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Case Report

Bilateral, fused pelvic, ectopic, laterally rotated kidneys: A case report ☆,☆☆,★

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ABSTRACT

Bilateral fused ectopic pelvic kidneys with lateral rotation abnormality in both kidneys is a fortuitous developmental renal anomaly that to the best of our knowledge this is the first report of this rare anomaly in English literature. Due to the morphologic appearance of this anomaly it is likely it could contribute to the individual remaining asymptomatic therefore discovered incidentally. We present a 42-year-old male who presented with acute unilateral flank pain and incidentally discovered this rare renal anomaly which is an important diagnosis for management by both radiologists and urologists.

Introduction

The definitive kidneys arise from the metanephros in the sacral region and ascend cranially to their final location in the lumbar Region due to differential growth of the anterior abdominal wall [1]. An ectopic kidney is due to arrested migration [2]. Different types of position and fusion anomalies include; simple and crossed fused ectopia as well as the horse shoe kidneys. The incidence of ectopic pelvic kidney is approximately 1:2200-3000 patients [3,4]. Malrotation of the kidneys is also rare and commoner in males but probably under reported as an Autopsy series had a prevalence of approximately 1 in 2000 [5]. The incidence of kidney malrotation in a separate study was put at 1 in 939 Cases. Of these lateral also known as reversed rotated kidney is the least common type with its true incidence unknown [6]. These conditions may remain asymptomatic or could lead to infections, stone formation, hypertension, and renal failure in childhood or as adults [7].

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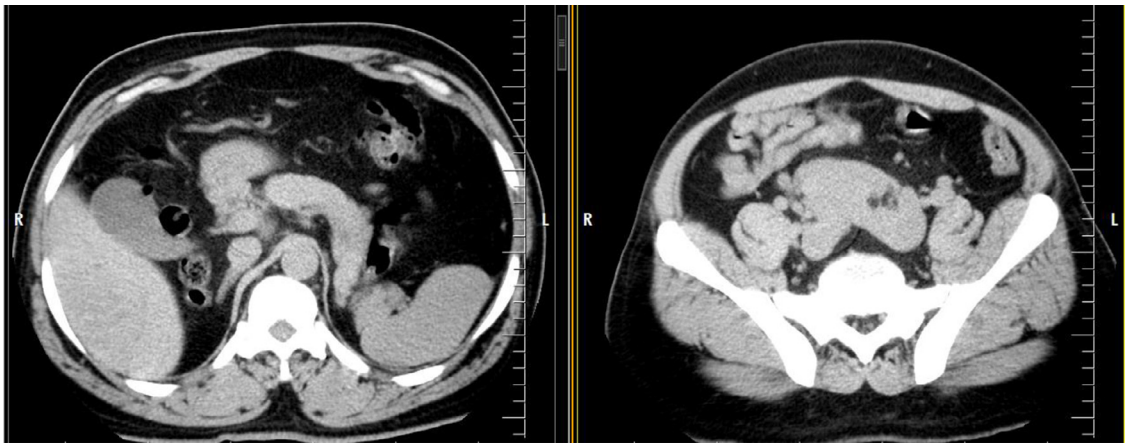

Fig. 1 – Axial noncontrast CT images showing absence of kidneys within the renal fossae and their location in the pelvis with posterior fusion seen. CT, computed tomography.

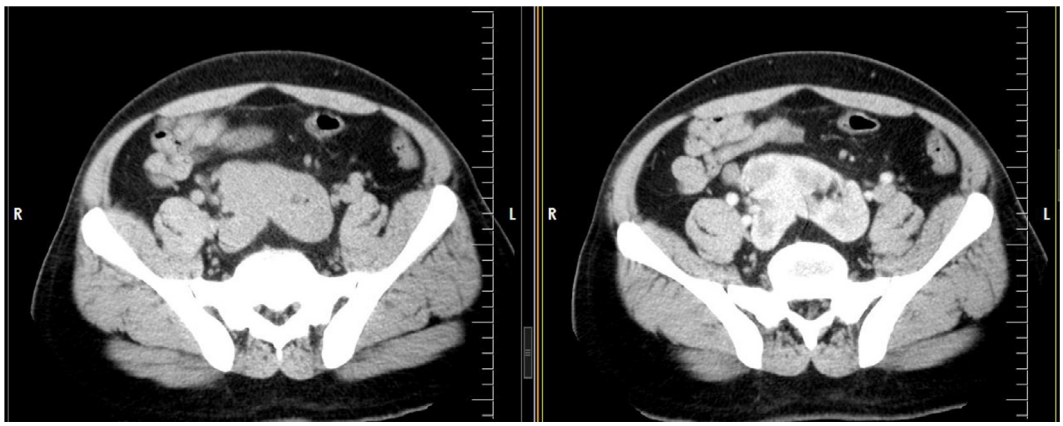

Fig. 2 – Axial pre- and postcontrast images at the level of the sacrum showing posteriorly fused, promptly excreting bilateral ectopic kidneys.

Case report

A 42-year-old male presented in the outpatient department of Limi Hospital, Abuja with complaints of vague right flank pain. No history of dysuria, fever, or previous urinary tract infection was noted. Examination findings were essentially normal and he was sent for an abdominal ultrasound, complete blood Count, urinalysis and electrolyte, urea, and creatinine.

The laboratory test results were normal however abdominal ultrasound showed absent kidneys in both renal beds with bilateral ectopic pelvic kidneys seen. No calculus or hydronephrosis was seen bilaterally and both kidneys showed good corticomedullary differentiation. Further evaluation with a computed tomography (CT) intravenous urogram was requested.

Contrast enhanced CT was performed by a 4 slice CT scanner (ECLOS; Hitachi, Japan). The protocol included a noncontrast CT scan with 5 mm thickness and dynamic acquisition at 30, 60, and 300 seconds after administration of iodine contrast medium (Iohexol).

The images (Figs. 1–6) show absent kidneys in both renal fossae with bilateral, normal sized, promptly excreting kidneys seen in the pelvis at the level of the sacrum measuring 8.48 and 9.23 cm in their bipolar lengths on the right and left respectively. Both kidneys were fused posteriorly and showed lateral rotation of both renal hilar including the ureters with anterior positioned renal vessels seen. The urinary bladder was normally located and well distended with contrast seen excreted given a contrast fluid level on the delayed images. No hydronephrosis or calculus was seen in both kidneys.

The patient was informed and advised on regular follow up with ultrasound scans and blood tests.

Discussion

Congenital renal anomalies in the position and in renal fusion are the result of impaired cephalic migration from the pelvis to the flank of the ureteric bud and metanephric blastema; a process that begins in the fifth week of gestation and

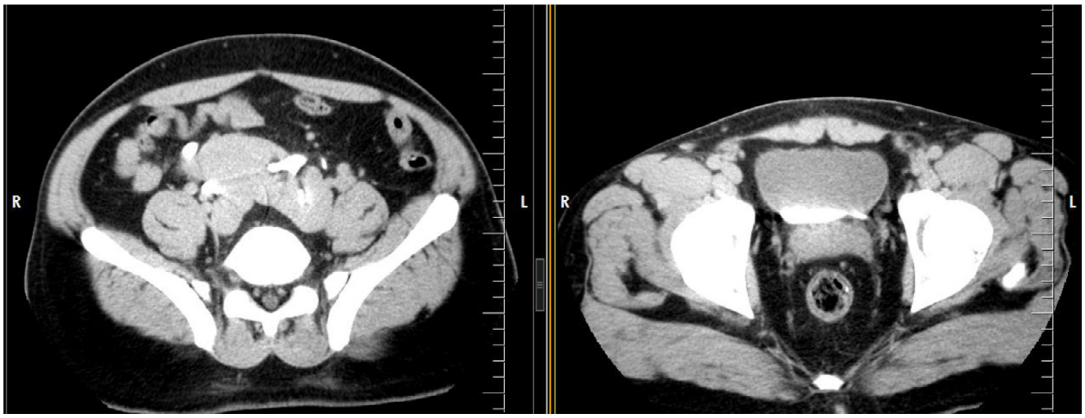

Fig. 3 – Delayed images showing good excretion into the urinary bladder with a contrast fluid level seen.

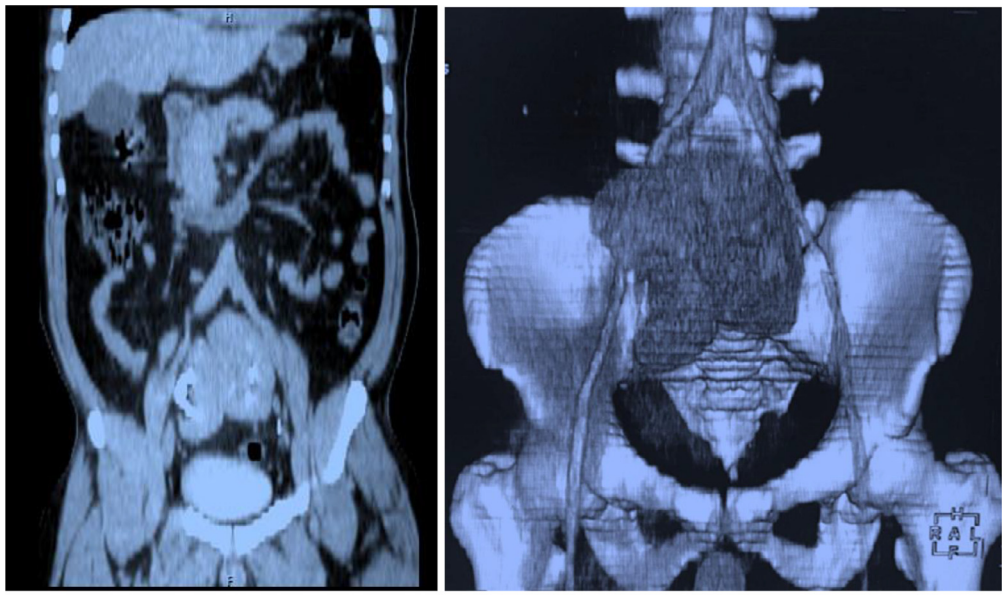

Fig. 4 – MPR Reformatted (A) and volume rendered (B) post contast images showing fused, ectopic pelvic kidneys inferior to the bifurcation of the abdominal aorta.

ends in the ninth week. They are frequently asymptomatic and their diagnosis are made after routine imaging studies like for a suspected urinary tract infection like what we see in this patient.

Ectopic kidneys are part of a subdivision of anomalies of the upper urinary tract grouped under anomalies of ascent as well as anomalies of form and fusion. These include simple renal ectopia which is a kidney that is on the same side of the body that bore its corresponding ureter but in an abnormal position. It may be unilateral or bilateral. Bilateral ectopic kidneys are rare and seen in 10% of cases. The location of ectopic kidneys in order of frequency may be pelvic, iliac, abdominal, or chest. Crossed renal ectopia is when 1 or both kidneys cross the midline and reach the opposite side to their corresponding ureteral orifice. It may be unilateral or bilateral and it can occur with or without fusion of the corresponding kidney. Horse shoe kidney consists of 2 distinct renal masses lying vertically on either side of the midline and fused in their lower (inferior) poles by an isthmus parenchymal or fibrous tissue that crosses the median plane of the body [8,9].

Ectopic kidneys are predominantly benign and discovered incidentally. However, it predisposes patients to renal or ureteral obstruction with consequent stone formation, infections, abdominal, or colicky pain; other common symptoms are hypertension and renal disorders or even Renal Failure [10].

It is noteworthy that both posteriorly fused, ectopic pelvic kidneys in this patient do not cross the midline but are located on the same side as their ipsilateral ureter which to the best of our knowledge has not been reported in English literature.

This patient has apart from posteriorly fused, bilateral ectopic kidneys also bilateral lateral (reverse) rotated kidneys. Normally, the renal hilum is directed anteromedially. It is initially oriented anteriorly but during its ascent from the pelvis

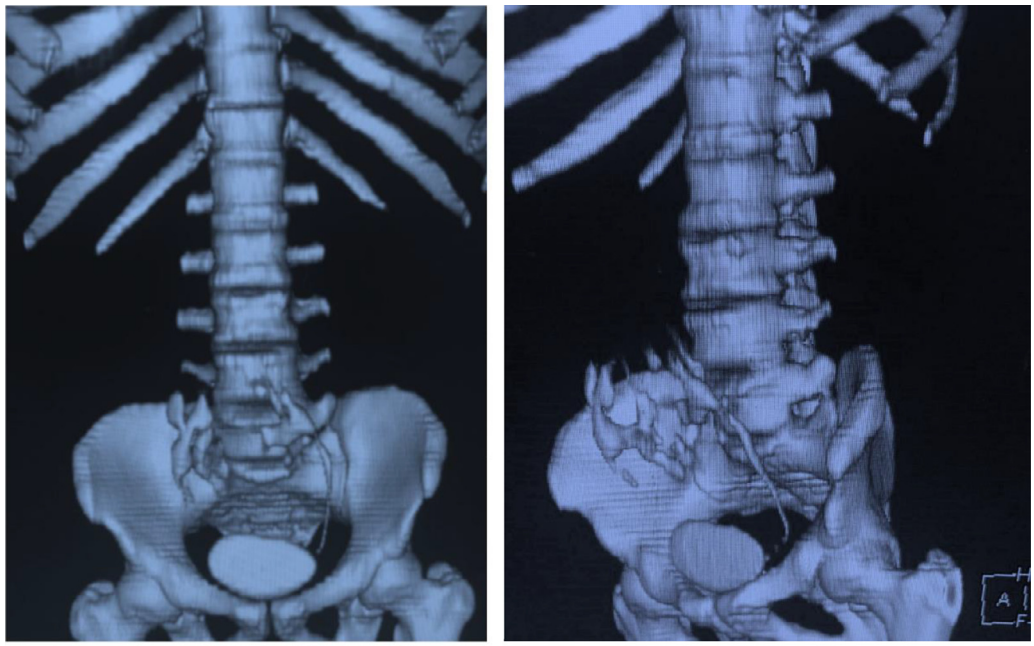

Fig. 5 – Volume rendered coronal (A) and oblique (B) images of delayed excretory phases highlighting the lateral courses of both ureters and drainage into a well distended urinary bladder.

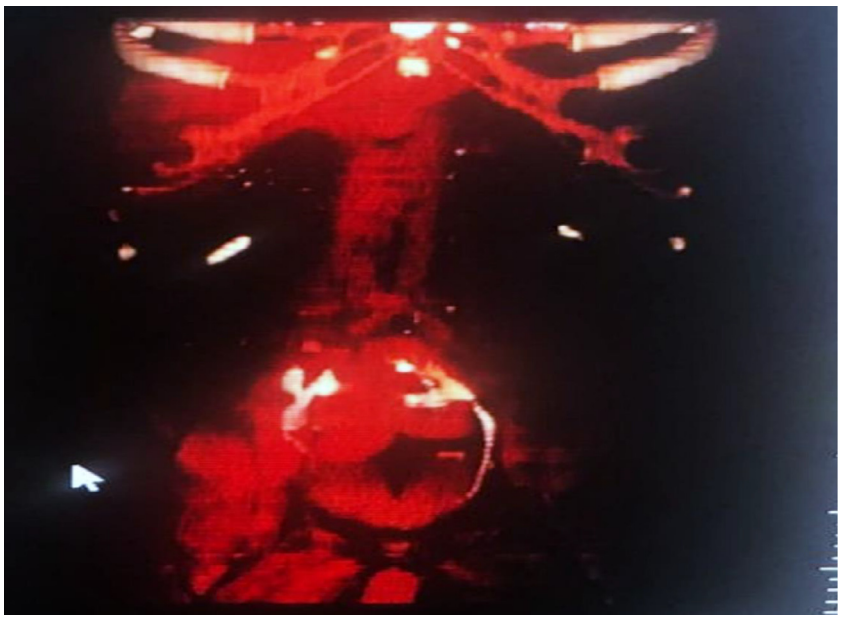

Fig. 6 – Volume rendered postcontrast imaging highlighting ureteral drainage from both pelvic kidneys.

the kidney rotates 90° along its longitudinal axis to its more typical orientation.

Anomalies in this process can result in (1) incomplete rotation – the commonest, (2) excessive rotation, or (3) lateral and/or reversed rotation where the hilum faces laterally, renal vessels are located anteriorly and the ureter is located laterally [6,11]. The incidence of laterally rotated kidneys is extremely rare and it is true incidence is unknown.

This to the best of our knowledge is the first reported case in English literature of a combination of 2 rare renal anomalies presenting incidentally in a 42 year old male. We postulate that the remarkable anatomical configuration seen in this patient in which both kidneys are not fused anteriorly

rather posteriorly with their ureters facing laterally (longer ureteric course) and without both kidneys crossing the midline thus resulting in the production and drainage of urine into the urinary bladder occurring seamlessly without any physical obstruction could result in a decreased risk of recurrent urinary tract infection, obstruction, or calculus formation with the patient also not being hypertensive secondary to renal impairment.

This illustrates a case where fortuitous anomalies have resulted in a normal quality of life in a patient with combined renal developmental anomalies which otherwise would have posed deleterious renal complications.

Conclusion

This index case of a rare combination of bilateral laterally rotated, posteriorly fused, ectopic pelvic kidneys discovered incidentally highlights how a patient could despite congenital renal anomalies be able to live devoid of urinary tract complications due to a fortuitous configuration of the urinary tract. To the best of our knowledge this is the first reported case in English literature.

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