Endourology

Anastomotic Urethroplasty for an Obstructing Calculus Within a Bulbar Urethral Diverticulum and Urethral Stricture

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A R T I C L E   I N F O
Article history:
Received 11 August 2016
Accepted 6 October 2016

Keywords:
Urethral calculus
Urethroplasty
Urethral stricture
Urethral diverticulum

A B S T R A C T
A 61-year-old male with prior history of endoscopic urethral calculus removal presented to the emergency room with urinary retention and a palpable perineal mass. A CT showed a large calcification within the bulbar urethra. After multiple unsuccessful attempts at foley catheter insertion, the urology service was consulted. The patient was taken to the operating room where an obstructing urethral calculus with associated urethral stricture was visualized on cystoscopy. We present an exceedingly rare case of recurrent urethrolithiasis with associated urethral stricture managed with initial suprapubic tube and delayed primary end-to-end urethroplasty, excision of urethral stricture and urethral diverticulectomy.

Introduction

Urolithiasis can manifest anywhere along the urinary tract but presents in the urethra only 0.3% of the time.1 Urethral calculi can be primary (arising de novo in the urethra) or migratory (translocating from the bladder or upper urinary tracts). Primary urethral calculi usually originate from calcification onto a foreign body nidus or from urinary stasis associated with a urethral diverticulum or stricture. Depending on the associated pathology, such calculi can be managed conservatively or with minimally invasive or open surgery. In this rare scenario of urinary retention due to recurrent primary urethral calculus with associated urethral diverticulum and stricture, we discuss management with initial suprapubic catheterization and delayed primary anastomotic urethroplasty and diverticulectomies.

Case presentation

A 61-year-old male with a past medical history of endoscopic removal of a urethral calculus presented to the ER with several months of urinary frequency, dysuria, difficulty emptying and bilateral flank pain which had worsened over the past several days. Clinically, he was stable. He had a leukocytosis of 19,000 per mm³. On exam, he had suprapubic fullness and a tender palpable 2 cm mass at the perineum. A CT scan was ordered which showed a 3 cm calcification in the bulbar urethra (Fig. 1). Attempts at foley catheter placement in the emergency room were unsuccessful and the urology service was consulted. On cystoscopy, a large obstructing calculus and a think circumferential fibrous stricture just distal to the calculus were visualized at the bulbar urethra (Fig. 2). A 16 Fr suprapubic catheter was then placed. Urine culture was positive for enterococcus and the patient was treated with intravenous antibiotics post operatively. He returned in one month for perineal stone extraction and end-to-end urethroplasty. Intraoperatively, a 3 cm calculus was discovered (Fig. 3) in a large bulbar diverticulum in addition to a 0.5 cm distal urethral stricture. Additionally, two 4 mm calculi were visualized just proximal to the stricture and extracted. The urethral stricture and diverticulum were excised and a primary tension-free anastomosis was performed.

Discussion

Urethral calculi can be primary or migratory and the symptomology of each is reflective of its pathogenesis. Primary urethral calculi originate in situ, present with gradually worsening lower urinary tract symptoms and are associated with foreign bodies, urethral strictures and/or urethral diverticula. Migratory urethral calculi originate from the bladder or upper urinary tract, present with acute lower urinary tract symptoms such as acute urinary obstruction and are less commonly present with concurrent urethral pathology. The treatment of each depends on the size and shape of the calculus, location within the urethra and associated urethral pathology. Calculi in the posterior urethra may be

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relocated retrograde into the bladder and treated using minimally invasive or open techniques. Open transvesical prostatolithotomy has been reported for a large vesico-prostatic calculus. Small calculi in the anterior urethra may be ‘milked’ out of the urethra and extracted. For small calculi without associated pathology, laser lithotripsy and lithoclast fragmentation can also be used. Larger calculi with irregular edges can be treated in an open fashion while simultaneously addressing the associated pathology. Kotkar and colleagues treated a large posterior urethral calculus with perineal stone excision, concurrent removal of urethral stricture and end-to-end urethroplasty.

In this case, the patient presented with a 3 cm bulbar urethral calculus located inside a diverticulum, several smaller urethral calculi and a circumferential distal urethral stricture. We propose that these calculi developed in situ for a number of reasons. First, the patient’s acute urinary retention was preceded by several years of progressively worsening urinary frequency, dysuria and sense of incomplete emptying. He was likely suffering from prolonged outlet obstruction as evidenced by a severely trabeculated bladder in the absence of an obstructing prostate. In addition, the history of endoscopic treatment of a prior urethral calculus likely contributed to development of a urethral stricture as well as structural defects of the urethral wall muscle tissue. Many years of high pressure voiding along with this history of urethral manipulation lead to the development of a urethral diverticulum, urinary stasis and the formation of primary calculi.

Due to the exceedingly rare presentation of urethral calculi and varying associated pathology, the management and eventual treatment is based on the individual clinical scenario. In this case, the location and close proximity of the urethral calculus, stricture and diverticulum predicted an excellent prognosis with a delayed perineal excision and primary urethroplasty. We advocate initial suprapubic tube diversion and delayed urethroplasty for the following situations: presence of adverse calculus characteristics (large size, irregular borders, multiplicity), adjacent urethral pathology (foreign body, stricture, diverticulum), sepsis, acute urinary obstruction and history of failed endoscopic management.

Conclusion

We present a case of acute urinary retention due to a recurrent obstructing urethral calculus inside a urethral diverticulum with associated urethral stricture. The patient was treated with initial suprapubic drainage and delayed urethroplasty with perineal excision of calculi, stricture and diverticulum. Due to the differing of clinical presentations of urethral calculi, treatment depends on the patient, characteristic and location of the calculus as well as presence and location of associated urethral pathology. In cases of large unfavorable bulbar diverticular calculi with adjacent stricture, excision and urethroplasty is favored.
Conflict of interest

The primary author listed above has no affiliations with or involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers’ bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements) or non-financial interest in the subject matter or materials discussed in this manuscript.

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