Neurogenic Bladder Complicated with Giant Urethral Stone in a Male

UROLOGY

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Abstract

We report an educational case of complicated urinary tract infection. A 72-year-old man was brought to our Emergency Department (ED) due to abdominal pain and general weakness for 2 days. He was febrile with a body temperature of 39.2°C. Physical examination showed lower abdominal tenderness. Serum laboratory examination revealed severe leukocytosis and high procalcitonin levels. Urinalysis revealed hematuria and pyuria. KUB showed multiple small calcified lesions and one huge calcified mass projecting in the lower pelvis. CT of abdomen displayed multiple calcifications of the prostate and a large calculus (4.2 x 2.7 cm) in the posterior urethra. The diagnosis of giant urethral stone complicated with urinary tract infection was made finally. Early recognition and appropriate treatment of urolithiasis associated complications is imperative.

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Keywords

Neurogenic Bladder; Urethral Stone.

Introduction

Urinary tract stones are a common disease; however urethral calculi are scarce in recent literature. Urethral calculi most usually originate from the upper urinary tract or from the bladder, but also it can form in situ. When stones occlude the urethra, it can cause acute urinary retention, urethral injury and obstructive renal failure [1-3]. To date, diagnosing urethral calculi is still challenging due to nonspecific symptoms. Giant urethral stones can lead to long-term urethral damage, incontinence and renal insufficiency [1-3].

Giant urethral calculus is uncommon and can cause acute renal failure associated with urological tract outflow obstruction combined with urinary tract infection and sepsis [1-3]. Patients who

have significant symptoms attributable to a giant urethral calculus should undergo surgical intervention as soon as possible to minimize associated complications.

Case report

A 72-year-old male was admitted to our emergency department (ED) due to lower abdominal pain and general weakness for 2 days. He had history of old intracranial hemorrhage and neurogenic bladder for more than 10 years. He was febrile with a body temperature of 39.2°C. His blood pressure was 80/50 mmHg, pulse rate was 120 beats/min, and respiratory rate was 21 breaths/min. Initial blood laboratory examination revealed abnormalities as follows: white blood cell counts $20.8 \times 10^3 /\mu\text{L}$; procalcitonin $> 200 \text{ ng/mL}$; blood urea nitrogen (BUN) 32.6 mg/dL and creatinine

2.74 mg/dL; phosphate 4.87 mg/dL; calcium 7.5 mg/dL. Urinalysis revealed numerous red blood cells and white blood cells (>100 high power fields (HPFs)). Physical examination revealed tenderness over supra-pubic region. Urinary catheterization was performed unsuccessfully at ED. Kidneys, ureters, and bladder x-ray (KUB) revealed multiple small calcified lesions and one huge calcified mass projecting in the lower pelvis (**Figure 1**). Abdominal non-contrast computer tomography (CT) (coronal view) demonstrated multiple calcifications of the prostate and a large calculus (4.2 x 2.7 cm) in the posterior urethra (**Figure 2a**). CT (axial view) demonstrated a high density mass in the median lower pelvis, at the level of urogenital diaphragm. Finally, the diagnosis of septic shock caused by the giant urethral stone complicated with urinary tract infection was made. Inotropic agents and broad-spectrum antibiotics were administered under the

Figure 1: KUB showed multiple irregular supra-pubic high density projections, in consistent with calcifications of prostate. There is a large calcified mass just projecting over and inferior to symphysis of pubis.

Figure 2: a) Abdominal non-contrast CT. (Coronal view) revealed multiple prostatic calcifications and a large calculus (4.2 x 2.7 cm) within the posterior urethra. The bladder showed irregular wall thickening without vesical stone.

critical situation. After administration, he recovered gradually with progressive improvement of kidney function. In the initial urine culture at ED grew *Escherichia coli*. Serum BUN and creatinine stabilized at 19.5 mg/dL and 1.02 mg/dL, respectively when discharged after 2 weeks in hospital. One month after discharge, the surgery of perineal urethrotomy with urethroplasty was made. It was performed well, and no recurrence was found after 3-month follow-up.

Figure 2: b) (Axial view) demonstrated a high density mass in the lower median lower pelvis, at the level of urogenital diaphragm

Discussion

This is an educational case because giant urethral calculi lead to complicated urinary tract infection with sepsis and acute renal failure. The common causes of urethra obstruction include inguinal hernia, benign prostate hyperplasia, stones formation and prostatitis. With regard to the renal failure, the urethral obstruction may have been significant. Despite antibiotic therapy for urinary tract infection, appropriate surgical intervention is the definitive treatment of choice. Management of giant urethral calculi has existing challenges and careful planning in preoperative preparation and postoperative monitoring is necessary for its prognosis.

Urethral calculi represent 1-2% of all urolithiasis in the genito-urinary tract. They are usually encountered in males. Primary urethral stones are generally small, multiple and formed de novo in the urethra; secondary urethral stones are usually larger and formed in the upper urinary tract with secondary downward descent [1]. Primary urethral calculi are usually associated with urethral stricture, posterior urethral valve disorder, diverticula, neurogenic bladder, and foreign body [2]. Urinary stasis and chronic infection have been identified as the causes of stones formation. Urethral stones may be completely asymptomatic or may have few symptoms like perineal and penile pain, or lower urinary tract symptoms. The diagnosis is based on clinical history and relevant investigations including KUB, ultrasounds and CT. Urethral stones are most commonly calcium oxalate, and are reported to be radiopaque. Some small and only faintly radiopaque may be missed in KUB, therefore CT is a helpful diagnostic tool [2]. The treatment of choice for an impacted large calculus in the bulbar urethra is perineal urethrotomy with urethroplasty. Other methods of management of the giant calculus impacted in prostatic urethra include radical prostatectomy, open retro-pubic prostatolithotomy, and endoscopic lithotripsy [3-5].

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