

Incidence of Congenital Anomalies of Collecting System of Kidneys in Pakistan

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Duplication of ureters are among the most common congenital anomalies of the urinary tract. The ureter may be duplicated throughout its entire length or may be double for only a portion of the distance from bladder to kidney, resulting in a Y-shaped ureter. Double ureter is commonly associated with bifid pelvis and kidney, it is only very rarely associated with the supernumerary kidneys. Double ureter may be asymptomatic but more frequently presents with recurrent urinary tract infections. This anomaly of urinary tract is linked with teratogen factors: chromosomal anomalies, hormonal factors, infections, radiations, and some drugs. The seriousness of the clinical symptoms and morphological alterations will determine that patient needs a urological surgery, or the conservative treatment should be preferred. In order to update the local data present research is carried out. It is found that this anomaly is not gender specific. The chances of unilateral or bilateral defect are not different.

Key words: Congenital Anomaly, Renal Collecting system.

The urogenital system is more likely to have birth defects than any other system. Of all the urinary tract anomalies, double ureter is the most common one. It may be incomplete duplication (bifid ureter) or complete duplication¹.

Ureter develops between 4th to 6th weeks of gestation by appearance of ureteral bud from distal part of mesonephric duct. Cranial part of bud joins metanephric blastema and induces the formation of renal parenchyma, major & minor calyces². Mesonephric duct caudally is incorporated into cloaca, which forms bladder trigone. When there is early splitting of ureteric bud it results in partial or complete ureteric duplication. If two ureteric buds arise complete double ureters are formed. The upper ureter with long submucosal tunnel opens usually outside the bladder where as lower one with short submucosal tunnel opens into the bladder. The upper ureter is more likely to be associated with ectopic insertion, stenosis, ureterocele, and/or obstruction and infection. Where as the lower ureter which has the normal insertion is frequently associated with vesicoureteral reflux (VUR) due to incompetent valve mechanism, which may lead to renal injury³.

A person with partial duplication may remain asymptomatic but with complete duplication of ureters a patient comes with recurrent urinary tract infection, ureteric stones or incontinence of urine (especially in females)^{4,5,6}.

Radiologically double ureter can be seen on USG (for ureterocele), IVU (drooping lily sign), Excretory urogram, voiding cystourethrogram (for VUR), antegrade pyelography (for 2nd ureter), Cystoscopy (for ectopic orifice), CT scan, MRI, Scintigraphy (to assess renal function)⁷. Ureteric duplication alone requires no specific intervention. If it is associated with vesicoureteral reflux, obstruction or ureterocele, an appropriate medical therapy or surgical correction is required which may include ureteral reimplantation with ureteropyelostomy (joining

upper pole ureter to renal pelvis) or ureteroureterostomy (joining upper pole ureter to lower pole ureter)^{1,8}. Treatment of vesicoureteral reflux with dextranomer hyaluronic acid copolymer is an alternative to open surgery⁹.

Materials and method:

A study on cadavers was conducted from 2001 to 2004, for the prevalence of double ureter. The project was designed after accidental finding of double ureter in right kidney during routine dissection in Anatomy department of FMH College of Medicine & Dentistry, LHR. In order to collect relevant data Anatomy departments of various other medical colleges of Lahore like KEMC & FJMC were approached. All kidney pairs were observed for the presence of double ureters. The kidney pairs that were found to have normal single ureters were listed in group A, while kidney pairs having double ureters were listed in group B.

Results:

Group A

: Out of 240 dissected cadaveric kidney specimen, 236 showed bilateral single ureters lying posterior most in renal pelvis.

Group B:

Four kidneys out of 240 dissected cadaveric kidney specimens had double ureters. One pair had unilateral right sided double ureters i.e B₁ & one pair showed bilateral double ureters i.e B₂.

Table 1

Groups	A	B ₁	B ₂
Total No of specimens	Kidneys with bilateral single ureters	Kidneys with unilateral double ureters	Kidneys with bilateral double ureters
240	236	02	02

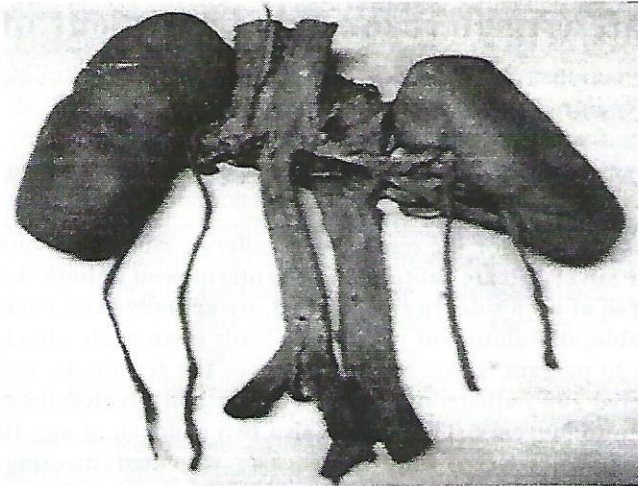


Fig. 1 Kidney pair showing bilateral double ureters (Group B₂)

Discussion:

Double ureter is the most common anomaly of urogenital system. 10-15% of population shows this anomaly¹. It is much more common in females.

A study carried out by Erdem Gimisburun showed, female predominance for this anomaly¹⁰. According to Ali Nawaz khan the incidence of incomplete duplication is 1 in 25 while complete duplication may appear 1 in 500 individuals⁷.

The case of double ureter is found to be associated with other congenital chromosomal abnormalities e.g., Trisomy 13¹¹, Trisomy 18¹² suggesting the genetic factor involved in its occurrence. Double ureter may end up in ureterocele or ureteric stones resulting in urinary retention. Ureteric duplication has been reported to be associated with Transitional cell carcinoma¹³ and Adenocarcinoma¹⁴ by various surgeons.

Emphasizing the role of UTI in individuals with collecting system abnormalities, S. Shimizu and H. Kojima have reported a case of a pregnant female who developed an infection with *Serratia marcescens* and was having double ureter, which carried infection to chorioamnion resulting in spontaneous abortion¹⁵. Kidney with double ureter can be taken and transplanted safely¹⁶. Geyky and Knight have reported a successful transplant of kidneys with bilateral double ureters¹⁷. The knowledge of ureteric duplication is important in choosing the most appropriate type of operation for vesicoureteral reflux, renal calculus and ureterocele.¹

Conclusion:

This Knowledge of Anatomic variation of urinary tract is not only important for academic purposes but also for

radiologists and surgeons. Clinicians need to keep in mind this variation before planning the mode of treatment. Above all this is important for successful transplantation of kidneys with double ureters.

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