Rupture of the ureteropelvic junction

Ugarte-y Romano Fernando,1 González-Serrano Adolfo.2

ABSTRACT

Ureteropelvic junction rupture is infrequent and therefore the aim of the present article is to report two new cases of this clinical situation, analyzing its physiopathology, symptomatology, and its diagnostic and therapeutic methodology.

Two cases are described of ureteropelvic junction rupture secondary to an increase in the intraluminal pressure of the renal pelvis. In both cases diagnosis was made by means of computed tomography and the two patients underwent double-J catheter placement.

Despite the fact that nontraumatic ureteral rupture is uncommon, we believe it should be contemplated as a differential diagnosis in cases of renal/ureteral colic. However, the symptomatology can be nonspecific and lead to diagnostic confusion.

Keywords: Ureteral rupture, ureteropelvic junction, renal/ureteral colic, Mexico.

INTRODUCTION

Spontaneous rupture of the ureter is an infrequent clinical situation. First described by Albarrán in 1895 and published by Solé in 1986, it was defined as urine flow outside the urinary tract in the absence of trauma, surgical intervention, urologic instrumentation, or excretory urography carried out with external compression.

Symptomatology usually consists of lumbar, perirenal, and abdominal pain that resembles acute

RESUMEN

El objetivo del presente trabajo es reportar dos casos nuevos de ruptura de unión ureteropélvica, debido a la baja frecuencia con la que se presenta esta situación clínica, así mismo analizar la fisiopatología, sintomatología y la metodología diagnóstica y terapéutica.

Se describen dos casos de ruptura de la unión ureteropélvica, secundarios al aumento de la presión intraluminal de la pelvis renal. En ambos casos, el diagnóstico fue realizado por tomografía computada y ambos pacientes fueron sometidos a colocación de catéter doble-J.

A pesar de que la ruptura ureteral no traumática no constituye una situación común, creemos que debe contemplarse como un diagnóstico diferencial en los casos de cólico renoureteral. No obstante, la sintomatología puede ser inespecífica y llevar a confusión diagnóstica.

Palabras clave: Ruptura ureteral, unión ureteropélvica, cólico renoureteral, México.

1 Urology Surgeon, Hospital Ángeles del Pedregal. Mexico City, Mexico.
2 Intern carrying out his Social Service, Universidad Nacional Autónoma de México. Mexico City, Mexico.
abdomen, and therefore surgical treatment has occasionally been chosen for these patients.

It is important to distinguish between rupture of the ureter or renal pelvis and rupture of the calyceal fornix, because their clinical course and treatment are usually different. In the first case, symptomatology is usually severe and management is surgical, whereas in the second case, symptomatology is usually mild and conservative management is preferred.2

CASE PRESENTATIONS

CASE ONE
A 69-year-old man had a past medical history of left varicocelectomy carried out 30 years before and a 3-year-old diagnosis of benign prostatic hyperplasia (BPH) for which he was being treated with dutasteride.

Illness onset had a progression of one week, with bladder tenesmus and postmicturition burning pain in the penile urethra. Patient sought medical attention at the emergency room after two hours of intense colicky pain in the right iliac fossa that radiated to the renal fossa and ipsilateral testis, associated with nausea and diaphoresis. Physical examination revealed tegumentary paleness, pain at the costovertebral junction and with fist percussion at the right renal fossa. The mid-ureteral point was positive and there was pain at the right iliac fossa.

Abdominal ultrasound study showed dilation of the right collecting systems, a hyperechogenic image in the intramural portion of the right ureter, and a prostate weighing approximately 60 grams. A computed tomography scan with contrast material showed perirenal liquid on the right side, dilation of the renal pelvis, interruption of the ureteral trajectory, and contrast agent leakage at the ureteropelvic junction level. A 0.5 cm calcic hyperdense image was observed at the ureterovesical junction (Figures 1 and 2).

Cystoscopy, ureteroscopy, and double-J catheter placement were carried out along with right retrograde pyelography, which showed contrast material leakage in the ureteropelvic junction.

Antibiotic therapy based on ceftriaxone and intravenous analgesia for 24 hours was administered, after which the patient was sent home with satisfactory progression.

CASE TWO
A 77-year-old woman had a week-old costal fracture with secondary hemotorax and community-acquired pneumonia. She had been in the hospital for seven days after thoracentesis and pleural decortication and was managed with ceftriaxone, moxifloxacin, and intravenous morphine at a dose of 10 mcg/kg/h for 96 hours.

Eighteen hours before the urologic evaluation, the patient complained of nausea and vomiting associated with abdominal bloating and pain in the renal fossa and right flank. She also presented with urine overflow that she described as urinary incontinence. Physical examination revealed a distended abdomen and bladder, pain upon pressing the right upper quadrant, and hypoactive peristalsis. An abdominal tomography scan showed asymmetric kidney size due to the larger size of the right kidney, perirenal liquid extended toward the ipsilateral parietocolic corridor, and a dilated renal pelvis. When contrast agent was administered, it was observed to
extravasate at the ureteropelvic junction, with absence of the right pyelographic-phase and filled bladder (Figures 3 and 4).

A bladder catheter was placed and then cystoscopy and ureteroscopy were carried out, in addition to retrograde pyelography that showed a contrast material leak at the ureteropelvic junction level, and a double-J catheter was put in place (Figures 5 and 6).

No postoperative complications were reported and the patient was sent home with a Foley catheter two days after the surgical intervention.

**DISCUSSION**

Spontaneous rupture of the ureter is not common. Up to the year 2002, Akpinar et al.\(^3\) reported the existence of 91 cases. In that review, the patients were divided into five groups, according to rupture etiology. Of the 91 patients, 65 had rupture due to stone disease, 10 to neoplastic processes, 5 due to connective tissue diseases and large doses of corticosteroids, 6 to other causes, and 5 to undetermined causes.

The physiopathologic mechanism of ureteral wall rupture may correspond to two injury mechanisms. The
first is a mechanical event secondary to a weakness in the ureteral wall due to an impacted stone, tuberculosis, tumors, or local inflammatory processes. The second is a dynamic event due to a sudden increase in intraluminal pressure of the urinary tract. The mechanisms in both of our cases corresponded to the second.

Normal intraluminal pressure in the renal pelvis is from 5 to 15 cm H₂O. A pressure of 50 to 100 cm H₂O is needed for there to be calyceal fornix rupture, and so we estimate the existing intraluminal pressure in our two cases to have been greater than 100 cm H₂O.

In our first case, urinary flow obstruction was secondary to ureteral lithiasis. In the second, the urinary retention secondary to morphine administration was considered to be responsible for the ureteral rupture. Nevertheless, the effect of this drug on ureteral pressure is controversial because, since the beginning of the century, there have been experimental studies on human ureters in which the increase in and duration of peristaltic waves were confirmed by means of morphine administration. On the other hand, recent in vivo studies have discarded this idea.

Ureteral rupture symptomatology can range from an ordinary renal/ureteral colic to symptoms of acute abdomen, and it can be confused with pyonephrosis, perinephritis, cholecystitis, appendicitis, or diverticulitis. In our first case, clinical symptoms corresponded to renal/ureteral colic, and in the second case, there were peritoneal irritation data.

Diagnosis in the majority of reported cases has been made through excretory urography and it has been described as the most sensitive method for ureteral rupture diagnosis. Computed tomography scans produce characteristic images in cases of partial or complete rupture of the ureter: with contrast material administration, the resulting image shows intact renal parenchyma and perirenal liquid premonitors.

We opted for abdominal tomography scan with contrast material, which has advantages in regard to precise urinoma localization and adjacent structure visualization. In addition, the study does not need any specific preparation to be done beforehand.

We also carried out retrograde pyelography during the surgical intervention to confirm the diagnosis. Treatment of this clinical entity in uncomplicated cases is usually with endourologic methods. Fluoroscopic double-J catheter placement allows for urine flow obtention without obstruction, resolution of ureteral perforation, and stabilization and residual absorption of the urinoma.

The review of the literature showed that in all cases reported as spontaneous rupture of the ureter, there was a fundamental process that led to the rupture. Therefore, Kaplan et al. recommend Designating these ruptures as traumatic or non-traumatic, because as they point out, the term spontaneous implies a primary event, and unless there is a case reported in a completely healthy individual, it is a term that should not be used.

**CONCLUSIONS**

Despite the fact that non-traumatic ureteral rupture is uncommon, we believe it should be contemplated as a diagnostic possibility in cases of renal/ureteral colic. However, symptomatology can be nonspecific and lead to diagnostic confusion.

Computed tomography scan with contrast material or excretory urography are regularly used to make the diagnosis, although ultrasound can offer important diagnostic data.

Patients are currently managed with double-J catheter placement and there are precise indications for performing more invasive surgical approaches.

**REFERENCES**