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Bladder Calculus Complicating Intravesical Foreign Body with Rectovesical Fistula and Fournier's Gangrene

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Abstract

We report a case of a 22-year-old man who presented with suprapubic pain and swelling, intermittent haematuria, acute-on-chronic urinary retention, leakage of urine from the rectum, scrotal gangrene and urosepsis. Abdominal ultrasound scan done showed a large bladder stone formed around a piece of bamboo stick with bilateral hydroureteronephrosis. He was treated by open cystolithotomy, scrotal debridement, suprapubic urinary diversion, scrotal wound dressing and broad-spectrum antibiotics. The chemical analysis stone showed that it was composed of calcium phosphate mixed with calcium oxalate. The rectovesical fistula healed spontaneously after three weeks and the scrotal gangrene healed by secondary intention after six weeks of antibiotics, sitz bath and wound dressing with honey-soaked gauze.

Key Words: Bladder calculus, foreign body, bamboo stick, rectovesical fistula, scrotal gangrene.

CASE REPORT

A 22-year-old man presented in the urology clinic with suprapubic swelling and pains of one year duration. He had associated fever, frequency, nocturia, urgency, dysuria and intermittent, total haematuria. He also complained of voiding symptoms including poor urinary stream, and straining. He had chronic urinary retention and leakage of urine from the rectum on straining at stooling and micturition. There was associated scrotal pain, swelling and gangrene with ulceration of six months duration. He initially denied any history of previous trauma, urethral instrumentation or urethritis at time of admission. But on further questioning, he admitted to having fallen from a palm tree two years previously, sustaining rectal injury with bleeding per rectum and haematuria following bamboo stick impalement, which was treated at home with herbal preparations. On examination, he was febrile, pale and moderately dehydrated with a firm, tender suprapubic mass, extending up to 10cm above the symphysis pubis in keeping with acute-on-chronic urinary retention. He also had scrotal gangrene limited to the posterior surface of the scrotum. Digital rectal examination revealed that the prostate gland was not enlarged with induration of the anterior rectal wall noted. Attempt at urethral catheterization failed with tip of catheter held up at bladder neck. Abdominopelvic ultrasound scan revealed a large bladder stone, with bilateral hydronephrosis. Plain abdominal X-ray showed large radio-opaque bladder calculus. Complete blood count showed that the patient was anaemic with haemoglobin of 8g/dl (haematocrit 24%), and had leucocytosis (white blood cell total count14.6 x109/l). Renal function tests revealed serum urea of 18.2 mmol/l, elevated creatinine level of 270 micromol/l, sodium of 137 mmol/l, potassium of 3.4 mmol/l, chloride of 96 mmol/l and bicarbonate of 22 mmol/l. Urinalysis revealed microscopic haematuria, proteinuria, pyuria and presence of nitrites. Urine culture grew Escherichia

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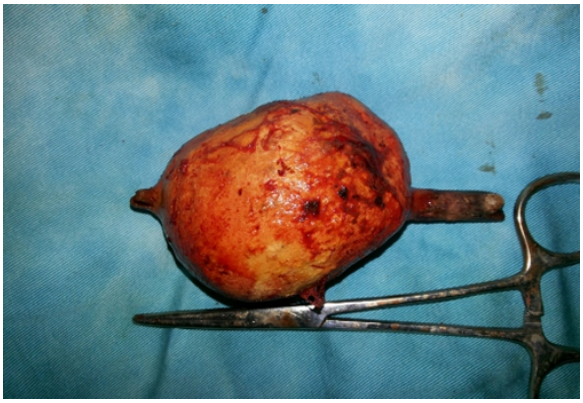

Figure 1: Bladder stone formed around a bamboo stick.

coli sensitive to cefuroxime and ceftazidime. Scrotal wound swab showed mixed growth of staphylococcus aureus, Escherichia coli and proteus mirabilis sensitive to ceftazidime, ceftriaxone, levofloxacin and gentamicin.

A diagnosis of Bladder Calculus complicating Intravesical Foreign Body with Rectovesical fistula, Fournier's gangrene and Urosepsis was made.

The patient was admitted and treated with intravenous fluids and antibiotics (ceftriaxone plus metronidazole and gentamicin). He had suprapubic cystolithotomy and scrotal wound debridement under spinal anaesthesia. A large intravesical calculus formed around a scaffold of bamboo stick penetrating the posterior bladder wall and anterior rectal wall was removed. The stone measured 10cm x 8cm x 7cm and the stick was 12.5cm long. The bladder was irrigated with normal saline and closed in two layers with suprapubic urine diversion. Urethral catheter was left in situ, spigoted initially with drainage via the suprapubic catheter. Retropubic tube drain was placed in the cave of retzius. Palpation of the rectum revealed a rectovesical fistula leaking urine. He had scrotal wound debridement, wound cleaning with hydrogen peroxide and normal saline. Wound dressing with sodium hypochlorite solution alternating with honey-soaked gauze was continued in the ward for 4 weeks. Renal function improved with suprapubic drainage. Urosepsis and anaemia were treated with appropriate antibiotics and blood transfusion. The suprapubic catheter was removed after 2 weeks and the urethral catheter at 4 weeks after satisfactory suprapubic wound healing. There was no leakage of urine from the rectum after 4 weeks. A cystogram done before removal of the urethral catheter did not reveal a rectovesical fistula. There was satisfactory scrotal wound healing after six weeks of sitz bath and dressing. Follow up in the urology clinic revealed no leakage of urine per rectum at straining during stooling or micturition. The bladder stone analysis revealed calcium phosphate mixed with calcium oxalate crystals.

Discussion

Bladder calculi account for about 5% of urinarycalculi1.Secondary vesical stones complicating bladder outlet obstruction, residual urine and infection from benign prostatic hyperplasia, prostate cancer, urethral stricture, bladder neck contracture, neurogenic bladder and vesical schistosomiasis are common[1,10]. Vesical calculi following intravesical foreign bodies are not as common. Foreign bodies in the bladder may be self-introduced, iatrogenic, migratory or following penetrating injuries. Self-insertion of foreign bodies may follow auto-eroticism, inquisitiveness or psychiatric illness. Diverse foreign bodies in the bladder including electric wires, light bulbs, thermometers, foreign bodies introduced to procure abortion or prevent conception, plastic tubing and aerosol caps have been reported[8,9,10,11]. Iatrogenic foreign bodies including fragment of catheter balloon, beak of resectoscope sheath, urethral stents, retained suture material, staples and vascular clips have also been documented[13,14,15,16]. Migratory foreign bodies from surrounding pelvic organs, including intrauterine contraceptive devices like copper T, vaginal pessaries, aerosol cap, artificial urinary sphincters and prosthetic slings have been found in the bladder[11]. Gossypiboma, textiloma and gauzoma are terms used to denote foreign materials like gauze, sponges and towels inadvertently left in body cavities after surgery[5]. Penetrating injuries from gunshot wounds and stick impalement injuries may lead to bullet fragments and stick splinters in the bladder. Complications of intravesical foreign bodies include lower urinary tract symptoms, recurrent urinary tract infections, urinary retention, calculi formation, renal failure, urosepsis, scrotal gangrene, fistulae formation and squamous cell carcinoma[8,9,11].

The index patient presented with a history of

neglected rectal impalement injury from a bamboo stick. The injury was managed at home by herbal treatment. He subsequently formed a large bladder stone with suprapubic pains, lower urinary tract symptoms, chronic urinary retention, haematuria, urosepsis, rectovesical fistula and scrotal gangrene. Treatment options for bladder stones include open or percutaneous cystolithotomy, cystoscopic removal, cystolitholapaxy, laparoscopic cystolithotomy and endoscopic cystolithotripsy, depending on the size and equipment availability[8]. Cystolitholapaxy using an electrohydraulic lithotripter and Holmium: YAG laser lithotripsy introduced in a resectoscope sheath are endoscopic methods of bladder stone fragmentation[15,16]. Open procedure is preferred when the foreign body is large and only partially inside the bladder, embedded in the bladder wall or cannot be easily fragmented[6,12]. Concomitant treatment of underlying bladder outlet obstruction is done if present. In the index patient, due to the large size of the stone, with the bamboo stick embedded in the posterior bladder wall and penetrating into the rectum, open cystolithomy was done. The bladder was closed in two layers with a suprapubic urinary diversion. The scrotal gangrene was debrided and treated with broad spectrum antibiotics. Satisfactory secondary wound healing occurred and the rectovesical fistula healed spontaneously.

Intravesical foreign bodies have the potential to form a calculus through the process of heterogeneous nucleation and aggregation. The bamboo stick in our patient had formed a scaffold which served as nidus for stone formation, with resulting supersaturation, aggregation and proliferation of crystal growth around the stick. The stone was radiopaque on plain abdominal radiograph and analysis of the stone revealed a mixture of calcium phosphate and calcium oxalate. Approximately 90% of urinary calculi are radiopaque since they consist of calcium phosphate and calcium oxalate. Less radiopaque stones include magnesium-ammonia-phosphate (struvite) and cysteine, while uric acid stones are radiolucent[8,13]. Phosphate stones account for 12-20% of all urinary calculi8. Foreign body intravesical stones are mostly composed of a mixture of struvite and carbonate apetite which are infective stones. Infection by urea-splitting organisms like proteus mirabilis lead to alkalinization of urine[15]. Foreign bodies increase susceptibility to urinary tract infection and accumulation of crystalline and organic components. Stone analysis in the index patient however showed mixture of calcium phosphate and oxalate, which are common components of urine, and phosphatic stones account for 20% of all urinary calculi[8,15].

In the index patient the stone was large enough to cause urinary retention and bilateral hydroureteronephrosis. He now voids freely with good urinary stream and improved renal function.

Conclusion

Bladder calculi and intravesical foreign bodies should be considered in the differential diagnosis of patients with lower urinary tract symptoms. Proper evaluation of patients with penetrating or blunt abdominoperineal trauma is important. History, clinical examination and basic radiological investigations like abdominal ultrasound scan, plain X-rays and cystoscopy would detect the presence of vesical foreign bodies. Penetrating genitourinary injuries should be explored and treated primarily. Removal of the retained bamboo stick at the time of the rectal impalement injury and subsequent complications of haematuria, urosepsis, bladder calculus, fistula formation and scrotal gangrene could have been prevented.

Declaration of patient consent:

The authors certify they obtained appropriate patient consent forms. The patient has given his consent for his images and other clinical information to be reported in the journal. The patient understands that his name and initials will not be published and due efforts will be made to conceal his identity.

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