

Inflammation and infection

## Spontaneous ureteric perforation: A rare complication of tuberculosis

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### ABSTRACT

Genitourinary tuberculosis (GU TB) is a rare condition that has historically been described as a great imitator, owing to its variable and deceptive clinical presentation and course. GU TB may affect any part of the urological system and lead to serious complications such as kidney and ureteric damage. The diagnosis of GU TB requires high index of suspicion especially if complications occur. We describe the first case of spontaneous ureteric perforation secondary to GU TB as spontaneous bladder perforation was previously described.

### 1. Introduction

Genitourinary tuberculosis (GU TB) is a rare condition that has historically been described as a great imitator, owing to its variable and deceptive clinical presentation. GU TB can affect any site of the urological system and may lead to serious complications such as auto-nephrectomy, ureteric strictures, and contracted bladder.<sup>1</sup> The clinical presentation of GU TB may become evident after many years, ranging up to 47 years, and usually, patients are treated as a case of recurrent urinary tract infections (UTIs), suspected bladder malignancy, or other non-specific urological diagnoses.<sup>2</sup> Bladder perforation as a complication of GU TB was early described in the literature as an intraoperative finding for a woman who had a laparotomy for a presumed diagnosis of perforated appendix.<sup>3</sup> However, spontaneous ureteric perforation has never been published in the literature. Therefore, we have decided to publish the first case to demonstrate such a potential complication and its clinical course.

### 2. Case presentation

A Fifty-eight years old female patient who is not known to have medical illnesses was referred to our tertiary hospital as a case of right-side hydronephrosis for percutaneous nephrostomy insertion. Upon arrival, she mentioned that she had a long history of recurrent UTIs for which she had been on long-term different antibiotic regimes. However,

she had never had a positive urine culture.

Also, she highlighted that she had been complaining of severe overactive bladder symptoms to the extent that sometimes she visited the toilet every 15 minutes day and night time. Physical examination was unremarkable except for right costovertebral angle tenderness. Her kidney function and electrolytes were normal (Serum Creatinine 0.7 mg/dl). Tri-phasic computerized tomography (CT) scan of the abdomen and pelvis showed that the right pelvicalyceal system and ureter are significantly dilated and there is a contrast extravasation from the right distal ureter during the delayed phase (Fig. 1A and B). There are no abdominal masses or stones on the CT scan.

She underwent flexible cystoscopy to look for bladder lesions but none were found. Nevertheless, the cystoscopy showed a very small bladder capacity (Less than 50 ml) and obliteration of the ureteric orifices. The Interventional radiology (IR) managed to insert a right-side nephrostomy where the contrast was injected and images were obtained (Fig. 2 A) shows the dilated and tortuous right ureter with contrast extravasation at the level of vesicoureteric junction (VUJ), but contrast does not reach the urinary bladder (Complete obstruction). A retrograde cystogram was done and showed small bladder capacity and leakage of contrast from the urethra (Fig. 2B and C) shows a small bladder capacity (Less than 50ml) and a severely contracted and dysmorphic urinary bladder (Thimble bladder). The sum of the clinical and radiological findings raises the possibility of GU TB diagnosis. Thus, urine acid-fast-bacilli screening was sent but it was negative twice. However, the

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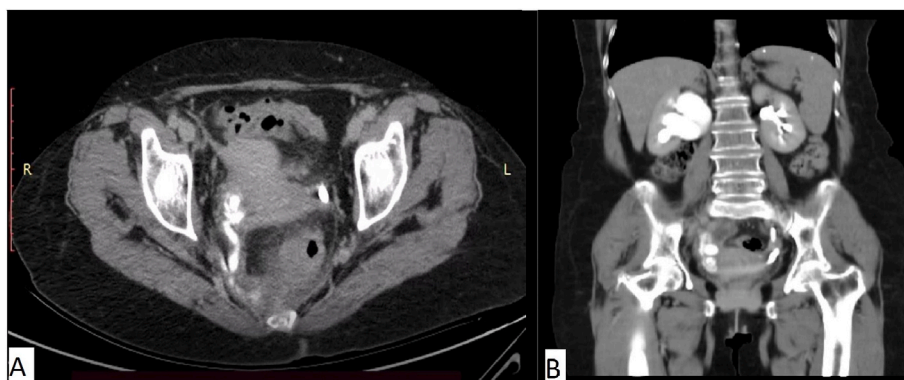
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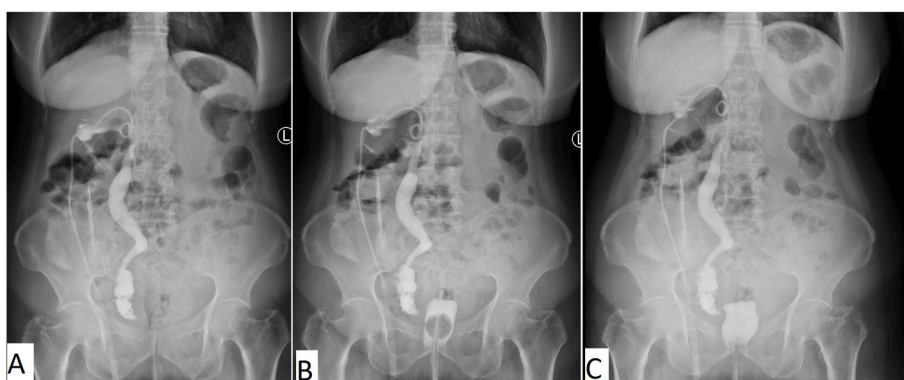
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**Fig. 1.** (A) Axial Pelvis CT-scan; delayed images at 20 min shows abnormal configuration of the distal ureter with contrast extravasation at the vesico-ureteric junction (VUJ). (B) Coronal reconstructed images of abdomen and pelvis CT-scan; delayed 20 min shows contrast extravasation at the right vesico-ureteric junction (VUJ) with proximal hydronephrosis.



**Fig. 2.** (A) Antegrade nephrostogram; shows dilated and tortuous right ureter with contrast extravasation at the level of vesico-ureteric junction (VUJ), but contrast does not reach the urinary bladder (Complete obstruction). (B&C): Cystogram shows small bladder capacity (Less than 50ml) and severely contracted and dysmorphic urinary bladder (Thimble bladder).

following test were performed and confirmed the diagnosis of GU TB. Quanti FERON-TB Gold was Positive and the Tuberculin skin test (Mantoux test) was  $>15$  mm. Digging deep in history, she confirmed that she had a bladder biopsy 3 years ago which showed upon reviewing the pathological slides of multinucleated giant cell reaction. Isoniazid, Rifampin, and Pyridoxine were prescribed and she is scheduled for reconstructive surgery in the future. The IR and urology meeting concluded that based on the clinical, radiological and laboratory data, this is the first case of spontaneous ureteric rupture in the literature secondary to GU TB.

### 3. Discussion

To the best of our knowledge, we present the initial instance of spontaneous ureteral rupture consequent to an overlooked diagnosis of GU TB. The clinical and radiologic indications may be subtle and ambiguous, but necessitate a heightened sense of doubt (Fig. 3) outlines the radiologic manifestation of this uncommon case, which matches previous findings in the literature.<sup>1</sup> The image displays a dilated pelvicalyceal system and convoluted ureter until the VUJ-presumed stricture. The stricture commonly causes proximal ureteral dilatation and thickening of the ureteral wall.<sup>4</sup> Specifically, the figure describes a rare, spontaneous rupture of the ureter just above the VUJ, as validated by the triphasic CT scan and antegrade nephrostogram. While previous studies have reported spontaneous bladder perforation, this represents the first instance of spontaneous ureteral perforation resulting from GU TB.<sup>3</sup> Furthermore, the figure depicts the effect of scarring and chronic inflammation on the bladder, leading to a contracted bladder with a

capacity of less than 50 mL. The radiological features of a contracted bladder secondary to GU TB are classically known as a thimble bladder a possible indicator of GU TB.

The treatment of this case involves three phases: initially, draining the urinary system through percutaneous nephrostomy to address urinary extravasation. A trial of antegrade stenting was infeasible due to a tight stricture. The second stage entails medical treatment with first-line antituberculosis therapy, which demonstrates a six-month standard course of treatment.<sup>5</sup> Finally, the third stage necessitates genitourinary reconstruction. For this specific case, ureteroneocystostomy and augmentation cystoplasty are the preferred methods for treatment. Alternatively, an orthotopic bladder may prove useful in instances of severely contracted bladder.

### 4. Conclusion

GU TB is rare and may lead to serious complications of the GU tract. High index of suspicion and prompt evaluation and management is the key to success in case of GU TB.

### Ethical statement

Informed consent was taken from the patient for publication of this case report and the associated images.

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This research has not received any fund or grant

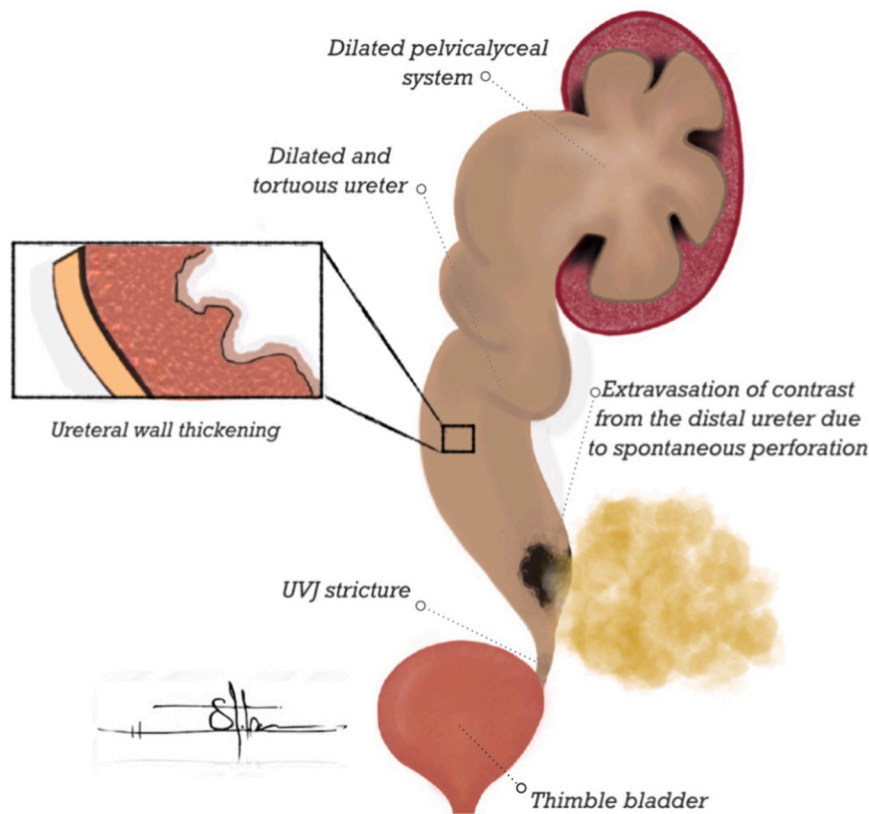


Fig. 3. A diagram that shows the clinical and radiological findings in the case which illustrates the site of ureteric rupture and the (Thimble bladder sign).

**Author contributions**

All authors made substantial contributions to conception and design. They have all agreed to submit to the current journal; gave final approval of the version to be published; and agree to be accountable for all aspects of the work.

**Declaration of competing interest**

The authors have no conflicts of interest.

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