



## A RARE CASE OF LARGE VESICAL CALCULUS PROVING TO BE A SURGICAL CHALLENGE.

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**ABSTRACT** Giant bladder calculi are not common in modern urology and many have been found to grow to enormous proportions with minimal symptoms. We report a 225 grams stone removed from the urinary bladder of a 65 year old Indian man. The stone was associated with troublesome urinary frequency, which necessitated removal by open cystolithotomy. The calculus measured approximately 11cmx11cmx4cm in length, breadth and height. The composition of the stone was calcium carbonate, calcium oxalate and uric acid. The patient had been operated multiple times for urethral stricture and presented to the casualty as a case of acute abdomen with burning micturition. Further evaluation revealed a vesical calculus of size 11.5cmx11cmx4.5cm on ultrasonography and a similar mass was observed in the Xray KUB. An elective open cystolithotomy was performed and the patient had an uneventful postoperative period. Large vesical calculi are a surgical challenge and extracting them with injury to bladder requires good surgical expertise.

**KEYWORDS :** Bladder, calculus, stone, Large bladder calculus, open cystolithotomy, surgery, urology.

### INTRODUCTION:

Bladder calculi have plagued mankind since time eternal. Archeologists discovered a stone resting in the pelvis of an ancient Egyptian skeleton dating back more than 7000 years.[1] Although the ancient Greeks described the perineal vesicolithotomy 4000 years later, it was not until the 5th century BC that Hippocrates thoroughly documented this aggravating malady. The first true "lithotomist," Ammonius of Alexandria, emerged about 200 BC. He utilized the perineal approach and invented the handheld lithotrite.[2] Many of the principles developed by early pioneers are still in use today.

Bladder calculi account for 5% of urinary calculi and usually occur because of foreign bodies, obstruction, or infection. Males with prostate disease or previous prostate surgery and women who undergo anti-incontinence surgery are at higher risk for developing bladder calculi. Patients with indwelling Foley catheters are at high risk for developing stones. There appears to be a significant association between bladder calculi and the formation of malignant bladder tumors in these patients. Patients who undergo bladder-augmentation procedures using a vascularized gastric patch appear to be protected from vesicolithiasis, perhaps by the acidic environment. Ileum and colon tissues, however, are colonized by urease-producing organisms, producing an alkaline pH that promotes stone formation. Children remain at high risk for bladder-stone development in endemic areas. Diet, voiding dysfunction, and uncorrected anatomic abnormalities, such as posterior urethral valves and vesicoureteral reflux, predispose them to bladder-calculus formation. Relieving obstruction, eliminating infection, meticulous surgical technique, and accurate diagnosis are essential in their treatment.

A urinary bladder calculus more than 100 gram (gm) in weight is classically labelled as giant vesical calculus.[3] Fewer than 100 cases have been reported in the literature with weight more than 100 gm and almost all of them had bladder outlet obstruction.[4]

### CASE REPORT:

#### History:

A 65 year old male presented to the casualty with complaints of pain in abdomen (pelvic region associated with burning micturition for 10 days. There was no h/o fever or vomiting. The patient had been operated multiple times for urethral stricture disease. He had no other comorbidities. He had no previous history of stone formation in kidneys or bladder.

#### Examination and Investigations:

On examination, he was vitally stable and fully conscious. Per

abdomen examination revealed a tenderness at the lower abdomen. The prostate was normal on per rectal examination. Blood investigations revealed an elevated leukocyte count and urine microscopy and culture sensitivity revealed *Escherichia coli* sensitive to amikacin. Antibiotics were started to control the urinary tract infection. Ultrasonography suggested a large vesical calculus of size 11.5cmx11cmx4.5cm with bilateral normal kidneys. Radiography of kidney-ureter-bladder revealed a radio-opaque shadow in the pelvic region corresponding to the USG findings.



Digital Xray KUB showing large vesical calculus

#### Surgical intervention:

The patient underwent an elective open cystolithotomy in which a large calculus measuring approximately 11cmx11cmx4cm in length, breadth and height and weighing 225 grams was extracted from the bladder. Post operative period was uneventful. The patient was

discharged on postoperative day 4 and catheter was removed on further follow up on postoperative day 14. At 6 weeks post-surgery, follow-up cystoscopy was normal without any residual stone, bladder outlet obstruction, or cystitis/urethritis.



**Gross specimen of large vesical calculus. Extraction necessitated breaking up of the calculus.**

#### DISCUSSION:

Urinary tract stones have continued to be a cause of concern for humans since time immemorial, and symptoms of bladder calculus were described by Hippocrates.[5] Prevalence rate of urinary tract stones in developed countries is between 4–20%, while in Asia it is estimated to be between 1–19.1%[6,7] Bladder calculi are usually secondary to calculi in the kidney or ureter, and it is rare to find primary bladder calculus in healthy adults. Bladder calculi constitute approximately 5% of all urinary tract stones.[3] Bladder stones in adults are composed of uric acid in almost 50% of the cases without having features of gout or hyperuricemia.[8]

Any factor causing urinary stasis, such as benign prostatic hyperplasia, neurogenic bladder, urethral strictures (as seen in our patient), and recurrent urinary tract infections, lead to formation of stones in urinary bladder.[9] Foreign bodies such as stents and catheter act as niduses for stone formation.[3] It is unusual to have giant bladder stone without any predisposing condition.

Bladder stones have varied clinical presentations ranging from completely asymptomatic to acute retention of urine. It may present with defecatory problems, bilateral hydronephrosis, hematuria or acute renal failure

Treatment of bladder stones has undergone a sea of changes in the last few centuries. The first documented suprapubic lithotomy was performed by Pierre Franco in 1561.[10] Bigelow in 1874 advanced bladder stone surgery by designing a larger lithotrite with which he performed litholapaxy.[10] Recently advanced endourological procedures have replaced an open approach to urinary tract stones but an open surgical approach is still used if stones have an atypical presentation, are large or multiple in number, or if advanced facilities are not available.[11,12] Endourological procedures such as pneumatic lithotripsy are equally effective and safe with considerably lower morbidity.[13] Percutaneous cystolithotripsy has a greater than 90% stone-free rate with the added benefit of no increased risk of developing urethral stricture as no endoscopic sheath is passed per urethra.[14,15] Stone clearance rate and success of lithotripsy also depends on size and Hounsfield unit of stones.[16] Extracorporeal shock wave lithotripsy is better for high-risk surgical patients or those having smaller stones.[14]

#### CONCLUSION:

Giant urinary bladder stones are rare and have different ways of presentation. Finding the cause of stone formation is as important as the diagnosis itself to prevent recurrence. Any pathology causing bladder outlet obstruction must be diagnosed and treated to prevent recurrence. Prompt diagnosis, early intervention, and follow-up are paramount to having a good prognosis. Treatment modality for each patient differs with respect to the size and number of stones and

associated comorbidities.

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