Single Large Bladder Stone in a Young Male Adult with Primary Hyperparathyroidism

Omar Halalsheh a,b, Firas Sahawneh a,b,+, Khaled Altopajee a,b, Abdelrahman Almanasra a,b

aFaculty of Medicine, King Abdullah University Hospital, Ar Ramtha, Jordan
bJordan University of Science Institution and Technology, Ar Ramtha, Irbid 22110, Jordan

Abstract
Bladder stones are caused when minerals are built up in the bladder, especially if the bladder is incompletely emptied. These stones will pass while they are small. Otherwise, they get stuck to the bladder wall or ureter. If this happens, they gradually gather more mineral crystals, becoming larger over time. Primary hyperparathyroidism is usually caused by a tumor within the parathyroid gland, and elevated calcium levels can cause digestive symptoms, psychiatric abnormalities, bone disease and multiple kidney stones.

Introduction
Primary hyperparathyroidism is a disorder of an overactive parathyroid gland that releases too much parathyroid hormone (PTH) which affects the rest of the body as the loss of calcium from bones. The disorder is diagnosed most often between age 50 and 60, and women are affected about three times as often as men.1

High PTH levels trigger the bones to release increased amounts of calcium into the blood, and this may weaken the bone. Also, small intestines may absorb more calcium from food, adding to the excess calcium in the blood. So; kidneys excrete more calcium in the urine, which can lead to kidney stones.

Bladder stones start to grow when there is urinary stasis that is caused by an underlying medical condition that prevent complete emptying such as atonic bladder, prostate enlargement, medical devices and bladder diverticulum.

Case presentation
A 20 year old male, visited our clinic complaining of severe lower urinary tract symptoms mainly frequency about 20 times daily with small amount of urine each time, nocturia, urgency, intermittency and sometimes suprapubic pain with gross hematuria and normal bowel habit. These symptoms started 7 months before the visit and affected his lifestyle. He is non-smoker, works in a restaurant, without family history of stone formation.

On physical exam he has normal vital signs, and the general and genital exams were unremarkable.

Uroflowmetry was good with maximum rate 21 cc per second and the bladder was empty post-voiding.

Ultrasound showed hyperechoic lesion with shadow in the bladder, without hydro-nephrosis. Non-enhanced CT-scan showed

![Figure 1. CT scan shows the bladder stone.](http://dx.doi.org/10.1016/j.eucr.2016.12.008)
At the induction of anesthesia the patient had irregular heart rhythm and abnormal ECG, and the operation was postponed for cardiac evaluation.

The cardiologist ordered electrolytes and the calcium was 3.7 mmol/L, others were normal. Then an endocrinologist was consulted and ordered parathyroid hormone which was very high 750 pg/mL.

After that we did thyroid and parathyroid ultrasound that showed a hypoechoic lesion in the posterior-lateral aspect of the left lobe of the thyroid gland measuring about 1.9 cm * 0.8 cm that may represent parathyroid adenoma.

Then electrolytes were corrected medically.

The surgeon did parathyroidectomy and the specimen was sent to frozen section and showed parathyroid adenoma, parathyroid hormone 15 minutes post parathyroidectomy went down to 49 pg/mL, then cystoscopy was unremarkable except for large bladder stone. Cystolithotomy was done through small pfannenstiel incision and the stone was sent to the analysis and it was pure calcium oxalate stone.

The patient was discharged home at day two post-operation and he was doing well.

Two weeks later he had good urination without storage or voiding symptoms.

Urodynamic study was done and showed normal study with good bladder capacity 450 cc and normal detrusor pressure at filling and at voiding phases (Fig. 3).

**Discussion**

Bladder stones are caused when minerals build up in the bladder and form small stones that can pass spontaneously. Sometimes, these stones can get stuck to the bladder wall or ureter and they gradually gather more mineral crystals, becoming larger over time.
This is often due to an underlying medical condition that affects the complete emptying of the bladder such as atonic bladder, prostate enlargement, medical devices and bladder diverticulum.

The majority of stones originate in the upper urinary tract. Only 16% are from the lower urinary tract and should be distinguished from endemic bladder stones which are now uncommon in Europe.²

The most common component of urinary calculi is calcium, which is a major constituent of nearly 75% of stones. Calcium oxalate makes up about 60% of stones; mixed calcium oxalate and hydroxyapatite, 20%; and brushite stones, 2%. Both uric acid and struvite stones occur approximately 10% of the time, whereas cystine stones are rare (1%).³

Primary hyperparathyroidism is usually caused by a parathyroid tumor. The symptoms of the condition relate to the elevated calcium levels, which can cause digestive symptoms, psychiatric abnormalities, bone disease and multiple kidney stones.

Our patient has single bladder stone which was calcium oxalate without any other urinary stones at all and without previous history of stone passage and there is no any similar case in the English literature.

Conclusion

Single large bladder stone in a young male adult is rare and mostly due to bladder outlet obstruction or neurogenic bladder and if there is bladder stones without these entities we have to rule out other metabolic disorders and abnormalities.

Conflict of interest

This case report was done in the division of urology for academic purposes and was not funded by any external fund, the submission has no commercial interests, and the authors of this case report are not linked to any external agencies.

References

1. Silverberg SJ, Bilezikian JP. Primary hyperparathyroidism. In: Jameson JL, DeGroot Senior LJ, eds. Endocrinology: Adult and Pediatric. 6th ed. Philadelphia: Saunders; 2010 (online version).
2. Peacock M, Robertson WG, Heyburn PJ, Rutherford A. The General Infirmary, Leeds, United Kingdom. Proc EDTA. 1979.
3. Wein Alan J. Campbell–Walsh Urology. Vol 45. 2012:1268.