

# Duplex Collecting System of a Right Kidney With an Ectopic Ureter-A Case Report

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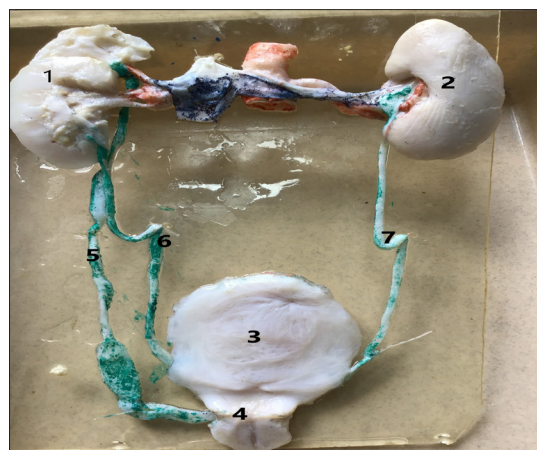
## Abstract

Ureteral abnormalities represent a complex subset of urologic anomalies that manifest in many ways. Duplication of the ureters is a common anomaly and is frequently encountered by radiologists. Duplication may be either complete or incomplete and is often accompanied by various complications. Here, we report a case of the complete duplicated ureters with an ectopic ureteral opening in to the prostatic urethra in a male cadaver on the right side during routine educational dissection in the academic years (2017-2018) in our department of anatomy at Siddhartha medical college, Vijayawada. Imaging techniques to visualize the ureters are excretory urography and voiding cystourethrography, as well as ultrasound, computed tomography, and magnetic resonance imaging.

**Keywords:** Duplicated ureters; Ectopic ureter; Excretory urography; Voiding cystourethrography; Prostatic urethra

## Case Report

In the routine educational dissection for the undergraduate students in the department of anatomy, Siddhartha medical college, Vijayawada in the academic years (2016-2017), in a male cadaver, on the right side, double ureters were observed. The ureter draining the lower pole opened in to the trigone of the urinary bladder from right side. The ureter draining the upper pole crossed the ureter of the lower pole posteriorly from medial to lateral side and opened into the prostatic urethra on the right side (Figure 1). There was a single ureter on the left kidney draining into the trigone of the urinary bladder.



**Figure 1:** Duplex collecting system of a right kidney with an ectopic ureter.

1. Right kidney.
2. Left kidney.
3. Urinary bladder.
4. Prostatic urethra.
5. Upper pole ureter of right kidney (ectopic ureter).
6. Lower pole ureter of right kidney.
7. Left ureter.

## Discussion

A duplex (duplicated) system refers to a kidney with two pelvicalyceal systems generally referred to as the upper or lower poles. If the kidney has two ureters that empty separately into the bladder (double ureters), it is considered a complete duplication. In contrast, in a partial or incomplete duplication, a common single ureter enters the bladder. A bifid system is a form of duplication with two pelvicalyceal systems joining at the ureteropelvic junction (bifid pelvis) or before emptying into the bladder (bifid ureters). The ectopic ureter may be defined by the fact that the orifice opening into the urinary bladder has a position different from the normal trigone. However, in current practice, the term ectopic ureter defines the situations in which the ureter is in the urethra or outside the urinary tract [1].

Duplication of the ureters is the most common anomaly of the urinary tract [2]. Ureteral duplication is one of the most common renal congenital abnormalities with an incidence of 0.7-4% [3]. Incomplete duplication is three times more common than complete duplication in about one of every 500 people. Duplications may be discovered in childhood or, less frequently, in later life, or they may be discovered at autopsy [4,5].

The ureters arise from the mesonephric ducts. The ureter of the lower renal pole arises inferiorly and is incorporated into the developing bladder first. It ascends during bladder growth and inserts superiorly and laterally to the ureter of the upper renal pole (Wiegert-Meyer rule). The ureter of the upper pole remains with the mesonephric duct longer. Its insertion is located in the bladder or wherever remnants or derivatives of the duct are found [6]. Incomplete duplication is most often associated with uretero-ureteral reflux or ureteropelvic junction obstruction of the lower pole of the kidney. Complete duplication is most often associated with vesicoureteral reflux, ectopic ureterocele, or ectopic ureteral insertion, all of which are more common in girls than in boys [7].

A case report of duplex collecting system of kidneys with ectopic ureter opening into the posterior urethra was reported by

Snjezana Milicevic et al. [8]. Johnston reviewed clinical series of 73 children with complete or incomplete duplication and of nine cases in which the abnormality was a post-mortem finding [9]. Both studies of intravenous pyelograms and cadavers for double ureters were done by Prakash et al and reported 1% complete duplication of ureters and 2% incomplete duplication of ureters [10]. In pelvic surgery, surgeons should be aware of duplication of ureters which is one of the commonest anomalies of upper urinary tract.

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