Unilateral Ureteral Triplication (Type 2) With Contralateral Trifid Pelvis

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INTRODUCTION
Although ureteral duplication is rather common, ureteral triplication is a rare congenital anomaly of the urinary tract but shares a similar female predominance (1). Although the first description of ureteral triplication was made by Wrany in 1870, it was classified into four types by Smith (2) in 1946. In this report, we presented a patient with ureteral triplication and contralateral trifid pelvis.

CASE REPORT:
21 year-old male with acute onset microscopic hematuria was referred to our clinic. He had a vague flank pain for a few days. Initial evaluation with intravenous pyelography documented three ureters on the right side. Subsequent Computed Tomography (CT) Urography revealed triplication of right renal pelvis without hydronephrosis or urolithiasis. Three ureters were arising from the right kidney (Fig. 1A) but two of these (lower and middle renal segments) were joining (Fig. 1B) and draining into two ureteric orifices. The upper orifice was draining the lower and middle renal segments and the lower orifice was draining the upper renal segment (Fig. 1C). Cystoscopic evaluation revealed no other anomalies except two normal-looking ureteric orifices at the right side. Although CT urography demonstrated type 2 ureteral triplication according to Smith’s classification, no other urological anomaly, except contralateral trifid pelvis was found on clinical and radiological evaluation (Fig 2).
Fig 1.A. Three-dimensional reconstructions for multislice CT Urography: Three ureters arising from the right kidney.

Fig 1. B. Conjugation of two ureters draining middle and lower poles on the right side.

Fig 1. C. Posterior view of the urinary system shows two ureters passing through the detrusor muscle in the right side (left side of the image).
DISCUSSION:

Ureteral triplication is a very rare anomaly of the urinary tract (1). It is presumed to arise either as a result of splitting of the ureteric bud or from formation of an accessory ureteric outgrowth of the Wolffian duct at around the fifth week of gestation (3). It was classified into four types by Smith (2) in 1946 (table 1).

Unlike the duplex systems the positions of the ureteral orifices in triplication of ureter do not always follow the Weigert-Meyer law (4). However, in our case the position of the ureteral orifices conformed to the above principle. In general the disease is more common in female and frequently associated with urological anomalies including contralateral ureteral duplications (37%), ureteral ectopia (28%) and renal dysplasia (8%). Renal colic, recurrent urinary tract infection and urinary incontinence are the most common presenting symptoms (5). Unusually, our case was presented with hematuria. As it is a congenital anomaly and can be associated with several other conditions, whole anatomic evaluation of the genitourinary tract is important. Intravenous urography and CT scan may help to clarify the diagnosis and other concomitant conditions. We performed CT urography to our patient. It can image both the renal parenchyma and urothelium and additionally gives valuable information regarding functional renal status. Thus a wide range of diseases can be identified. In our experience, CT urography has been successful in clearly depicting anatomic variants, stone disease, inflammatory processes, and benign and malignant neoplasms.

In conclusion, our case represents that diagnosis with complete anatomic and functional evaluation of the urinary tract with CT Urography is an effective method, and once the diagnosis made every patient with ureteral triplication requires an individual strategy for management and treatment.

The authors declare that they have no conflict of interest.

Table 1. Smith Classification

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<tr>
<th>Type 1</th>
<th>Complete ureteral triplication (35%). Three separate ureters arise from the kidney and drain with three separate orifices.</th>
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<tr>
<td>Type 2</td>
<td>Incomplete triplication (21%). Three ureters arise from the kidney but drain into two ureteric orifices after joining two of them somewhere in the urogenital tract.</td>
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<td>Type 3</td>
<td>Trifid ureter (31%). All three ureters join together before reaching the bladder and drain through a single orifice.</td>
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<td>Type 4</td>
<td>Double ureter, one bifurcated (9%). Two ureters from the kidney. One divides into two to have three draining orifices.</td>
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REFERENCES