

## A Large Staghorn Calculus in Cross-Renal Ectopia: A Rare Presentation

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### ABSTRACT

Crossed renal ectopia is a rare congenital malformation and is the second most common fusion anomaly after a horseshoe kidney. Crossed ectopic kidneys are fused to their ipsilateral mate in 90% of cases. crossed fused renal ectopia is usually diagnosed when other disease states are being investigated. It rarely causes significant clinical problems. Treatment is only indicated for the complication of the anomaly rather than for the anomaly itself.

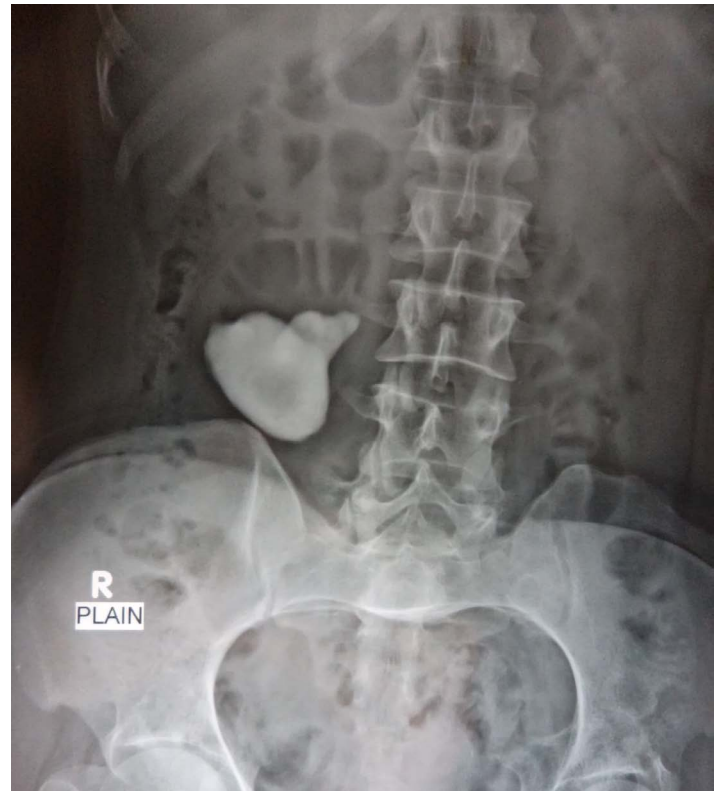
### INTRODUCTION

Crossed renal ectopia is a rare congenital malformation and is the second most common fusion anomaly after a horseshoe kidney. Crossed ectopic kidneys are fused to their ipsilateral mate in 90% of cases. A case of crossed-fused, left-to-right renal ectopia with a staghorn calculus is reported herein.

### CASE REPORT

A 30-year-old male presented with a 6-month history of intermittent, dull, right lower abdominal pain. There was no history of hematuria, graveluria, increased urinary frequency, urgency, or weight loss. Physical examination revealed a tender palpable lump of 7 cm x 6 cm in size without guarding and rigidity. Urinalysis revealed microscopic hematuria, while the urine culture was sterile. His hematological and biochemical profile was normal. Abdominal ultrasound revealed a large calculus in the left-to-right crossed-fused kidney measuring 5 cm maximum, casting a posterior acoustic shadow with dilatation of the pelvicalyceal system. A plain abdominal X-ray showed a large radio-opaque shadow at the level of L3-L4 (Figure 1). Intravenous urography revealed a normally functioning, malrotated, orthotopic right kidney with a nondilated pelvicalyceal system and laterally deviated ureter. Figure 2 shows the left-to-right crossed ectopic kidney showed a large staghorn calculus with a dilated pelvicalyceal system.

Figure 1. A plain abdominal X-ray showing a large radio-opaque shadow at the level of L3-L4.



**KEYWORDS:** Crossed-fused renal ectopia, staghorn, nephrolithiasis

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Figure 2. The left-to-right crossed ectopic kidney shows a large staghorn calculus with a dilated pelvicalyceal system.



A micturating cystourethrogram showed no reflux. Cystoscopy showed normal bilateral ureteric orifices. Bilateral ureteric catheterization was done.

A right pyelolithotomy was done in the flank position with an extraperitoneal approach. The Gerota fascia was opened by sharp dissection, and peripelvic dissection was carried out. No significant vessels crossing the pelvis were noted. A liberal pyelotomy was done. The pelvic and calyceal part of the stone (approximately 6 cm x 5 cm x 4.5 cm) was delivered with little manipulation (Figure 3). The postoperative period was uneventful.

## 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.

Figure 3. The pelvic and calyceal part of the stone (approximately 6 cm x 5 cm x 4.5 cm) was delivered with little manipulation.



Some of these cases are discovered incidentally, when a child or adult is having ultrasonography for a medical condition unrelated to renal ectopia [1]. 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 Pamarolus in 1964 [2,3].

Crossed-renal ectopia was classified by McDonald and McClellan into 4 types: 1) crossed renal ectopia with fusion, 2) crossed renal ectopia without fusion, 3) solitary crossed renal ectopia, and 4) bilaterally crossed renal ectopia. Those with fusion were further classified by the nature of the fusion and position [4]. The last significant review of the subject was conducted in 1959 and reported 500 cases of crossed renal ectopia with or without fusion that presented primarily with clinical symptoms [5].

Embryology of crossed renal ectopia is unclear. Some have suggested that the developing kidney crosses to the opposite side [6]. According to others, the ureteral bud alone is responsible for crossing. This is based on the fact that ureteral pain from stones is felt on the side of the ureteral orifice, where renal pain is felt on the side of the kidney [7].

In 20 to 30%, the pathology is an incidental finding. In the rest, the most common symptoms reported are abdominal or flank pain, a palpable mass, hematuria, urinary tract infection, and dysuria [7]. The urological conditions associated with crossed renal ectopia are hydronephrosis, reflux or tumors, and

nephrolithiasis [8].

The simultaneous occurrence of bilateral multiple calculi leading to acute on chronic renal failure has been reported [9]. Stubbs and Resnick reported 2 cases of staghorn calculi in crossed fused ectopic kidney, which were treated by anatomic nephrolithotomy [10].

Modi, Goel, and Dodia 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 [11]. Gupta, Yadav, and Singh described a similar procedure in a child with a similar presentation [12]. Mishra et al. reported supine percutaneous nephrolithotomy for bilateral complete staghorn calculi in an L-shaped crossed fused renal ectopic anomaly. [20]. The diagnosis is made by ultrasonography and intravenous urography. Ultrasound can detect concomitant urinary pathology and cystic changes [13].

Anatomic delineation is best achieved by intravenous urography. Besides showing function, it can give an idea of ureteric displacement [14]. Other imaging modalities such as retrograde and intraoperative antegrade ureterography, renal cortical scintigraphy using <sup>99m</sup>Tc dimercaptosuccinic acid, computed tomography, and magnetic resonance imaging have been shown to be useful in the diagnosis of renal ectopia and ectopic ureters [15].

Generally, no treatment is needed for an ectopic kidney if renal function is normal and no complication, such as a UTI, stones, or obstruction, is found. Even in the absence of any of these, patients need to be followed up closely [3]. Renal ectopia complicated with calculi could be managed conservatively or with a number of endoscopic and other procedures, including shock-wave lithotripsy, ureteroscopy, percutaneous nephrolithotomy, laparoscopic guided percutaneous lithotomy, and laparoscopic pyelolithotomy.

In conclusion, crossed fused renal ectopia is usually diagnosed when other disease states are being investigated. It rarely causes significant clinical problems. Treatment is only indicated for the complication of the anomaly rather than for the anomaly itself.

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