

## Malrotated Ectopic Kidney

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### Abstract

Ectopic kidney is a congenital defect where kidney is in unusual anatomical position. An ectopic kidney is often associated with increased incidence of stone formation as a result of stasis because of altered geometry of urinary drainage[1]. Diseases in ectopic kidney may present diagnostic problems and excised mistakenly as an unexplained mass[2]. It can present with chronic urinary symptoms or mass per abdomen. This needs detailed evaluation and effective intervention to prevent loss of kidney.

**Keywords:** Ectopic Kidney; Urinary Tract Anomalies; Hydronephrosis; Unascended Kidney.

### Introduction

During embryonic development, fetal kidneys appear as buds inside the pelvis at 4<sup>th</sup> week, near the bladder. As the kidneys develop, they climb gradually toward their normal position near the rib cage in the back by 8<sup>th</sup> week. The ascent of the kidneys precedes the descent of the gonads into the pelvis. Ectopic kidneys may be pelvic, iliac or abdominal, anywhere along the path of their usual ascent or contralateral, referred to as "crossed".

### Case Presentation

A 23-year-old male presented with severe right iliac

fossa pain extending to the umbilical region since one day. He had no lower urinary tract symptoms. On palpation of abdomen there was a tender palpable mass of about 6x5 cms in Right Iliac fossa extending till umbilicus. His external genitalia were normal. Examination of the chest, cardiovascular and respiratory system had no abnormality. Patient was conservatively managed for pain. Investigations revealed normal Renal function. Ultrasound showed Right Ectopic Kidney with a 3mm stone in PUJ causing Mild hydronephrosis. CT confirmed the diagnosis. It had anteriorly-placed extra-renal pelvis with. Patient improved with conservative management and fluid flush therapy was given. Repeat USG on day 3 revealed no stone in right PUJ. Patient discharged on day 4.

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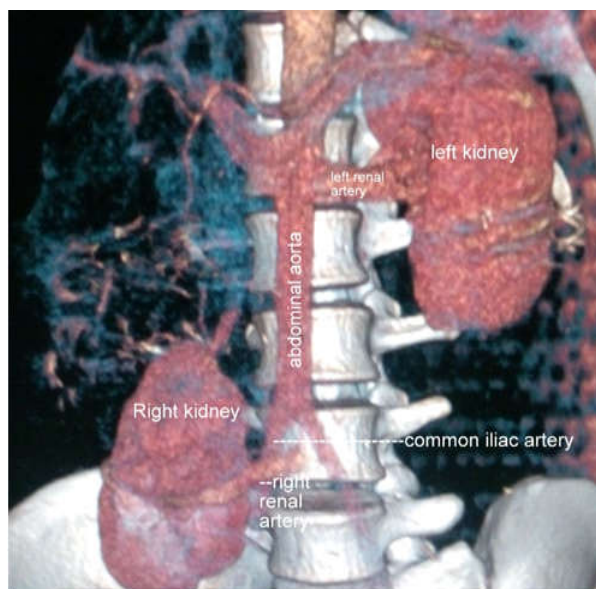


Fig. 1: CT KUB with 3D reconstruction

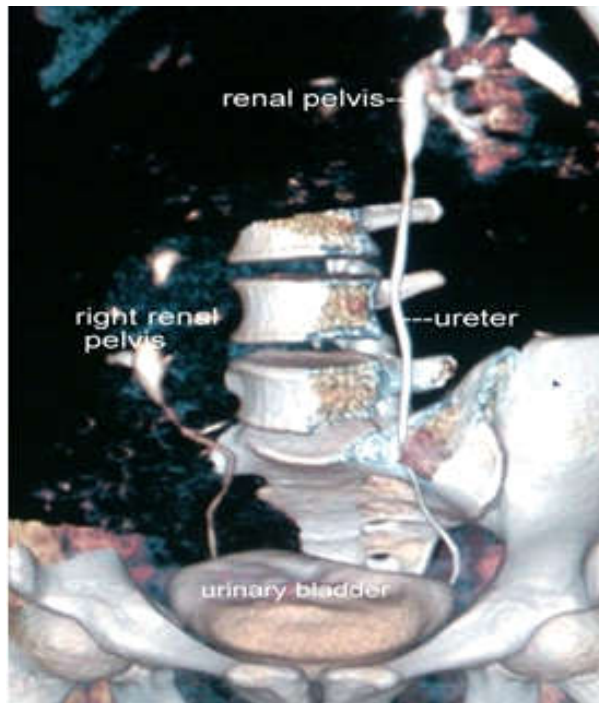


Fig. 2: Anteriorly placed Rt Renal pelvis

## Discussion

Ectopic kidney is described as abnormal position of a kidney due to a developmental anomaly and it occurs when migration of the kidney to its normal location during the embryonic period stops at a point. Incidence of ectopic kidney reported in the literature is 1:500 to 1:1100, Incidence of one normal and one pelvic kidney is 1:800 to 1: 3000. Ectopic thoracic kidney is 1:13000, Single pelvic kidney is 1:22000. Crossed renal ectopia 1:7000. When they reach the highest point, they receive new branches from the aorta, and the former branches degenerate. If those vessels do not degenerate in the ectopic caudal kidney, more than one accessory and polar arteries may arise[3,4]. Various congenital anomalies with urogenital system have been described. These are: multicystic dysplasia in a fused or unfused crossed kidney, ureterocoele, patent urachus, hydronephrosis, ectopic ureteric orifice, vesicoureteric reflux, vaginal agenesis, hypospadias etc.

Anomalies of Rotation may be seen in normal or ectopic kidneys. Four rotational anomalies have been identified. Non Rotation-Renal Pelvis facing ventrally, Incomplete Rotation-ventromedially, Reverse and Excessive Rotation-Hilum faces laterally. In our case it's incomplete rotation (Figure 1).

Even though it is not in its usual position, an ectopic kidney may not cause any symptoms and may

function normally. Many people have an ectopic kidney and do not discover it until they have tests done for other reasons. Sometimes, a doctor may discover an ectopic kidney after feeling a lump in the abdomen during an examination. In other cases, an ectopic kidney may cause abdominal pain or urinary problems.

When a kidney is out of the normal position, drainage problems are likely. Sometimes, urine can even flow backwards from the bladder to the kidney, called vesicoureteric reflux. Abnormal urine flow can set the stage for some of the problems associated with ectopic kidney:

1. Infection
2. Stones
3. Renal failure
4. Trauma

Contrast-enhanced CT scan can differentiate vascular and non-vascular structures and is a diagnostic method of choice[5]. The treatment varies with presence of symptoms or complications. If the urinary function is normal, no treatment for ectopic kidney is needed. There can be more than one aberrant artery and aberrant arteries can originate from the abdominal aorta, common iliac artery, external iliac artery or inferior mesenteric artery [6].

*Prognosis:* The ectopic kidney is no more susceptible to disease than the normally positioned kidney, except for the development of hydronephrosis or urinary calculus formation due to the anteriorly placed pelvis and malrotation of the kidney (Figure 2), there may be an increased risk of injury from blunt abdominal trauma, because the low-lying kidney is not protected by the rib cage.

## Conclusion

Ectopic kidney is a congenital anomaly where the kidney is in abnormal anatomical position and tend to retain vascularity from nearest vessel. Asymptomatic, non-complicated cases are managed conservatively but percutaneous nephrolithotomy or flexible ureterorenoscopy is necessary if there are complications such as recurrent stones and failure of conservative line management. Nephrectomy is considered only when poorly functioning kidney with recurrent stone formation and recurrent infection. Thorough understanding of morphological variants of kidneys plays an important role in kidney transplantation, percutaneous nephrolithotomy and other surgical procedures.

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### References

1. Chang Gung Med J 2011; 34(6Suppl):10-2.
  2. Bailey & Love Short practice of Surgery, 25<sup>th</sup> edition: chap 75, pg 1282.
  3. Bauer SB. Anomalies of the kidney and ureteropelvic junction. In: Walsh PC, Retik AB, Vaughan ED Jr, eds. Campbell's Urology, 7th ed. Philadelphia B Saunders, 1998; 1709-55.
  4. Sadler TW: Urogenital system. In Langman's Medical Embryology. 6th edition. Baltimore: William and Wilkins; 1990; 266-281.
  5. Mayo J, Gray R, St. Louis E Et al. Anomalies of the inferior vena cava. Am J Roentgenol 1983; 140: 339-344.
  6. Yano H, Konagai N, Maeda M, Itoh M, Kuwabara A, Kodou T, Ishimaru S. Abdominal aortic aneurism associated with crossed renal ectopic without fusion: A casereport and literature review. J VascSurg 2003; 37:1098-102.
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