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Unilateral Isolated Bifid Ureter- A Case Report.

KEYWORDS: Bifid, Ureter, Anomalies

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ABSTRACT *Bifid ureter is commonly associated with other congenital defects. Here we report a case of bifid ureter which is isolated and unilateral and was not associated with any other congenital anomaly. The embryological reasons for the formation of bifid ureter are discussed.*

Introducton:
Ureteral duplication results from the abnormalities of the ureteric bud. Ureteric duplication may be complete or incomplete. Incomplete ureteric duplication is known as bifid ureter. Lowsly et al (1956), in a comprehensive study of a series of 4215 autopsies reported the incidence of incomplete duplicate ureter to be 18. Amongst these 2 were bilaterally incomplete duplicate, 7 were unilaterally incomplete duplicate and 8 were unilaterally complete duplicate.

On routine excretory urograms studied by Russel et al (2000) reported duplication in 3% of the cases. Bifid ureter is often seen to be associated with congenital hydronephrosis(Angulo et al.,1991), contralateral orthotopic qudrafid ureter(Bhandarkar et al.,1997). Here we present a case report of unilateral bifid ureter with no other associated congenital defects.

Methodology:
During routine dissection in the department of anatomy, a case of right unilateral bifid ureter was found in a male cadaver aged 70 years. The specimen was photographed after looking for any other associated anomalies.

Case report:
In the present case bifid ureter was found on the right side. The ureter has two limbs which join distally after a short distance. Both the limbs of the ureter had their respective pelves coming out separately from the hilus of the kidney. The pelvis of the upper limb had its exit at the upper end and that of the lower limb at the lower end of the hilus. No gross morphological abnormalities were found in abdominal, thoracic and pelvic viscera.

Figure. Photograph showing bifid ureter in a male cadaver.
K. KIDNEY
I. INFERIOR VENA CAVA
A. ABDOMINAL AORTA
Note: The two limbs of bifid ureter joining at upper level.

Discussion:
Bifid ureter has been reported in the past in association with various congenital anomalies. It has been associated with complete duplication of contralateral ureter(Borrego et al.,1994;Tundidor et al.,1999). It has also been associated with unilateral pulmonary hypoplasia(Prasad et al.,1996) goltz's syndrome(Gunduz et al.,1997) ureteropelvic junction obstruction of the lower pole of the kidney(Fernbach sk et al.,1997) high cephalad kidney and duplication of pelvis(Al Attia,1999).

Whereas unilateral isolated bifid ureter like our present case was reported by two other investigators (Das et al., 2001; Gokul et al., 2014).

Bifid ureter may remain asymptomatic in life. But complications including urinary lithiasis, pyelonephritis, non-functioning of kidney units(Chalouhy et al.,1992) ; uretero ureteric reflux, ureteric stenosis(Busslinger et al.,1992); frequent urinary tract infection, calculi(Giannokopoulos et al.,1994) have been reported.

Embryological basis:

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Collecting ducts of the permanent kidney develop from the ureteric bud, an outgrowth of the mesonephric duct close to its entrance to the cloaca, around the 5th week of intrauterine life. The bud penetrates the metanephric tissue, which is molded over its distal end as a cap. Subsequently, the bud dilates, forming the primitive renal pelvis, and splits into cranial and caudal portions, the future major calyces. Thus the ureteric bud gives rise to the ureter, the renal pelvis, the major and minor calyces, and approximately 1 to 3 million collecting tubules.

Bifid ureter may be formed due to error in development. When ureteric bud divides before penetrating the metanephric tissue; it gives rise to bifid ureter having a single opening into the bladder (Langman's medical embryology 12th edition).

Clinical relevance:

Bifid ureter is generally asymptomatic and discovered as incidental findings at autopsy or during investigations. Sometimes, there are features of reflux and as a result, urinary calculi (Giannokopoulos et al., 1994), pyelonephritis and uretero-hydronephrosis(Chalouhy et al.,1992) develop. The above complications will present with symptoms thereby requiring surgical intervention.

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