

Giant bladder calculus in a patient with recurrent urinary tract infections

Cálculo vesical gigante em um paciente com infecções urinárias de repetição

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Abstract

A giant bladder stone is rare and is usually defined as “giant” if its weight is over 100g. We describe a 43-year-old man who presented with urinary sepsis, hypotension, abdominal pain, and a vesicocutaneous urinary fistula. Laboratory tests showed hemoglobin 6.6 g/dL, leukocytes 22,700/mm³, creatinine 7.29mg/dL (eGFR 8.8mL/min/1.73m²), urea 181 mg/dL, serum pH 6.99 and bicarbonate 6 meq/L. Abdominal tomography showed bilaterally reduced cortical thickness of the kidneys and a bladder stone of 6x6x11 cm. He was treated with antibiotic therapy, dialysis, and open cystolithotomy. Clinical improvement was observed, despite kidney disease persistence, with chronic dialysis therapy.

Keywords: giant calculus; urinary tract infection; bladder. kidney disease.

Resumo

Cálculos gigantes na bexiga são raros e são definidos como “gigantes” quando o peso é superior a 100g. Apresentamos um homem de 43 anos com sepsé urinária. O exame físico revelou hipotensão, dor abdominal e fistula urinária vesicocutânea. O laboratório mostrou hemoglobina 6,6 g/dL, leucócitos 22.700/mm³, creatinina 7,29 mg/dL (TFGe 8,8mL/min/1,73m²), ureia 181 mg/dL, pH sérico 6,99 e bicarbonato 6 meq/L. A tomografia abdominal mostrou redução da espessura cortical dos rins bilateralmente e cálculo vesical de 6x6x11 cm. Foi tratado com antibioticoterapia, diálise e cistolitotomia aberta. Melhora clínica foi observada, apesar de persistência da doença renal, com terapia dialítica crônica.

Palavras-chave: cálculo gigante; infecção urinária; bexiga. doença renal.

INTRODUCTION

A giant bladder stone is rare. It is usually defined as a “giant stone” if its weight is over 100g¹. This type of urinary calculus typically develops from a single nidus on the bladder, whether it is a foreign body, an infectious focus, or a ureteral stone that has migrated into the bladder. A giant stone, however, can also originate from the fusion of smaller stones². It is unusual to have a giant bladder stone without any predisposing factor. Thus, evaluation regarding etiology should be performed once this diagnosis is made. We describe a rare case of the giant bladder in a young male with a history of recurrent urinary tract infections.

CASE REPORT

A 43-year-old male was admitted to the emergency department with lower abdominal pain, dysuria, and fever. He reported countless episodes of urinary tract infection (UTI). His habits included alcohol abuse and illicit drug use (crack). Physical

examination revealed hypotension (84 x 50 mmHg), tachycardia (132 bpm), fever (38°C), abdominal pain, and a vesicocutaneous fistula draining a large amount of urine. Laboratory tests revealed hemoglobin 6.6 g/dL, leukocytes 22,700/mm³, creatinine 7.29 mg/dl (eGFR 8.8mL/min/1.73m²), urea 181 mg/dL, sodium 138 mEq/L, potassium 4.7 mEq/L, serum pH 6.99 and bicarbonate 6 meq/L. Abdominal tomography showed bilaterally reduced cortical thickness of the kidneys, severe bilateral ureteropelvic dilation, and a bladder stone measuring 6.1 x 6.1 x 11 cm (940 HU density) (Figure 1A). Urine culture isolated *Klebsiella pneumoniae* (100.000 UFC/ml) amikacin, gentamicin, tigecycline, and ceftazidime-avibactam sensitive and resistant to the other antibiotics tested. Antibiotic therapy (gentamicin culture-guided) and dialysis were initiated. After clinical stabilization, an open cystolithotomy was performed (Figure 1B). The patient had clinical improvement, with complete resolution of the infectious condition, and is currently undergoing chronic dialysis therapy.

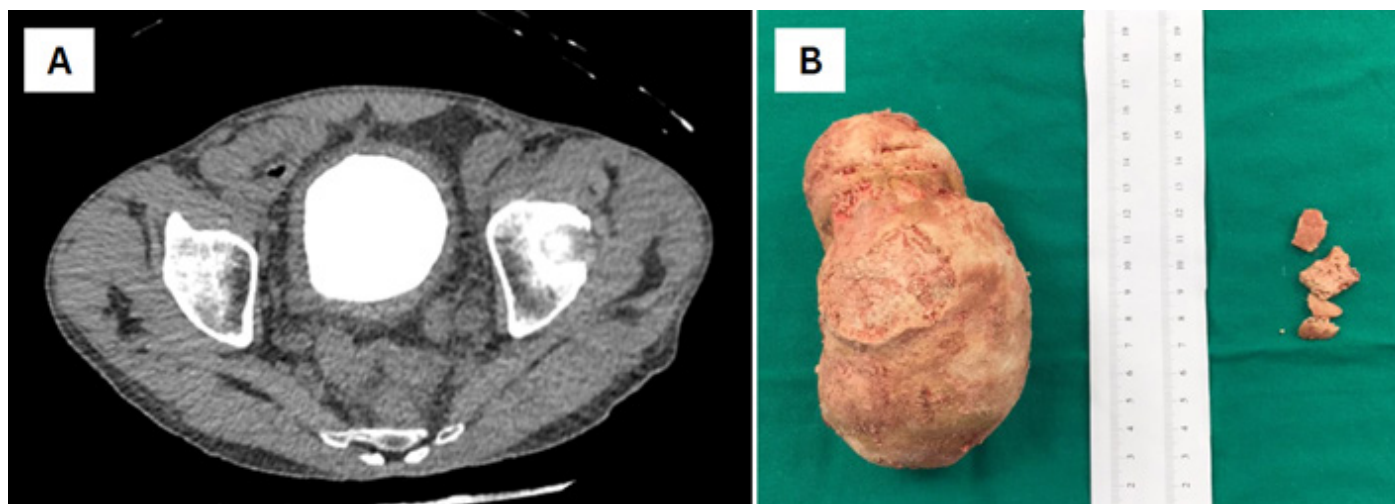
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Figure 1. (A) Abdominal tomography showing a bladder calculus of 6.1 x 6.1 x 11 cm and (B) bladder calculus of 11 cm in the largest diameter and its fragments, products of an open cystolithotomy.



DISCUSSION

Urinary bladder calculi represent approximately 5% of all urolithiasis cases³. The incidence is higher in males and lower-middle-income countries^{4,5}. Currently, most bladder stones are diagnosed when they are smaller due to the widespread availability of traditional diagnostic methods (ultrasound and abdominal radiography). Patients without access to healthcare facilities or whose diagnosis has been delayed are at greater risk of developing giant stones. Clinical presentation of bladder calculi ranges from asymptomatic to dysuria, abdominal pain, gross hematuria, and acute retention of urine. The present case illustrates a young patient with recurrent urinary tract infection and possible inadequate follow-up, predisposing to the development of bladder calculus.

Urinary flow obstruction is usually involved in giant bladder stone formation. Some causes of bladder obstruction are more prevalent in men, such as bladder neck stenosis, benign prostatic hyperplasia, urethral stricture, bladder diverticulum, neurogenic bladder, as well as intravesical foreign bodies^{3,6,7}. Bladder stones in adults are composed of uric acid in almost 50% of the patients, and most do not have gout or hyperuricemia. Chronic bacteriuria and UTIs (mainly those with spinal cord injuries or hypotonic bladders) predispose patients to develop

struvite (infection) and calcium phosphate stones⁸. UTIs with urease expressing bacteria, such as *Proteus*, *Klebsiella*, and *Staphylococcus*, result in urinary alkalization and excess ammonium production. Urea is converted into ammonium, increasing the urine pH and thus lowering the solubility of triple phosphate [9]. In the present case, the metabolic evaluation did not reveal underlying disorders regarding calciuria, uricosuria, oxaluria, or citraturia. The mechanism proposed as the cause of the giant stone was recurrent UTIs.

Treatment of giant calculi often includes antibiotics (if UTI is associated) and surgery. The open surgical approach is the method of choice in most cases due to the large size of the stone. Percutaneous cystolithotripsy has a stone-free rate greater than 90% [10]. This patient was submitted to an open cystolithotomy followed by catheterization for 30 days and was discharged after 36 days.

In summary, giant bladder calculus is a rare condition, generally associated with predisposing factors. In the present case, recurrent UTI was considered the main risk factor and was also possibly a contributing factor for chronic kidney disease.

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