НИРКИ KIDNEYS

DOI: https://doi.org/10.22141/2307-1257.13.3.2024.471

Radika Naufal Hadi Surya, Reza Gautama, I Gede Yogi Prema, Danial Habri Arsyi
Medicine Faculty, Universitas Airlangga, Surabaya, Indonesia

Multiple giant bladder stones in spinal cord injury patient from rural Indonesia: a rare case report

For citation: Počki. 2024;13(3):243-245. doi: 10.22141/2307-1257.13.3.2024.471

Abstract. *Bladder stones or vesicolithiasis may complicate spinal cord injury patients due to their impaired sensory and motor function, causing several urological complications termed neurogenic lower urinary tract dysfunction. A 42-year-old man with spinal cord injury presented with complaints of urinary urgency and frequency for the past two years, worsened in the past week. There was also a three-day spell of intermittent fever. Ultrasonography revealed four giant stones in the bladder, each measuring 3.85 cm. Open vesicolithotomy revealed four ping pong ball sized stones and three smaller stones, without adhesion to the bladder mucosa. No visible tumors were found. The postoperative phase was uneventful and four weeks post-surgery, the patient had no urological complaints.*

Keywords: *bladder stones; neurogenic bladder; spinal cord injury; vesicolithiasis*

Introduction

Bladder stones or vesicolithiasis constitutes approximately 5 % of all urinary tract stones, contributing to up to 8 % of urolithiasis-related deaths in developed countries [1]. Giant bladder stones, defined as those exceeding 100 grams in weight and 4 cm in length, represent an uncommon variant. Symptoms associated with giant bladder stones can vary widely, including asymptomatic cases, lower abdominal pain, dysuria, gross hematuria, or urinary retention [2].

Spinal cord injury (SCI) may impair sensory and motor function, causing several urological complications termed neurogenic lower urinary tract dysfunction, such as neurogenic bladder. The prevalence of bladder stones among individuals with SCI varies from 3 to 36 % [2]. Patients with SCI also have higher predisposition to other urological diseases e.g. urinary tract infection (UTI), urinary incontinence, or bladder cancer [3]. This article discusses a case involving a colossal bladder stone observed in an adult male patient exhibiting paraplegia in a rural hospital in East Java, Indonesia.

Case report

A 42-year-old gentleman presented to our hospital with complaints of urinary urgency and frequency for the past two years. The urinary incontinence had worsened in the past week. This individual, employed as a roof-tier, had a previous injury in 2008 while working abroad. The incident involved a fall from a roof roughly two meters high causing spinal cord injury necessitating spinal surgery. Since then, the patient has lived with paraplegia, steadily making progress under orthopedic care.

The patient's primary complaint is urinary incontinence, marked by frequent urination, reaching up to 10 times daily. This incontinence gradually manifested over two years. Concurrently, he encountered terminal dribbling, hesitancy, and incomplete emptying. For the past year, he experienced a sharp, intense flank pain radiating downward, exacerbated by pressure or coughing. There was also a three-day spell of intermittent fever. Noteworthy, there were no signs of blood, sand, or pain during urination. Despite the spinal cord injury, the patient refrained from using an indwelling catheter for an extended duration.

The vital signs and past medical history of the patient were unremarkable. Palpation of the suprapubic area revealed hardness and pain sensitivity. Motoric muscle scoring for the lower extremities was 4/3, with normal sensorics function. Additionally, the patient brought along a recent ultrasound scan, displaying four giant stones, each measuring 3.85 cm, dominating most of the bladder. Prostate volume clocked in at 28 cc, featuring calcification. Renal function was unremarkable, but leukocyturia and heightened epithelial cells in urine were noted (Table 1).

For correspondence: Radika Naufal Hadi Surya, Medicine Faculty, Universitas Airlangga, Surabaya, Indonesia; e-mail: radikanaufal@gmail.com
Full list of authors' information is available at the end of the article.

Following prophylactic oral antibiotic treatment, an abdominal X-ray examination was conducted (Fig. 1), paving the way for a planned open vesicolithotomy. In the course of the operation, four ping pong ball sized stones and three smaller stones were uncovered. Notably, these stones exhibited no adhesion to the bladder mucosa. No visible tumours were observed during the operation, and biopsy pathology provided no indication of malignancy. The stones measured roughly $5 \times 3.5 \times 4$ cm each (Fig. 2).

The postoperative phase transpired smoothly, with removal of the urethral catheter after ten days and a return to normal urinary output. A urology outpatient clinic evaluation took place four weeks post-surgery, revealing an absence of urological complaints. No residual bladder stones or urinary system dilation were identified. Hydronephrosis was no longer evident four weeks post-surgery. Urodynamic assessments and urinalysis yielded normal results, warranting an annual ultrasound to monitor bladder and renal progress.

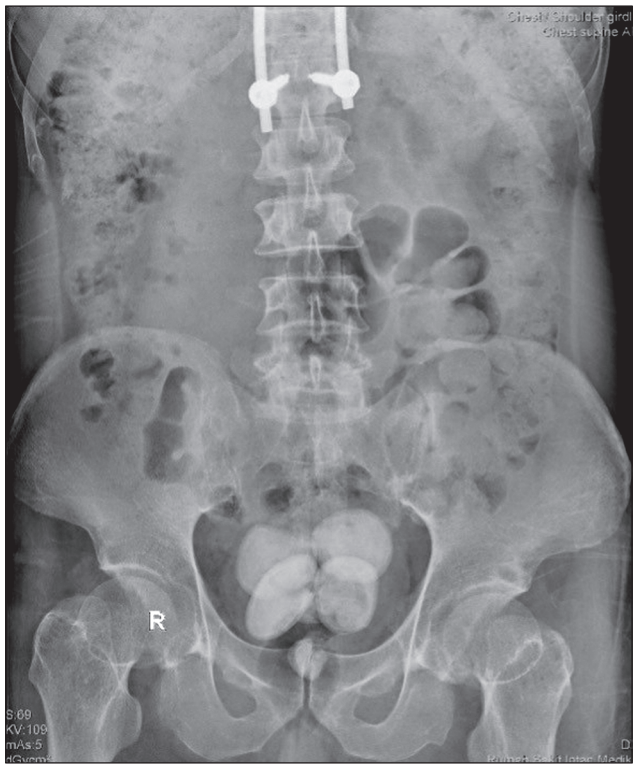

Figure 1. Plain abdominal X-ray examination of the patient

Discussion

Bladder stones constitute approximately 5 % of urinary calculi and frequently arise from factors such as infection, obstruction, or the presence of foreign bodies [1]. The demographic exhibiting the highest incidence of bladder stones falls within the age bracket of 30 to 60 years. Predisposing factors encompassing tropical climates, deleterious habits and lifestyles, nutritional deficiencies, limited educational attainment, and low socioeconomic status have been identified as contributors to bladder stone formation [2]. Notably, SCI stands out as a risk factor for neurogenic bladder, thereby fostering the development of bladder stones. In the context of SCI patients, heightened bone resorption due to prolonged immobilization and urinary stasis resulting from neurogenic bladder dysfunction may induce hypercalciuria, thereby enhancing the propensity for stone reformation [3]. This particular patient presented with risk factors including male gender, residence in a tropical climate, limited educational background, low socioeconomic status, and developed SCI.

The majority of bladder stones exist as solitary entities, with multiple occurrences identified in only a quarter of cases. The primary constituents of these stones include calcium oxalate, calcium phosphate, and ammonium. A stone surpassing 4 cm in diameter or exceeding 100 grams is categorized as a giant bladder stone, which is an exceedingly rare occurrence [2]. In this case, the patient presented with multiple stones, each surpassing 4 cm in diameter.

Common complaints associated with giant bladder stones include recurrent lower urinary tract symptoms

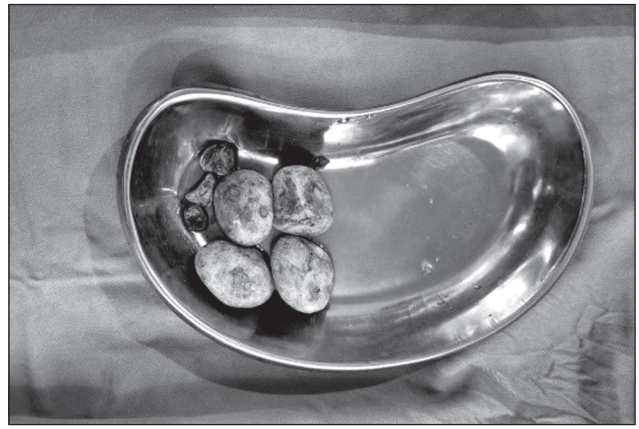

Figure 2. Multiple giant stones sized around $5 \times 3.5 \times 4$ cm each

Table 1. Blood and urine analysis of the patient

Haemoglobin	14.1 g/dL	**Leukocytes in urine (Dipstick)**	Positive 3
Urea	27 mg/dL	**Leukocytes in urine**	> 50/field
Creatinine serum	0.8 mg/dL	**Erythrocytes in urine**	6–7/field
Haemoglobin	14.1 g/dL	**Epithelial cell in urine**	10–13/field
Thrombocytes	263.000 u/L	**Bacteria in urine**	Positive
Crystal in urine	Positive	**Ca oxalates in urine**	Positive 1

(LUTS), frequent urination, urinary incontinence, and UTIs. Renal failure, however, is an infrequent outcome among patients with giant bladder stones [1]. The presented patient reported experiencing LUTS and UTIs for approximately two years but refrained from seeking medical attention until the symptoms exacerbated.

The management of bladder stones encompasses diverse modalities such as direct calculus chemo lysis, extracorporeal shock wave lithotripsy, cystolithotomy, energy lithotripsy, transurethral cystolithotripsy, and percutaneous cystolithotripsy. Both transurethral and percutaneous approaches demonstrate comparable efficacy in treating bladder calculi overall [4]. Variances in efficacy are primarily influenced by the hardness of the stone. Generally, transurethral cystolithotripsy stands as the preferred method due to its high stone-free rate, abbreviated hospitalization duration, and diminished pain. However, in the instance of giant bladder stones, the treatment paradigm slightly deviates. Given their considerable size, vesicolithotomy emerges as the appropriate procedure for addressing giant bladder stones [1–3]. In this particular case, open vesicolithotomy was selected as the patient presented with a giant bladder stone. Consistent with the guidelines of the American Urological Association (AUA), open surgeries are considered more efficacious for the extraction of large or complex calculi, especially in patients necessitating anatomical reconstruction. Therefore, the choice of open vesicolithotomy aligns with the AUA guidelines in this patient's case [5].

Conclusions

Giant bladder stones are a rare occurrence in modern urology, posing challenges for urologists. In individuals with SCIs, effective bladder management plays a crucial role in preventing bladder stone development, with optimised bladder care appearing to correlate with a lower incidence of stones in SCI patients. The primary mode of treatment for giant bladder stones remains open surgical procedures. The choice of treatment varies based on the stone's size and the feasibility of surgery.

Acknowledgment. The authors want to acknowledge people who help this research and our institution Universitas Airlangga.

References

1. Napitupulu T, Susanto M, Duma G, Yudha Rahman E. Giant Bladder Stone: A Case Report and Literature Review. JMA J. 2022 Jul 15;5(3):384-388. doi: 10.31662/jmaj.2022-0061.

2. Bartel P, Krebs J, Wöllner J, Göcking K, Pannek J. Bladder stones in patients with spinal cord injury: a long-term study. Spinal Cord. 2014 Apr;52(4):295-297. doi: 10.1038/sc.2014.1.

3. Ord J, Lunn D, Reynard J. Bladder management and risk of bladder stone formation in spinal cord injured patients. J Urol. 2003 Nov;170(5):1734-1737. doi: 10.1097/01.ju.0000091780.59573.fa.

4. Donaldson JF, Ruhayel Y, Skolarikos A, et al. Treatment of Bladder Stones in Adults and Children: A Systematic Review and Meta-analysis on Behalf of the European Association of Urology Urolithiasis Guideline Panel. Eur Urol. 2019 Sep;76(3):352-367. doi: 10.1016/j.eururo.2019.06.018.

5. Assimos D, Krambeck A, Miller NL, et al. Surgical Management of Stones: American Urological Association/Endourological Society Guideline, Part I. J Urol. 2016 Oct;196(4):1153-1160. doi: 10.1016/j.juro.2016.05.090.

Received 04.07.2024
Revised 18.08.2024
Accepted 23.08.2024

Information about authors
Radika Naufal Hadi Surya, Medicine Faculty, Universitas Airlangga, Surabaya, Indonesia
Reza Gautama, Medicine Faculty, Universitas Airlangga, Surabaya, Indonesia
I Gede Yogi Prema, Medicine Faculty, Universitas Airlangga, Surabaya, Indonesia
Danial Habri Arsyi, Medicine Faculty, Universitas Airlangga, Surabaya, Indonesia

Conflicts of interests. Authors declare the absence of any conflicts of interests and own financial interest that might be construed to influence the results or interpretation of the manuscript.
Information about funding. No funding.
Authors' contribution. *Surya R.N.H.* — concept and design study, analysis; *Gautama R.* — data collection; *Prema I.G.Y., Arsyi D.H.* — draft manuscript preparation.

Radika Naufal Hadi Surya, Reza Gautama, I Gede Yogi Prema, Danial Habri Arsyi
Medicine Faculty, Universitas Airlangga, Surabaya, Indonesia

Множинні гігантські камені в сечовому міхурі в пацієнта з травмою спинного мозку, який мешкає в сільській місцевості Індонезії: рідкісний випадок

Резюме. Камені в сечовому міхурі, або везиколітіаз, можуть становити проблему для пацієнтів із травмою спинного мозку через порушення в них сенсорної та моторної функції, викликаючи урологічні ускладненя, що називають нейрогенною дисфункцією нижніх сечових шляхів. Сорокадворічний чоловік із травмою спинного мозку звернувся зі скаргами на раптову потребу до сечовипускання та часте сечовипускання протягом останніх двох років, які погіршилися за останній тиждень. Також фіксувався триденний період інтермітуючої лихоманки. Ультразвукове дослідження виявило чотири гігантські камені в сечовому міхурі, кожен розміром 3,85 см. Під час відкритої везіколітотомії вилучено чотири камені розміром з м'ячик для пінг-понгу та три камені меншого розміру без спаяння зі слизовою оболонкою сечового міхура. Видимих пухлин не виявлено. Післяопераційна фаза протікала без ускладнень, через чотири тижні після операції пацієнт не мав урологічних скарг.

Ключові слова: камені сечового міхура; нейрогенний сечовий міхур; травма спинного мозку; везиколітіаз