

VERY RARE CASE OF DISTAL URETERIC DUPLICATION WITH A PROXIMAL BLIND-ENDING BRANCH SHOWING URETERO-URETERIC REFLUX

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ABSTRACT

We report a very rare case of unusual pelvic pain, i.e. left ureteral duplication with a blind ending distal branch showing uretero-ureteral reflux, also called as yo-yo, saddle, or seesaw reflux. Most of the cases of partial duplication of PCS reported till now involves the calyces, pelvis, and proximal ureter, which fuses and urine from one of them gets into other called as yo-yo reflux [1],[2]. In our case, there is no separate PCS or duplication of proximal part, but bifurcation is seen in the distal end.[3] This entity is very difficult to suspect and diagnose clinically. We illustrate the role of Intravenous Urography (IVU) and CT urography in the evaluation of such cases.

KEYWORDS

Ureteric Duplication, Ureterocoele.

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INTRODUCTION

Yo-Yo reflux into a blind ending distal branch of ureter is a very rare cause of pelvic pain and recurrent urinary tract infections in children and adolescences.[4] This entity is usually diagnosed by invasive tests (Voiding Cystourethrography or Retrograde Pyelography), but in our case we emphasized the role of non-invasive tests (IVU and CT Urography) in the diagnosis of these entity.

CASE REPORT

A 19-year-old girl presented to our department with complaints of recurrent intermittent pelvic pain, dysuria, and episodes of burning micturition.

Laboratory tests showed normal renal parameters, urine analysis (Microscopic and culture) were within normal limits.

Ultrasound shows normal echotexture of both kidneys with maintained corticomedullary differentiation. Pelvicalyceal System (PCS) and upper ureters of both kidneys were normal and not dilated.

On plain radiograph of KUB, no radiopacity seen.

The patient was put on Intravenous Urography (IVU) to evaluate the function of kidneys to check the course of ureters and to rule out any existing pathology along their course.

In the 15 minutes film (Figure 1), we see the normal opacification of both PCS and normal course of both ureters in their whole extent, but in the 45 minutes film (Figure 2 and 3) we see left duplicated system with bifid blind-ending left distal ureter, which is dilated and tortuous suggestive of either due to uretero-ureteral reflux or vesicoureteric reflux.

To confirm the diagnosis, the girl was subjected to CT urography. In the excretory phase, the CT showed the bifurcated left distal ureter and the branch (Measuring 2.8 cm) is blind ending in its proximal part with uretero-ureteral reflux.

The patient was explained about the cause of her recurrent symptoms and counselled about the need for elective surgery, i.e. excision of the blind-ending refluxing ureter and empirically treated with antibiotics and analgesics.



Fig. 1: 15 Minutes IVU Film Showing Normal Opacification of Pelvis and Ureters

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Fig. 2: 45 Minutes IVP Film Showing Bifid Left Distal Ureter



Fig. 5



Fig. 3: Showing the Bifid Left Distal Ureter, Which is Dilated and Tortuous. (Arrows)



Fig. 6

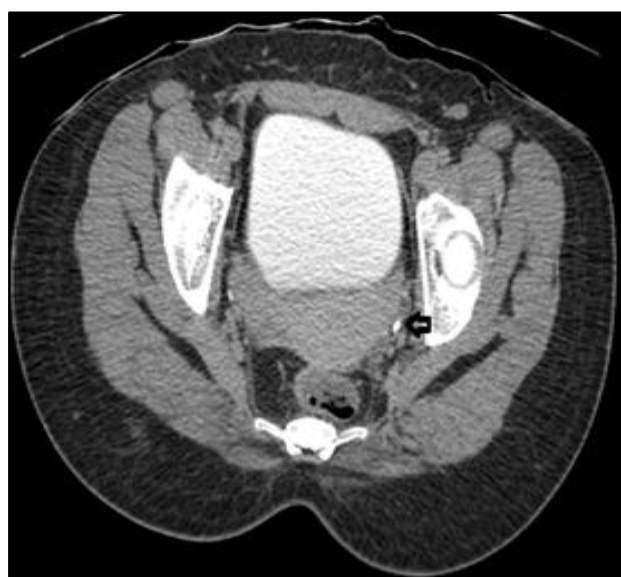


Fig. 4



Fig. 7



Fig.8

Axial sections of the CT scan of the pelvis in the excretory phase (Figure 4-8) shows the normal left ureter in figure 4 (Arrow).

In Figures 5-7, there is small bifurcated branch of the left ureter, which is dilated and tortuous secondary to Yo-Yo reflux.

In Figure 8, the bifurcated branch fuses with the ureter just proximal to the V-U junction and there is single opening of the left ureter into the bladder.^[5]



Fig. 9



Fig. 10

Figures 9 and 10-sagittal sections of the CT scan in the excretory phase shows the fusion of the ureter with its blind-ending branch just proximal to V-U junction.

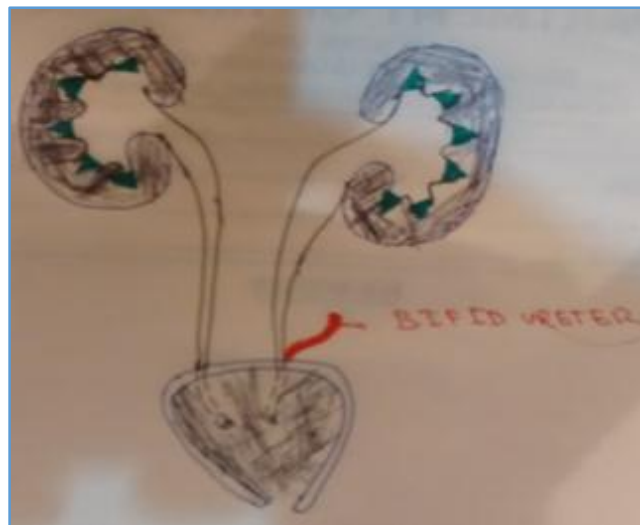


Fig. 11

Figure 11, Schematic diagram of the collecting system shows a blind ending branch arising from the left distal ureter.

DISCUSSION

At the fifth week of development, the ureteric bud arises as a diverticulum from the mesonephric (Wolffian) duct. The bud grows laterally and invades the centre of the metanephrogenic blastema, the primordial renal tissue. The meeting of these two tissues causes changes in the bud and the metanephros. The metanephrogenic blastema forms glomeruli, proximal tubules, and distal tubules. The ureteric bud divides and branches forming the renal pelvis, infundibulae, calyces, and collecting tubules, which will provide a conduit for urine drainage in the mature kidney. This process is known as the induction of the kidney.^[6]

The problem occurs when the ureteric bud fails to make contact with the metanephros or if two ureteric buds arise from the mesonephric duct.

Embryologically, duplication occurs when two separate ureteric buds arise from a single Wolffian duct (mesonephric duct). Due to the future lower pole ureter separating from the Wolffian duct earlier, it migrates superiorly and laterally as the urogenital sinus grows and becomes the upper pole moiety. Despite this, migration of the upper tract, the insertion inferiorly maintains the original embryologic relationship and thus the upper pole moiety ureter drains inferomedial to the normal lower moiety ureter explaining the Weigert-Meyer law.

Duplication can be variable. At one end of the spectrum, there is merely a duplication of the renal pelvis draining via a single ureter. At the other extreme, two separate collecting systems drain independently into the bladder or ectopically.

Duplex collecting system or duplex kidney anomalies can be classified into the following categories depending on the level or lack of fusion.^[7,8]

Duplex Kidney

Two separate pelvicalyceal systems draining a single renal parenchyma.

Duplex Collecting System

A duplex kidney draining into:

Single Ureter

i.e. Duplex kidney's duplication pelvicalyceal systems uniting at the pelvi-ureteric junction (PUJ).

Bifid Ureter (Ureter Fissus)

Two ureters that unite before emptying into the bladder.

Double Ureter

(Complete duplication).

Bifid Collecting System

Refers to a duplex kidney with the two separate pelvicalyceal collecting systems uniting at the PUJ or as bifid ureters.

Double/Duplicated Ureters (or Collecting System)

Two ureters that drain separately into the bladder or genital tract.

Our cases is very rare one demonstrating left ureteral duplication with a blind ending distal branch showing uretero-ureteral reflux.

Till now, less than 100 cases are reported worldwide.

Most of the cases are asymptomatic and detected incidentally. In severe cases like complete duplication of ureters, symptoms may occur and are secondary to vesicoureteric reflux and the reflux may reach to the kidneys causing reflux nephropathy.

Radiographic Features

Radiographic features depends upon the type of anomaly present.

Ultrasound may be considered suboptimal in the detection of the site and type of duplication. In our case, ultrasound failed to detect this entity.

Intravenous Urography (IVP)

It is an excellent modality to image the collecting system and simultaneous assessment of renal function. In our case, the lower blind ending bifid ureter was clearly demonstrated in the 45 minute film and it appears dilated and tortuous likely secondary to uretero-ureteral reflux.

CT Urography

It is one of the best modality to image the entire collecting system especially during the excretory phase. Acquisition of thin sections and its coronal and sagittal reconstruction provide excellent anatomic detail of the entire collecting system in a single image. Our diagnosis was also confirmed in the CT scan.

Differential Diagnosis

The main differential of this entity is Ureterocele^[9], which is congenital dilatation of the distal most part of the ureter. The

dilated portion of the ureter may herniate into the bladder secondary to the abnormal structure of vesicoureteric junction (VUJ).

On ultrasound, it appears as a cystic structure projecting into the bladder.

On IVP, the characteristic cobra head sign i.e. filling defect in the bladder, which maybe distended, collapsed, or even everted is seen.

On Voiding Cystourethrogram, it appears as a round to oval lucency near the trigone of bladder.

CONCLUSION

Duplex collecting system is one of the most common congenital anomaly, but duplication in the distal part of ureter, sparing the proximal ureter, and pelvicalyceal system is a very rare entity.

Our case describes left distal ureteric duplication with a blind ending branch, which is dilated and tortuous secondary to uretero-ureteric reflux.

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