

UNILATERAL URETER FISSUS: A CADAVERIC STUDY

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ABSTRACT

The ureters are conduit for urine as they leave the kidney and enter the urinary bladder. Bifid ureter is one of the malformations of urogenital system. The possible embryological reasons for the formation of a duplicated ureter could be splitting of ureteric bud, resulting two ureters draining into single kidney. It may be complete or incomplete duplication. Prevalence occurs in an approximately 1% of the population. It may be associated with or without other congenital defects. Here a case of unilateral bifid ureter in a male cadaver was discussed with its variation and their clinical significance.

Keywords: Bifid ureter, Anatomy, Embryology, Clinical significance.

INTRODUCTION

The ureters are two muscular tubes whose peristaltic contractions convey urine from the kidney to the urinary bladder¹. Each ureter measures 25-30cm in length. It is thick-walled, narrow, and continuous superiorly with the funnel-shaped renal pelvis¹. The diameter of the ureter is normally 3mm but is slightly less at its junction with the renal pelvis. When ureter passes at the brim of the lesser pelvis near the medial border of psoas major, and where it runs with in the wall of the urinary bladder, is its narrowest part¹. These are the common sites for renal stone impaction¹. The opening of the right and left ureter lies at the lateral angles of a triangular area on the posterior wall of the urinary bladder called the **trigone**².

Relations: The inferior vena cava is medial to the right ureter while the left ureter is lateral to the aorta. The inferior mesenteric vein close to the medial aspect of the left ureter. At its origin the right ureter over-

lapped by the descending part of the duodenum and crossed anteriorly by the right colic and ileocolic vessels. It passes behind the lower part of the mesentery and terminal ileum. The left ureter is crossed by the gonadal and left colic vessels. It passes posterior to loops of jejunum and sigmoid colon and its mesentery in the posterior wall of the intersigmoid recess¹. In the male, it crosses the superior vesical artery, the obturator nerve, and vessels and the inferior vesical artery. In the female it crosses the vaginal and uterine arteries and the ovary lies in front of the ureter. In both posteriorly to the internal iliac vessels and separates it from the lumbosacral trunk and from the sacroiliac joint³.

Development of Ureter

Ureter develops from ureteric bud that rises from Wolffian duct (mesonephric duct)³.

The part of ureteric bud that lies between renal pelvis and vesicourethral canal (a portion of cloaca) forms ureter³.

Anomalies of Ureter

Ectopic ureter: Abnormal sites of ureteric openings.

Ureteric obstruction: Congenital obstruction leads to hydroureter.

Duplication/Duplex ureters: Partially or completely duplicated. May or may not be associated with duplication of kidney. It may open into bladder together or separately.

Blind ureter: Rare and is not connected to kidney.

Ureteroceles: A cystic dilatation of the lower end of the ureter.

Congenital Megaureter: The ureter is not only dilated but also its wall is also thickened⁴.

Stenosis or Atresia of the ureter: valves or folds may also cause obstruction to urine in the ureter⁴.

Duplication of the ureters is most common renal abnormality, occurring in approximately 1% of the population, although according to some authors they are usually unilateral. Furthermore, it can be associated with other anomalies, such as horseshoe kidney, goltz's syndrome, renal ectopy, H shaped ureter, ureterocele, megaureter and obstruction.

Here we report a case of unilateral incomplete bifid ureter in a male cadaver from Karnataka, India.

Case Report

A male cadaver fixed with a 10% formalin solution was dissected for PG teaching purposes and found the presence of a duplex ureter- a unilateral bifid ureter. Figure shows the anomaly.



DISCUSSION

During routine dissection of a male cadaver with unknown medical history, we observed unilateral bifid ureter on left side only. On careful examination revealed that there was incomplete bifid ureter on left side enclosed in single facial sheath. It was also observed that both the ureter have different pattern of origin. On the right side, the normal pattern of origin. On the left side one ureter emerged from the hilum

while the second one near the base of the kidney. Other all anatomical relations were found normal.

Duplicated ureter or duplex collecting system is a congenital condition. In which the ureteric bud or the embryological origin of the ureter will split or arises twice, resulting in two incomplete ureters draining a single kidney. Ureter development begins in the human fetus around the 4th week of embryonic development. As already mentioned above, a ureteric bud, arising from the mesonephric or Wolffian duct, gives

rise to the ureter, as well as other parts of the collective system. The mesonephric duct forms a diverticulum in its caudal extremity, which will form the renal calyces and the ureter. Furthermore, the cranial portion of the mesonephric duct together with the metanephros will form the kidney, thus explaining the associated abnormalities that usually accompany congenital defects of the ureter.

The ureter duplication is either of partial or complete. In partial/incomplete the two ureters drain into the bladder via a single common ureter. The two ureters drain separately in complete type. In this one ureter opening normally into the bladder, and the other being ectopic. The complete type of duplication is important clinically.

According to Bergman et al. (1988), the most common variation of the ureter is the division of this structure into two, although the ureter can triple, quintupled or even sextupled, and when this branching happens, they can also be complete or incomplete⁵.

According to Chawla et al. (2014) reported a variation in which there were incomplete bifid ureters associated with vascular variations of the renal artery, although the latter was unilateral⁶.

Incomplete bifid ureter may remain asymptomatic, although it can produce symptoms of uretero-ureteric reflux, frequent urinary tract infections, urinary lithiasis, ureteric stenosis, and renal colic. In female patients it causes vesicovaginal fistula that needs surgical repair⁵.

Endoscopic manipulation of a ureteral calculus with a stone basket may result in ureteral perforation. Passage of a ureteral catheter beyond an area of obstruction may perforate ureter⁴. So, urologist and surgeons should recognize these, before surgery in order to avoid complications or chances of damage during surgery in bifid ureter.

Cystoscopy, ureteroscopy, CT, MRI, USG and renal scintigraphy are useful to determine the presence of these anomalous ureters. Symptomatic patients should be treated accordingly with the intensity of the symptoms, and no intervention should be performed in asymptomatic patients.

CONCLUSION

Incomplete bifid ureter is a condition, where the patient maybe asymptomatic. However, it is vital to pay attention to the symptoms when appeared and to diagnose other associated malformations. It helps in order to reduce the possible iatrogenic injuries during surgeries and surgeon should be aware of these variations.

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