



## Spontaneous Rupture of the Urinary Collecting System During Computed Tomography Scan

### Rotura Espontânea do Trato Urinário Durante a Realização de Tomografia Computorizada

Willy Baccaglini<sup>1\*</sup>, Cristiano Linck Pazeto<sup>1</sup>, Antonio Corrêa Lopes Neto<sup>1</sup>

#### Abstract

*Spontaneous rupture of the urinary tract is a rare entity. It probably occurs due to increased pressure in the urinary tract and usually is associated with obstructive factors. We report a case of a patient who presented rupture of the upper urinary tract during computed tomography without any associated obstructive factor. We believe that this happened due to the distension of the urinary system in function of contrast infusion. Our case is interesting because of the unusual etiology of this clinical entity and alerts us to the risk of high intraluminal pressures during urological endoscopic procedures and image exams. In addition, curiously the patient presented spontaneous resolution without performing the treatment suggested in the literature, which is the placement of a double-J catheter*

**Keywords:** Rupture, Spontaneous; Tomography, X-Ray Computed; Urinary Tract

#### Introduction

Spontaneous rupture of the urinary tract is considered a rare and difficult diagnosis entity, usually due obstructive factors and increased pressure on the urinary system.<sup>1,2</sup> We are going to report an unusual case where the urinary system rupture occurred during a radiologic exam without any obstruction factors. The hypothesis is that the distention of the urinary system during the computed tomography (CT) study, noticed by the large bladder filling in the images, was responsible for the rupture. Our case highlights about the risks of increased pressure on the urinary system either during endoscopic procedures or image exams.<sup>2,3</sup> Interesting, there was spontaneous resolution of rupture without any urinary diversion. This outcome goes against to the treatment suggested by the literature in cases of rupture of the urinary system.<sup>1,2</sup>

#### Case Report

A 66-year-old man with a history of several episodes of left back pain presented to our outpatient clinic for investigation of probable urinary lithiasis. In previous ultrasonography, there was

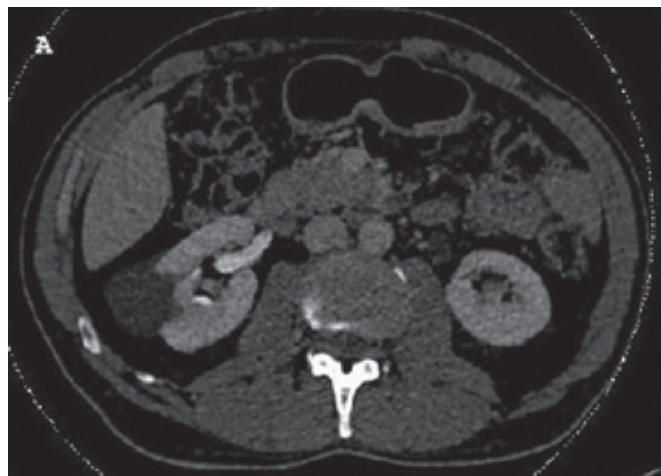
#### Resumo

Rotura espontânea do trato urinário é uma entidade rara. Esta provavelmente ocorre devido ao aumento da pressão na via urinária e geralmente está associada a fatores obstrutivos. Nós relatamos o caso de um paciente que apresentou rotura do trato urinário superior durante a realização de tomografia computadorizada sem qualquer fator obstrutivo associado. Nós acreditamos que isto aconteceu devido à distensão do sistema urinário em função da infusão de contraste. Nosso caso é interessante devido à etiologia não habitual desta entidade clínica e nos alerta sobre o risco de altas pressões intraluminais durante procedimentos endoscópicos urológicos e exames radiológicos. Além disso, curiosamente o paciente apresentou resolução espontânea sem realização do tratamento sugerido pela literatura, que é a colocação de um catéter duplo J.

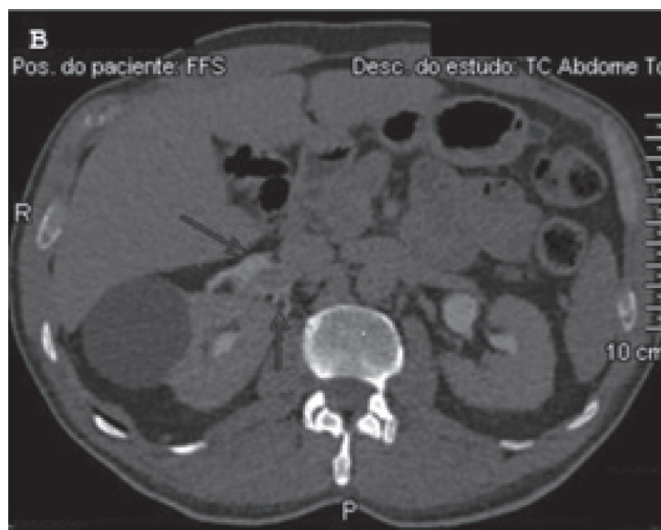
**Palavras-chave:** Ruptura Espontânea; Sistema Urinário; Tomografia Computorizada

not any dilatation or stone images, but described exophytic cystic formation in the upper pole of the right kidney. At the time of our evaluation, the patient was asymptomatic. We requested a contrast enhancement CT scan to investigate the possibility of urinary lithiasis and to clarify the origin of cystic lesion. Even asymptomatic at the time of exam, he presented an intense and sudden voiding desire accompanied by intense right lumbar pain that quickly ceased. After forty-five days, he remained asymptomatic and returned for a medical evaluation. The cross-section study revealed a 4 mm stone in the contralateral ureter associated with a mild ectasia. The right exophytic cyst in upper pole was also noted, with no signs of malignance. The nephrographic and excretory phases initially did not show any abnormalities, but the late excretory phase revealed a contrast leak in the upper calyceal region close to the right renal pelvis (Fig. 1). There are not any adjacent collections or stone images. A control CT was performed after two months to confirm the spontaneous resolution of this rupture (Fig. 2). It did not identify any collections or leakage signs. Also, the upper renal cyst remained unchanged and the contralateral ureteral stone migrated to a distal position. Two weeks later, the left ureteral stone was spontaneously eliminated. Even after several months of the incident, the patient remained asymptomatic.

<sup>1</sup>Discipline of Urology, Faculdade de Medicina do ABC. Santo Andre/SP – Brazil



**Figure 1A:** CT images shows a normal excretory phase without any leakage and ureterohydronephrosis in left side.



**Figure 1B:** After reported pain, a later stage was obtained with evidence of contrast extravasation in the right upper calyceal region.

## Discussion

Spontaneous rupture of the urinary tract is considered a rare and difficult diagnosis entity.<sup>2</sup> Usually, the initial presentation is a sudden and severe pain. The most common cause is a ureteral stone causing obstruction and increased pressure on the urinary system.<sup>4,5</sup> Other causes are urothelial tumor, extrinsic compression by tumors and retroperitoneal fibrosis, including during endoscopic procedures.<sup>6-9</sup>

The explanation for this event may be an ischemic mechanism that weakens the wall of the urinary tract and a fluid overload may also be involved in some cases.<sup>6-8,10</sup>

Basically, the treatment is resolution of any obstructive factor and antibiotic therapy to preventing urinoma infection and abscess formation.<sup>1,2</sup> In a retrospective study, ten patients with rupture of the upper urinary tract were submitted to ureteral stent.



**Figure 2:** Control CT scan performed two months after the rupture. Absence of any contrast leakage during the excretory phase. Note the persistence of contralateral ureterohydronephrosis.

The control was performed with ultrasound, which demonstrates a decrease of urinoma after an average of five days and resolution after 30 days. Only one case required percutaneous drainage, besides the ureteral stent.<sup>11</sup>

Similarly, a study reported a series of 14 patients whose showed contrast leak during excretory urography exams performed. The occurrence of leakage was correlated with the sudden increase intra-pelvic pressure. Twelve of 14 patients presented as our patient with sudden onset back pain.<sup>12</sup>

The contrast enhancement CT scan is the gold standard to detect this entity, once the extravasation and accumulation of urine may not be detected by ultrasound or CT without contrast.<sup>13-15</sup> However, the Doppler study can also identify and measure the dimensions of the rupture. It may be indicated in cases where exposure to radiation should be avoided or where the use of contrast is prohibited, as in children and pregnant women.<sup>1,16,17</sup>

Therefore, it is important to include the spontaneous rupture of the urinary collecting system in differential diagnoses of patients who present with sudden back pain associated with urinary symptoms.<sup>1</sup> If we do not have a high suspicion index, this condition may remain undiagnosed.

Finally, about evolution of our case, we assume that the delay between the realization of cross section study and medical evaluation (after several weeks) allowed a time interval enough to resolution of the rupture. However, this evolution raises the following question: are there cases of spontaneous rupture of urinary collecting system for a conservative treatment, when not accompanied by obstruction and worsening of clinical parameters? ●



### Ethical Disclosures

Conflicts of Interest: The authors report no conflict of interest.

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Confidentiality of Data: The authors declare that they have followed the protocols of their work center on the publication of patient data.

### Responsabilidades Éticas

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### \*Corresponding Author / Autor Correspondente

Willy Baccaglioni

Faculdade de Medicina do ABC. Av. Lauro Gomes,  
2000 - Vila Sacadura Cabral, Santo André - SP, 09060-870, Brasil  
E-mail: wbaccaglioni@gmail.com

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