the list of differential diagnosis for acute appendicitis.

Provenance and peer review

Not commissioned, externally peer-reviewed.

Consent

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

Ethical approval

Ethical approval not needed as no randomised controlled trial (RCT) done..

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Author LT was the scientific advisor. All authors read and approved the final manuscript.

Declaration of competing interest

Authors have declared that no conflicts of interest exist.

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