Aberrant Renal Vessel Causing Hydronephrosis in Crossed-Fused Ipsilateral Ectopic Kidney: A Rare Case Report

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Received: 13 July 2011 / Accepted: 12 June 2012 / Published online: 23 June 2012
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Abstract A crossed-fused ectopic kidney is a rare congenital anomaly, and uncommonly we see an aberrant vessel as a cause of hydronephrosis in a kidney. We report a case of 4-year-old boy with crossed-fused right renal ectopia with hydronephrosis in the both kidneys. The aberrant renal vessel was found pressing the left pelvi-ureteric junction causing hydronephrosis. Dismembered pyeloplasty of the left kidney was performed anterior to the aberrant vessel. The patient is doing well in the follow-up visits and his renal function is stabilized. Aberrant blood supply may be a cause of hydronephrosis in the crossed-fused ectopic ipsilateral kidney. Keeping this entity in differential diagnosis will help in successful management of the crossed-fused ectopic kidney.

Keywords Crossed fused renal ectopia · Aberrant vessel · Hydronephrosis

Introduction

A crossed-fused ectopic kidney is a rare congenital anomaly. It is commonly associated with other anomalies in the urogenital tract such as hydronephrosis, vesicoureteric reflux, renal dysplasia, and hypospadias. Usually it is asymptomatic, but may

present as abdominal lump and pain. Hydronephrosis in a crossed ectopic kidney caused by the aberrant renal vessel is not a rare phenomenon, but the aberrant renal vessel causing the ectopic fused ipsilateral kidney to be hydronephrotic is a rare presentation.

Case Report

A 4-year-old boy reported in the outpatient department with complaints of pain and a lump in the left side of the abdomen for 2 years. Physical examination revealed a lump in the left lumbar region which was firm in consistency. Routine blood, urine, and renal function tests were within normal limits. Ultrasonography of the abdomen revealed empty right renal fossa and the crossed-fused right kidney to the left along with hydronephrosis of both kidneys. Intravenous urography showed nonexcretion of dye in the right side with hydronephrotic changes in the left kidney (Fig. 1). Micturiting cystourethrography revealed no vesicoureteric reflux. Renal scan showed the poorly functioning ectopic right kidney in the left pelvic cavity which was crossed-fused with the lower pole of the left kidney along with compromised glomerular and cortical function of the hydronephrotic left kidney with significant pelvi-ureteric junction obstruction (Fig. 2). Split renal function of right and left was 37.2 and 62.8 %, respectively. Intraoperative examination revealed the crossed-fused right renal ectopic kidney with aberrant renal vessels pressing over the left pelvi-ureteric junction causing hydronephrosis of the left kidney. The right kidney was hydronephrotic owing to compression from the left distended pelvis (Fig. 3). Dismembered left pyeloplasty was performed anterior to the crossing vessel (Fig. 4). Postoperative period was uneventful and his renal function improved in the follow-up visit.

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Fig. 1 IVP showing crossed ectopic kidney to the left

Discussion

Crossed renal ectopia is the second most common fusion anomaly after horseshoe kidney [1]. This condition occurs in 1 in 7,000 autopsies with a male-to-female ratio of 2:1. Both kidneys are located on the same side and may occur with fusion (85 %), without fusion (<10 %) or rarely may be solitary or bilateral. The left kidney is three times more likely to migrate to the right than vice versa [2]. Renal ectopia results from failure of normal ascent of the embryonic kidney. Common symptoms associated with renal ectopia are abdominal or flank pains, a palpable mass, hematuria, urinary tract infection, and dysuria [3]. There was no associated anomaly found in our case as also demonstrated by Marshal and Freedman [3]. Renal ectopia may arise as a result of abnormalities of the ureteric bud or metanephros, an abnormal vascular supply, or genetic abnormalities acting as a barrier to ascent [4]. In our case, there

Fig. 3 Showing aberrant vessel crossing PUJ of left kidney

was migration of the right kidney to left in which the upper pole of the crossed kidney fuses with the lower pole of the left kidney. Pelvi-ureteric junction obstruction is present in 33–52 % of ectopic kidney. This is frequently due to a high insertion of the ureter on the renal pelvis, malrotation of the kidney, or an anomalous blood supply which obstructs the collecting system [5]. Aberrant arteries can cause hydronephrosis. Eustachius reported such anomalous or aberrant arteries in one of his famous plates which remained unprinted in the Papal Library until 1714 [6]. According to Gleason et al., hydronephrosis was present in 15 of 58 contralateral nonectopic kidneys; out of them 11 required surgeries mostly for vesicoureteral reflux disease [7]. Mustafa et al. reported the aberrant renal vessel causing hydronephrotic changes, but it was associated with contralateral crossed ectopia without fusion [8]. In our case, there was an aberrant vessel causing pelvi-ureteric junction obstruction in the normally placed left kidney associated with the contralateral crossed-fused right kidney which was a rare finding. Obstructed drainage in the ectopic right kidney was due to malrotation and compression effect of the hydronephrotic left kidney.

Fig. 2 DTPA scan showing crossed ectopic right kidney

Fig. 4 Pyeloplasty performed with vessel passing behind anastomosis

Anomalies of renal migration and fusion are rare. They are mostly asymptomatic. Among that symptomatic aberrant vessel crossing ipsilateral crossed ectopic kidney causing hydronephrosis should be considered to minimize perioperative morbidity when surgery is planned. A long-term follow-up is needed as there are chances of chronic renal failure in these patients.

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