

ANATOMY

BILATERAL COMPLETE DUPLICATION OF THE URETERS: A CASE REPORT

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Abstract

Double ureter refers to presence of two separate ipsilateral ureters. It presents complete or incomplete uretric duplication. In the complete uretric duplication the two ureters enter separately in the urinary bladder. In the incomplete duplication one ureter enters the urinary bladder after the two ureters are combined. In our routine dissection at Yenepoya medical college we found bilateral double ureter which is rare.

Keywords: Uretric duplication, Metanephric blastema, Uretric bud, Vesicoureteral reflux

Introduction

Ureters are thick-walled cylindrical tubes which convey urine from the corresponding kidney to the urinary bladder(1). Each ureter is about 25cm long and 3mm in diameter each ureter is developed from the stalk of the uretric diverticulum which grows headwards from the caudal part of the mesonephric duct, before the latter opens into the ventral part of the cloaca. The portion of the mesonephric duct between the uretric bud and cloaca is known as common excretory duct. Subsequently the common excretory duct is incorporated to form the vesical trigone and ureter directly opens into the urinary bladder (3,4). The presence of two ipsilateral ureters, believed to be the result of premature branching of the uretric bud during prenatal development. Duplication of the ureters, frequently called renal duplication, is the most common anomaly of urinary tract. Incomplete duplication is three times more common than complete duplication, which is reported to occur in about one of every 500 people.

Case Report

During the routine dissection class in anatomy at Yenepoya medical college we came across a male cadaver 60 years of age showing bilateral double ureters. Each of the kidney showed complete uretral duplications. The bilateral duplication of the ureter was of the complete type. The upper ureter was seen to arise from the upper moiety of the kidney and the lower ureter was seen to arise from the lower moiety of the kidney. Both the kidneys were normal in size, shape and positions. The duplicated ureters of both the sides, the right and the left followed the normal course and opened separately into the urinary bladder (Fig 1). These ureters were supplied by branches of renal artery on both the sides. The knowledge about this type of duplications are important to the clinicians, as it

is often associated with vesicoureteral reflux, ectopic ureterocele or ectopic ureteral insertion.

Fig-1, Right kidney, 2. left kidney, 3. inferior vena cava, 4. right ureters, 5. left ureters, 6. urinary bladder



Discussion

The anomaly of duplication of ureters and pelvis has been recognized for many years. Double ureters have been classified as (1) Complete, wherein two pelvis on the same side, one superior to the other, drain by separate orifices onto the floor of the bladder. The opening may lie side by side or one may be superior to the other. They may also be closely situated or set at some distance apart. (2) Incomplete, wherein two pelvis and the two ureters join and enter the bladder by one common orifice both of these forms of

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duplication may be unilateral or bilateral .The bifurcation in this latter group may be present at any point in the course of the ureter ,from just above the bladder, upto the renal pelvis .Minor degrees of bifurcations are called bifid pelvis (5,6,7)

Complete duplication has been thought to be due to early splitting of the ureteral bud ,the twin ureters being so closely placed that ,by the expansion of the lower end of the wolffian duct ,they would be drawn on to the bladder floor as separate openings .Chwalla (4) on the other hand has shown that they are most probably due to the formation of twin ureteral buds ,arising one above the other on the lower end of the wolffian duct. These two twin ureters then grow upward and laterally, as does the single ureter ,and meet the nephrogenic cells in the upper sacral region ,forming separate renal pelvises.the upper pelvis as a rule is the smaller of the two .Upon the distance separating the two pelvis depends whether the two halves of the kidney are entirely separate, fused by connective tissue bands or one solid mass of secreting kidney tissue. Upon the distance separating the two pelvis also depends on the blood supply, whether it is supplied by one main renal artery, a branched vessel or separate renal arteries from the aorta (8, 9, 10)

The incomplete or branched ureter has been shown by Pohlman (7) to be due to splitting of ureteral bud as or after, it arises from the Wolffian duct. The ureteral bud usually divides to form the superior and the inferior calyces after the primitive renal pelvis has grown into the lower end of the nephrogenic cord .Thus a premature splitting before it reaches the nephrogenic cord gives rise to incomplete or branched ureter. Each division of the ureter takes place at any point between the ureteral bud and the renal pelvis ,the commonest site according to Braasch (2) , being in the upper third of the ureter. Cases have been reported where the main ureter branched into three ,four or five divisions .These are really elongated calyces ,without the formation of a true pelvis .Kretschmer (3) ,and others have reported cases where one branch of the bifid ureter ended blindly –evidently a lack of development of the nephrogenic cells forming a cap about its terminal dilatation ,or a failure of the ureter branch to meet these cells .This condition has been thought by some to be a congenital diverticulum of the ureter.

From the clinical point of view, the anomaly of double ureter and pelvis is extremely important. It is a well recognized rule that an abnormal organ is more liable to disease than a normal one (9,10,11), so that the possibility of this duplication must be kept in mind in investigating all renal lesions. Duplication of ureter is rather a common anomaly however; bilateral duplication is much rarer(12). Most of the patients are asymptomatic; with genitourinary tract abnormality patients with this anomaly have an increased risk of

developing urinary tract infections pain, hydronephrosis and stone formation. Females may present with continuous dribbling due to ectopic ureter.This does not occur in males, because of the ectopic insertion is proximal to the sphincter (13, 14)) Although bilateral ureteral duplication is an even rarer malformation than unilateral duplex ureter,it should always be considered as a differential diagnosis(15) .Injury to double ureters could cause serious urogenital symptoms, which could lead to complications postoperatively.

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