

Giant bladder stones: A case report of three egg-sized calculi in a resource-constrained environment

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Abstract

Bladder stones represent an important public health issue in developing nations, especially Indonesia. We report a 51-year-old female who exhibited dysuria and suprapubic pain. Clinical evaluations, imaging studies, and laboratory analyses identified three bladder stones, each the size of an egg. The patient underwent an open cystolithotomy, during which three calculi averaging 5x4 cm and weighing approximately 560 g were excised. The patient encountered no notable surgical complications and was discharged with significantly improved urine flow.

Keywords: Giant Bladder Stones; Urology; Radiology; Limited-Resources

1. Introduction

Bladder stones are relatively rare in the general population, accounting for only about 5% of all urinary tract stones. However, they are more common in certain patient populations, particularly those with underlying urinary tract abnormalities or dysfunction [1]. In humans, urinary stasis is the primary factor in the development of bladder stones. Urinary stasis frequently results from cervicoprostatic or urethral obstruction or from neurological dysfunction of the bladder [2]. Complications of bladder stones include urinary obstruction, infections, bladder wall damage, renal complications, and urethral complications, all of which can profoundly affect the patient's health and quality of life [3].

Numerous references indicate that giant bladder stones, defined as those exceeding 10 cm in diameter or weighing more than 100 grams, are uncommon [4–6]. These large bladder stones can cause considerable urinary obstruction and complications, including hydronephrosis and renal failure [4,5]. The dimensions of bladder stones also affect the selection of treatment. Smaller calculi may be suitable for endoscopic interventions such as transurethral cystolithotripsy or percutaneous cystolithotripsy, whereas larger calculi typically necessitate open surgical extraction (cystolithotomy) [7].

2. Case Presentation

In December 2024, a 51-year-old female was admitted to Talisayan Regional Public Hospital with dysuria that had persisted for three months and was refractory to treatment at a local health center. The dysuria has progressively worsened over the past two weeks, prompting the patient to seek a hospital referral. The patient reports escalating pain in the suprapubic region lasting more than a week, accompanied by dysuria. The patient possesses a history of hypertension. The patient reports no additional symptoms, including hematuria, nausea and vomiting, fever, or urinary

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tract bleeding. The patient reported no significant weight loss in recent months and denied any personal or family history of cancer.

Imaging analysis via abdominal X-ray revealed three bladder stones measuring each 5 cm in size; however, no hydronephrosis was revealed in the ultrasonography. Urine lab work showed 30-35 epithelial cells per high power field, 10 to 15 red blood cells per high power field, and 8-10 white blood cells per high power field. Her blood examinations show a mild anemia with a hemoglobin level of 10 g/dL and a low rate of hematocrit. Urine analysis showed a high white blood cell count, indicating an inflammation of the urinary tract.

After urinary tract infection treatment with intravenous antibiotics, an open cystolithotomy was performed. During the operation, digital rectal manipulation was used to remove the stone, which was adherent to the bladder mucosa. There was no anatomical urethral obstruction. Three stones with an average size of 5x4 cm and approximately 560 g in weight were removed. However, due to our limited access, the biochemical analysis of the stones could not be done.

On the 3rd postoperative day, the surgical drain was removed, and there was not any bleeding on the operative site. On the 5th postoperative day, the urethral catheter was removed, and the patient's urinary output was normal. The postoperative events were simple, and the patient was voiding normally.



Figure 1 Three substantial pelvic stones, each with an estimated long axis of 5 cm.



Figure 2 Three 5x4 cm bladder stones extracted by open cystolithotomy

3. Discussion

Bladder stones are uncommon in the general population, representing approximately 5% of all urinary tract stones [1]. Nonetheless, they are more prevalent in specific patient demographics, especially those with preexisting urinary tract anomalies or dysfunctions. Epidemiologically, bladder stones constitute approximately 1-2% of the total population of bladder stones [8]. They are more common in children, particularly in endemic regions, where they can constitute a substantial percentage of urinary calculi [9]. Bladder stones constitute a considerable health concern in developing countries, representing a significantly higher percentage of urinary tract stones than in developed nations. The prevalence of bladder stones remains notably elevated in these regions [9,10]. The principal causes of bladder stones in developing nations are frequently associated with nutritional factors and dietary deficiencies. Research indicates that people with bladder stones typically follow a predominantly vegetarian diet deficient in fats and proteins [11]. Inadequate water sanitation and elevated temperatures in these regions may also contribute to the increased prevalence [12].

Numerous sources indicate that bladder stones are more prevalent in middle- and low-income nations due to factors such as inadequate water sanitation and warm climates. The absence of access to potable water and adequate sanitation may lead to the formation of bladder stones in these areas [12]. Poor water sanitation can elevate the risk of urinary tract infections, a recognized risk factor for the formation of bladder stones [13]. Urease-producing bacteria in contaminated water can facilitate the formation of infectious bladder stones. Moreover, inadequate access to appropriate medical care and treatment alternatives in resource-constrained environments may exacerbate the prevalence and severity of bladder stones in developing nations. The male-to-female ratio of bladder stones is elevated in developing countries, varying from 10:1 to 4:1, in contrast to the developed world [10]. This is probably attributable to the heightened incidence of bladder outlet obstruction resulting from benign prostatic hyperplasia in males [14].

Bladder stones can vary considerably in size, ranging from diminutive stones to large bladder calculi. The dimensions of bladder stones significantly influence their clinical manifestation and treatment. Numerous sources indicate the presence of giant bladder stones, defined as stones exceeding 10 cm in diameter or weighing more than 100 grams [4-6]. These large bladder stones can cause considerable urinary obstruction and complications, including hydronephrosis and renal failure [4,5]. The dimensions of bladder stones are frequently linked to the underlying etiology. Bladder stones resulting from urinary stasis, bladder outlet obstruction, or foreign bodies typically increase in size over time [15]. Imaging techniques, including plain radiography, ultrasound, and computed tomography (CT) are frequently employed to evaluate the dimensions and position of bladder stones [16,17]

The dimensions of bladder stones also affect the selection of treatment. Smaller calculi may be suitable for endoscopic interventions like transurethral cystolithotripsy or percutaneous cystolithotripsy, whereas larger calculi typically necessitate open surgical extraction (cystolithotomy) [7,18,19]. Open cystolithotomy is a significant surgical alternative for addressing large or giant bladder stones, especially when endoscopic or minimally invasive methods are impractical or unsuitable [1,4,20]. Factors that support open cystolithotomy encompass stone dimensions exceeding 6.5 cm, significant stone burden, and related complications such as obstructive uropathy or renal failure. Open cystolithotomy facilitates the comprehensive extraction of the entire stone burden in one procedure, thereby diminishing the likelihood of residual fragments. [1,20]. Open cystolithotomy is typically a safe and efficacious procedure, yielding high stone-free rates; however, it is linked to prolonged hospital stays and increased postoperative discomfort relative to minimally invasive methods [15].

4. Conclusion

In conclusion, bladder stones constitute a considerable public health issue in developing nations, predominantly influenced by nutritional factors and dietary deficiencies. The evidence indicates a significant correlation between inadequate water sanitation and the prevalence of bladder stones, especially in developing nations. Enhancing access to potable water and adequate sanitation facilities may significantly alleviate the incidence of bladder stones in these areas. The dimensions of bladder lithiasis can vary considerably, with certain calculi attaining substantial sizes, resulting in considerable urinary obstruction and complications. Open cystolithotomy is a significant surgical alternative for addressing large or giant bladder stones, especially when endoscopic or minimally invasive methods are impractical or unsuitable.

Compliance with ethical standards

Disclosure of conflict of interest

The authors declare that there are no conflicts of interest regarding the publication of this case report.

Statement of ethical approval

This case report was reviewed and approved by the Ethics Committee of Talisayan Public Health Office. All necessary patient consent was obtained.

Statement of informed consent

Informed consent was obtained from individual participant included in the study

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