INTRODUCTION

Ureteral duplication is relatively common anomaly of the genitourinary tract with an incidence of 0.8%. Ureteral duplication means there is a duplex collecting system. Duplex systems have two pelvicaliceal regions, each of them having a ureter. These ureters may join to form a partially duplicated ureter or remain fully separated and join the bladder separately representing complete duplication. Bilateral duplication consists of 20 - 40% duplications and is found in 0.16 - 0.32% of the population. The ureteral duplication is more common in females and when bilateral and complete; four ureters open into the bladder trigone.

I report a case of bilateral duplicated ureters: the left complete and the right incomplete ureteral duplication with nephrolithiasis in lower pole of the right kidney, which was treated with two sessions of flexible ureterorenoscopy.

CASE REPORT

A 45-year Iraqi man presented with flank pain for 3 months. The patient had no history of operations and previous disorders. Laboratory studies revealed serum creatinine and blood count within normal range (creatinine: 1 mg/dl, haemoglobin: 14.4 g/dl), and microscopic haematuria in the urine test. Ultrasonography showed 4 cm stone in the right kidney and intravenous urography (IVU) demonstrated bilateral collecting systems. Computered tomography (CT) urography revealed right kidney stone in the lower pole with bilateral ureteral duplication with complete type on the left side and incomplete on the right side (Figure 1 and 2). Under general anaesthesia in the lithotomy position, three ureteral orifices in the trigone of the bladder were demonstrated. Two of these orifices were on the left side and one on the right side. Ureterorenoscopy (URS) was inserted with 0.035 hydrophilic guidewire from the right orifice. The junction of duplicated ureters was noted in the middle ureter position (Figure 3). The guidewire was inserted into the posterior lumen and URS passed to the lower pole of the kidney. An ureteral access (9.5 F) sheath was used with a guidewire and flexible URS (Karl...
Storz, Flex X2) passed into the ureter, reached the upper ureter and the stone was fragmented with laser lithotriptor. After half of the stone was fragmented, a 4.8F double J (DJ) stent was inserted (Figure 4). The second procedure was performed after 3 weeks. The patient has no complaints during the 3 months follow-up period.

**DISCUSSION**

Ureteral duplication is one of the most common congenital anomalies of the genitourinary tract. Complete ureteral duplication is more rarely seen when compared to single ureter or incomplete duplication. Embryologically, duplication occurs as a result of two separate ureteric buds arising from the Wolffian duct to interact with the metanephric blastema. In the Weigert-Meyer rule, the upper pole ureteral orifice is distal or lower and the lower pole ureteric orifice is located more cranially or higher up in the bladder. Sometimes, the upper pole ureteral orifice can be located ectopically in a variety of locations.

Most of the patients are asymptomatic and diagnosed incidentally. Although the most common clinical presentation is with recurrent urinary tract infections (UTIs) in childhood, vesicoureteral reflux, and flank pain are seen in all age groups. Haematuria and stone formation are other clinical symptoms, especially in adults. When complete duplication has an ectopic ureter, that is located in the urethra or vagina, it may cause incontinence and ureterocele.

Kidney morphology and ureter status should be demonstrated by imaging modalities preoperatively. IVU is useful for renal function. CT can show the ectopic, urinary tract morphology and renal function. Magnetic resonance imaging (MRI) is another modality that can be a choice for children because of the lack of radiation.

Duplicated collecting systems' management depends on the symptoms and presentation of the patients. The previous investigators reported that the patients were treated with URS with laser lithotripsy. The flexible URS is a good alternative for the patients who have ureteral duplication and kidney stone, as in this case. This case highlights a rare genitourinary anomaly presenting in adult age with lower pole kidney stone, and discusses its management.

**REFERENCES**