Right ureteral and bilateral renal lithiasis in complete bilateral double collecting system

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ABSTRACT

Background: Double ureter is the most common congenital anomaly of the urinary tract. It can be associated with other developmental abnormalities of the renal and genital system due to its close relation to the latter. Even though it can be asymptomatic, it is most frequently associated with vesicoureteral reflux.

Case presentation: Patient is a 57-year-old woman with past history of recurrent urinary tract infection since childhood. She began to present with urinary tract infection again five years prior and was managed with multiple antimicrobial regimens, but symptomatology persisted. Excretory urography identified radio-opaque image suggestive of left kidney stone and two more in right paravertebral location at L4 level. In addition, bilateral double collecting system image was identified. The right system had contrast medium amputation in lateral ureter that ended at the tip of the abovementioned radio-opaque image. There was adequate passage of contrast medium in medial ureter and no dilation was apparent in left ureters. Surgical management with right flexible ureteroscopy was planned, and retrograde pyelography was done in lateral ureter that identified

RESUMEN

Introducción: La presencia de doble uréter es la anoma-lía congénita más común de las vías urinarias. Su presenta-ción también puede asociarse a otras anomalías del de-sarrollo del sistema renal y genital por su estrecha relación con este último. No obstante que pueden cursar de forma asintomática, la asociación más frecuente del doble uréter con una entidad patológica es con la presencia de refluo vesico-ureteral.

Presentación del caso: Se trata de paciente femenino de 57 años de edad, con antecedente infección de vías urinarias de repetición durante la niñez. Inició hace cinco años nuevamente con infecciones de vías urinarias que se manejaron con múltiples esquemas antimicrobianos, con persistencia de la sintomatología. Se solicitó urografía excretora, donde se identificó imagen radiopaca sugestiva de litio renal izquierdo, y dos más en situación paravertebral derecha a nivel de L4. Además de identificarse imagen de doble sistema colector bilateral, el derecho con amputación del medio de contraste en ureter lateral que termina en el punto de la imagen radiopaca referida anteriormente, con paso adecuado del medio de contraste en ureteros media-dial, ureteros izquierdos sin datos de dilatación. Se planeó
yellowish spiculated stone under direct vision with flexible ureteroscope. It was fragmented with Holmium laser. Second surgery was planned and rigid and flexible ureteroscopy were carried out for residual lithiasis in inferior third of right lateral ureter and ipsilateral kidney stone in the inferior calyx, completely resolving both. Patient is currently asymptomatic and is under surveillance at outpatient service of the authors’ institution where she is undergoing conservative management of left renal lithiasis.

**Conclusions:** The present authors believe that patients with associated lithic disease do not require treatment or postoperative care that varies from the norm. Rigid or flexible ureteroscopy or percutaneous nephrolithotomy can be carried out in patients with this disease.

**Keywords:** Lithiasis, urethral anomaly, treatment, Mexico.

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**INTRODUCTION**

Double ureter is the most common congenital anomaly of the urinary tract. Double ureter is complete when there is double collecting system in which double ureter has a separate entrance into the bladder wall for each ureter and it is incomplete when there is double collecting system in which double ureter joins together above the bladder and enters into the bladder wall as a single ureter. Although its frequency is difficult to evaluate, a prevalence of 0.6% has been shown in large series of cases, and prevalence has increased to 2.5% and 3.5% for well-determined situations indicating the presence of environmental factor.

The renal system progressively develops as three distinct entities: pronephros, mesonephros, and metanephros. The latter is the final development phase of the renal system and originates in both the intermediate mesoderm and the mesonephric duct. An accessory ureteral yolk can develop from the mesonephric duct forming a double ureter. The two ureteral yolks invert their relation as they move from the mesonephric duct to the urogenital sinus, crossing each other in that tract (Weigert-Meyer law). The principal ureteral yolk drains the inferior portion of the kidney and the accessory yolk drains the upper pole. The accessory yolk can be smaller than the principal yolk. The accessory yolk ends in the bladder in an opening that is medial to the principal yolk, and is lower than normal. It could even open into the urethra, the seminal vesicles, the vas deferens, and into the vestibular margin. Double ureter can also be associated with other developmental anomalies of the renal system and of the genital system, because of their close relation.

Double ureter can be asymptomatic but it is most frequently associated with vesicoureteral reflux in patients with urinary tract infections. There is a 22% prevalence in patients with incomplete double ureter (there is no difference with patients that do not present with double ureter) and a 69% prevalence in patients with complete double ureter. Likewise the relation to other diseases is the same as that of other patients that do not present with this anatomical variant.

Double ureter identification can be made through incidental diagnosis and is more often associated with the study of urinary tract infection. It can appear in excretory urography, retrograde pyelography,
urotomography, or cystoscopy but it can also be missed in these studies and be identified only during surgical intervention. It is not unusual for urolithiasis to be present when there is double ureter. When this is the case the same treatment criteria are used as in cases without this anomaly, except when there is ureterocele.

## CASE PRESENTATION

Patient is a 57-year-old woman with high blood pressure who presented with recurrent urinary infections as a child. She was treated with multiple antimicrobial regimens and had been asymptomatic from about the age of fifteen years. Symptomatology recurred five years ago. Patient presented with right kidney lithiasis in 2001 that was successfully managed with right flexible ureteroscopy. She had acute posterior-inferior myocardial infarction in 2007 that was managed with selective coronarography and stent placement. She was referred to the authors’ department due to recurrent urinary tract infection.

With the recurrence of urinary tract infection five years ago, patient was given multiple antimicrobial regimens but symptomatology persisted and urinalysis suggested urinary tract infection. At the authors’ department plain radiographs and then excretory urography (Image 1) were ordered in which radio-opaque image suggested left kidney stone and two more at the right paravertebral location at the L4 level, with symmetrical nephrographic phase. In the elimination phase the calices and renal pelves were not dilated and bilateral double collecting system image was identified. In the right system there was contrast medium amputation in lateral ureter that ended at the radio-opaque image mentioned above. There was adequate contrast medium passage in the medial ureter and the left ureters showed no signs of dilatation and there was adequate contrast medium passage towards the bladder. The totality of both systems was not observed and at that moment they were thought to be incomplete. Renal ultrasound did not show collecting system dilatation data.

Right flexible ureteroscopy revealed right medial and right lateral ureteral meatuses (Image 2). The medial meatus was cannulated and retrograde pyelography did not show any filling defects in that ureter. The same procedure was carried out for the lateral meatus and a filling defect in the upper third of the ureter was identified. A yellowish spiculated stone was found under direct vision flexible ureteroscopy and was fragmented with Holmium laser.

A second surgery was planned and rigid and flexible ureteroscopy was performed for residual lithiasis in inferior third of right lateral ureter (Image 3) and ipsilateral kidney stone in the inferior calyx resulting in complete resolution of both conditions. Left retrograde

![Image 1](Image 1). Excretory urography. Elimination phase in which bilateral double collecting system is observed but complete double ureter is not identified.

![Image 2](Image 2). Double-J catheter inside lateral ureter. Radio-opaque image suggestive of stone in inferior third of the ureter is observed.
pyelography was done during the same procedure and complete left double collecting system was identified (Image 4) along with one medial ureteral meatus and one unobstructed lateral ureteral meatus. Patient is presently asymptomatic and is under out-patient surveillance. Left renal lithiasis is being conservatively managed.

**DISCUSSION**

Double ureter is one of the most common congenital abnormalities. Its prevalence is difficult to determine, given that systematic autopsies are no longer performed in the majority of hospitals. Frequency can be overestimated in radiological studies due to bias inherent in ordering such studies in each case. The increase in its prevalence could be due to the evermore frequent use of contrast imaging studies used to study the urinary tract or when studying some other pathology. Incomplete bilateral double ureter is not very common and complete bilateral double ureter is even less common. Lithiasis in these patients is expected to be the same as in patients that do not present with double ureter and likewise treatment is related to stone size and location and the same treatment criteria are used.

Diagnosis should be suspected in patients presenting with recurrent urinary tract infection who later present with vesicoureteral reflux.

**CONCLUSIONS**

It is the authors’ opinion that patients with associated lithiasis do not require special treatment or special postoperative care that varies from the norm and it does not represent a limitation for carrying out rigid or flexible ureteroscopy or percutaneous nephrolithotomy, except when there are stricture sites (or narrow infundibulum) or pronounced angulation. The patient presented here did not have renal cavity dilatation at any time, even though there was complete lateral ureter obstruction, and so it was assumed that there was urinary tract drainage above the ureteropelvic junction. This could be a possible explanation as to why patient symptomatology was not very conspicuous or specific in relation to the clinical picture.

**BIBLIOGRAPHY**