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Coincidental finding of a giant bladder calculus and squamous cell carcinoma of bladder: A case report

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Abstract

Chronic irritation of bladder by urinary bladder calculus is a known risk factor for bladder cancer. The use of Wrigley's obstetrical forceps in general surgical practice is a rare event. Herein, we report a case of a giant urinary bladder calculus which was removed by Wrigley's obstetrical forceps during open cystolithotomy. The bladder biopsy showed squamous cell carcinoma of the bladder. With this report, we aim to create an awareness among surgeons about the role of the Wrigley's obstetrical forceps during open cystolithotomy, and the role of taking urinary bladder biopsy from chronically inflamed/unhealthy sites.

Keywords

Urinary bladder calculi, obstetrical forceps, cystolithotomy, urinary retention, hematuria, squamous cell carcinoma of bladder

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Introduction

Urinary bladder calculus accounts for 5% of all urinary calculi,[1] which is curable with many options for treatment.[2] Calculus weighing more than 100 grams, or measuring more than 4 cm, is regarded as a giant calculus.[3,4] Urinary bladder calculi is reported in children,[5] in pregnancy,[6] as well as after colposuspension.[7]

It usually develops due to urinary stasis, bladder outlet obstruction (BOO), or a combination of both.[1] Benign prostatic hypertrophy (BPH), urethral strictures, and adenocarcinoma of prostate predispose to bladder calculus formation. Urinary tract infection (UTI) with certain bacteria predisposes to bladder calculi.[8] Interestingly, urinary bladder calculus too causes BOO.[9]

Acute urinary retention is a common presentation of bladder calculus, especially in association with a small bladder calculus.[10] Such a presentation is common in young patients with a history of recent renal colic. Some patients remain completely asymptomatic, whereas some present with dysuria, frequency, hematuria, poor stream, and lower abdominal pain.[8,10] Obstructive uropathy is a known complication of urinary bladder calculus, which might resolve after removal of the calculi.[8]

The surgical treatment of bladder calculus includes direct calculus chemolysis, extra-corporeal shock waves lithotripsy, cystolithotomy, transurethral cystolithotripsy, holmium laser, and different energy source.[2,6,9,11–13] The choice of surgery would depend on the availability of equipment, surgeons' expertise, and patients' factors including general fitness and size of calculus. There are reports of using obstetrical forceps to extract giant bladder calculus,[4,14,15] and reports of urinary bladder calculus with squamous cell carcinoma of bladder (SCCB).[13,16–19] Chronic irritation of the bladder by calculus is considered carcinogenic.

Herein, we report a case of late diagnosis of a giant bladder calculus in a 64-year-old man, despite being symptomatic for the last 2 years. His bladder calculus was extracted with the help of Wrigley's obstetrical forceps. The random biopsy from inflamed bladder mucosa revealed SCCB. With this report, we aim to create awareness among surgeons about the role of Wrigley's obstetrical forceps during open

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cystolithotomy for a giant bladder calculus, and the role of biopsy from chronic inflamed bladder mucosa.

Case report

A 64-year-old male, presented to the general surgical outpatient department (GS-OPD), Jigme Dorji Wangchuck National Referral Hospital (JDWNRH) with suprapubic pain for 2 years duration. The pain was dull aching in nature, which started gradually. He also experienced occasional hematuria and dysuria in the last 2 months. He does not give a history of flank pain associated with fever. There is no history of acute urinary retention, history of surgeries for urinary tract stones, gallstones, and other surgeries of his bladder or urethra. There is no history of previous urethral catheterization or taking treatment for UTI.

He has been a hypertensive patient for the last few years, not on regular medication.

On abdominal examination, there was no suprapubic tenderness or palpable pelvic mass. Digital rectal examination revealed normal size and consistency of prostate gland. Rest of the examination findings did not reveal anything abnormal. He was able to walk independently without any neurologic deficit.

The urine microscopic examination showed red blood cells (RBC) > 15/high power field (HPF) (normal is <5/HPF), and absent white blood cells (WBC). There was no growth of organisms in urine culture. His serum creatinine was 1.1 mg/dL (normal is 0.6–1.2), blood urea was 39 mg/dL (normal 15–45), serum calcium was 8.9 mg/dL (normal 8.6–10.8), serum uric acid was 7.1 mg/dL (normal 3.6–8.2), and random blood sugar (RBS) was 115 g/dL.

X-ray KUB (kidneys, ureters, and bladder) revealed a large right staghorn calculus and a giant bladder calculus (Figure 1). Computed tomography (CT) of KUB confirmed the presence of a large staghorn calculus in the right renal pelvis and calyces, causing moderate hydronephrosis and renal parenchymal thinning. A giant solitary bladder calculus was noted (Figure 2). There was no obvious growth in the bladder, pelvic and para-aortic lymphadenopathy, and lesions in the lungs and liver in the CT scan. Diagnostic cystoscopy was not performed preoperatively, as we did not suspect abnormalities other than the giant calculus.

Patient and his party were informed about the diagnosis and management plan. After appropriate counseling, written informed consent was obtained for open cystolithotomy under spinal anesthesia. Percutaneous nephrolithotomy (PCNL) under general anesthesia was planned for the next sitting.

A suprapubic transverse skin incision was made, and cystostomy performed via extra-peritoneal approach by making a vertical incision, which further revealed an oval off-white-colored hard calculus. An attempt to deliver the calculus bimanually was quickly abandoned, fearing the possible risk of injury to the nearby organs. The next option of using the Wrigley's obstetrical forceps (Figure 3) for stone extraction was decided. The forceps blades were applied on the bladder calculus ensuring that the bladder is not entrapped between the blades of forceps and the calculus (Figure 4). The extraction pull was applied in upward, followed by forward direction, and then gentle side-to-side movement,[14] thereby removing the calculus (Figure 5) without causing injury to the surrounding structures. The pieces of calculi that were

Figure 1. X-ray KUB showing a large radiopaque density with branching pattern conforming to renal pelvis and calyces indicative of right staghorn calculus. There is another even bigger round to oval-shaped radiopaque density within the pelvic cavity suggestive of a giant bladder calculus.

Figure 2. Plain CT KUB showing right staghorn and giant bladder calculus measuring $9.5 \times 9.4 \times 11.1\ cm^3$.

Figure 3. The Wrigley's obstetrical forceps that was used for calculus extraction.

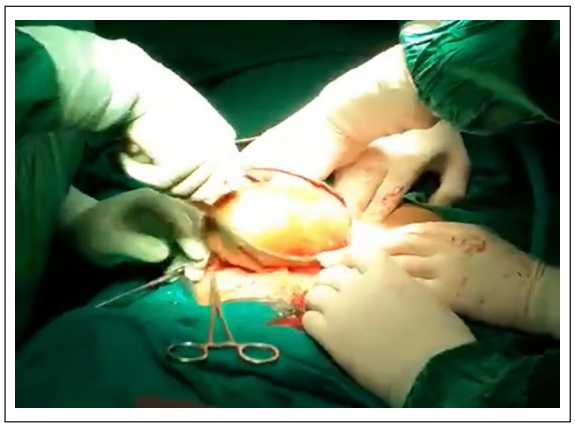

Figure 4. Intraoperative image showing removal of calculi by Wrigley's obstetrical forceps.

broken during the procedure were irrigated with copious amounts of normal saline.

The base of bladder epithelium was noted to be thickened, probably due to chronic inflammation as a result of bladder calculus. Multiple biopsies from the inflamed site were taken, which later revealed SCCB in the histopathology examination. Foley's three ways urethral catheter was kept in situ. The bladder wall and the abdominal wall were closed in the standard steps.

Bladder irrigation was continued for 48 h. He made an uneventful postoperative recovery, and he was discharged home on third postoperative day with catheter in situ. The urethral catheter was removed on the 14th postoperative day. He did not develop acute urinary retention after removal of the catheter. Ultrasound scan to assess the post-void residual (PVR) volume of urine was not performed, as he did not complain of any lower urinary tract symptoms.

The patient passed away on the 45th postoperative day, while he was awaiting assessment of SCCB for staging

Figure 5. Urinary bladder calculus measuring 16 × 12 cm^2 size, and weighing 800 grams.

purposes, due to some respiratory complications in the community. The exact cause of death remains unknown.

Discussion

Urinary bladder calculus is more common in male than in females.[9] It is commonly associated with urinary stasis due to neurologic injury, bladder reconstruction, or BPH.[8] It may develop in the presence of chronic infections with urea-splitting bacteria or secondary to the presence of foreign bodies.[8,19] Most giant bladder calculi are composed of struvite or calcium phosphate, and rarely uric acid.[1] While our patient is a 64-year-old male, he did not have any one of these risk factors, and the chemical constitution remains unknown, due to lack of facilities for analysis.

Our case presented with chronic lower abdominal pain, associated with recent onset hematuria and dysuria which is in line with the symptoms of urinary bladder calculi.[8,14]

As in our case, urinary bladder calculi are diagnosed using X-ray KUB[4,9,14,19] and CT-KUB.[15,19] Ultrasound scan is useful to look for bladder stones and hydroureteronephrosis.[19]

Similar to our case, Wrigley's obstetrical forceps is used for safe removal of surrounding structures. The largest giant urinary bladder calculus removed by obstetrical forceps in 1940 was 35 × 29 cm^2 size.[14] If bladder stone forceps fail, or if the manual removal has risk of injury to the surrounding structures, it is safer to use obstetrical forceps.[14,15] In our case, considering the giant calculus, open cystolithotomy was opted. The giant solitary bladder calculus was removed by using Wrigley's forceps safely following the steps described by Albert M. Crance.[14]

The age-standardized incidence rate of bladder cancer in south-east Asia is 4.6 in males and 1.1 in females per 100,000 in 2020.[20] SCCB consisted of 1.2% of all bladder cancers.[21] Chronic bladder irritation by calculus is considered carcinogenic.[17] Similar to our case, there are reports of SCCB in association with a giant bladder calculus.[13,18,19] Other risk factors for developing bladder cancer includes

male sex, smoking, urinary catheterization, repeated UTI, personal or family history of bladder cancer, and medical conditions like diabetes and obesity.[22,23]

The treatment of non-muscle-invasive bladder cancer is aimed at reducing recurrences and preventing disease progression. In case of muscle-invasive disease, the goal is to determine whether the bladder needs to be removed or preserved without compromising survival. For metastatic disease, the concern is to prolong survival with quality life. Depending on the stage of disease, the surgical options are transurethral resection of bladder tumor (TURBT), partial cystectomy, and radical cystectomy taking into consideration bladder function, comorbidities, and life expectancy.[22]

Our hypothesis about our case is that the SCCB resulted from prolonged irritation with a large giant calculus, because there was no obvious growth on the bladder wall. However, the calculus as a cause or consequence of cancer is difficult to ascertain.[17] This suggests the importance of taking multiple biopsies from an unhealthy or an inflamed area of bladder during open cystolithotomy for bladder calculus. A diagnostic cystoscopy prior to open cystolithotomy will be useful to diagnose unsuspected growth in the bladder and plan management accordingly.

Conclusion

Any patient with lower urinary tract symptoms should be thoroughly investigated by proper history, physical examination including digital rectal exam. Urine analysis might give a clue to the possible etiology which will be done by imaging studies such as X-ray and CT scan. In cases of a giant bladder calculus, the Wrigley's obstetrical forceps is a helpful tool that can be used for removal of calculus. Multiple biopsies from chronic inflamed bladder mucosa or unhealthy areas may reveal malignancy, which otherwise will remain undiagnosed. A diagnostic cystoscopy prior to open cystolithotomy will be useful to diagnose unsuspected growth in the bladder and plan management accordingly.

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Ethical approval

Our institution does not require ethical approval for reporting de-identified individual case reports.

Informed consent

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