

# Recurrent Spontaneous Perforation of Urinary Bladder due to Tuberculosis: A Case Report

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## ABSTRACT

Although tuberculosis most commonly causes thickening and contracture of the urinary bladder, rarely, inflammatory infiltration with central necrosis and perforation may occur. Hereby, the authors present a case report of a 24-year-old man with recurrent spontaneous perforation of the urinary bladder due to tuberculosis. In the first presentation, he recovered well with conservative treatment. In the second presentation, he underwent ileal augmentation cystoplasty, and he did well after the definitive surgery. To the best of authors' knowledge, this is the first report of recurrent perforation of tuberculous urinary bladder. Perforation of the urinary bladder due to tuberculosis is a rarity, and a high index of clinical suspicion and appropriate investigation is needed for timely diagnosis and treatment.

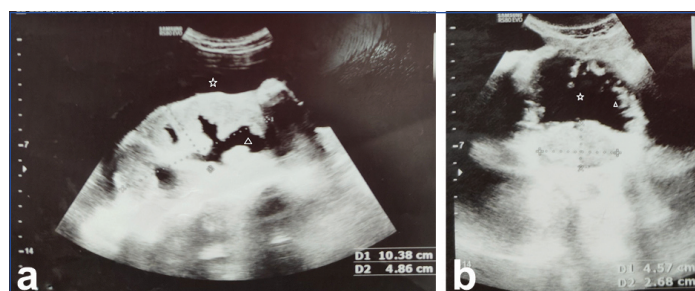
**Keywords:** Coronavirus disease-2019, Cystoscopy, Cystography, Urography

## CASE REPORT

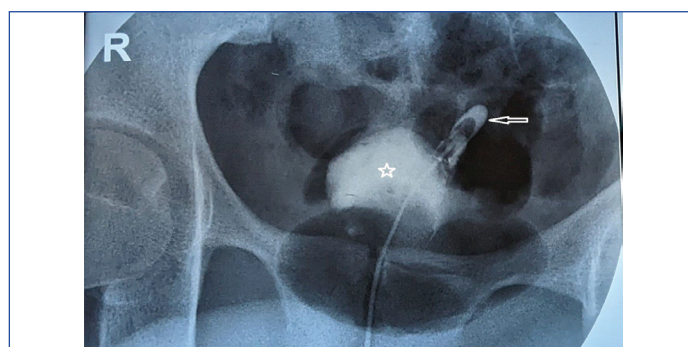
A 24-year-old man presented to the Emergency Department with a three-day history of abdominal pain and decreased urine output. There was no fever or history of trauma. He did not have a history of chronic cough, anorexia, or weight loss. There was no family history of tuberculosis. On examination, the patient was afebrile. His pulse rate was 114 beats per minute, and his blood pressure was 113/82 mmHg. The abdomen was distended, with mild tenderness present in all quadrants but no guarding or rigidity. The fluid thrill was positive, and normal bowel sounds were present. The right renal angle was tender. Chest examination was unremarkable. His haemoglobin was 7.7 g/dL, and his total leukocyte count was 6900/mm<sup>3</sup> with a neutrophil count of 83%. His serum creatinine was 5.5 mg/dL; blood urea was 285 mg/dL, and Erythrocyte Sedimentation Rate (ESR) was 88 mm in 1 hour. Urine microscopy showed 9-19 Red Blood Cells (RBCs)/ High Power Field (HPF) and 29-49 White Blood Cells (WBCs)/ HPF. Urine culture grew *Enterococcus faecium*, sensitive to nitrofurantoin, gentamicin, and vancomycin. Ultrasonography showed gross ascites, bilateral chronic renal parenchymal disease and pyelonephritis, left renal calculi, chronic cystitis, and bilateral moderate pleural effusion [Table/Fig-1a,b]. Foley catheterisation was performed, after which the abdominal distension and pain markedly decreased. Right percutaneous nephrostomy was performed. Urinary smear was positive for acid-fast bacilli, and Cartridge-based Nucleic Acid Amplification Test (CBNAAT) also tested positive for *Mycobacterium tuberculosis* (not Rifampicin resistant). He was started on Antitubercular Treatment (ATT) according to the Revised National Tuberculosis (TB) Control Programme [1]. The patient responded well to the treatment, and the serum creatinine improved to 1.1 mg/

dL. Due to the COVID-19 pandemic in the region during that period (December 2021 to May 2022), patient was discharged with a right nephrostomy tube and Foley catheter in-situ. Cystoscopy after one month showed a contracted urinary bladder with a capacity of 50 mL and no perforation. So, the Foley catheter was removed. Since, the right nephrostomy tube was draining only 5 mL per day, it was also removed. The patient voided well after Foley catheter removal. The patient completed a full course of ATT and was doing well. Intravenous urography showed a non excreting right kidney and a normally excreting left kidney with multiple calculi. The patient was advised augmentation cystoplasty and an operation for left renal stones. However, the patient declined to undergo the operation at that time.

One year later, he presented again with a similar history of five days' duration and similar physical findings. His haemoglobin was 7 g/dL, and his total leukocyte count was 15500/mm<sup>3</sup> with a neutrophil count of 87%. His serum creatinine was 21.6 mg/dL. Ultrasonography showed ascites, bilateral pleural effusion, and left renal calculi. Due to high serum creatinine, the patient underwent one session of haemodialysis. Foley catheterisation was performed, following which the abdominal distension subsided. The repeat ultrasonography after Foley catheterisation reported the tip of the Foley catheter to be in the peritoneal cavity adjacent to the omentum. Contrast cystography confirmed a perforation in the dome of the urinary bladder with the tip of the Foley catheter lying in the peritoneal cavity [Table/Fig-2]. Serum creatinine dropped to a nadir value of 1.6 mg/dL. After a transfusion of three units of



**[Table/Fig-1]:** a) Ultrasound showing gross ascites (star) with right pyelonephritis (triangle); b) Ultrasound showing distended urinary bladder (star) with irregular wall (triangle).



**[Table/Fig-2]:** Contrast cystogram showing a contracted bladder (star) and Foley catheter tip (arrow head) in the peritoneal cavity.

packed red cells, he underwent ileal augmentation cystoplasty. The operative findings included a severely contracted urinary bladder with a 1.5x1.5 cm perforation at the dome of the bladder, a golf-hole left ureteric orifice, a non identifiable right ureteric orifice, adherent omentum to the dome of the bladder, and a few intestinal adhesions. Histopathological examination of the tissue from the resected bladder edges showed findings suggestive of the burnt-out phase of tubercular granuloma with no epithelioid granuloma or caseation necrosis. After the Foley catheter was removed 21 days after surgery, he voided well, and post-void residual urine was 25 mL. He was followed up regularly for nine months, and he was doing well. He was asked to come for the treatment of left renal stones and right nephrectomy later.

## DISCUSSION

Tuberculosis most commonly affects the lungs, and extrapulmonary tuberculosis is seen in 8% to 15% of cases [2]. Genitourinary tuberculosis accounts for 20% to 73% of all cases of extrapulmonary TB [3]. In genitourinary tuberculosis, the kidney is affected in 61% of cases, the ureter in 19%, and the urinary bladder in 16% [4]. Most commonly, tuberculosis causes thickening and contracture of the urinary bladder, but rarely inflammatory infiltration with central necrosis and perforation may occur [5]. Perforation of the tuberculous bladder is extremely rare. Only a few cases of bladder perforation due to tuberculosis have been reported in modern English literature [Table/Fig-3] [6-11]. To authors' knowledge, this is the first report of recurrent perforation of a tuberculous urinary bladder. During the first hospitalisation, the abdominal distension and pain improved with Foley catheterisation and antituberculous treatment. Contrast cystogram could not be performed as investigations were restricted because of the COVID-19 pandemic. However, he was told that a contrast cystogram would be performed if he developed abdominal pain and swelling again.

Authors Name	Age (in years)/gender	Chief complaint	Physical examination findings	Radiological findings
Doig CM [6]	34/Male	Severe abdominal pain for 3 days.	Rigid abdomen, rebound tenderness.	Abdominal radiograph: no air under diaphragm, no air-fluid levels, and no stones.
Kumar R V et al., [7]	22/Female	Fever, abdominal distention, oligoanuria	Ascites	Ultrasonography: bilateral hydronephrosis, collapsed bladder with thickened, irregular wall
Pal RP et al., [8]	28/Female	Lower abdominal pain	Diffusely tender peritonic abdomen	Pelvic MRI: intraperitoneal bladder perforation
Kong CH et al., [9]	25/Female	Suprapubic pain, fever, dysuria and frequency of 5 days duration	Tenderness, guarding of lower abdomen	Ultrasonography: mild right hydronephrosis, moderate ascites, and multiple cortical cysts of left kidney.

Sallami S et al., [10]	43/Male	Acute hypogastric pain, fever and anuria for 4 day	Abdominal tenderness, guarding, and rigidity.	Chest X-ray: miliary tuberculosis; Ultrasonography: free peritoneal fluid.
Alaga A et al., [11]	45/Male	Generalised abdominal pain and distention	Abdominal tenderness and guarding.	Ultrasonography: free fluid in the peritoneal cavity.

**[Table/Fig-3]:** Cases of tuberculous bladder perforation reported in the modern English literature [6-11].  
MRI: Magnetic resonance imaging

The omentum probably sealed the bladder perforation. However, the perforation recurred after a year. The contrast cystogram and ultrasonography diagnosed the bladder perforation, and ileal augmentation cystoplasty was performed. Since, the biopsy from the resected bladder edges was reported as suggestive of the burnt-out phase of tubercular granuloma with no epithelioid granuloma or caseation necrosis, an additional course of ATT was not considered. Following the definitive treatment, the patient was doing well.

## CONCLUSION(S)

Even though urinary bladder perforation is a rare event in genitourinary tuberculosis, if a patient presents with ascites, bladder perforation should be suspected, and a contrast cystogram should be performed so that urinary bladder perforation is not missed.

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