

## Case Report

# AN UNASCENDED RIGHT KIDNEY WITH LEFT SIDED URETERIC CALCULI: A CADAVERIC CASE REPORT

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## ABSTRACT

Anomalies of the urinary system constitute approximately 30% of all the congenital malformations. There are various associated anomalies involving number, size, shape, position and vascularity of the kidneys. Unascended kidneys refers to a halt in the migration of the kidneys during their normal embryological development. Defect in the ascent of the kidneys are closely related with variations in the branching pattern of aorta. Here we report a case of an unilateral unascended right kidney in a male cadaver encountered during routine medical dissection. A left sided ureteric calculi was also seen as an incidental finding in the same cadaver. Ureterolithiasis occurs worldwide in all sets of population with 80% of the stones found in the male sex in the age group of 30-60 years. There are various factors which favour the formation of ureteric calculi which includes geographical, socio-economical as well as the mineral content of water consumed and some general medical causes. An attempt has been made to document the causes for this variation and the preventive measures that can be adopted to prevent the formation of ureteric calculi.

**KEYWORDS:** Ureteric calculi, Unascended kidney, Metanephros, Renal artery.

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## INTRODUCTION

Kidneys are a pair of excretory organs situated behind the peritoneum on either side of the vertebral column. It extends from the upper border of twelfth thoracic vertebrae to the third lumbar vertebrae. Right kidney is slightly lower in position than the left due to the presence of the liver [1]. In mammals, though pronephros, mesonephros and metanephros develop in the intermediate mesoderm, only metanephros persist as the permanent kidney. Initially, the metanephric kidney are present in the pelvic cavity opposite the sacral segments [2]. It then ascends and reaches the iliac fossa.

Finally, it appears on the undersurface of diaphragm where its further ascent is prevented by the presence of suprarenal gland [3]. Congenital renal anomalies comprise of a vast spectrum of pathologies and unascended kidneys are one among them.

Ureteric calculi is also a common feature seen in humans. It varies in size, number and location. Life time risk of developing a ureteric calculus is about 5%. 90% of the ureteric stone formations are idiopathic. 10% maybe due to hyperparathyroidism, Vit D excess or hyperoxaluria [4]. The factors favouring the formation of ureteric calculi may include increas-

ed urinary concentration of constituents, dietary habits, frequency of urination and genetic factors [5]. The chemical composition of the calculi may vary. Calcium oxalate stones have the highest frequency followed by calcium phosphate, mixed variety, struvite and uric acid stones. Changes in the socio economic conditions and the dietary habits may affect the chemical composition of the calculi [6].

### CASE REPORT

During routine dissection of an adult male cadaver in Yenepoya Medical College, Mangalore, we observed an unascended right kidney with a left sided ureteric calculi. Both the kidneys were bean shaped and were normal in size and shape. The left kidney was normal in position. Whereas the right kidney was situated lower down anterior to the bodies of L5, S1, S2 and S3 vertebrae. The transpyloric plane passed through the hilum of the left kidney. There was a single renal artery arising from the abdominal aorta on both the sides supplying the right and left kidneys (Fig 1). A hard mass was felt in the distal part of the left ureter. A tiny incision was put and a calculus was found in the distal 1/3rd of the ureter. The calculi weighed 25gms and measured 11mms in length and 7mms in width. Longitudinal section of the kidney was taken. There was no signs of any dilatation of the pelvis or scarring of the calyx. The ureter showed hydroureteric changes (Fig 2).

### DISCUSSION

Unilateral unascended kidneys are seen commonly. During embryological ascent, the metanephros derives its blood supply from median sacral artery initially followed by common iliac and inferior mesenteric arteries and lastly from aorta. During the ascent, the former vessels degenerate. Failure of degeneration of these vessels results in origin of accessory renal arteries[7]. The hilum of the kidney is directed ventrally during ascent and then it undergoes 90 degrees medial rotation when it reaches the permanent position [8]. In this case, the hilum of the kidney is directed medially and there are no accessory renal arteries present. Therefore the failure in the migration of the kidney is not related with any anomaly of the renal vascular development.

**Fig. 1:** An unascended right sided kidney.



**Fig. 2:** A left sided ureteric calculi.



Stone diseases are one among the most painful and prevalent urological disorders. Most of the urinary stones typically leave the body by passage in the urine stream. When stone grows to sufficient size, it causes ureteral obstruction [9]. Despite modern investigative methods, the ureteric calculus found in this male cadaver was left untreated.

One of the main reasons for stone formation is the loss of body fluids. It increases the chance of crystal formation from materials within the urine as there is less fluid available to dissolve them [10]. Diet can also affect the probability of stone formation. A diet rich in protein and salt are regarded as risk factors. South India being a hot place, climate and diet has got a higher significance in calculi formation [11].

The stone formed in the urinary tract may often grow in size and the location may also get changed.

The symptoms begin when there is obstruction to the outflow of urine. In this modern era of medicine, there are various imaging techniques available for the diagnosis of ureteric calculi. The treatment modality depends on the size, number, location and the severity of the symptoms caused by the calculi. Ureteric calculi if left untreated may grow in size and lead to complications like obstruction, ureteric strictures and infection. It may also lead to acute renal failure.

### CONCLUSION

Ectopic kidneys and vascular anomalies have got greater clinical significance. It is important to know about these anatomical variations particularly during surgeries. Recurrence rate of ureteric calculi are close to 50%. Regular intake of fluid is considered as the most important preventive measure for stone formation and recurrence [12]. A low sodium and low animal protein diet can also aid in the prevention of stone formation. There are cases where the stones are initially formed in the upper urinary system and may descent down with time. In this case, probably, the stone was formed in the ureter as the kidney does not show any sign of stone formation. It is always better to treat the ureteric stone using the suitable mode of treatment rather than leaving it untreated.

**Conflicts of Interests: None**

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