Two giant stones located in the penile and prostatic urethra: a case report and review of the literature

Penil ve prostatik üretra yerleşimli iki dev üretra taşı: bir olgu sunumu ve literatürün gözden geçirilmesi

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ABSTRACT

Urethral stones account for less than 2% of all urinary stone diseases in developed countries. Most urethral stones are associated with abnormalities that predispose individuals to urinary stasis and infections, such as strictures, lower urinary tract surgery, congenital or acquired diverticula, chronic urinary infections, foreign bodies, and schistosomiasis. The aim of this case report was to present a fifty-nine-year-old man with two giant penile and prostatic ureteral stones who received a different treatment approach. After the impacted urethral stone was seen in the anterior urethra in ureteroscopy, urethrotomy was performed with a 3 cm vertical incision in the penile urethra. Pneumatic lithotripsy was performed extracorporeally via incision. The stone in the penile urethra was disintegrated and extracted using forceps. The prostatic stone was pushed back into the bladder and disintegrated by the same urethral incision with a lithotripter through a cystourethroscope. For large, impacted urethral stones, external urethrotomy combined with externally pneumatic lithotripsy may prevent long urethral incisions. Therefore, this technique may reduce the risk of postoperative stricture.

Key words: Giant urethral stone; urethrolithotomy; urolithiasis

ÖZET

Üretra taşları gelişmiş ülkerlerdeki tüm taş hastalığının %2'den azını oluşturmaktadır. Üretral taşların çoğu striktür, alt üriner sistem cerrahisi, konjenital veya edinsel mesane divertikülü, kronik üriner enfeksiyonlar, yabancı cisimler ve şistozomiazis gibi stenoz ve enfeksiyona yol açan bozukluklarla ilişkilidir. Bu olgu raporunda, iki dev penil ve prostatik üretra taşı olan olan 59 yaşındaki erkek hastaya uyguladığımız farklı bir tedavi yaklaşımını sunmayı amaçladık. Üretroskopide anterior üretrada impakte üretra taşı görüldükten sonra penil üretraya 3 cm'lik vertical insizyonla uretrotomi uygulandı. Pnömotik litotripsi ekstrakorporeal olarak insizyondan uygulandı. Penil üretradaki taş parçalandı ve forseps kullanılarak dışarı çıkarıldı. Prostatik üretradaki taş mesane içerisine itildi ve sistoüretroskop vasıtasıyla aynı üretral insizyondan girilerek litotriptör ile parçalandı. Büyük üretra taşlarında üretrotomiyle birlikte eksternal pnömotik litotripsi uzun üretral insizyondan kaçınarak postoperatif striktür riskini azaltabilir.

Anahtar sözcükler: Dev üretra taşı, üretrolitotomi, ürolitiyazis

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Introduction

Urethral stones constitute less than 2% of all urinary stone diseases in developed countries.[1] The condition is most prominent in men rather than women because women have low rates of bladder calculi and a short urethra that permits passage of many smaller calculi.[2] Most urethral stones are associated with predisposing factors for urinary stasis and infections, such as strictures, lower urinary tract surgery, congenital or acquired diverticula, chronic urinary infections, foreign bodies, and schistosomiasis. These stones are frequently composed of struvite, calcium phosphate or calcium carbonate. The majority of urethral stones are migrated from the bladder or upper tract, and most of them locate to the posterior and anterior urethra.[3,4] Urethral stones may present with acute urinary retention, frequency, dysuria, suprapubic pain with poor or interrupted urinary stream, incomplete emptying and dribbling or incontinence. Whereas urethroscopic lithotripsy is the first choice for all urethral stones, external urethrotomy is recommended

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for large, impacted anterior urethral stones, along with urethral strictures and diverticula.[5] However, external urethrotomy potentially places a patient at an increased risk for stricture. To eliminate the necessity of external urethrotomy, the authors performed a number of manipulations, including endoscopic push-back and cystolithotripsy, non-surgical expulsion with lidocaine gel and shock wave lithotripsy.[6,7]

Our aim was to describe a patient with two large penile and prostatic urethral stones who received external urethrotomy combined with extracorporeal pneumatic lithotripsy, as well as discuss this treatment option according to the current literature.

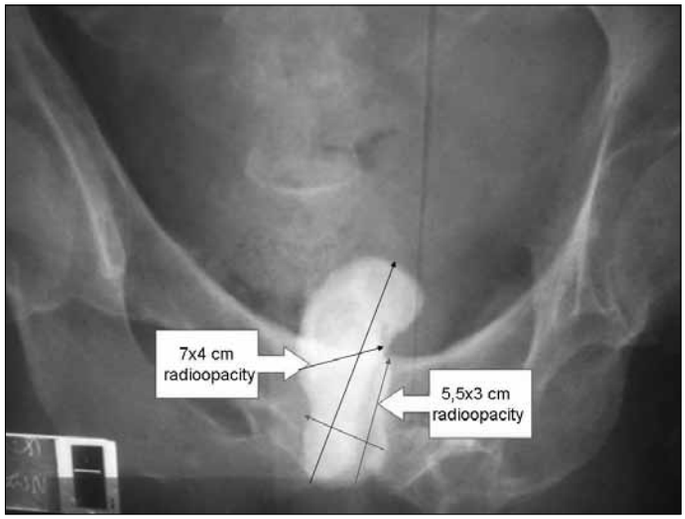

Figure 1. Pelvic radiography of the patient with two radioopacities measuring 7x4 cm and 5.5x3 cm behind the symphisis pubis

Case report

A fifty-nine year old man was admitted to our outpatient clinic with lower urinary tract symptoms. The patient had received open bladder repair surgery after a motor vehicle accident 30 years ago. According to his statement, he experienced no urination problems after the surgery. The physical examination revealed two large solid masses, which were palpated in the penoscrotal region and prostatic urethra. Pelvic radiography, ultrasound and abdominal computed tomography (CT) were performed. The pelvic radiography detected the presence of 7x4 cm and 5.5x3 cm radioopacities behind the symphisis pubis (Figure 1). Bilateral hydroureteronephrosis and a distended bladder with a 35x78 mm anterior diverticulum were seen in the ultrasound. Abdominal CT revealed a 25x40x55 mm calcification lodged in the prostatic urethra, a 30x40x70 mm calcification lodged in the penile urethra and an anterior bladder diverticulum of the aforementioned size (Figure 2a-c).

The surgery was started endoscopically by using a 22F cystourethroscope. In the endoscopic view, the impacted urethral stone was seen 10 cm from urethral meatus. After an attempt to push the stone back into the bladder failed, a urethrotomy was performed by creating a 3 cm vertical incision in the penile urethra. To avoid extending the incision, a pneumatic lithotripsy was performed extracorporeally via incision. The stone in the penile urethra was disintegrated and extracted using forceps. Then, the prostatic stone was pushed back into the bladder and disintegrated using the same urethral incision with a lithotripter through a cystourethroscope. The incision was closed with a double layer suture using 4/0 absorbable poliglycolic acid, and a urethral catheter was inserted. The patient had no postoperative complications. The catheter was withdrawn on the 14th day after surgery. At

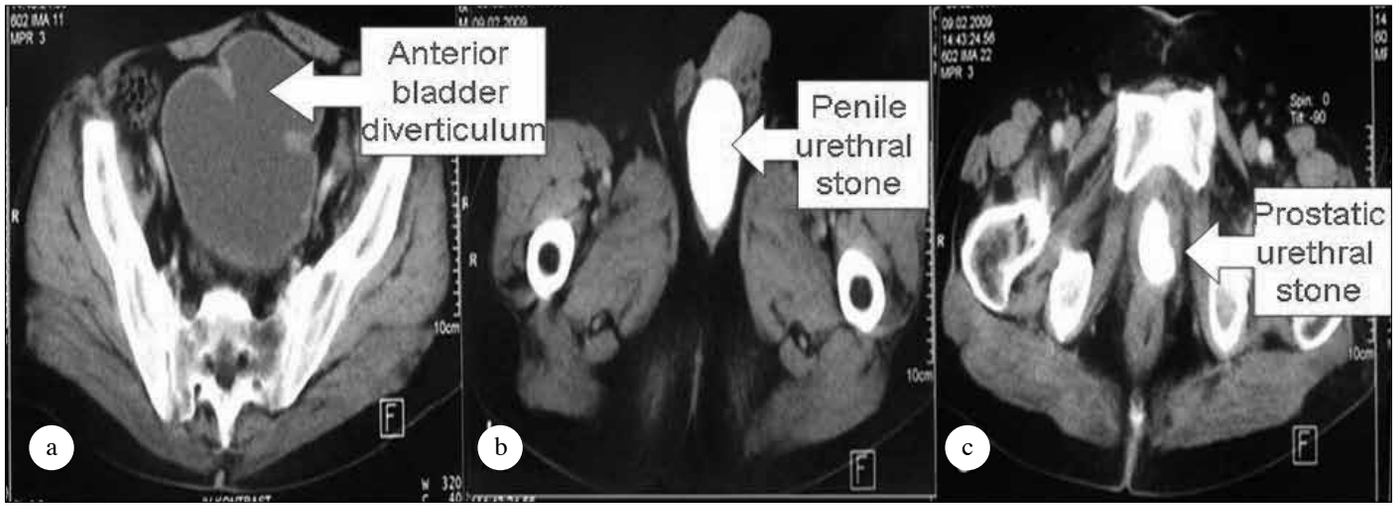

Figure 2. Abdominal CT slices of the patient with an anterior bladder diverticulum (a), calcification lodged in the prostatic urethra (b) and penile urethra (c)

Figure 3. Post-operative radiography of the patients revealed no residual fragment

Figure 4. Normal urethrography of the patient at the 3rd month follow-up

follow-up, no residual stone was observed in pelvic radiography, and no pathology was found during urethrography (Figure 3, 4). A photo of the extracted stones is shown in Figure 5. The stones were composed of calcium phosphate.

Discussion

Selli et al.[5] and Sharfi[8] reported that 56% of urethral stone patients had anatomical abnormalities in the urethra. However, stones originating from the urethra do not generally cause acute symptoms because of their slow growth and subsequent spontaneous passage. Additionally, Koga et al.[1] found that urethral stones were associated with upper urinary tract stones, such as kidney, ureter and bladder stones, and were found in 32% of the patients. According to studies, urethral stones are generally located in the posterior urethra (26.2-88%) and anterior urethra (8-68.4%) (Table 1).

The symptoms of urethral stones depend on the size and location of the stones. Male patients with urethral calculi may present with acute retention if a stone is lodged in the penile urethra. Frequency, dysuria, weak urinary stream, incomplete emptying, dribbling or incontinence are shown if a stone is situated in the prostatic or membranous urethra. Pelvic radiography and CT are the most appropriate imaging procedures despite the technical challenges. Paulk et al.[3] noted that only 42% of urethral calculi were detected at urethrography. Cystourethroscopy is a diagnostic and therapeutic tool.

According to studies, the most prominent urethral stone-associated urologic abnormalities are urethral stricture (9.3-44.1%), urolithiasis (13.3-100%) and urethral diverticulum (10.5-11.7%) (Table 1). However, we only found a bladder diverticulum measuring 35x78 mm. We hypothesized that the stones originated in the anterior bladder diverticulum in our case.

Figure 5. Extracted stones from the penile and prostatic urethra

Treatment for urethral stones depends on the size and location of the stone and on the condition of the urethra. The main objective of treatment is to remove the stones without damaging the urethra and periurethral tissues in order to avoid urethral stricture. Over the years, numerous techniques have been described for urethral stone removal. The success rates of these treatments were 77.7-100%. The characteristics of the urethral stone treatments in these studies are shown in Table 1. Although endoscopic treatments with different types of lithotripsy are the accepted standard therapies, external urethrotomy can be performed for large and impacted stones with or without ure-

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Table 1. Characteristics of urethral stone treatments in the literature

Author	Number of male patients	Presenting symptoms (number of patients) (%)	Most prominent associated urological abnormalities (n) (%)	Location of urethral stones	Largest diameter of stone (mm)	Treatment types (n) (%)	Type of Lithotripsy	Overall Success (%)
Koga et al.[1]	54	Dysuria 54 (100) Gross hematuria 10 (18.5) Urinary retention 7 (13)	Urolithiasis 18 (32) Urethral stricture 5 (9.3) Benign prostatic hyperplasia 5 (9.3)	Posterior urethra 37 (68.5) Anterior urethra 9 (16.6) Fossa navicularis 6 (11.1) Bulbous urethra 2 (3.7)	Not specified	Retrograde manipulation and litholapaxy 32 (59.2) External urethrotomy 6 (11.1) Meatotomy and forceps extraction 7 (13)	Litholapaxy	
Sharfi [5]	34	Dysuria 12 (35.3) Interruption of urinary stream 10 (29.4) Urinary retention 8 (23.5)	Urethral stricture 15 (44.1) Urinary bilharziasis 4 (11.7) Urethral diverticulum 4 (11.7)	Anterior urethra 10 (29.4) Posterior urethra 20 (58.8) Fossa navicularis 4 (11.7)	Not specified	Endoscopically push-back and litholapaxy 12 (35.3) Retrograde manipulation and litholapaxy 9 (26.4) Retrograde manipulation and open cystolithotomy 5 (14.7) External urethrotomy 7 (20.5)	Litholapaxy	
El-Sherif and El-Hafi [6]	18	Any urologic symptoms	Not specified	Anterior urethra 10 (55.5) Posterior urethra 7 (38.8) Fossa navicularis 1(5.7)	12	İntraurethral 2% lidocaine jelly instillation for spontaneous passage	N/A	77.7
Al-Ansari et al. [7]	62	Urinary retention 62 (100)	Upper urinary tract stones 62 (100)	Posterior urethra 62 (100)	25	SWL 62 (100) Retrograde manipulation and re-SWL 3 (4.8) Cystourethroscopy and lithotripsy 1 (1.6)	SWL	98.4
Durazi and Samiei [9]	7	Urinary retention 7 (100)	Ureteral stricture by schistosomiasis 2 (28.5)	Anterior urethra 2 (28.5) Posterior urethra 4 (57) External meatus 1 (14.5)	19	24 F nephroscope and lithotripsy	Ultrasonic	

Verit et al.[10]	15	Urinary retention 7 (46.7) Interrupted or weak stream 4 (26.7) Pain (penile, urethral) 3 (20)	Hypospadias 2 (13.3) Meatal stenosis 2 (13.3) Renal Calculi 2 (13.3)	Posterior urethra 6 (39.9) Anterior urethra 5 (33.3) Fossa navicularis 4 (26.6)	10	Retrograde manipulation and lithotripsy 4 (26.6) Retrograde manipulation and cystolithotomy 2 (13.3) Meatotomy 4 (26.6) Cystourethroscopy and lithotripsy 2 (13.3)	Electrohydrolic	
Kamal et al.[11]	50	Urinary retention 40 (78) Interrupted or weak stream 11 (22) Pain (penile, urethral and perineal) 23 (45)	Not specified	Posterior urethra 45 (88) Anterior urethra 4 (8) Fossa navicularis 2 (4)	13	Cystourethroscopy and lithotripsy Cystourethroscopy and forceps extraction Non surgical expulsion	Electrohydrolic Litholapaxy	80
Hemal and Sharma[12]	26	Urinary retention 12 (46.1) Dysuria and weak stream 11 (42.3) Pain (penile, urethral and perineal) 26 (100)	Recurrent Urinary infection 14 (53.8) Urethral stricture 7 (27) Transvesical prostatectomy	Posterior urethra 16 (61.5) Anterior urethra 7 (26.9) Fossa navicularis 3 (11.5)	60	Retrograde manipulation and cystolithotomy 13 (50) Cystourethroscopy and lithotripsy 3 (11.5) Cystourethroscopy and forceps extraction 3 (11.5) Meatotomy 3 (11.5) External urethrotomy 2 (7.6)	Ultrasonic	
Hassan et al.[13]	19	Urinary retention 9 (47) Dysuria 7 (36.8)	Posterior urethral valve 4 (21.1) Urethral stricture 4 (21.1)	Anterior urethra 13 (68.4) Posterior urethra 6 (31.6)	Not specified	Retrograde manipulation and open cystolithotomy 4 (21.1) Cystourethroscopy and lithotripsy 4 (21.1) External Urethrotomy 3 (15.7)	Litholapaxy	100
Maheshwari and Shah[14]	42	Urinary retention 28 (66.6)	Upper tract urinary stones 17 (40.4)	Not specified 24 (57.1) Posterior urethra 11 (26.2) Anterior urethra 7 (16.6)	22	Retrograde manipulation and cystolithotripsy 24 (57.1) Cystourethroscopy and lithotripsy 18 (42.8)	Holmium Laser	
Ahmed and Saeed[15]	7	Dysuria 7 (100) Pain (penile) 7 (100)	Urolithiasis 1 (14.2)	Posterior urethra 2 (28.4) Anterior urethra 5 (71.4)	35	Retrograde manipulation and cystolithotomy 7 (100)	N/A	

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thral stricture and diverticula.[5] Gögüs et al.[16] extracted a 2x1 cm anterior urethral stone by urethrolithotomy through a 2 cm lateral coronal incision in the dorsal urethra.

We performed external urethrotomy for a penile urethral stone after failed endoscopic treatment, and pneumatic lithotripsy was performed via incision. Then, the posterior urethral stone was pushed back into the bladder and treated endoscopically as a bladder calculi through same incision. According to studies, external urethrotomy was performed for 7.6-20.5% of urethral stones (Table 1). No study reported complications associated with external urethrotomy, however most did not specify the surgical complications. In addition, the largest diameters of the stones reported in these studies were 10-60 mm, whereas the largest diameter of the penile urethral stones was 70 mm in our case. If external urethrotomy was performed alone, we had to lengthen the incision along the stone, which might have increased the risk of urethral stricture.

Although urethrocystoscopy and lithotripsy in situ or treatment in the bladder with push-back and lithotripsy provide the best treatment alternatives for most urethral stones, external urethrotomy in combination with external pneumatic lithotripsy may be a useful technique to prevent long urethral incisions and the risk of postoperative stricture for large, impacted urethral stones.

Conflict of interest

No conflict of interest was declared by the authors.

References

1. Koga S, Arakaki Y, Matsuoka M, Ohyama C. Urethral calculi. Br J Urol 1990;65:288-9. [CrossRef]
2. Faydaci G, Tarhan F, Eryildirim B, Ozgul A, Yucetas U, Kuyumcuoglu U. Female Urethral Diverticulum and Diverticular Stones. Turkiye Klinikleri J Gynecol Obst 2008;18:331-5.
3. Paulk SC, Khan AU, Malek RS, Greene LF. Urethral calculi. J Urol 1976;116:436-9.
4. Englisch J. Ueber eingelagerte und eingesackte Steine der Harnröhre. Arch Klin Chir 1904;72: 487-556.
5. Sharfi AR. Presentation and management of urethral calculi. Br J Urol 1991;68:271-2. [CrossRef]
6. El-Sherif AE, El-Hafi R. Proposed new method for nonoperative treatment of urethral stones. J Urol 1991;146:1546-7.
7. Al-Ansari A, Shamsodini A, Younis N, Jaleel OA, Al-Rubaiai A, Shokeir AA. Extracorporeal shock wave lithotripsy monotherapy for treatment of patients with urethral and bladder stones presenting with acute urinary retention. Urology 2005;66:1169-71. [CrossRef]
8. Selli C, Barbagli G, Carini M, Lenzi R, Masini G. Treatment of male urethral calculi. J Urol 1984;132:37-9.
9. Durazi MH, Samiei MR. Ultrasonic Fragmentation in the Treatment of Male Urethral Calculi. Br J Urol 1988;62:443-4. [CrossRef]
10. Verit A, Savas M, Ciftci H, Unal D, Yeni E, Kaya M. Outcomes of urethral calculi patients in an endemic region and an undiagnosed primary fossa navicularis calculus. Urol Res 2006;34:37-40. [CrossRef]
11. Kamal BA, Anikwe RM, Darawani H, Hashish M, Taha SA. Urethral calculi:presentation and management. BJU Int 2004;93:549-52. [CrossRef]
12. Hemal AK, Sharma SK. Male urethral calculi. Urol Int 1991;46:334-7. [CrossRef]
13. Hassan I, Mahammed I. Urethral calculi: a rewiev. East Afr Med J 1993;70:523-5.
14. Maheshwari PN, Shah HN. In-situ holmium laser lithotripsy for impacted urethral calculi. J Endourol 2005;19:1009-11. [CrossRef]
15. Ahmed A, Saeed NM. Experience with the management of urethral stones presenting with urinary retention at Gusau. Niger J Clin Pract 2008;11:309-11.
16. Gögüs O, Isıkay L, Yaman O, Sarıca K, Bozlu M. An unusually large anterior urethral stone. BJU 1995;76:801-2.