Unilateral Isolated Bifid Ureter — A Case Report

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Abstract. Double ureters are classified either as bifid or duplex. A bifid ureter is commonly found in association with other congenital anomalies and defects. The present case report describes a rare case of isolated bifid ureter with no other associated congenital anomaly. The possible embryological reasons for the formation of bifid ureter are discussed.

Key words : Ureter, bifid, anomalies.

Introduction :

Duplication of ureter might be complete or incomplete. Incomplete duplication of ureter is known as bifid ureter. Lowsly et al (1956), reported the incidence of incomplete duplicate ureter to be 18 out of a series of 4215 autopsies studied. Amongst these 2 were bilaterally incomplete duplicate, 7 were unilaterally incomplete duplicate and 8 were unilaterally complete duplicate. According to recent studies of Russel et al (2000) on an average, 3% excretory urograms show ureteral duplication on routine examination. Presence of bifid ureter is often seen to be associated with congenital hydronephrosis (Angulo et al., 1991), contralateral orthotopic quadrafid ureter (Bhandarker et al., 1997) etc. Here we present a case report with unilateral bifid ureter with no other associated congenital anomaly.

Materials and Methods :

In routine dissection of 32 cadavers in the Department of Anatomy, a rare case of unilateral bifid ureter was detected on the right side of a female cadaver aged 60 years. Any other associated anomalies were looked for and the specimen was photographed.

Results :

In the present case, a bifid ureter was found on the right side of a female cadaver (Fig 1 and 2). The ureter had two limbs for most of its length and both the limbs joined at about a distance of 4 cms from the bladder wall. The two limbs of this ureter had their respective pelves coming out as separate entities from the hilus (which was relatively longer than the other side) of the kidney. The pelvis of the upper limb had its exit at the upper end of the hilus and that of the lower limb at the lower limit of the hilus. The opening of the ureter into the bladder did not show any abnormality, Examination of other thoracic, abdominal and pelvic viscera and other structures revealed no other gross morphological abnormality.

Discussion :

Bifid ureter had been detected in the past in association with various congenital anomalies and defects. It has been associated with Goltz's syndrome (Gunduz et al., 1997) high cephalad kidney and duplication of pelvis (Al Attia, 1999), unilateral pulmonary hypoplasia (Prasad et al.,1996). Bifid ureter has also been reported in association with complete duplication of contralateral ureter (Tundidor et al. 1999; Borrego et al., 1995).

Thus, the majority of the investigators have reported this anomaly in association with other disease conditions but in the present case, the unilateral incomplete bifid ureter of the right side was associated with no other abnormality. Bifid ureter may remain asymptomatic in life and create academic interest only. Nevertheless complications including frequent urinary tract infection, calculi (Giannokopoulos et al., 1994); uretero ureteric reflux, ureteric stenosis (Busslinger et al., 1992); urinary lithiasis, pyelonephritis, non-functioning of kidney units (Chalouhy et al., 1992) have been reported. Bifid ureter is reported to be twice more common in females and on the right side (Rege et al., 1986) which goes well with the present case report.

Developmental basis :

The bifid ureter may be formed due to some error or disturbance during development. The ureteric bud arises from the mesonephric duct around the 5th week of intra uterine life. The caudal part of Wolffian duct and ureteric bud get incorporated into the posterior wall of urogenital sinus at around 7th week. The concomitant medial rotation results in placing the opening of the ureteric bud above and lateral to that of the Wolffian duct (the future vas deferens). The ureteric bud grows and penetrates the metanephric tissue and subsequently forms renal pelvis which on division gives rise to major and minor calyces. Thus, the collecting system including ureter, pelvis, major and minor calyces originate from the ureteric bud.
However, sometimes the ureteric bud may divide before penetrating the metanephric tissue, thus giving rise to a bifid ureter having a single opening into the bladder. In case of very early division of the ureteric bud, there is incorporation of ureteric division into the posterior aspect of urogenital sinus which results in duplication of ureter with separate orifices for each. Bifid ureters unless symptomatic, might he detected during routine investigations or are incidental findings at autopsy. 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. These complications manifest with symptoms and immediate life saving surgical interventions are warranted. However in the present case the individual had lived through 60 years of life without a surgical intervention related to complication of bifid ureter.

References:

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Opp. 44 Bifid Ureter

Fig. 1. Photograph showing anterior view of Kidney (K) with bifid ureter in a female cadaver.

A. Abdominal aorta

Note: The two limbs of bifid ureter joining at a lower level (showing with artery forceps).

Fig. 2. Photograph showing more clear view of bifid ureter (arrows). The Kidney (K) has been turned posteriorly and placed on a blank paper.