DOI: http://doi.org/10.4038/gmj.v27i4.8176

An incidental diagnosis of crossed fused ectopia of kidneys in a child

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Submitted on 22.09.2021 and accepted for publication on 19.06.2022

Introduction

Ectopic kidney is a kidney placed outside the normal renal fossa (1). In simple ectopia presents a kidney ectopic on its own side while crossed ectopia, fused or unfused, presents when the kidney is located across the midline with its contralateral kidney (1). The exact prevalence of crossed fused kidneys are not known as most of the patients are asymptomatic (2,3). Prevalence of 1 : 2000 was estimated in an autopsy study (4). It is the second commonest fusion abnormality in the urinary tract after horseshoe kidney (1). Most crossed fused kidneys are diagnosed incidentally (3). It shows 3 : 2 male-to-female ratio and left to right is more common than right to left (3:1) (1). Abnormal development of metanephric blastema and ureteric bud during 4th to 8th weeks of gestation is thought to give rise to crossed fused ectopia (2). There are six types of Crossed fused kidneys described (3). They are described in the order of decreasing incidence as Type a - Inferior crossed fusion, Type b - Sigmoid or S - shaped kidney, type c - Lump kidney, type d - Disc kidney, type e - L-shaped kidney and type f - Unilateral fused kidney (superior ectopia) (2).

Case presentation

A nine-year-old boy presented to Kalawana Base Hospital with fever for 2 days with lower abdominal pain and body aches. He did not have vomiting, diarrhoea, cough or urinary symptoms. There was no contact history of COVID 19. He denied contact with muddy water. There was no past history of urinary tract infection or episodes of abdominal pain. He had been immunised up to presentation and had achieved developmental milestones at appropriate age. His weight was 28 kg (25th to 50th centile) and height was 137 cm (50th to 75th centile). On examination, he was febrile (temperature 100.5 ^{0}F), not pale and throat was inflamed. His pulse rate was 100 beats per minute and blood pressure was 112/50 mmHg (95th centile - 119/80 mmHg). There were no rashes. Abdominal examination revealed suprapubic tenderness without organomegaly. His respiratory and cardiovascular system examinations were normal. His urine analysis showed occasional pus cells without any red cells. He was observed in hospital and fever settled after one day. He was discharged on day 3 following admission, after being afebrile for 24 hours. The patient presented one week later complaining of episodes of lower abdominal pain. Abdominal examination showed enderness in suprapubic region. His urine analysis was normal and Full blood count showed White cell count of 19000/mm^3 (Neutrophils 45%, Lymphocytes 47%), Haemoglobin 12.3 g/dL and platelet count of 247000/mm^3. His C-reactive protein level was 2.3 g/L. Ultrasound Scan of Abdomen showed that right kidney was not in normal position and crossed fused ectopia of right kidney where right kidney was fused to the lower end of left kidney without evidence of hydronephrosis or hydroureter. Rest of the abdominal scan was normal.

His serum creatinine, serum sodium, serum potassium were 0.45 mg/dL, 141 mmol/L and 4.6 mmol/L respectively. The Tc-99 mm DMSA renogram showed crossed fused ectopia of right kidney where right kidney lied in the midline

attached to the lower pole of the left kidney (Figure 1). He is currently on follow up with six monthly blood pressure measurements and serum creatinine levels and annual ultrasound scans of urinary system. He did not develop any complications such as pyelonephritis, hypertension or urolithiasis.

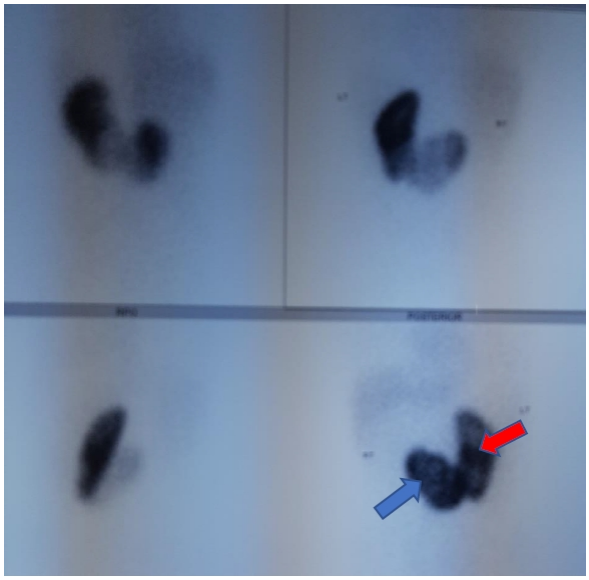

Figure 1: DMSA scan of the patient showing the right kidney (blue arrow) lying in the midline attached to the lower pole of left kidney (red arrow) "L-shaped kidney".

Discussion

Crossed fused ectopia in children is a rare condition which is mostly diagnosed incidentally and requires long term follow up to detect complications early for timely interventions.

Our patient who is a male who had a L-shaped kidney which is the second least common variety with right to left crossover. It was diagnosed incidentally as in majority of cases (3). Vesicoureteric reflux, pyelonephritis, urolithiasis are known complications which were not present in our patient (3). Crossed fused ectopia is known to cause acute abdominal pain (5). Solanki *et al.,* analysed six patients with crossed fused ectopia retrospectively and it was an incidental diagnosis while investigating for possible abdominal pathology in four of them (6). In the same case series, all patients needed a surgical procedure where three patients needed ureteric re-implantation and two patients needed pyeloplasty. Renal functions of all children were normal during long term follow up (6). Our patient did not need any surgical procedure.

Investigations should be tailored to detect the abnormalities associated. DMSA scientigraphy which detect the renal cortex helps to establish the position of kidneys and renal scarring while micturating Cystourethrogram (MCUG) will detect vesico-ureteic reflux (3). Doppler ultrasound studies help to detect the vascularization of kidneys (1). Management is individualised depending on the predominant abnormality and functional status. Surgery is required in patients with obstruction. Ureteric re-implantation is the commonest surgery performed followed by pyeloplasty (7). It is important to follow up children diagnosed with crossed fused ectopia with regular ultrasound imaging, monitoring blood pressure and renal function tests to detect the complications early. Long-term prognosis is good in most children with crossed fused ectopia (7).

Informed consent was obtained from the parents of this child to publish the case report with images.

Acknowledgements

We would like to thank staff of Kalawana Base Hospital and Radiology Departments of Ratnapura Teaching Hospital and Lady Ridgeway Hospital for Children, Colombo for their contribution in managing the patient.

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