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Case Report

Normal Functioning Fused Pelvic Kidney: A Very Rare Renal Anomaly

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Abstract

This study highlights two cases having fused pelvic kidneys who were referred at this institute by clinicians/nephrologists for ^{99m}Technetium (^{99m}Tc) DMSA and DTPA renal scintigraphy. One case was 24 year old female and the other case was 21 year old male. Both cases were undergone ultrasonographic examination for correlative purpose before renal scintigraphy. Their urinary drainage system was assessed with DMSA and DTPA renal scintigraphy, showing normal functioning fused pelvic kidneys. The authors also used diuretic during DTPA renogram to exclude the true obstructive feature of urinary tract.

Keywords: fused pelvic kidneys, normal functioning, ^{99m}Tc-DMSA and -DTPA renal scintigraphy.

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Case report:

Both cases (24 year old female and 21 year old male; Figure 1 and 2) were referred separately and independently at this institute in 2014 for ^{99m}Technetium (^{99m}Tc) DMSA and DTPA renal scintigraphy. And, they were sent by their clinicians for the confirmation of previously found anomaly diagnosed through ultrasonographic examination. However, they consulted their doctor with vague symptoms, namely, abdominal discomfort and abdominal pain. At this institute, the authors also performed ultrasonography of whole abdomen for correlative purpose before conducting ^{99m}Technetium (^{99m}Tc) DMSA and DTPA renal scintigraphy. Dynamic renal scan images were obtained with camera in posterior position and 15% window centered at 140 keV using a 128 X 128 matrix. Acquisition was started on bolus injection of 185 MBq of Tc-99m DTPA and dynamic images were acquired at 3 seconds/ frame for 60 frames and then 60 seconds/frame for 27 frames. The renal scan revealed pelvic kidneys fusing at the midline and dynamic renogram showed normal functioning curve with no features of obstruction. Also, their X-ray KUB revealed no abnormality and blood biochemistry was within normal limits.

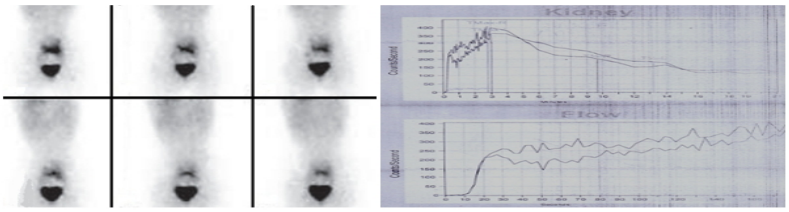

Fig. 01: ^{99m}Technetium (^{99m}Tc)-DTPA renal sequential images and –DTPA renogram curve of Case 1 (24 Yr. old female).

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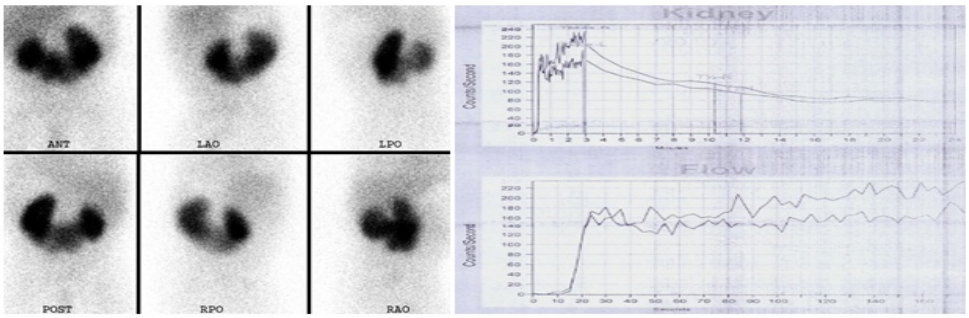

Fig. 02: ^{99m}Technetium (^{99m}Tc)-DMSA renal scan and –DTPA renogram curve of Case 2 (21 Yr. old Male).

Discussion:

From the embryologic viewpoint, fused pelvic kidneys result from the fusion of each metanephric tissue in the pelvis during the early ascent. After the occurrence of fusion, cranial ascent to the usual lumber position is impaired by the retroperitoneal structures. And regarding the probable causes of this anomaly, faulty ureteral bud development, abnormalities of renal vasculature (an abnormally located umbilical artery may force the metanephric tissues into opposition and cause fusion[1]), teratogenic factors etc may play the role[2,3]. Vascular supply of this anomaly is usually derived from the common iliac artery or terminal aorta. Although, its incidence is very rare; the exact incidence rate of this anomaly is not defined in the literature[4].

Mostly, patients with pelvic renal ectopia remain entirely asymptomatic, as seen in these study cases. However, when symptoms are present, they typically relate to calculi, hydronephrosis, infection, or hematuria, because fusion anomalies and pelvic ectopia are prone to cause stasis of urine, pyelectasis, calicectasis, infection and stone formation. Besides, the anomalous position of the kidneys, pelvis, and ureter predisposes to poor drainage and may result in extensive hydronephrosis[5]. The ureters are also short in fused pelvic kidneys and have a tangential course, which increases the risk of ureteric obstruction, stone formation, and infection[6]. As a result, pelvic kidneys are more susceptible to calculus formation than normal ones and are also more frequently observed to be hydronephrotic, the cause of which may be true obstruction or nonobstructive dilatation due to vesicoureteral reflux, dysmorphism, malrotation, and so on[7-9].

Conclusion:

Role of renal scintigraphy is absolutely effective in detecting such anomaly; as, this discipline evaluates the functional status as well as anatomic information of the urinary system through the static and dynamic images. Nonetheless, early diagnosis and follow-up of such anomaly is important so that associated anomaly (such as Fallot tetralogy[10], vaginal absence[11], sacral agenesis and caudal regression[12,13]) and urinary complication (for example, urinary tract infection, calculi, obstruction etc) can be managed properly.

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