

요로결석으로 오인한 곰팡이덩이에 의한 세균성 요로성패혈증

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Bacterial Urosepsis by a Fungal Ball Mimicking a Ureteral Stone

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Ureteral obstruction caused by a fungal ball is rare. Diabetes mellitus and immunocompromised conditions constitute the predisposing factors. Urosepsis due to unilateral ureteral obstruction with a fungal ball is extremely rare. The radiologic findings of fungal ball have been described as nonspecific. We report on a female patient with urosepsis that occurred by unilateral ureteral obstruction by a fungal ball, mimicking a ureteral stone. She was managed with systemic antibiotics, percutaneous nephrostomy, and ureteroscopic fungal ball removal.

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Although fungal infections of the urinary tract often occur, upper urinary tract involvement is relatively rare. Approximately 50 cases of ureteral obstruction by candida bezoars have been reported.¹ But, bacterial urosepsis with ureteral obstruction by candida bezoar are extremely rare. Radiologic findings of fungal bezoars are generally nonspecific. The findings can easily mistake bezoars for a radiolucent urinary stone, blood clot, urinary tract malignancy, or necrotic tissue. Theoretically, obstructive uropathy increases the host susceptibility to urinary tract infection. Herein, we report a woman with obstructive uropathy, and bacterial urosepsis by candida bezoar, and describe her diagnosis and management.

CASE REPORT

A 75-year-old woman was referred to our emergency department, with a 5-day history of right flank pain and fever. Although she was treated in a local clinic for 3 days, her symptoms and signs were worsening. The patient had been diagnosed with diabetes mellitus about 8 years ago, but she had not been treated. Her mental status was alert, initial blood pressure was 70/40 mmHg, heart rate was 110 beat/min, and body temperature was 36.2°C. Physical examination revealed right flank tenderness. Initial laboratory test demonstrated a peripheral white blood cell count of 3,630/mm³. Her urea and creatinine levels were 40 mg/dl and 2.89 mg/dl. The glucose concentration was 204 mg/dl, and glycosylated hemoglobin level was 11.1%. Urinalysis

showed hemato-pyuria. Blood cultures grew *Klebsiella pneumoniae*, and the urine culture revealed *Candida albicans*.

We promptly managed septic shock, with intravenous fluid, systemic antibiotics, and vasoactive agent. After her vital signs were stable, we carried out radiologic study. Non-enhanced computed tomography (CT) scan showed hydronephroureterosis on the right side, and upper ureteral obstruction. For infection control and renal failure management, right side percutaneous nephrostomy was performed. Antegrade urography showed a radiolucent

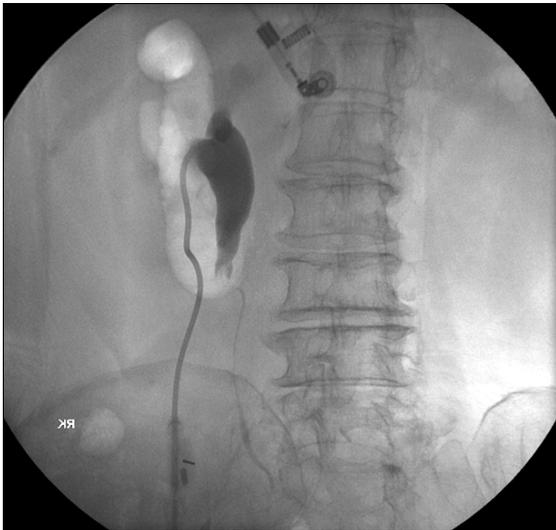


Fig. 1. Antegrade ureterography: a filling defect of the right upper ureter, and hydronephroureterosis, due to radiolucent material.

filling defect in the right upper ureter. The findings were highly suspicious for blood clot, necrotic tissue or matrix stone (Fig. 1). After creatinine levels were normalized, enhanced CT scan of the abdomen was carried out. The CT scan was unable to obtain any findings of urinary stone or enhancing mass, and only showed abrupt luminal narrowing in the right upper ureter (Fig. 2). Three weeks later, the general conditions were improved. We performed diagnostic ureteroscopy for right ureteral obstruction. Ureteroscopy revealed about 1 cm sized whitish and soft material, mimicking ureteral stone, on the upper right ureter. The obstructing material was easily removed by stone basket (Fig. 3). The pathology demonstrated a fungal ball consisting of the pseudohyphae and spores. Grocott-Gomori's methenamine silver staining of these structures was positive (Fig. 4). The nephrostomy tube was removed on postoperative day 4. In follow-up during the postoperative 6 months, the patient had neither any symptoms, nor subsequent urinary tract infection.

DISCUSSION

Risk factors for the urinary tract candidiasis include diabetes mellitus, immunosuppressive therapy, prior antibiotic therapy, intravenous drug abuse, neuropathic bladder, and malignancy.² Although candida infections of the urinary tract occasionally occur, obstructive uropathy by fungal bezoar is rare.³ An obstructing fungal ball leading

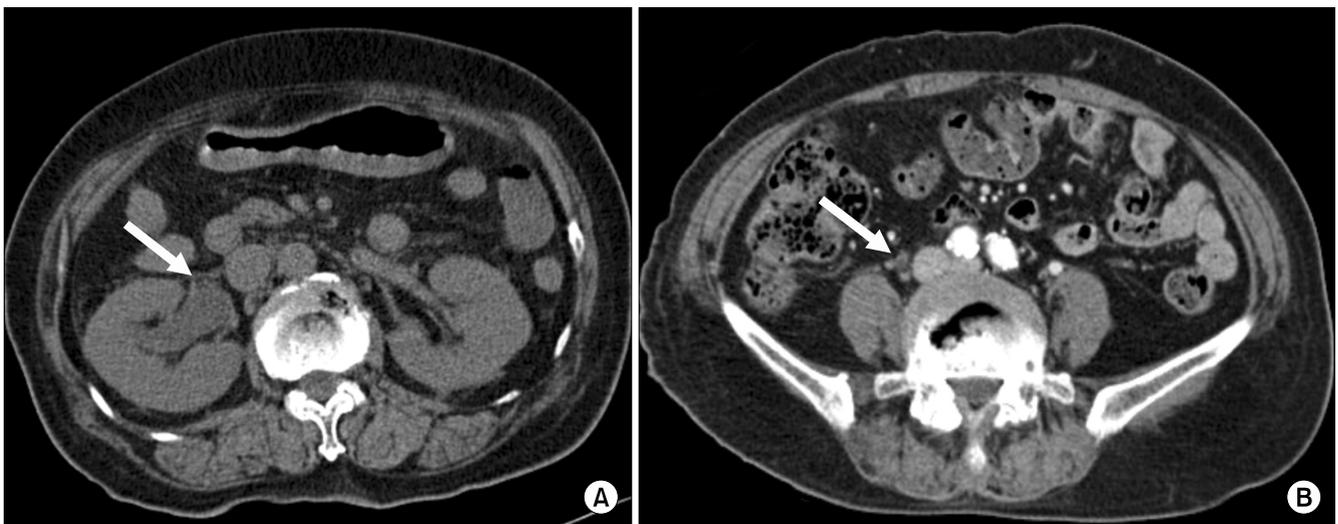


Fig. 2. Computed tomography of abdomen. (A) Hydronephroureterosis on right-side (arrow). (B) Abrupt luminal narrowing, without findings of urinary stone, extrinsic compression, or enhancing mass (arrow).



Fig. 3. Ovoid and white colored material: fungal bezoar by *Candida albicans*. The scale is in centimeters.

to fungal urosepsis has been infrequently reported.⁴ In the present case, *Klebsiella pneumoniae* was demonstrated on the patient's blood culture. Bacterial septic shock as a result of ureteral obstruction by *Candida bezoar* is extremely rare. Sepsis is defined as infection, and signs of systemic inflammation. Septic shock is defined as sepsis-induced hypotension, despite adequate fluid resuscitation. Millions of people worldwide each year are affected by septic shock, and one in four die. The cornerstone in the management of septic shock consists of fluid resuscitation, appropriate diagnostic tests, early empiric broad-spectrum antibiotics, and source control.⁵ We promptly managed by central venous catheter insertion, arterial catheter insertion, crystalloid infusion, norepinephrine infusion, and broad spectrum antibiotic injection. Obstructive uropathy may occur by urinary stone, stricture, tumor, blood clot, necrotic tissue, extrinsic compression, vascular cause, etc. Regardless of the cause of obstruction, obstruction to urine flow is a key factor in increasing both host susceptibility, and morbidity to urinary tract infection, and has to be promptly managed by percutaneous nephrostomy, or ureteric stent.⁶ Therefore, percutaneous nephrostomy was done for infection control and renal failure management.

When a fungal bezoar is diagnosed, parenteral antifungal agent treatment is the first option. And local irrigation of the fungal balls with antifungal agents through a percutaneous tract has been shown to be an effective treatment option. However, radiologic findings of *Candida bezoars* are not pathognomonic frequently, and can be mistaken for blood clot, matrix stone, air bubbles, necrotic tissue, or urothelial cell carcinoma.⁷ On ureteroscopy for correct

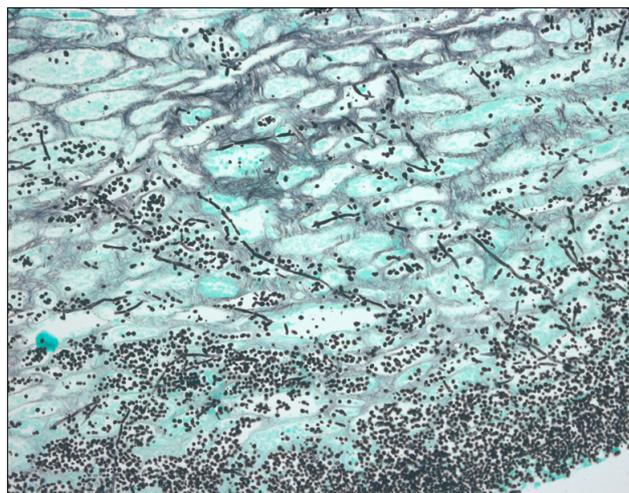


Fig. 4. *Candida* spores and pseudohyphae (Grocott-Gomori's methenamine silver, $\times 200$).

diagnosis, an obstructing fungal ball was detected, and easily removed by stone basket. Fungal bezoars in the upper urinary tract have been treated by surgery, but endourological methods are more safe and effective.^{8,9} Our experience has shown that *Candida bezoar* was easily removed, and without any urinary tract damage.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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