Case report

Urosepsis and abscess in an adult with a triplicated renal collecting system treated percutaneously and endoscopically

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ABSTRACT

Ureteral triplication is an extremely rare congenital disorder of the urinary tract. A review of the literature has shown that only about 100 cases have been reported worldwide. We present a case of a 50-year-old female with a known complete ureteral duplication on the right side and incomplete ureteral triplication on the left side that presented with signs of sepsis accompanied by a tender left flank mass. A detailed evaluation including imaging studies and endoscopy revealed a middle moiety obstruction causing abscess formation in the collecting system. A connection between the mid and lower moieties was demonstrated through an upper calyx of the lower moiety. The abscess was drained, and the patient further underwent ureteral stents placement to both the mid and lower ureters.

Following antimicrobial treatment and several weeks of maximal drainage, the connection between the moieties was obviated, with no further episodes of urinary tract infection documented in follow up.

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Introduction

Triplication of the ureter is a rare congenital anomaly of the upper urinary tract, often associated with other urinary tract anomalies [3]. It is mostly asymptomatic but may present as urinary discomfort and urinary incontinence and may be responsible for recurrent urinary tract infection (UTI) episodes [2]. Management of this anomaly varies from conservative to reconstructive surgery.

We present a case of urosepsis and abscess formation in a triplicated ureteral system of a patient treated percutaneously and endoscopically.

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Fig. 1 – CTU showing renal abscess and tripled collecting system. (A) An abscess in the left kidney, axial view. (B) An abscess in the left kidney, coronal view. (C) An obstructed middle moiety in the left kidney with an abscess formed, upper moiety drained by a separate ureter. (D) Lower and upper ureters inserting the bladder, middle ureter is not seen. CTU, computed tomography urogram.

Case presentation

A 50-year-old female, with a past medical history significant for diabetes and hypertension presented with left sided flank pain, nausea and general weakness for the prior 2 weeks. She had a known complete ureteral duplication on the right side with small low-functioning kidney and incomplete ureteral triplication on the left side, with 2 ureteral orifices on both sides of the bladder visualized at cystoscopy previously conducted. Bilateral high-grade vesico-ureteral reflux diagnosed at childhood was the drive for a ureteral reimplantation of 1 ureter on the right side whereas on the left side both ureters were reimplanted and an ureterocele on that side was deroofed.

On presentation, vital signs showed blood pressure of 90/60 mm Hg, fever of 37.8°C and pulse of 94 bpm, although fully conscious. A tender left flank mass was noted on physical examination. Laboratory work-up was significant for a marked drop in hemoglobin to 6.8 g/dl from a baseline of 12, a creatinine 1.75 mg%, and a C-reactive protein of 44 mg/dl. Urinalysis showed pyuria and positive nitrates. Renal ultrasonography showed a hydronephrotic left kidney. She completed a computed tomography (CT) urogram that revealed (Fig. 1) a triple collecting system with the upper moiety drained by a separate ureter, the middle moiety was obstructed, and an abscess had formed there, whereas the lower moiety suffered from renal parenchymal loss. The mid and lower moieties ureters joined at the level of the distal ureter.

The patient was initially stabilized with antibiotics and blood transfusion with packed red blood cells. She subsequently underwent interventional radiology-guided percutaneous drain placement that initially yielded over 10 cc of purulent material. An antegrade pyelography was performed
Fig. 2 – Antegrade pyelography showing a connection between the mid and lower moieties through an upper calyx of the lower moiety. The mid and lower ureters were connected at the level of the sacro-iliac joint.

(Fig. 2) and a connection between the mid and lower moieties was revealed through an upper calyx of the lower moiety. The mid and lower ureters were connected at the level of the sacro-iliac joint.

In order to eliminate the connection between the 2 moieties, the patient further underwent ureteral stents placement to both the mid and lower ureters (Fig. 3).

The patient’s clinical condition rapidly improved. The abscess culture grew E. coli as did her blood cultures whereas her urine culture was positive for Enterobacter cloacae, all sensitive to ceftriaxone therapy she received.

After 2 months of maximal drainage a CT with contrast material injection through the percutaneous drain (Fig. 4) was performed showing no connection between the moieties and the drain was removed. The ureteral stents were removed 2 weeks later. No episodes of urinary tract infection were documented during the next 1 year of follow up.

Discussion

Ureteral triplication is a rare congenital anomaly of the upper urinary tract with about 100 cases reported in the literature, first described by Wrany in 1870 [3,4].

In normal circumstances, the ureter arises as the ureteric bud from the Wolfian duct at the fourth week of gestation. It grows cranially and dorsally, and during the sixth to eighth weeks the distal end differentiates into the renal pelvis and calices. Ureteric triplication results from splitting of the ureteric bud or from formation of an accessory ureteric outgrowth of the Wolffian duct [4]. It may occur in isolation or in
conjunction with other urological anomalies, most common of which is ureteral duplication in the contralateral side (37%), like in our case. Other associated anomalies include ureteral ectopia (28%), renal dysplasia (8%) [5] and vesicoureteral reflex [6].

Ureteral triplication is mostly asymptomatic but can present as urinary incontinence and discomfort and may be the reason for recurrent UTI episodes and impaired kidney function.

It was classified into 4 types by Smith [7] in his review of 11 cases in 1946: (1) triple ureters or complete triplication (35%), (2) incomplete triplication- 2 out of the 3 ureters join on their course to the bladder and 2 orifices present in the bladder (21%), (3) trifid ureters that unite and drain in a single orifice (31%), and (4) double kidney ureters with 1 bifurcation as an inverted Y draining into 3 orifices (9%). Our patient was of the second type.

In this case we were faced with a septic patient due to a large abscess. We gained control of the septic episode using maximal drainage not only percutaneously but also endoscopically in the other 2 collecting systems. This revealed an unexpected connection between them. The separate drainage permitted rapid clinical improvement and eventual closure of that connection obviating the need for a complicated surgical solution that could put the whole system at risk.

Fig. 4 – CT with injection of contrast material through the percutaneous drain. (A) Contrast material passing from the middle moiety to the lower showing that the connection between them both is still viable. (B) One month later - The connection between the 2 moieties has vanished. CT, computed tomography.

Patient consent

This case report did not include any patients identifying data and all images are anonymous, thus informed consent of the patient is not provided.

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