

Blind-ending ureteral duplication with calculi

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Blind-ending ureteral duplication is a rare congenital anomaly of the urinary system, with only a few cases reported in the literature.¹ The anomaly is diagnosed three times more frequently in women than in men, and twice as often on the right side. It has also been reported in twins and sisters.² The majority of cases are diagnosed in the third or fourth decade of life. Many of these blind segments cause no problems. Symptomatic patients most often complain of vague abdominal or chronic flank pain, due to complication by infection, calculi or reflux.³

Because of non-filling of the blind ureter on intravenous urography (IVU), the diagnosis of blind-ending ureteral duplication is best made with the help of retrograde pyelography. However, a blind-ending bifid ureter can be opacified on IVU if uretero-ureteral reflux is present. The anomaly can also be seen on computerized tomography.⁴ We report a case featuring a long, blind-ending ureteral duplication complicated by stone formation.

Case Report

A 45-year old male was admitted with right loin pain, dysuria and frequency of micturition of 3 months duration. He reported passing stones in urine in the past, but had no history of fever or recurrent urinary tract infection (UTI). The patient had presented to another hospital with the same complaints 6 weeks before reporting to our unit. Cystoscopy at that hospital showed a normal bladder with no calculus in the bladder or the ureters. He came to our unit because of persistent pain. Laboratory investigations showed normal renal function. Urine microscopy and culture showed red blood cells in the urine, but no bacterial growth. Plain radiograph of the kidneys, ureters and bladder (KUB) revealed two radio-opaque shadows in the region of the lower third of the right ureter (Figure 1). However, IVU showed patent ureters with no calculus seen in either ureter (Figure 2). A pre-operative CT scan showed grossly normal kidneys and ureters with 2 extravesical masses in the pelvis.

Cystoscopy in our unit revealed an edematous mass just caudal and medial to the right ureteric orifice. A guide wire introduced into the right ureter under fluoroscopic control showed that the radio-opaque shadows seen on KUB were extraureteral and extravesical. Right retrograde pyelography showed a patent ureter with opacification of a normal pelvicalyceal system. Transurethral resection of the bullous, edematous mass revealed another ureteric orifice. Retrograde pyelography through the other ureteric orifice revealed multiple filling defects and a long blind-ending ureter, with no opacification of the pelvi-calyceal system (Figure 3). Ureteroscopy through the second ureteric orifice confirmed the presence of 2 calculi, which were removed using a Dormia basket. Post-operatively the patient became pain free. Postoperative micturating cystourethrogram (MCUG) performed 3 months after calculus extraction from the duplicated ureter, showed no vesicoureteric reflux (VUR).

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Figure 1. Plain radiograph of kidney, ureters and bladder showing two radio-opaque shadows in the pelvis just above the position of the bladder.



Figure 2. Intravenous urography showing two filling defects in the dome of the bladder. Gives a false impression of possible vesical stone.

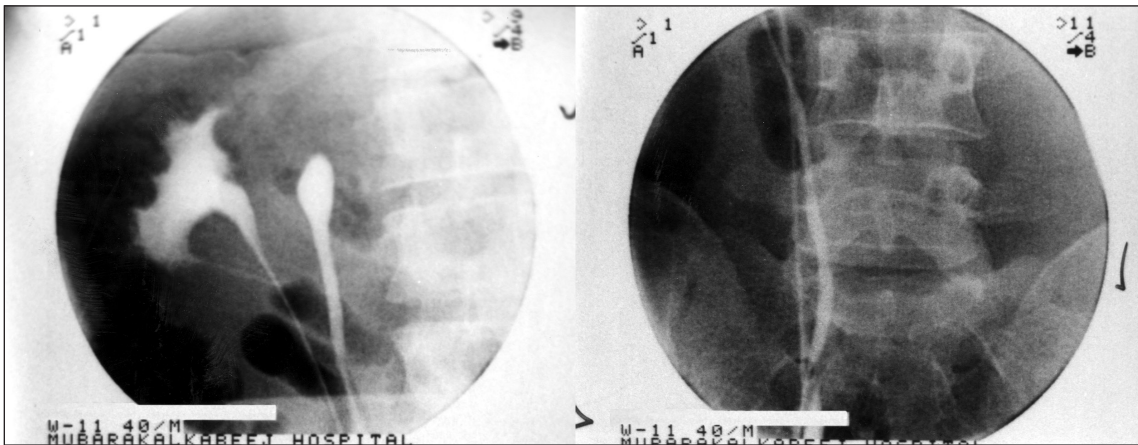


Figure 3. Retrograde ureterogram showing right duplex ureter with a long, blind-ending duplicated ureter.

Discussion

During voiding, blind ending ureteral duplications are prone to developing VUR, in a manner similar to a bladder diverticulum.⁵ Hence, they are responsible for recurrent UTI in patients with these disorders. Poor peristalsis in the long blind-ending ureteric duplication will also lead to stasis. The combination of recurrent UTI, urinary stasis and decreased peristalsis will explain the development of calculi in the blind-ending ureter. This is also the explanation proffered for the increased incidence of stone formation in ureteric stumps after urological procedures like augmentation cystoplasty.^{5,6} It has been reported that the longer the ureteral duplication, the higher the rate of UTI.³ Hence, it is not surprising that our patient, having a very long blind-ending duplicated ureter developed calculi in the duplicated unit. However, as MCUG 3 months post op did not show VUR nor

did the patient have a history of recurrent UTI or of lower urinary tract obstructive symptoms, the probable important factors in this patient's lithogenesis appear to be poor peristalsis and inadequate drainage because the abnormal ureteric orifice was not visible at the time of surgical intervention. We chose to observe the patient rather than excise the duplicated blind-ending ureter because the patient had no VUR. Follow up for 18 months showed no recurrent calculus formation in the blind-ending ureter.

Long, blind-ending ureteral duplication is a rare congenital anomaly of the ureters, that may remain largely asymptomatic. However, it is a frequent cause of occult repeated UTI and loin pain due to associated VUR, and if the drainage is poor, a calculus may develop in its lumen as in our patient. If associated with VUR, the treatment of choice for this anomaly is surgical excision of the blind-ending ureter.

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