

A Rare Cause of Acute Renal Failure - Giant Urinary Bladder Calculus



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Abstract

Urinary bladder calculus accounts for < 5% of urinary calculi. Elderly men are more prone to bladder calculus secondary to intravesical obstruction caused by benign prostatic hyperplasia, neurogenic bladder and urinary tract infection. Bladder stones are also seen in patients with augmentation cystoplasty and neobladder construction following radical cystectomy due to chronic exposure to intestinal mucosa. However, primary bladder calculus in the absence of renal stones is rare and presentation as renal failure is rarely reported. We present a case of young male without prior significant past medical history presenting with acute renal failure and was found to have massive urinary bladder calculus, discussing the etiopathology and management.

Introduction

Though urolithiasis is a common problem worldwide, urinary bladder calculi are rare. Primary bladder calculi are more common in children exposed to low protein, low phosphate diet. Secondary bladder calculus is seen in adults and generally associated with bladder outlet obstruction. Giant urinary bladder calculus is defined as weight > 100gm or > 4cm in size. Most common presentation is lower urinary tract symptoms like intermittency, dysuria, frequency and urgency. Acute renal failure as an initial presentation is rare and only 1 case has been reported.

Case Presentation

A 35year male with no significant past medical history presented with complaints of nausea, vomiting and oliguria along with bothersome lower urinary tract symptoms (LUTS) of 15 days duration. On examination, patient was conscious, afebrile, vitals were stable and physical examination revealed bilateral lower limb oedema. On systemic examination, a non tender hard mass was palpable in lower abdomen. Routine hemogram and biochemistry lab work up was normal. Renal function test showed serum Urea-114mg/dl and serum Creatinine - 5.4mg/dl. Urine routine showed 15-20pus cells. Patient was catheterized with 16 French Foley s catheter and 500ml clear urine was drained immediately. Ultrasound abdomen was done which showed bilateral hydronephrosis and a large high intensity lesion with posterior acoustic shadowing

in urinary bladder suggestive of calculus. Subsequently, x ray kidney, ureter and urinary bladder showed a massive radio opaque shadow in the pelvis (Figure 1). A non-contrast CT abdomen and pelvis confirmed giant urinary bladder calculus with bilateral hydroureteronephrosis likely due to obstruction (Figure 2).



Figure 1: X-ray kidney, ureter, urinary bladder showing a large calculus in the pelvis.

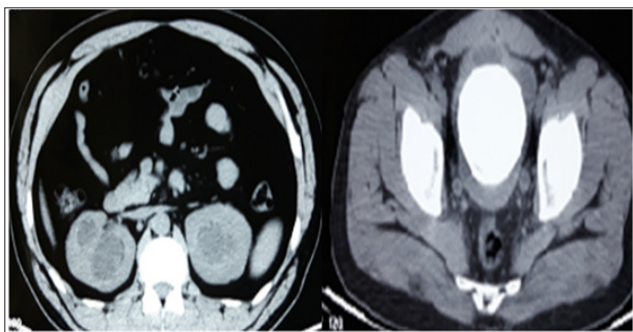


Figure 2: Non contrast CT Abdomen and pelvis showing large calculus occupying the whole surface of bladder with bilateral hydronephrosis.



Figure 3: Stone fragment removed after making them piece meal with chisel and hammer weighing over 490gm.

Patient was kept under observation and discharged after 48hrs of hospital stay on oral antibiotics. Patient was reviewed after 2weeks, renal function test showed serum Urea-34mg/dl and serum creatinine-1.4mg/dl. Urine culture was sterile. We planned for an extraperitoneal open cystolithotomy in this case. Lower midline incision was given, abdomen opened in layers, peritoneum was carefully mobilized above, and we ensured to remain extraperitoneal space. Bladder was palpable was hard giant stone felt prominently. After stay sutures on bladder wall, anterior surface of bladder was opened for a length was 4cm. Stone was visible which appeared smooth in surface. Urinary bladder wall was thickened. In view of giant stone and to avoid large bladder incision, we broke the stone into fragments using chisel and hammer keeping deavers retractor inside the bladder as counterbalance mechanism to avoid injury to the bladder wall. All the fragments were removed piecemeal and weighted over 490gm. Figure 3 Both the ureteric orifices were visualized, and clear efflux documented. Suprapubic catheter was placed, and urinary bladder and abdomen was closed in layers over extraperitoneal drain. Post-operative course was uneventful. Patient was discharged on day 5 and followed up after 3weeks. Stone analysis using infrared spectroscopy revealed calcium oxalate stones. A cystogram was performed which showed no evidence of filling defects and contrast extravasation. Per urethral was removed and supra pubic catheter

was clamped. Patient was voiding well, and suprapubic catheter was removed after 1 week as well. Patient is now planned for stone metabolic work up including 24 hour urine sampling.

Discussion

Bladder stones comprise around 5% of urinary stones [1]. They can be primary or secondary stones. Most common causes are neurogenic bladder dysfunction, bladder outlet obstruction, urinary tract infection, bladder diverticulum, foreign bodies and long term catheterization. It is more often seen in low socioeconomic and underdeveloped countries secondary to malnutrition and consist 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. A giant urinary bladder calculus defined as weighing >100 gm is rarely seen in urology practice [2]. Only few case reports of giant bladder calculus weighing around 500 gm have been reported. The pathophysiology behind large bladder calculus is nidus of infection or a small stone which gets layered with deposition of calcified matrix. Bladder stones are often multilayered. Males are affected more common than females. The typical symptoms of bladder calculi are suprapubic pain, dysuria, intermittency, terminal hematuria and urinary retention [3]. Acute renal failure with features of oliguria and raised creatinine is a rare presentation of bladder calculus.

The index case presented with features of acute renal failure to start with, which settled after placing per urethral catheter. The likely cause of such rare manifestation is either intravesical obstruction or giant bladder calculus pressing on bilateral ureteric orifices causing upstream dilatation. Diagnosis is confirmed by imaging studies which include ultrasound, x ray and CT scan. The choice of treatment depends on aetiology and size of bladder calculus. Giant bladder calculus surgery is usually done by open cystolithotomy. Endoscopic lithotripsy and percutaneous lithotripsy are other options [4]. In the era of minimally invasive surgery including laparoscopy and robotics, few remote places with no access, open procedures are still preferred with excellent results and minimal morbidity. In the index case, we performed open cystolithotomy, crucial point to high lightened was we operated with small bladder incision, unlike large incision or remove bladder stone in toto. We rather fragmented the calculus into small pieces using chisel and hammer carefully preventing bladder wall injury and completely removed the stone.

Conclusion

Patients can develop giant urinary bladder calculi even in the absence of secondary causes. Acute renal failure is rare presentation. Complete clearance is the key for prevention of recurrence. Early detection by surveillance will avoid the unnecessary morbidity.

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