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IMAGING OF CROSSED UN-FUSED RENAL ECTOPIA- A RARE CONGENITAL RENAL ANOMALY.

Radiology

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ABSTRACT

The anomaly of crossed renal ectopia is rare, in this, one of the kidneys crosses the midline and lies on opposite side. Ninety percentage of the crossed renal ectopia are fused while only 10% are un-fused which accounts for 1: 75000. The ureter of the ectopic kidney is short and thus more prone to infection and nephrolithiasis. Since the crossed kidney is placed superficially, it is more prone to blunt injury. Most of the renal anomalies are found incidentally during radiological investigations. This is a case of a 56 year old male with incidental finding of left crossed unfused kidney.

KEYWORDS

Crossed, renal, congenital, anomalies

INTRODUCTION:

Crossed renal ectopia accounts for 1:7000 autopsies. The kidneys may be either fused or unfused ,with the unfused variant accounting for 1:75000 autopsies(1).In crossed renal ectopia the kidney crosses midline and lies on contra lateral side with the insertion of the ureter maintained at the normal position. It has been proposed that the migration anomalies occur due to abnormal renal fusion of kidneys which hamper its normal ascent in most cases but the cause of unfused crossed ectopic kidneys is largely unknown. The ureter of the ectopic kidney is short and thus more prone to infection and nephrolithiasis. Since the crossed kidney is placed superficially, it is more prone to blunt injury. Here we present a case of left crossed non fused ectopic kidney which is found incidentally

CASE HISTORY

A 56 year old male patient was referred for ultrasound (USG) of whole abdomen for evaluation of liver parenchymal disease and right inguinal hernia. On USG right kidney appeared normal and was situated in right renal fossa. The left kidney could not be visualized in the left renal fossa instead it was seen on the right side below the normal right kidney at the junction of right lumbar region and right pelvis. Left kidney also appeared malrotated with hilum facing anteriorly (Figure 1). No demonstrable continuity in both kidneys was seen.

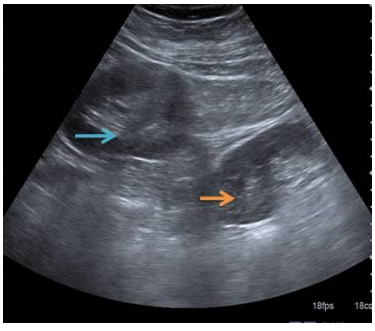

Figure 1. USG abdomen, longitudinal view of right lumbar region shows two closely placed kidneys without demonstrable continuity.

A CT abdomen was done for the same patient for screening. The scout radiograph shows absence of renal shadow on left side, an ectopic renal shadow was noted on right side. The right kidney appeared normal. Left kidney was seen low lying on the right side at the level of L3-L5 below the right kidney (Figure 2,3). It was mal-rotated with hilum facing anteriorly. No evidence of fusion was noted in the kidneys.

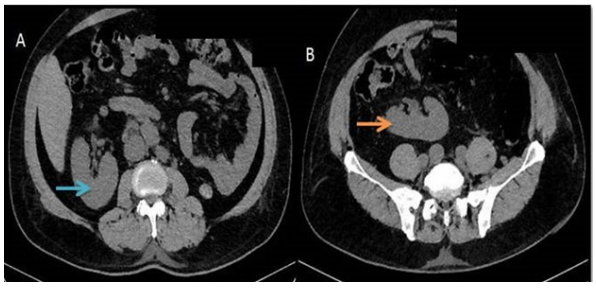

Figure 2.CT axial section shows normally placed right kidney (blue arrow) and and low lying crossed fused crossed unfused left ectopic kidney with hilum facing anteriorly (red arrow).

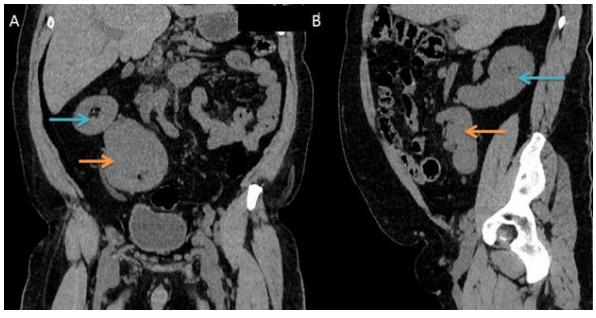

Figure 3. CT coronal and sagittal section shows normally placed right kidney (blue arrow) and low lying crossed fused crossed unfused left ectopic kidney (red arrow)

DISCUSSION:

Crossed renal ectopia unfused variant is a rare congenital anomaly (1,2). It is more common in males and is around 1.4 to 2: 1 ratio with higher incidence of left kidney lying on right side (3).Crossed renal ectopia being rare has been sporadically reported in literature. About 62 cases have been reported till 1959(4, 5, 6).USG is the initial modality of diagnosing crossed renal ectopia and most cases are found incidentally as in present scenario. Some cases might present with complications like infection, pelviureteric junction obstruction and nephrolithiasis. These patients present with symptoms of flank pain and dysurea. The ectopic kidney is usually malrotated, has high insertion of ureter and many a times has anomalous blood supply. This can lead to compression of pelviureteric junction and symptoms of obstruction. Patients might present with complaints of abdominal mass

due to the size of the fused kidney or more anterior location of the ectopic kidney. This also makes the kidney more susceptible to trauma. Intravenous pyelogram provides anatomical details. Micturating cystourethrogram is done for associated vasicoureteric reflex. CT KUB can be diagnostic as was done in our present case. CT and MR urogram are done for anatomical details. CT angiogram is helpful in equivocal cases. Tecnitium 99m Mercaptoacetyltriglycerine3 scan is done in case of renal obstruction. Kidneys and collecting systems are formed from ureteric bud, which arises from lower portion of Wolffian duct and metanephric blastema which is mesodermal in origin. Embriologically kidney lies in pelvis with hila facing anteriorly. In 6th to 9th week kidneys ascend upwards with rotation of hila medialy.(7) Types of crossed renal ectopia are given by McDonald and McCallen classification (8), the present case falls under Type B: Crossed renal ectopia without fusion. In this variant both the kidneys can be identified separately. Following theories of cause of renal ectopia have been proposed(9) .Mechanical theory, ectopia occurring due to anomalous arterial fork of umbilical artery(10).Genetic theory, mutation in Sonic hedgehog gene(11).Ureteral theory, ectopia due to wandering ureteric bud (10). and abnormal caudal regression(10) Renal ectopia may present as a single anomaly or it might be associated with (12,13) malrotation, as in our case, other associations may be present with vesicoureteric reflex reproductive tract anomalies such as cryptochidism, hypospadias, unilateral agenesis of fallopian and ovaries ,urinary tract anomalies, such as megaureter, urethral valve, ureteropelvic duplication.

Conclusion

Unfused congenital renal ectopia is a rare condition which is often undiagnosed. Diagnosis is mostly incidental. It does not require treatment unless complications occur. Follow up may be suggested to see the complications. Knowledge of the renal anomalies is essential for surgeons, urologist and radiologist for accurate diagnosis and treatment.

REFERENCES:

1. Al-Hamar NE, Khan K. Crossed nonfused renal ectopia with variant blood vessels: a rare congenital renal anomaly. Radiol Case Rep. 2016 Nov 29;12(1):59-64.
2. Felzenberg J., Nasrallah P.F. Crossed renal ectopia without fusion associated with hydronephrosis in an infant. Urology. 1991;38:450–452.
3. Nursal G.N., Buyukdereli G. Unfused renal ectopia: a rare form of congenital renal anomaly. Ann Nucl Med. 2005;19:507–510.
4. C.S. Ramesh Babu, Bindu Agrawal, Vinay Sharma, Arjun Kumar, Ravi Jain, O.P. Gupta. crossed renal ectopia without fusion: a multidetector computed tomography study. Int J Anat Res 2015;3(4):1585-1592. DOI: 10.16965/ijar.2015.293
5. Bauer SB. Anomalies of the upper urinary tract. In: Walsh PC, Retik AB, Vaughan ED, Wein AJ (Eds) Campbell's Urology, Vol.3, 8th. Ed. Philadelphia: WB Saunders. 2002;1898-1906
6. Winram RG, Ward-McQuaid JN. Crossed renal ectopia without fusion. Canad.M.A.J. 1959:81:481- 483.
7. Kaur N, Saha S, Mriglani R, Saini P, Gupta A. Crossed fused renal ectopia with a single ureter: A rare anomaly. Saudi J Kidney Dis Transpl 2013;24:773-6
8. McDonald J.H., McClellan D.S. Crossed renal ectopia. Am J Surg. 1957;93:995–1002
9. Jad A. Degheili, Murad M. AbuSamra, Fadi El-Merhi, and Albert El-Hajj, "Crossed Unfused Ectopic Pelvic Kidneys: A Case Illustration," Case Reports in Urology, vol. 2018, Article ID 7436097, 4 pages, 2018
10. W. A. Cook and F. D. Stephens, "Fused kidneys: morphologic study and theory of embryogenesis," Birth Defects Original Article Series, vol. 13, no. 5, pp. 327–340, 1977.
11. C. S. dos Santos Junior, D. M. de Miranda, and A. C. Simões e Silva, "Congenital anomalies of the kidney and urinary tract: an embryogenetic review," Birth Defects Research Part C - Embryo Today: Reviews, vol. 102, no. 4, pp. 374–381, 2014.
12. L. Akdogan, A. K. Oguz, T. Ergun, and I. Ergun, "The rarest of the rare: crossed fused renal ectopia of the superior ectopia type," Case Reports in Nephrology, vol. 2015, Article ID 742419, 4 pages, 2015.
13. V. J. Mansberg, M. A. Rossleigh, R. H. Farnsworth, and M. Van Rooijen, "Unfused crossed renal ectopia with ectopic left ureter inserting into a prostatic utricle diverticulum," American Journal of Roentgenology, vol. 172, no. 2, pp. 455-456, 1999.