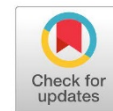


Case Report

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Giant Vesical Calculus Presented with Anuria in a Young Male Patient: A Case Report

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Abstract

A giant Vesical calculus (GVC) is a calculus that weighs more than 100 grams (g) or measures more than 4 centimeters (cm) in its widest diameter. It is a rare clinical condition in adults. Over the past few years, the number of patients with GVCs has decreased due to the wider availability of healthcare and improved diagnostic modalities. In the literature, there are very few reports of GVCs leading to bilateral obstructive uropathy and anuria. Here, we present a case of azotemia and anuria in 39-year-old male Libyan man. His workup revealed a giant vesical calculus (10×9×6) centimeters, and an open Cystolithotomy was performed. A giant brown hard vesical solitary calculus weighing 435 grams was removed. He passed an uneventful post-operative course, apart from a short period of post-obstructive diuresis, and discharged home on the eighth postoperative day with almost normalized renal function.

Keywords: Giant vesical Calculus, Hydroureteronephrosis, Anuria, Young Male, Suprapubic Cystolithotomy, Benghazi, Libya

INTRODUCTION

Bladder stones are responsible for 5% of all urinary system stones and seen more frequently in men than women, and they rarely develop spontaneously (Ofluoglu et al, 2013). Urinary tract infection, urethral stricture, benign prostatic hyperplasia, and intravesical foreign body encrustation are the most common causes of urinary bladder calculi formation (Faisal et al., (2022). Fewer than 100 cases have been reported in the literature with a weight more than 100 grams and almost all of them had bladder outlet obstructions (Elkhafifi et al., 2021). Vesical calculi are often of small to moderate size, but at times can attain a huge size.

They may be smooth or multifaceted. Struvite stones are usually smooth and are commonly responsible for giant GVCs, while the multifaceted stones are typically composed of calcium oxalate (Lawal et al., 2016). Vesical calculi have a varied presentation, ranging from completely asymptomatic to dysuria, lower abdominal pain, gross hematuria, and retention (Vidhyathy et al., 2020). However, it is rare for the stone to become so large as to compress both ureteric orifices and block the bladder outlet, causing renal failure (Mukherjee et al., 2020). Here, we present a case of a GVC presented with anuria and renal impairment; the patient was managed successfully with an open cystolithotomy.



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CASE Report

A 39-year-old male Libyan patient presented to the outpatient department with anuria for a duration of two days prior to his hospitalization. For the past seven months, he has complained of bilateral flank pain and dull Suprapubic pain and heaviness. The patient's medical history indicated that both obstructive and irritative symptoms had been observed for a duration exceeding 15 years. There was no history of hematuria, catheterization, trauma, or instrumentation. Due to the lack of medical facilities in such areas of the country, he claimed that he only received traditional therapy and unspecified antibiotics for the presumptive diagnosis of UTIs.

On general physical examination, the patient was afebrile, conscious, and oriented, had mild pallor (2+), and was mildly dehydrated. His vital signs were stable. Abdominal examination revealed local cautory marks, soft, lax upper abdomen, mild tenderness, and there is a hard mobile mass in the Suprapubic region that is deeply palpable. A digital rectal examination disclosed a prostate of normal size and consistency and an easily palpable stone. An attempt at urethral catheterization was unsuccessful due to the resistance encountered at the bladder neck by the stone. His baseline investigations were as follows: Hemoglobin, 8.7 g /dL; total leukocyte count, $9.1 \times 10^9/L$. In addition, serum creatinine is 8.7mg/dL, Urea 107mg/dL. His electrolytes were within normal limits. Routine urinalysis which was performed 3 to 4 days before presentation to our hospital showed a reddish-yellow aspect, turbid and an acidic PH, 1+ albuminuria, 1+ blood, while being negative for nitrates and bilirubin. Urine microscopy revealed 8-10 HPF leukocytes 20-25 HPF red blood cells, and neither cast nor crystals were present. Urine culture was negative.. The plain abdominal x-ray (KUB) showed a large radiopaque shadow in the pelvic region (Figure 1).



Figure (1). plain abdominal x-ray (KUB) showed a large vesical calculus occupying the pelvic region.

Abdominopelvic ultrasonography disclosed bilateral moderate Hydroureteronephrosis and a thickened bladder wall with a large stone about 6.7×5.9 cm with a normal sized prostate and echogenicity. On day 2, under spinal anesthesia, a urethroscopic evaluation was performed that showed a normal urethra, non-obstructed prostatic lobes, and a patent bladder neck. Cystoscopy could not be done due to the resistance encountered by the obstructed stone at the bladder neck level. Through a pfannestiel incision, he underwent an open cysto-lithotomy and a giant yellowish-brown calculus measuring 10×9 ×6 CM and weighing 435 grams was removed [Figure 2].

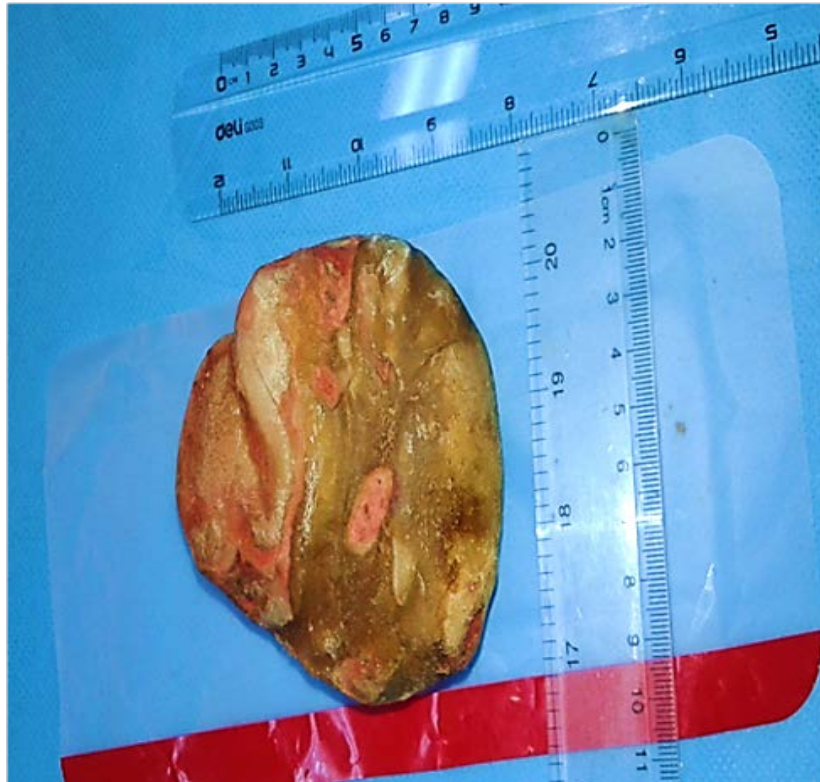


Figure (2). Giant vesical calculus extracted by cystolithotomy measuring 10x9x6 cm and weighing 435 gram.



Figure (3). Gross appearance of the calculus immediately post -cystolithotomy

The calculus was adherent to the bladder mucosa, which was acutely inflamed and edematous, but there was no visible lesion necessitating a biopsy. The urinary bladder and abdominal wall were closed accordingly over a 20 Fr three-way Foley catheter and fixation of the pelvic drain. He had an uneventful post-operative course, except for a short period of diuresis lasting for two to three days. On the second post-operative day, the pelvic drain was removed and he was discharged nine days later with almost normal renal functions (S. cr. creatinine 1.5 mg/dl). Unfortunately, our patient was from the countryside, and he lost scheduled follow-up and chemical stone analysis.

DISCUSSION

The term “giant vesical calculus” refers to any bladder stone weighing more than 100 g or measuring more than 4 cm in its largest diameter (Lawal et al., 2016)

- Bladder stones are commoner in men than in women with an incidence of 95% (Ismail et al., 2021). Most bladder stones are in the range of 1 to 2.5 cm and weigh less than 100gm. (Arthure, 1953). The biggest vesical calculus described weighed 6294 g (Diniz et al., 2017) & the mean size in the longest diameter was 8.38 cm, the bigger one had 17 cm in the longest diameter (Molla et al., 2022).
- Primary or endemic bladder stones are formed in the absence of underlying uropathy, which is less common in the developed world (XWei et al., 2022). With the development of medicine and the improvement of living standards, the incidence of bladder stones has progressively decreased (Bestari et al., 2022). Bladder stones can typically be classified as primary, secondary, or migratory based on the etiology. Spontaneous bladder stones rarely occur in adults; therefore, predisposing factors must be explored to identify the cause and prevent recurrence (Hamad et al., 2006).

The typical symptoms of bladder calculi are Suprapubic pain, dysuria, intermittency, terminal hematuria and urinary retention (Parma et al., 2018). Acute renal failure with features of oliguria and raised creatinine is a rare (Becher et al., 1978). It is more often seen in low socioeconomic and underdeveloped countries secondary to malnutrition and consists of predominantly ammonium urate and calcium oxalate stones. Bladder calculus is usually associated with renal or ureteric calculi and they rarely occur without upper tract stones as was seen in our index case (Otieno et al., 2015). As the majority of bladder calculi are radiopaque can be detected by plain radiograph (KUB) (G Shilpi et al., 2007). Other investigations, which can show bladder calculi, are ultrasound, CT scan, magnetic resonance imaging and intravenous urogram but non-contrast-enhanced CT is the investigation of choice as it has remarkable sensitivity in detecting urinary tract stones, including uric acid stones. It can reveal the concentric nature of stones (Mazlan et al., 2022).

The treatment of bladder stones depends on the size and the composition of the stone, the comorbidities of the patient, the presence of previous surgery, and anatomic abnormalities of the lower urinary tract, costs, as well as the equipment available. It is essential to eliminate the causative factors in order to ensure therapeutic success (Papatsoris et al., 2006). Open cystolithotomy is still the preferred type of surgery for bladder stones measuring more than 4 cm as proposed by Torrecelli and colleague (Torricelli et al., 2013). Though we are moving toward the era of minimally invasive procedures methods such as extracorporeal shock wave lithotripsy and transurethral cystolithotripsy still have their limitations. The prolonged surgery increases the risk of complications such as urethral stenosis, urethral trauma, and visual disturbance due

to hematuria and stone dust (Thakur et al., 2007). Patients with large obstructive bladder stones and renal impairment should be monitored for post obstructive diuresis in the early postoperative period. Recovery of renal function after stone removal depends on the extent of renal damage. All the authors of giant bladder stones with renal failure mentioned improvement in renal function after cystolithotomy. In some cases, the recovery in renal function was complete (Ofluoglu et al., 2013, LaiAY-H et al., 2007, Wei & Wang 2010, Aron et al., 2003); however, in others, either the recovery was partial or there was no record of renal function beyond the initial 3–5 days of surgery (Kamal et al., 2008, Komeya et al., 2013, Hassan et al., 2019). Minimal data exist on the causes, incidence and management of giant bladder stones considering their rare occurrence (Agrawal et al., 2019). During the last 20 years, only a handful of case reports reported the development of kidney failure due to bladder stone [Table 1].

Table (1). Showing Most of the Cases of GVC presented with Obstructive Uropathy and Renal Impairment during the last 20 years.

Author & year	Age	Sex	S. Cr on admission	Symptoms	Size	Weight	Treatment	S. Cr on discharge
Our case , 2024, <u>Libya</u>	39	♂	8.7mg/dl	Anuria and renal impairment	10×9×6 cm	435 gms	Cystolithotomy	1.5mg/dl
Molla <i>et al.</i> , 2023, <u>Ethiopia</u>	25	♂	4.29 mg/dl	Suprapubic pain, Dysuria, difficulty of Urination	10×6 cm	260 gms	Cystolithotomy ,Resecitation, catheterization	1.1 mg/dl
Bestari <i>et al.</i> , <u>Indonesia</u>	43	♂	9m/dl	Dysuria, intermittent urination, bilateral flank pain, gross hematuria recently	10×9×7 cm	Not mentioned	HD and cystolithotomy	6.6mg on second post-operative day
Mazlan <i>et al.</i> , 2022 <u>Malaysia</u>	30	♂	15.12 mg/dl	Intermittent hematuria and lower abdominal pain	15× 10×10 cm	1000 gms	PCN+HD+ cystolithotomy	Marked Improvement
Wei X <i>et al.</i> , 2022 <u>China</u>	31	♂	8.4 mg/dl	LUTs, Urine retention and Milky – white urine	11×11 cm	Not mentioned	Cystolithotomy	Not mentioned
Mukherjee <i>et al.</i> , 2021 <u>UK</u>	53	♂	2.9m/dl	Frequency, urgency, poor stream, S.p.pain	9×6.5×4.5 cm	Not mentioned	Cystolithotomy	Normalized
Agrawal <i>et al.</i> , 2019 <u>USA</u>	56	♀	6.1 mg	Lower abd. Pain, Dysuria ,Frequency	11×11×10.4cm	Not mentioned	PCN + Cystolithotomy	Not mentioned
Hassan <i>et al.</i> , 2019 <u>USA</u>	57	♀	6 mg /dl	Recurrent UTI , bilateral flank pain and sp.p.pain	11×9.5×8.6cm	1300 gms	PCN + Cystolithomy	2.6 mg/dl on second week
Parmar <i>et al.</i> , 2018 <u>India</u>	35	♂	5.4mg/dl	LUTS , N/V and oliguria	Not mentioned	490 gms	U. Cath. + cystolithotomy	1.4mg/dl
Diniz <i>et al.</i> , 2017 <u>Brazil</u>	52	♂	6.3 mg/dl	Acute renal failure	10.7×7.7×5.8cm	623 gms	Cystolithotomy	2mg/dl
Otieno <i>et al.</i> , 2015 <u>Kenya</u>	52	♂	2.844mg/dl	Dysuria , overflow incontinence, colicky lower abdominal pain & swelling and constipation	8×7×7 cm	260 gms	Cystolithotomy	Not mentioned

Author & year	Age	Sex	S. Cr on admission	Symptoms	Size	Weight	Treatment	S. Cr on discharge
Komeya et al., 2013 Japan	81	♂	8.09 mg/dl	Renal failure	7× 6× 6 cm	Not mentioned	Urethral cath. + Cystolithotomy	2.53 mg/dl on Third post-Operative day
Ofluoglu et al., 2013 Turkey	56	♂	1.6mg/dl	Nocturia ,dysuria and mild sp.p pain	11×10×6.5 cm	402 gms	Cystolithomy	1.2 mg
Wei et al., 2010 China	31	♂	8.09 mg/dl	Repeated UTIs and lower abdominal pain	11 cm	Not mentioned	Cystolithotomy	Normalized after two weeks
Kamal et al., 2008 Canada	30	♂	8.60 mgs	Decrease urine stream and prolonged voiding time	Not mentioned	95 gms	Cystolithotomy	1.87 mgs
Lai et al., 2008 Taiwan	69	♂	7.59 m/dl	Repeated UTIs and lower abdominal pain	11×8×7 cm	320 gms	Cystolithotomy	1.40 mg/dl
Thakur et al., 2007 India	72	♂	9 mg/dl	Urine retention and sp.p. Pain	6.6×6.25 cm	305 gms	B/L PCN+ cystolithotomy	5 mg/dl

Abbreviations:

S.cr.	Serum creatinine
H.D.	Hemodialysis PCN: Percutaneous nephrostomy
U.	Cath. Urethral catheter
S.p.pain	Suprapubic pain
UTI	Urinary tract infection
GVC	Giant vesical calculus

CONCLUSION

GVCs are a rare clinical condition in contemporary practice. Furthermore, it is extremely rare for it to present with obstructive uropathy and renal impairment. It should be considered in the differential diagnosis of any patient present with lower urinary tract symptoms. This case is interesting because of the following two reasons. Our patient did not have an infra-vesical obstruction that predisposed him to GVC, and he is among the rare patients with GVC who presented with anuria and severe renal impairment. However, we suspected recurrent UTIs during childhood as a possible cause of the vesical calculus. To the best of our knowledge, this is the first reported case in our department.

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