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Giant Bladder Stone with Renal Impairment: A Case Report and Literature Review

M. Cheqboub[1*], A. Agnaou[1], M. Oubihi[1], A. Chatar[1], M. A. Lakmichi[1], Z. Dahami[1], I. Sarf[1]

[1]Department of Urology, Errazi Hospital, Mohammed VI University Hospital Center of Marrakech

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***Corresponding author:** M. Cheqboub
Department of Urology, Errazi Hospital, Mohammed VI University Hospital Center of Marrakech

Abstract | **Case Report**

Bladder lithiasis refers to the disease related to the formation of stones in the bladder. These stones, which can reach several centimeters in size, are made up of aggregates of various mineral substances (calcium, phosphates, magnesium...) and organic substances. Most often, these stones are formed as a result of poor bladder emptying, due to a sub-vesical obstruction or bladder dysfunction of neurological or other origin. We present a case of giant bladder stone responsible for left renal dilation associated with a right ureteral stone and a right staghorn kidney stone, caused by bladder neck disease and complicated by renal failure. This is a 42-year-old male patient who was admitted through the emergency room for recently worsening hypogastric pain associated with chronic right lower back pain and lower urinary tract symptoms of filling type: pollakiuria, and emptying type: dysuria, all symptoms evolving for 20 years. Physical examination revealed bilateral lumbar tenderness and a palpable hard hypogastric mass. Imaging revealed a giant bladder stone occupying almost the entire bladder associated with a pelvic ureteral stone and a right staghorn kidney stone. The treatment consisted of a suprapubic cystotomy with extraction of the giant bladder stone and extraction of the ureteral stone delivered through the meatus by ureterotomy. Postoperative recovery was uneventful. The purpose of this article is to emphasize the importance of early consultations for lower urinary tract symptoms, which appears difficult given the context of ignorance and traditions that consider the urogenital system a taboo, in addition to delays in care due to geographical distance and difficulty of access to care.

Keywords: giant bladder stone, bladder stone, cystotomy, ureteral lithiasis, ureterotomy, renal failure, bladder neck stenosis.

INTRODUCTION

Lower urinary tract lithiasis, formerly known as stone disease, is found at all socioeconomic levels of society, especially among populations with a very low standard of living, hence its name 'poor man's lithiasis' or endemic lithiasis [1].

Stones in the lower urinary tract (bladder, urethra) are rarer. Bladder stones are most often due to a sub-vesical obstruction (benign prostatic hyperplasia, bladder neck sclerosis), or an intravesical foreign body (threads, bladder catheter balloon). They are generally discovered due to urinary functional signs: hematuria, dysuria, pollakiuria.

However, in well-targeted populations, lower urinary tract lithiasis is very common. This is mainly the case for neurological patients with severe motor impairment: tetraplegia, advanced MS... [2]

We report a case of giant bladder stones diagnosed in a man. We discuss the social and cultural specificities of the context.

CASE

A 42-year-old patient was admitted through the emergency room for chronic hypogastric pain with recent worsening, associated with chronic right lower back pain and lower urinary tract symptoms of filling type: pollakiuria and emptying type: dysuria, all symptoms evolving for 20 years.

Furthermore, the patient had no surgical or medical history: notably no history of urethral trauma, recurrent urethritis, endo-urethral procedure, or prostatic pathology. The patient is not diabetic and does not suffer from neurological disorders, tumor pathology, tuberculosis, or schistosomiasis, apart from taking medicinal plants for the previously described symptoms. However, the diet was based on cold cuts, salts, and

white sugar (sucrose), and water intake came from a well.

Physical examination revealed:

- A conscious patient, hemodynamically and respiratory stable.
- Normal blood pressure and normal pleuro-pulmonary auscultation.
- Diuresis of 1500 ml/24 hours.
- No lower limb edema.
- Bilateral lumbar tenderness with positive Giordano's sign on the right.
- A hard hypogastric mass.
- Digital rectal examination revealed a hard anterior mass, a soft prostate of 30g, with a mobile bladder base.

Given the lower back pain and lower urinary tract symptoms, the patient initially underwent a KUB X-ray **(Image 1)** which showed a calcified opacity in the right renal area, a calcified opacity in the bladder area with a double calcified image on the right side and some small calcifications in the pelvic area.

Image 1: KUB X-ray: enormous calcified opacity in the bladder area associated with another opacity in the right renal area

Initial biological tests were requested:
Which revealed acute renal failure:
Creatinine was 53.2 mg/L and glomerular filtration rate (GFR) was 15 ml/min with elevated urea at 1.5 g/L and hyperkalemia: 5.9 mmol/L.
Bicarbonate: 15 mmol/L.
Calcium: 93 mg/L.
Phosphorus: 42 mg/L.
Sodium: 140 mmol/L.
Uric acid: 69 mg/L.
Cytobacteriological examination of urine (ECBU) was positive for Proteus Mirabilis sensitive to 3rd generation cephalosporins.
CRP: 13.56.
Complete blood count and liver function tests were normal.

The patient was hospitalized in our department for acute obstructive renal failure for medical treatment first of hydro-electrolytic disorders and infection before starting surgical treatment:
Volume-by-volume rehydration with hyperkalemia correction measures: calcium gluconate + insulin + glucose serum.
For urinary infection, the patient was put on ceftriaxone 2g/24 hours.

After conditioning:
The patient benefited from a metabolic workup which came back negative.

And an unenhanced abdominal CT scan which showed major bilateral ureterohydronephrosis with a right staghorn calculus responsible for cortical thinning of 8mm and on the left side cortical thinning of 16mm, a giant calculus occupying the entire bladder of 89x80mm (850UH), presence of a distal right ureteral calculus of 2 cm (1100) (Images: 2, 3, and 4).

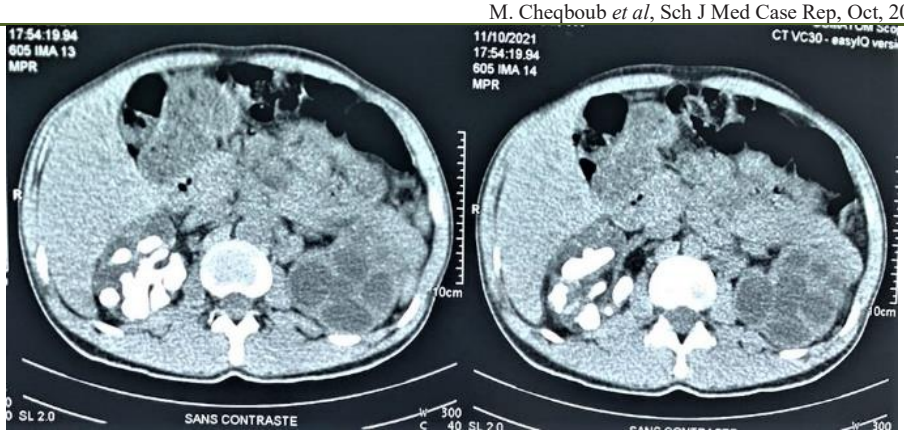
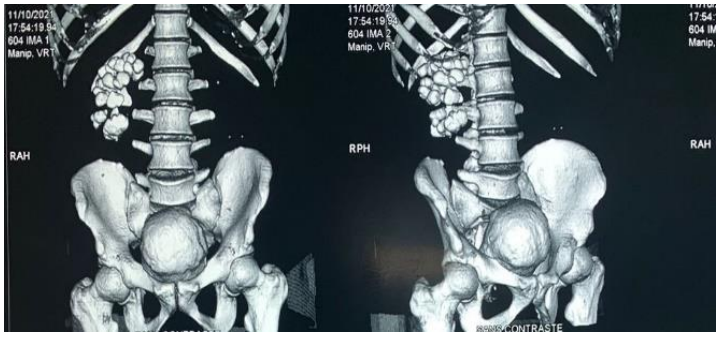


Image 2: Transverse abdominal CT scan: bilateral renal dilation with large staghorn calculus on the right and cortical thinning

Image 3: Transverse CT scan: Giant calculus occupying almost the entire bladder with pelvic ureteral calculus

Image 2: Frontal CT scan: bilateral renal dilation with large right staghorn calculus and cortical thinning, giant calculus occupying almost the entire bladder



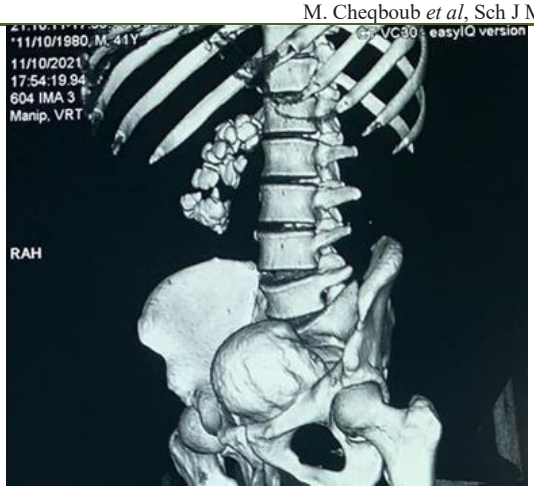


Image 4: 3D reconstruction CT scan clearly showing the right staghorn kidney stone and the giant bladder stone

After treatment of urinary infection and hyperkalemia, the patient underwent cystostomy with extraction of the giant bladder stone and the right intramural ureteral stone. The operative times were as follows:

Patient placed in dorsal decubitus under spinal anesthesia, a 5 cm median sub-umbilical incision with opening of musculo-aponeurotic planes and placement of two marker threads on the bladder then cystotomy. Laborious extraction of a giant calculus of approximately 10 cm, yellowish in color and rough surface, weighing 800g (photo 1).

Photo 1: 10 cm giant bladder stone extracted by cystostomy

Upon exploration, bladder neck stenosis was observed with individualization of a calculus delivered through the right ureteral meatus. The procedure consisted of a cervico-prostatic incision at 5 o'clock and 7 o'clock with an electric scalpel followed by a right ureterotomy and extraction of a 3 cm blackish calculus **(photo 2).**

Placement of a double-lumen catheter CH 20.
Cystorrhaphy with resorbable thread: viryl 0 with separate stitches.
Layer-by-layer closure with placement of a Redon drain CH18 in the pre-vesical space and finally dressing.

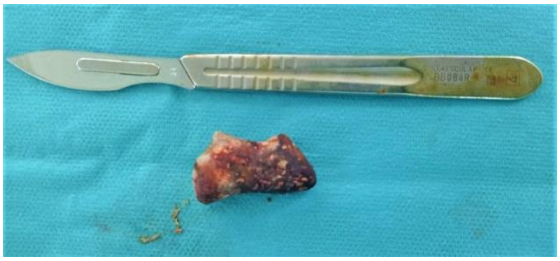


Photo 2: 3 cm calculus of the pelvic and intramural ureter delivered through the right meatus extraction after ureterotomy

Postoperative follow-up was uneventful.

With improvement of renal function, glomerular filtration rate at 50 ml/min versus 15 ml/min before surgery. The two calculi were sent for spectrophotometric examination. Hygienic-dietary advice was given to the patient: increased fluid intake to at least 3 liters per 24 hours with distribution throughout the day, limitation of meat, salt, and fast sugar consumption. Annual monitoring is prescribed after the first postoperative appointment in 15 days.

DISCUSSION

Although a cosmopolitan affection, lower urinary tract lithiasis is more frequent in underdeveloped countries [1]. In the West, lower urinary tract lithiasis, which was frequent and essentially vesical until the 19th century, has almost disappeared today with the improvement of living conditions of populations. In Africa, lower urinary tract lithiasis remains a public health problem due to the low standard of living of populations and the existence in most countries of a hot and dry climate with high temperatures responsible for dehydration [3]. Lower urinary tract lithiasis occurs in the majority of cases in a context of lower urinary tract obstruction in both children (posterior urethral valves with diagnostic delay) and adults (prostatic pathology, urethral stricture or bladder neck disease or in a context of neurogenic bladder) [4].

Physical examination is only useful for large palpable giant calculi in the suprapubic area or on pelvic examination [5]. Urinary imaging: KUB, ultrasound, and especially abdominopelvic CT scan constitute the key examination for diagnosis and also for evaluating the impact on the upper urinary tract and identifying the etiology. Calculi without obvious causes, called primary idiopathic calculi [6], are rare. However, returning to the literature, it is often secondary, particularly to an intravesical foreign body (catheter balloon fragment [3], vesical migration of an intrauterine device [9] or iatrogenic after pelvic surgery or urinary incontinence surgery (sub-vesical obstruction, non-resorbable threads [7]. Chronic urinary infections are mentioned in infectious phospho-ammoniaco-magnesium calculi [7]. Neurogenic bladders can also be a cause of calculus depending on vesical urinary stasis. Large calculi that fill the entire bladder lumen exert mechanical compression on the ureteral meatus, thus causing obstruction of the upper urinary tract with the development of obstructive renal failure [9], which is a rare incident and is the case of our patient.

Treatment begins first with the correction of infectious and obstructive complications of this calculus. The technique for extracting a bladder calculus depends on its size, composition, patient comorbidities and medical history, the presence or absence of anatomical malformation of the lower urinary tract. Thus, a calculus less than 2cm recommends endoscopic extraction after fragmentation, for calculi from 2 to 4cm a percutaneous cystolithotomy is recommended, while if the calculus is more than 4cm, open surgical extraction remains the most recommended technique [1].

Our treatment consisted of calculus extraction by cystotomy. Currently, surgical treatment of bladder calculi involves extracorporeal lithotripsy and fragmentation during cystoscopy [9]. However, cystotomy remains the recommended indication for large bladder stones such as those presented by our 2 patients (9). The overall management of urinary lithiasis always includes a component on recurrence prevention. This component takes into account the etiology and includes general hygienic-dietary measures and measures applicable to each type of calculus [9].

CONCLUSION

Lower urinary tract lithiasis is not exceptional in our daily practice. It is more frequent in subjects aged between 1 and 15 years, and with 75% of underlying urological pathologies, lower urinary tract lithiasis is endemic. The definitive treatment of lower urinary tract lithiasis necessarily involves that of the causal disease, because simple calculus extraction is only part of the treatment of lithiasis disease. The prevention of lower urinary tract lithiasis involves not only early diagnosis and upstream management of cervico-urethro-prostatic affections, but also by carrying out information and awareness campaigns on this condition.

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