CASE REPORT

Giant urethral diverticulum calculus presenting as scrotal abscess

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We report herein a patient with a urethral calculus associated with urethral diverticulum. A 39-year-old man presented with scrotal swelling and acute retention of urine. Computed tomography of the pelvis and cystoscopy demonstrated a giant calculus in the proximal penile urethra. Emergency in-situ lithotripsy was performed. Complete stone clearance was achieved and a large urethral diverticulum was encountered. The rare occurrence of urethral diverticulum and associated stone disease were discussed.

Case report

A 39-year-old man was admitted to our hospital with a 1-week history of progressive scrotal swelling, dysuria, and urethral discharge. He was initially treated with antibiotics by his family physician, but with no improvement. Physical examination showed an 8-cm, tender, cystic scrotal swelling with neither crepitus nor necrotic skin change. He was afebrile and his vital signs were stable. Soon after, however, he developed retention of urine. Attempts to insert a urethral catheter were unsuccessful. Flexible cystoscopy showed a large stone causing complete obstruction at the penile urethra. A suprapubic catheter was inserted. Urgent computed tomography of the pelvis showed a 2.3 x 4.1 x 2.3 cm (anteroposterior x width x height) calculus at the proximal penile urethra and a 5.4 x 6.5 x 7.6 cm rim-enhancing fluid collection inferior to the stone in the midline (Fig 1). An emergency operation was performed under general anaesthesia. Rigid cystoscopy showed a 4-cm stone jammed in the proximal penile urethra. Disimpaction of the stone back to the bladder was unsuccessful. In-situ fragmentation of the stone with Lithoclast (EMS, Switzerland) was performed and fragments were removed with forcep. After fragmentation of the impacted stone, it was found that he had a wide-necked diverticulum in the proximal urethral. The membranous urethra, prostatic urethra and bladder were normal. An 18-Fr 2-way Foley catheter was inserted over a guidewire and its position confirmed by cystography. For his postoperative fever, he received antibiotics. He was successfully weaned off his urethral catheter and the suprapubic catheter spigotted in the early postoperative period. Daily milking of the diverticulum was performed to enhance drainage of its infected content via the urethra. The scrotal swelling gradually subsided. Follow-up micturating cystourethrogram showed dilatation of the proximal penile urethra (Fig 2) with no obstruction or residual stone fragments. There was complete emptying of bladder. We have reviewed the films with radiologists who suggested that the dilation may represent a diverticulum which was not well shown up in the micturating cystourethrogram due to lack of pressure. Retrograde urethrography was suggested for better delineation of the diverticulum. The patient defaulted all further investigations and management however.

Discussion

The overall prevalence of urethral diverticulum in both sexes is between 0.5% and 5%.[1] As suggested by Watts in 1906, urethral diverticulum can be classified into congenital versus acquired.[2,3] It is more common in females due to the anatomically poor support of the urethra, complications of childbirth, and higher frequency of periurethral abscesses.[4,5] In men, 67 to 90% of diverticula are acquired and their causes include infection, stricture disease, prolonged urethral catheterization, and accidental or iatrogenic trauma.[6]

Both congenital and acquired urethral diverticula have similar presenting symptoms and signs. Obstructive lower urinary tract symptoms, post-micturition dribble, recurrent urinary tract infections, and perineal swelling were common. In a recent Indian series, the mean age of presentation for congenital diverticula was 25 years while that for those that are acquired was 35 years, showing that a urethral diverticulum may remain asymptomatic until complications arise.[7]

Ascending urethrogram, micturating cystourethrogram, and cystoscopy are investigations that can help to make the diagnosis and reveal the configuration of such diverticula. Recently, magnetic resonance imaging has become popular in delineating their anatomy.[8]

Key words
Diverticulum; Scrotum; Urethral diseases; Urinary bladder neck obstruction; Urinary calculi

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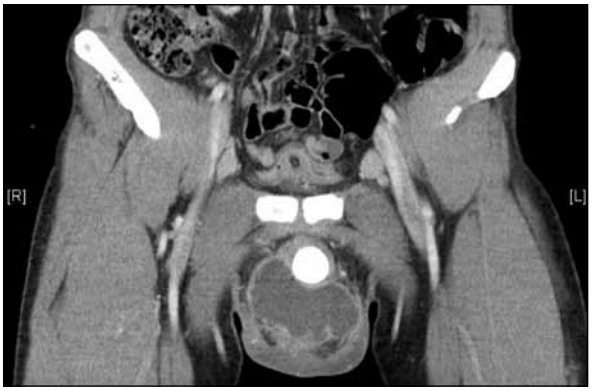

FIG 1. Reconstructed coronal computed tomographic pelvis image with contrast showing the penile urethral calculus and collection beneath

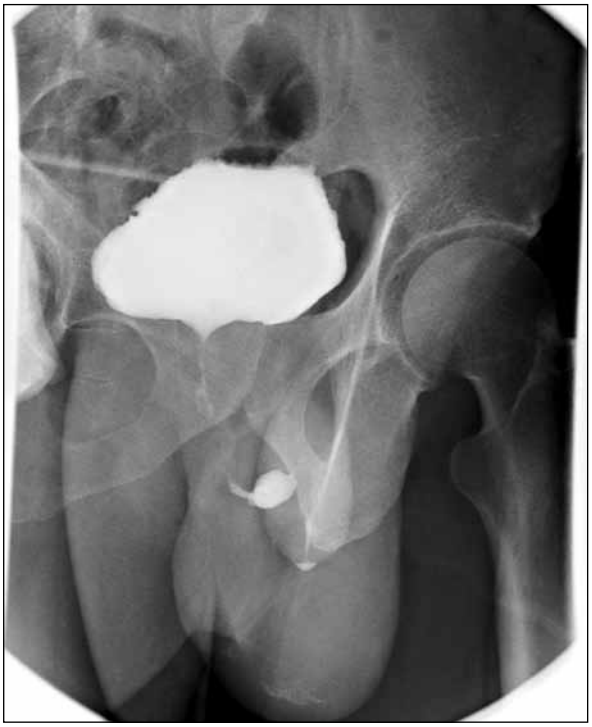

FIG 2. Micturating cystourethrogram showing focal penile urethral dilatation

The treatment of urethral diverticulum should be individualised. Options include primary anastomosis after excision or substitutional urethroplasty.[2,7,9] Alphs et al[2] demonstrated the promising results of surgical excision and reconstruction. The overall success rate was 92% with an overall complication rate of 42% after a mean follow-up of 21 months. Their group used the length of urethral defect after complete excision of diverticulum and surrounding scarred fibrotic tissue as the criteria for choosing between primary anastomosis and substitutional urethroplasty.[2] Any defect less than 4 cm is suitable for primary anastomosis, while any larger defect should be reconstructed with substitutional urethroplasty. Either buccal mucosa or penile skin can be used for substitutional urethroplasty. Common postoperative complications include urinary tract infections (25%), urinary retention (8.3%), and recurrence (8.3%).

We postulate that our patient had a pre-existing urethral diverticulum and a stone formation inside it, gradually enlarged and dislodged into the urethra causing obstruction and finally an infected collection. This could explain the occurrence of such a large stone in the penile urethra. In-situ stone formation without anatomical abnormality or passage of a bladder stone of such size seems unlikely.

Few case reports in the literature describe urethral diverticula with calculi. Ho et al[10] described a 71-year-old man with multiple stones inside peno-scrotal urethral diverticulum. There was no associated infection, and open diverticulectomy and stone removal was performed. In our patient, we undertook endoscopic in-situ lithotripsy instead of immediate surgical exploration, in order to prevent the formation of a urethro-cutaneous fistula. A staged reconstructive operation was planned but the patient defaulted.

In conclusion, urethral diverticulum is a rare disease in males. Our case presented with associated calculus and scrotal swelling. Complete stone clearance was achieved with in-situ lithotripsy. From the literature, surgical excision and reconstruction shows promising results for the treatment of urethral diverticulum.

尿道憩室內巨形結石病發時出現陰囊膿瘍

本文報告一個與尿道憩室有關的尿道結石病例。一名39歲男性出現陰囊膿瘍，並有急性尿瀦留。骨盆電腦斷層攝影及膀胱鏡檢查均顯示陰莖尿道近端有巨形結石。緊急為病人進行原位碎石後，結石完全排空，並見一個大型尿道憩室。本文討論有關尿道憩室及尿道結石的罕見病例。

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