Giant bladder stone: A case report and review of the literature

Dev mesane taşı; olgu sunumu ve literatürün gözden geçirilmesi

İbrahim Nüvit Tahtalı[1], Turgay Karataş[2]

ABSTRACT

Bladder stones comprise 5% of urinary tract stones. Generally, they occur in the presence of bladder neck obstruction, urinary tract infections associated with neurogenic bladder and foreign objects. They are more common among men than women. Infection stones comprise approximately 15% of urinary tract stones. A giant bladder stone is a rare finding in contemporary urological practice. The general clinical setting is recurrent urinary tract infections, hematuria and urinary retention. We performed an open cystolithotomy on a mentally impaired patient who had a giant bladder stone. The stone removed weighed 465 grams. There was no evidence of any infravesical obstruction on the cystoscopy performed before the operation or during the operation. The stone consisted of 75% carbonate apatite and 25% struvite. Given that such a stone was found in a mentally impaired patient indicates that infection stones can form without infravesical obstruction.

Key words: Ammonium phosphate (struvite); carbonate apatite; giant vesical calculus; magnesium.

ÖZET

Mesane taşları üriner sistem taşlarının %5'ini oluştururlar. Genellikle, mesane boyun obstriksiyonu, nörojenik mesane, üriner sistem infeksiyonları etkisiyle ve yabancı cisim gibi hazırlayıcının varlığında oluşmaktadırlar. Erkeklerde kadınlara göre daha sık görülürler. İnfeksiyon taşları üriner sistem taşlarının yaklaşık olarak %15'ini oluşturmaktadırlar. Günümüz üroloji pratiğinde dev mesane taşlarına nadiren rastlanmaktadır. Genel klinik tablo tekrarlayan üriner sistem infeksiyonları, hematüri ve üriner retansiyondur. Biz, dev mesane taşı olan mental retardasyonlu hastaya açık sistolitotomi cerrahisi uyguladık. Alınan taş 465 gram ağırlığındaydı. Hem ameliyat öncesinde hem de ameliyat sırasında yapılan sistoskopide infravezikal tıkanma bulgusu yoktu. Taşın yapılan analizinde; taşın %75 karbonat apatit, %25 sitrüvitten oluştuğu görüldü. Mental retarde hastada bulunan taş; infeksiyon taşlarının, özellikle infravezikal tıkanma bulgusu vermeden de oluşabileceklerini bize göstermiştir.

Anahtar kelimeler: Amonyum fosfat (sitrüvit); karbonat apatit; dev mesane taşı; magnesyum.

Introduction

Giant vesical calculi weighing more than 100 gm are rare.[1-3] Of the reports written in English, fewer than 85 involve a stone more than 100 gm. Almost all of the articles published in Pubmed are about giant bladder stones that developed secondary to infravesical obstruction. We report a giant stone found in the pelvic region of a mentally impaired patient.

Case presentation

A 43-year-old mentally impaired patient who had lower abdominal pain, moderate to severe dysuria, pollakiuria, nocturia (8-10 times) and hematuria for a many years first presented to the general surgery clinic. After listening to the patient's complaints, he was sent to the urology clinic and was subsequently hospitalized. The required consent for publishing this case was obtained from the patient's relatives because the patient is mentally impaired.

An X-ray showed a radio-opacity in the pelvic region measuring 6x7 cm in size (Figure 1). Ultrasonography revealed bilateral hydronephrosis along with a giant vesical calculus. Digital rectal examination revealed a normal prostate. Likewise, blood counts and renal and liver function tests were normal. Urine analysis indicated a very high white blood cell count.

We learned that the patient had a history of anemia resulting from geophagy. He was admitted to the hospital ten years ago due to anemia; then, five units of blood were transfused, and he was given oral iron supplementa-

[1]Department of Urology, Malatya State Hospital, Malatya, Turkey

[2]Department of General Surgery, Malatya State Hospital, Malatya, Turkey

Submitted: 30.10.2013

Accepted: 06.01.2014

Correspondence: İbrahim Nüvit Tahtalı, Department of Urology, Malatya State Hospital, Malatya, Turkey
Phone: +90 422 326 15 69
E-mail: nuvit_tahtali@hotmail.com

Available online at www.turkishjournalofurology.com

Turkish Journal of Urology 2014; 40(3): 189-91
DOI:10.5152/tud.2014.02603

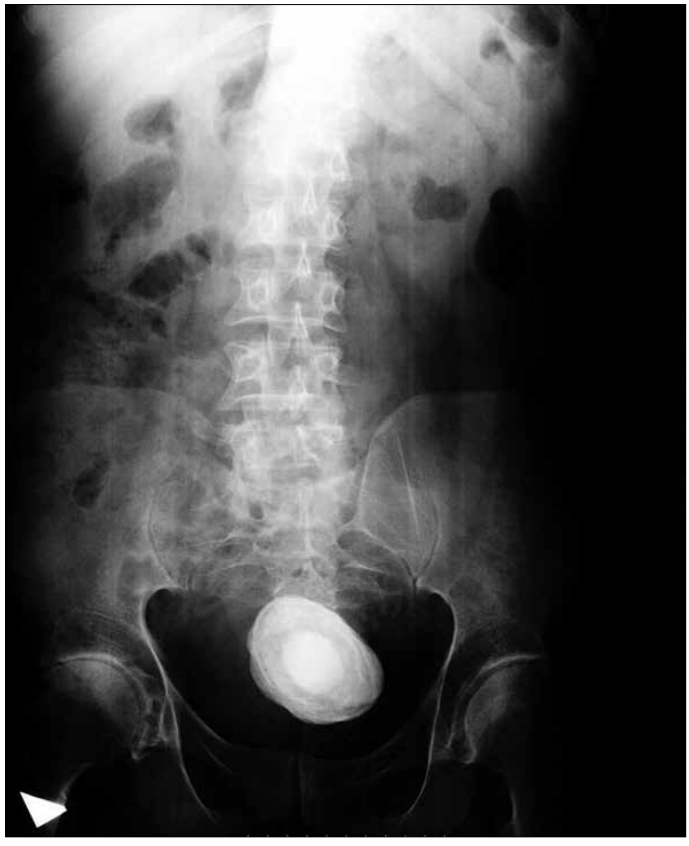

Figure 1. Large pelvic stone in direct ultrasonography

tion. In addition, the patient had received medical treatment for frequent urinary tract infections and urinary incontinence over the past 15 years.

After treating the urinary tract infection with intravenous antibiotics, an open cystolithotomy operation was planned. Our patient underwent a cystoscopic examination before open surgery on the same operation day. Then, we performed an open cystolithotomy. During the operation, digital rectal manipulation was needed to remove the stone, which was adherent to the bladder mucosa. No anatomical urethral obstruction was observed.

A stone 11x6x7 cm in size and approximately 465 grams in weight was removed (Figure 2). Biochemical analysis indicated that the stone consisted of 25% struvite and 75% carbonate apatite. The stratified lamellae stone was composed of carbonate apatite and magnesium ammonium phosphate.

The post-operative period was uneventful. The urethral catheter was removed on the 8th postoperative day, and the patient's urinary output was normal. The patient was discharged on postoperative day 8. The patient was voiding normally, despite complaining of mild lower urinary tract symptoms (LUTS), mostly

Figure 2. 11x7x6 cm bladder stone was extracted by open cystolithotomy

irritative, and the bilateral hydronephrosis improved markedly within 3 weeks.

Discussion

Epidemiological surveys of urolithiasis have shown a prevalence between 4 and 20% in developed countries.[4,5] Mostly resulting from bladder outlet obstruction, neurogenic voiding dysfunction, urinary tract infection or foreign bodies, bladder calculi account for 5% of urinary calculi.[1,3] Children remain at high risk for bladder stone development in endemic areas.[6] In non-endemic regions, bladder calculi are often found in adults. Females are less affected than males.[1,4,6] Recurrent urinary tract infection, hematuria and urinary retention are common disorders in these patients.[1,3] Nevertheless, in endemic areas, in children in whom a major anatomic abnormality does not coexist, bladder calculi can occur; in these regions, the primary influential factors are dietary intake and socio-economic factors leading to the formation of bladder calculi.[7,8]

Bladder stones are mostly associated with renal or ureteral calculi, and they rarely ever occur without associated upper urinary tract calculi, as in our patient.[1] Primary vesical calculosis is quite commonplace in Asia, with calculi consisting of ammonium urate and calcium oxalate. Because of malnutrition in the very early years of life, vesical calculosis is now common in Turkey, Iran, India, China, and Indonesia; however, there is a decrease in the incidence as social conditions gradually improve.[5]

Infected stones make up approximately 15% of urinary stone diseases and are thus an important group.[5,9] These stones are composed of struvite and/or carbonate apatite. The basic

precondition for the formation of infected stones is a urease-positive urinary tract infection. As a result, ammonium ions can form, and at the same time, alkaline urine develops. Both are preconditions for the formation of struvite and carbonate apatite crystals. When these crystals deposit, infected stones form.[9]

The preferred method for diagnosis is cystoscopy, but an X-ray or an ultrasound is sometimes enough. Because of its size, cystolithotomy is the correct treatment for a giant bladder stone.[1,3,6]

There are a number of techniques and modalities available to remove bladder stones. Relieving the obstruction, eliminating the infection, meticulous surgical technique, and accurate diagnosis are essential in their treatment.[6,10]

In recent urological practice, a giant bladder calculus is rare, especially those greater than 100 grams.[1,2] When searching Pubmed for articles on this topic in the last 30 years, less than 85 relevant articles were found.

Our aim in this report is to show that this rare clinical presentation is able to develop in the absence of infravesical obstruction.

In conclusion, almost all reports of giant bladder stones published so far are stones that formed secondary to preoperative situations, such as infravesical obstruction, neurogenic bladder or foreign bodies. We think that this case is striking because of the finding that a giant infected stone can develop in the bladder without any predisposing cause, warranting further investigation.

As a second finding after reviewing the related literature on this topic, we believe that large bladder stones should be viewed as a different clinical presentation than small bladder stones, especially regarding the cause of their formation and treatment option. We propose that this topic needs further discussion and evaluation.

Informed Consent: Written informed consent was obtained from patient who participated in this case.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept - İ.N.T.; Design - İ.N.T., T.K.; Funding - İ.N.T.; Analysis and/or Interpretation - İ.N.T.; Literature Review - İ.N.T., T.K.; Writer - İ.N.T.; Critical Review - T.K.

Acknowledgements: We sincerely thank for interpretations, Assistant Professor Turan Yıldız, Sakarya University in Medical School, Departmant of Pediatric Surgery Sakarya, Turkey.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

Hasta Onamı: Yazılı hasta onamı bu olguya katılan hastadan alınmıştır.

Hakem değerlendirmesi: Dış bağımsız.

Yazar Katkıları: Fikir - İ.N.T.; Tasarım - İ.N.T., T.K.; Kaynaklar - İ.N.T.; Analiz ve/veya yorum - İ.N.T.; Literatür taraması - İ.N.T., T.K.; Yazıyı yazan - İ.N.T.; Eleştirel İnceleme - T.K.

Teşekkür: Makalenin yorumlanmasında Sakarya Üniversitesi Tıp Fakültesi Çocuk Cerrahisi Anabilim Dalı'nda görevli Doçent Doktor Turan Yıldız'a teşekkür ederiz.

Çıkar Çatışması: Yazarlar çıkar çatışması bildirmemişlerdir.

Finansal Destek: Yazarlar bu çalışma için finansal destek almadıklarını beyan etmişlerdir.

References

1. Aydogdu O, Telli O, Burgu B, Beduk Y. Infravesical obstruction results as giant bladder calculi. Can Urol Asoc J 2011;5:77-8. [CrossRef]
2. Thakur RS, Minhas SS, Jhobta R, Sharma D. Giant vesical calculus presenting with azotaemia and anuria. Indian J Surg 2007;69:147-9. [CrossRef]
3. Hızlı F, Yılmaz E. A giant bladder struvite stone in an adolescent boy. Urol Res 2012;40:273-4. [CrossRef]
4. Trinchieri A. Epidemiology of urolithiasis: an update. Clin Cases Miner Bone Metab 2008;5:101-6.
5. Trinchieri A. Epidemiology of urolithiasis. Arch Ital Urol Androl 1996;68:203-49.
6. Schwartz BF, Stoller ML. The vesical calculus. Urol Clin Nort Am 2000;27:333-46. [CrossRef]
7. Ali SH, Rifat UN. Etiological and clinical patterns of childhood urolithiasis in Iraq. Pediatr Nephrol 2005;20:1453-7. [CrossRef]
8. Douenias R, Rich M, Badlani G, Mazor D, Smith A. Predisposing factors in bladder calculi: Review of 100 cases. Urology 1991;37:240-3. [CrossRef]
9. Bichler KH, Eipper E, Naber K. Infection-induced urinary Stones. Urologe A 2003;42:47-55.
10. Saito S, Izumitani M, Shiroki R, Ishiguro K, Nagakubo I. Prolonged exposure to ıntravesical foreing body induces a giant calculus with attendant renal dysfunction. Nihon Hinyokika Gakkai Zasshi 1994;85:1777-80.