Original Article

Pan Cake Kidney-A Rare Congenital Renal Fusion Anomaly and Renal Ectopia

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Abstract

Background: Pan cake kidney is renal ectopia with rarest fusion anomaly with multiple accessory renal arteries. Pan cake Kidney is formed due to extensive fusion of both kidneys upper poles and lower poles along their medial borders. It is also called as shield kidney and Dough nut Kidney. It is a rarest fusion Anomaly of kidneys very few cases were reported all over the world. During routine dissection found Pan cake kidney in a female cadaver in anterior midline in front of L3,L4,L5 and upper part of sacrum in lumbosacral region of female Pelvis. A study on Renal fusion Anomalies and Renal ectopia. **Material and Methods:** Routine cadaveric dissection as a part of undergraduate MBBS Teaching curriculum. Total 51 kidneys were studied in 26 Cadavers 18 Kidneys were studied in 9 Cadavers in Government Medical college, Suryapet. 8 Kidneys were studied in 4 Cadavers in Government Medical college, Bhadradri Kothagudem 24 kidneys were studied in 12 cadavers,1Pan cake kidney in female cadaver in Kakatiya medical Medical College, Warangal. **Results:** Kidney shape-Bean shaped -50(98.32%), Pan cake kidney-1(1.96%), Location-Extent of Left kidney-FromT12-L2 -25(96.15%), Extent of Right kidney L1-L3 -25(96.15%), Renal ectopia-Failure of ascent of both kidneys-pelvic kidneys-1(1.96%). Fusion Anomalies-Pan cake kidney-seen in midline anterior to mid L3,L4,L5 and upper part of sacrum-1(1.96%). Origin of single right and left renal arteries-Arise from abdominal aorta below level of superior mesenteric arteries-50(98.32%), Multiple accessory renal arteries-Arise from abdominal aorta below level of inferior mesenteric artery-1(1.96%). **Conclusion:** Variation in shape and location of kidney found during cadaveric study, reminds clinical importance of diagnostic procedures such as excretory, retrograde urograms, Ultrasound exam of abdomen.

Keywords: Pancake kidney, Shield Kidney, Doughnut Kidney.

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Introduction

Pan cake kidney is a type of Renal ectopia with rarest fusion anomaly with multiple accessory renal arteries that belongs to a group of congenital anomalies of the kidney.

Pan Cake Kidney: Anterior View with Irregular surface with aberrant renal arteries arising from abdominal aorta and Renal pelvis is anteriorly placed with two ureters remain uncrossed.

Case Report

Pan cake kidney is formed due to extensive fusion of both upper and lower poles of both kidneys along their medial borders. It is also called as Shield kidney, Dough nut kidney, Discoid kidney, Lump Kidney.

Pelvic Pan cake kidney is seen in a female cadaver in anterior midline L3,L4,L5 vertebrae and upper part of sacrum . Failure of ascent of pancake kidney is arrested by inferior mesenteric artery. Renal pelvis of this pan cake kidney is anteriorly placed ureters remain uncrossed. Each collecting system drains its respective half of kidney and does not communicate with the opposite side. Aberrant renal arteries seen arising from abdominal aorta below origin of inferior mesenteric arteries.

Right renal vein and left renal veins are seen draining corresponding halves of pancake kidney into inferior vena cava

Supra renal glands are not seen in upper poles instead they are seen in subdiaphragmatic fascia.

Pan cake kidney is covered by true capsule, abundant perinephric pad of fat, renal fascia of gerota, paranephric pad of fat.

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Pan Cake Kidney: Posterior view with flat surface showing right and left renal veins draining into inferior venacava.

Discussion

Renal ectopia with fusion anomalies were first described in 1938 by Wilmer. Congenital malformations of kidneys include abnormalities of number (renal agenesis, Supernumerary kidneys),shape(horse shoe kidney, pancake kidney), location(Unilateral or bilateral ectopia, crossed renal ectopia, crossed renal ectopia with or without fusion),and rotation of kidneys, Renal parenchymal structure (polycystic kidneys, dysplastic kidneys),pelvic and ureteral duplication.

Pan cake kidney is first described in 1926 by looney and Dodd. Pelvic Pan cake kidney is renal ectopia with abnormal location in pelvis instead of usual normal lumbar region and abnormal shape like a pan cake or dough nut or discoid shape which is rarest type amongst other renal anomalies instead of normal bean shape kidney Renal hila are rotated ventrally with anterior renal pelvis and ureters instead of normal renal hila facing medially. Pan cake kidney showed aberrant origin of renal arteries from abdominal aorta below the origin of inferior mesenteric artery.

Pan cake kidney was incidentally found during routine cadaveric study as a part of undergraduate and post graduate teaching curriculum of Anatomy for Medical students in a female cadaver.

Abnormal location of pan cake kidney in female pelvis might had impact on other female pelvic viscera urinary bladder and uterus. This renal malformation may lead to recurrent urinary tract infections, renal calculi, increased risk of developing malignancies. Additionally it may be associated with other anomalies like vaginal agenesis, uterine anomalies, rudimentary ovaries .

Turners syndrome 45XO Monosomy of X chromosome may also be a cause for occurrence of this rare congenital anomaly.

Conclusion

Pan cake kidney is rarest renal fusion anomaly due to embryological opposition of meta nephric masses found during cadaveric dissection in lumbo sacral region as a single renal mass in pelvic region that is renal ectopia.

This can be detected by ultra sound abdomen, MRI scan, excretory and retro grade urograms, reminds clinical importance of these diagnostic procedures.

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Conflicts of interest

There are no conflicts of interest.

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