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Case Report

Crossed Renal Ectopia Coexisting with Nephrolithiasis in a Young Nigerian Man

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Abstract

Introduction: Renal ectopia or ectopic kidney is a congenital anomaly in which one or both kidneys are located in an unusual position. It results from the kidney failing to ascend properly from its origin in the true pelvis. In some cases, one kidney may cross over (crossed renal ectopia) so that both kidneys are on the same side of the body. When a crossover occurs, the two kidneys may grow together and become fused (crossed fused renal ectopia). Renal ectopia is generally uncommon; its coexistence with nephrolithiasis is even rarer. Due to its variable presentations, it is usually discovered incidentally, especially when investigating patients for abdominal pain. Treatment may be conservative when renal function is preserved and no complication is associated.

Case report: we highlight the unusual occurrence of renal ectopia with nephrolithiasis in a 34 year-old Nigerian businessman who presented to the renal clinic of our hospital with a three-month history of intermittent dull right flank pain radiating to the right groin. Physical examination revealed right lumbar tenderness without guarding. The rest of the examination was unremarkable. An abdominal ultrasound scan done revealed a linear calculus in the right renal collecting system but the left kidney was not visualised. An intravenous urogram (IVU) showed a crossed ectopic kidney with nephrolithiasis. The patient was treated conservatively and his kidney function has remained stable.

Conclusion: This case report describes the relatively uncommon finding of crossed renal ectopia associated with nephrolithiasis.

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Introduction

Renal ectopia or ectopic kidney is a congenital anomaly in which one or both kidneys are located in an unusual position. It results from the kidney failing to ascend properly from its embryonic origin in the true pelvis. Some kidneys ascend toward the rib cage, but one may cross over (crossed renal ectopia) so that both kidneys are on the same side of the body. When a crossover occurs, the two kidneys may grow together and become fused (crossed fused renal ectopia).

Renal ectopia is a rare condition occurring in one out of one thousand births with variable clinical presentations. Due to its non-specific presentations, it is usually discovered incidentally, especially when investigating patients for abdominal pain. Crossed renal ectopia is very uncommon; its coexistence with nephrolithiasis is even rarer. In this case report, we highlight the unusual occurrence of crossed renal ectopia in a patient with nephrolithiasis to raise clinician awareness of this condition.

Case Report

A 34-year-old Nigerian businessman presented to the outpatient nephrology clinic of our hospital with a three-month history of intermittent dull right flank pain radiating to the right groin. The pain was gradual in onset, moderately severe, relieved by analgesics, but with no known aggravating factors. There was no associated nausea or vomiting. There was no history of hematuria, dysuria, increased urine frequency or urgency, loin swelling or weight loss. The patient reported inadequate fluid intake as he drank less than 1 liter of fluid per day. He gave history of passing concentrated urine but no history

Figure 1: Plain abdominal radiograph showing an oval calcific density at the level of the L1-L2 intervertebral space on the right side, overlying the 12th rib

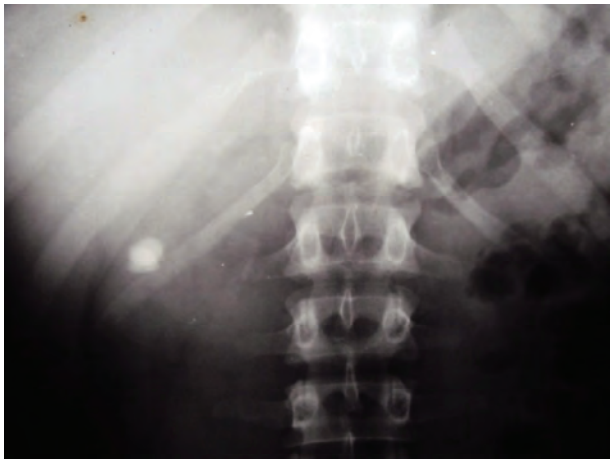
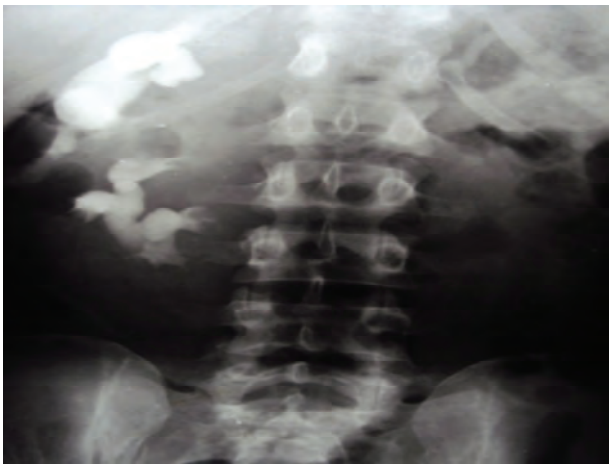


Figure 2: Intravenous urogram showing both kidneys on the right side. There is associated mild dilatation of the pelvi-calyceal system of the right kidney.



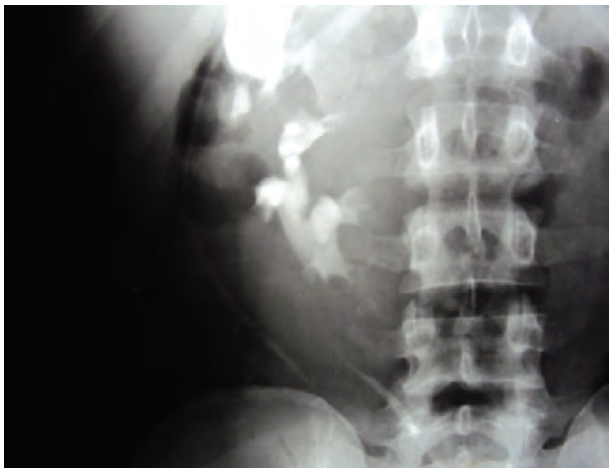
of reduced urine output, facial swelling, leg swelling, fever or jaundice. Physical examination revealed right lumbar tenderness without guarding or rigidity while the rest of the examination was unremarkable. Urinalysis revealed microscopic hematuria, proteinuria and positive leucocytes esterase. Urine culture yielded no bacterial growth after 72 hours of incubation. Hematological parameters, renal and liver function tests were normal. Abdominal ultrasound scan revealed a linear calculus in the right renal collecting system, measuring 14 mm in length, casting posterior acoustic shadow with mild dilatation of the mid-pole calyx. The left kidney was not visualised on the ultrasound scan. A plain abdominal radiograph showed an oval calcific density at the level of L1-L2 intervertebral space on the right side, overlying the 12th rib, suggestive of nephrolithiasis (Figure-1). An intravenous urogram was performed which revealed that both kidneys were on the right side of the abdomen (Figure-2). There was prompt excretion of contrast by both kidneys. The ectopic left kidney was inferior to the right kidney with malrotation of both pelvi-calyceal systems and dilation of the upper and middle polar calyces of the right kidney. Both ureters were normal in caliber and inserted on respective sides of the urinary bladder, which had a smooth outline and was well distended (Figure-3). Twenty-four hour urinary excretion of calcium, uric acid and potassium were normal. An assessment of complicated urinary tract infection in a patient with right sided nephrolithiasis and left renal ectopia was made. The patient was treated conservatively and he was advised to take at least 4.5 liters of fluid per day. He was also commenced on oral levofloxacin 500 mg daily for 2 weeks and oral tramadol 50 mg twice daily for pain relief and referred for urgent urologic intervention. Surgery was advised but couldn't be performed because of financial constraints. He is now on regular follow-up with 3-monthly assessments of kidney function and ultrasound scans and his renal function has remained stable.

Discussion

Ectopic kidneys are thought to occur in approximately 1 in 1,000 births but only about 1 in 10 of these cases is ever diagnosed [1]. Some of these cases are discovered incidentally, when a child or adult is having ultrasonography for a medical condition unrelated to renal ectopia [1]. A radiographic survey of symptom-free potential transplant donors found ectopic kidneys in 2 of 151 individuals [2]. Simple renal ectopia refers to a kidney that is located on the proper side of the abdomen but is abnormal in position. Crossed renal ectopia on the other hand, refers to a kidney that has crossed from left to right or vice-versa and was first described by Pannorlus in 1964 [3].

Renal ectopia is a rare condition that has variable clinical presentations. Abdominal pain is one of the commonest presentations as was the case in this patient. Ectopic kidneys have increased susceptibility for the development of complications like urinary tract infections, urolithiasis, and tumors [5]. There are reported cases of renal cell carcinoma and Wilm's tumour associated with crossed fused renal ectopia [6, 7]. Muhammad and Fidaullah in 2008 studied the prevalence of renal ectopia in patients with abdominal complaints [8]. They found that 0.2% of 12,000 patients investigated for the cause of abdominal pain had renal ectopia. In their study, 7 had right ectopic pelvic kidney, 5 had left ectopic pelvic kidney, 5 had crossed ectopic fused kidney, 2 had crossed ectopic unfused kidneys, 4 had horseshoe shaped and 2 had

Figure 3: Both ureters are normal in calibre and insert on respective sides of the urinary bladder, which has a smooth outline and is well distended.



bilateral ectopic pelvic kidneys [8]. Other researchers have reported several associations and coexistence of renal ectopia with different conditions. Modi, Goel and Dodia in India reported a laparoscopic pyeloplasty and pyelolithotomy performed on an 8-year- old boy who had calculi in the lower pole of the right kidney coexisting with crossed fused renal ectopia [9]. Gupta, Yadav and Singh [10] described a similar procedure in an 11 year old child with a similar presentation. Ali *et al* in 2001 reported cases of ureteropelvic junction obstruction coexisting with renal calculi in children [11]. Also in 2007, Riaz Ahmad reported a case of a rare syndrome called Thrombocytopenia and Absent Radius (TAR) syndrome with crossed fused renal ectopia [5]. However, no one to the best of our knowledge has reported the coexistence of renal ectopia with nephrolithiasis in Nigeria. Nochiri in Ibadan, Nigeria reported a case of chronic nephritis in a crossed renal ectopia with fusion identified during necropsy [12]. As was the case in other reports [5, 8] the diagnosis of renal ectopia in this patient was incidental. The abdominal ultrasound scan done in this patient was to identify any possible cause of abdominal pain. However, it visualized the right kidney but not the left suggesting a right solitary kidney. The finding of a stone in the visualised kidney necessitated the IVU which established the diagnosis of left renal ectopia [13]. Both kidneys were located on the right side of the abdomen and this explained why the left kidney was not visualised during the initial abdominal ultrasound scan [13, 14]. Other imaging modalities such as retrograde and intraoperative antegrade ureterography, renal cortical scintigraphy using 99mTc-dimercaptosuccinic acid, CT scan (computerized tomography) and MRI (magnetic resonance imaging) have been shown to be useful in the diagnosis of renal ectopia and ectopic ureters [15]. Gharagozloo and Lebowitz reported that the high sensitivity and specificity of renal cortical scintigraphy make it a useful diagnostic study in the setting of an ectopic dysplastic kidney. It can be used as an excellent targeting device before CT scan, which will then more accurately locate the poorly functioning kidney for surgical removal [15].

Generally no treatment is needed for an ectopic kidney if renal function is normal and no complication such as UTI, stone or obstruction is found. Even in the absence of any of these, patients need to be followed up closely. If investigations show that obstruction is present, surgery may be necessary to correct the position of the kidney to allow better drainage of urine. Our patient was offered surgery on account of the presence of a stone which was causing obstruction however, surgery was delayed because the patient could not afford the surgery immediately. Urinary tract infection when detected should be promptly treated with appropriate antibiotics. If extensive kidney damage has occurred, the kidney is often removed as long as the other kidney is functioning properly. Renal ectopia complicated with calculi could be managed conservatively or with a number of endoscopic and other procedure including shock wave lithotripsy, ureteroscopy, percutaneous nephrolithotomy, laparoscopic-guided percutaneous nephrolithotomy and laparoscopic pyelolithotomy [16-19]. Stones in ectopic kidneys which fail to respond to the treatment by extracorporeal shock wave lithotripsy or ureteroscopic laser lithotripsy have been treated by laparoscopic procedures, such as pyelolithotomy and more commonly by laparoscopic guided percutaneous nephrolithotomy (PCNL) [16-19].

Conclusion

Early detection of an ectopic kidney with prompt intervention and/or close follow up is necessary in order to prevent complications that may arise. Periodic evaluation of the patient and interdisciplinary involvement by the nephrologists and urologists in managing this condition can't be overemphasized.

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