



## Case report

## Giant long-standing urethral calculus without urinary retention: A case report

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## ABSTRACT

**Introduction and importance:** In this case report, we found a giant urethral stone that lasted for ten years without urinary retention and was admitted to the hospital with a non-urinary main complaint.

**Case presentation:** We reported a 53-year-old patient, initially admitted to the emergency room because of decreased consciousness. Notably, the patient also presented with a bulged suprapubic area. Careful examination of the external genitalia pointed to palpable, large-sized calculus proximal to the external meatus. The patient's relatives acknowledged that the stone had been present for ten years, but he could void it spontaneously before admission. The imaging series (KUB X-Ray, Head CT, TAUS) confirmed the diagnoses of brain hemorrhage, bilateral hydronephrosis, and a stone at the navicular fossa. Sequential extra-ventricular drainage and dorsal meatotomy were performed under general anesthesia, resulting in a good local condition. We successfully extracted 4 × 2 cm calculus from the patient's urethra, and the hydronephrosis resolved after the extraction.

**Clinical discussion:** The patient has mild hydronephrosis due to chronic urinary retention and LUTS from the giant urethral stone. The stroke to the dominant hemisphere and insula could lead to acute urinary retention, which worsens hydronephrosis. Immediate diversion of urine by taking stones from the anterior meatus urethra can improve the patient's hydronephrosis condition.

**Conclusions:** This report demonstrated an interesting case of an impacted giant urethral stone in a critically ill male patient without urinary retention before admission. Prompt evaluation and management are required and should prioritize conditions predisposing patients to severe complications.

## 1. Introduction and importance

Urolithiasis could be identified at any location along the urinary tract. Urinary tract calculi are a common disease entity in industrialized countries. In developing countries, most cases are bladder stones. In contrast, upper urinary tract stone disease is most prevalent in developed countries due to the influence of nutritional status and daily activities. [1]. Kidney stones account for the majority of clinical presentations of the disease. Whereas urethral stones are rare, accounting for less than 1–2% of all urinary tract stones. However, when a calculus occludes the urethra, it can cause acute urinary retention, urethral injury, and obstructive renal failure [2]. Diagnosing a urethral stone can be challenging, as symptoms can be nonspecific, and not every imaging modality used to evaluate kidney stones includes the whole lower urinary tract. Failure to diagnose an impacted urethral stone can lead to long-term urethral damage, incontinence, and renal insufficiency

[3]. Therefore, it is essential to know a complete clinical picture of urethral stones to be identified and managed appropriately. We report a case of a 53-year-old man who presented with giant long-standing urethral calculus without urinary retention. This case report has been reported in line with the SCARE Guideline. [4]

## 2. Presentation of case

A 53-year-old male presented to the emergency department with the main complaint of acute decreased consciousness. Patients also experienced weakness of the left extremities, headache, and vomiting. The patient had a history of urinary stones for ten years. He could feel the stone at the tip of the penis but delayed seeking medical help because he could still urinate spontaneously. The presence of fever or flank pain was denied. The patient had uncontrolled hypertension and did not take any medication. His medical history was otherwise unremarkable. On vital

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sign examination, Blood pressure was 190/110 mmHg, Pulse 88 times per minute, spontaneous breathing with 22 breaths per minute, and axillary temperature 36.5 °C; the patient was not fully conscious (Glasgow Coma Scale of 9). The abdominal examination revealed a bulged suprapubic area extended to two fingers below the umbilicus. The genitalia examination revealed a stone in the external urethral meatus, as shown in Fig. 1. Blood tests revealed leukocytosis  $15,4 \times 10^3/\mu\text{L}$  with elevated creatinine serum and blood urea nitrogen levels. A series of imaging, including KUB plain X-Ray and plain Head CT-Scan, were then performed. Besides the normal image of chest x-ray, abdominal ultrasound and plain KUB X-Ray showed moderate bilateral hydronephrosis and a radio-opaque stone at the navicular fossa, respectively, as shown in Figs. 2 and 3. The head CT-Scan found an extensive subarachnoid hemorrhage along the right and left frontal, parietal, temporal, and occipital areas. Intraventricular hemorrhage and non-communicating hydrocephalus were also identified, as shown in Fig. 3. The CT angiography revealed a left internal carotid artery aneurysm.

The neurosurgeon aid in diagnosing brain hemorrhage, hypertension, and hydrocephalus. The initial management consisted of an intravenous drip of nicardipine 2 mg per hour and an intravenous pump of diltiazem 5  $\mu\text{g}/\text{kg}/\text{min}$ , and an external ventricular drain surgery was performed. On the same evening, the patient underwent a dorsal meatotomy for the anterior urethral stone, and a 4 × 2 cm-sized stone was removed. The patient showed stable hemodynamics and a Foley catheter was inserted post-operatively. Postoperative creatinine serum and blood urea nitrogen levels were improved to the normal range. A follow-up ultrasound three days we remove the urethral stone showed improvement in hydronephrosis. Unfortunately, the patients did not regain consciousness until 12 days post-operatively and died the next day after sustaining subarachnoid hemorrhage causing vasospasm, brain edema, and brain stem herniation.



Fig. 1. Visualized stone in the external meatus of the urethra.

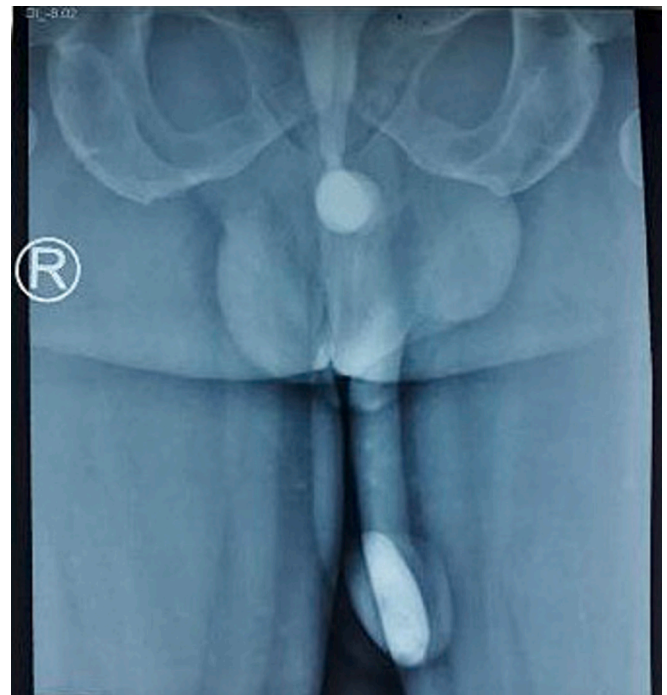


Fig. 2. Plain X-Ray showing a radio-opaque stone located at the navicular fossa.

### 3. Clinical discussion

Urethral stones are rare in the industrialized world, accounting for 0.3 %–2 % of all urinary tract stones [5]. They occur almost exclusively in men, in whom the urethra is longer and more tortuous, although cases in women and children have been reported [6]. Urethral stones can form in situ secondary to urethral pathologies, such as strictures and diverticula (primary stones), but more commonly originate from the kidneys or the bladder (secondary stones) [5,7]. Most urethral stones in the developed world contain calcium oxalate or phosphate, reflecting the composition of renal stones [5,8]. In developing countries, where bladder stones are far more common (because of a complex interplay of socioeconomic and nutritional factors), urethral stones are predominantly composed of struvite or uric acid [3,5,9]. The impaction of a stone usually occurs at the level of the prostate, although up to 30 % of stones may be found in the anterior urethra [5].

The stones generally have to be larger than 1 cm in diameter to cause urinary retention [3] However, in our case, with a stone measuring 4 × 2 cm, there was no incidence of acute urinary retention before the patient entered the hospital. In contrast to previous case reports from Ali et al. that they also found a 5.6 × 2.2 cm urethral stone in the anterior urethra which is roughly the same size as our case. It is likely to have formed slowly since ten years ago, with LUTS symptoms increasing progressively, but at the end of it appeared acute urinary retention symptoms that took the patient to the hospital [10]. Similar to our case, Abidin et al. reported that they also found a giant urethral calculus, sized 2.5 × 1.2 cm, without acute urinary retention. The patient came to the hospital with the main complaint of flank pain due to a renal staghorn stone. But they managed the patient differently using an endoscopic approach, which was commonly using the open surgery approach [11].

The patient lost consciousness due to a hemorrhage in the brain and urine retention. The combination is explainable since the brain governs inhibition and stimulation of urination [12]. Studies found urine storage influences the activity of the anterior cingulate and insula [13,14]. Strokes to the dominant hemisphere and insula could lead to urinary retention [15]. Therefore, if these areas were harmed by the stroke, it would result in impaired micturition control and produce acute urinary

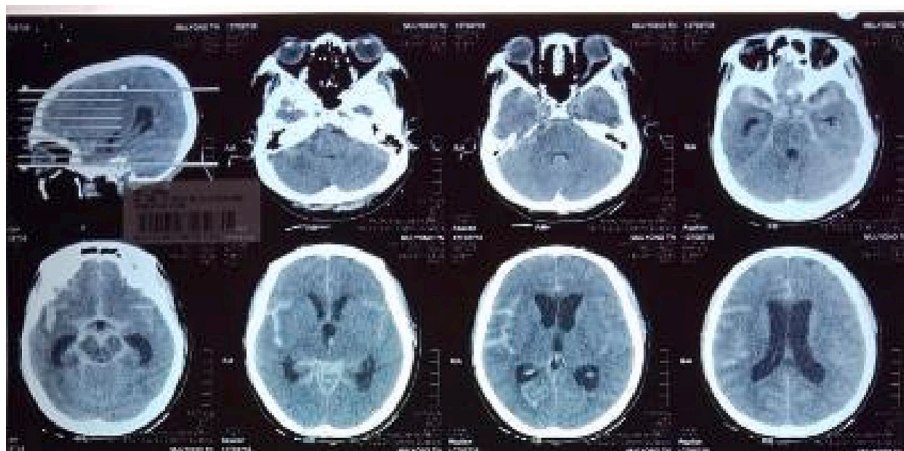


Fig. 3. Head CT revealing subarachnoid and intraventricular hemorrhage.

retention. Retention of urine is the most common symptom of urethral calculus [16]. Stones may cause irritative, obstructive, and referral urinary symptoms. The symptoms of hydronephrosis mimic renal colic due to obstruction in the case of urethral calculus. Costovertebral angle discomfort, a palpable bladder, or a rectal or penile stone may be found in a physical examination [3].

Size and location impact the management of urethral stones. An anterior urethral stone may be removed using lignocaine jelly at 2 %, a ventral meatotomy, or urethroscopy. Following the exclusion of the urethral stricture, intraurethral xylocaine is delivered to massage any residual stones, whereas the stones in the posterior urethra can be pushed back to the bladder [3]. Large urinary stones may need open surgery or less invasive procedures such as Holmium laser lithotripsy and Extracorporeal Shockwave Lithotripsy (ESWL) [17,18]. We performed a dorsal meatotomy on the patient. Due to the stone's location, which was in proximity to the external meatus, a dorsal meatotomy was necessary. A meatotomy can be performed if the stone is in the navicular fossa or external meatus. The size of the stone was also large, according to the plain radiograph. Dorsal meatotomy was a viable choice for critically sick patients for the low risk of postoperative sequelae. This procedure can be performed fairly quickly with minimal complications [3].

The limitation of this study was that the patient involved in this subject died a day after the procedure, so the patient's condition could not be evaluated. The patient's significant comorbid condition shifts the emphasis away from urological situations. Thus, urological symptoms may be linked to other disorders.

#### 4. Conclusion

Urethral stones are rare in cases of urolithiasis, especially large urethral stones. The incidence of urinary retention due to urethral stones are rarely reported due to the frequent passage of stones spontaneously without requiring any procedure. Systemic disease, in this case, stroke, could not be ignored as one of the causes of urinary retention, which can aggravate the patient's initial condition due to urolithiasis. The proper procedure can solve the problem of urinary retention in patients.

#### Informed consent

Written informed consent was obtained from the patient's family for the publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

#### Provenance and peer review

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#### Ethical approval

Ethical approval has been acquired in this study by Health Research Ethics Committee of Dr. Soetomo General-Academic Hospital, Surabaya, Indonesia.

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#### Author contribution

Conceptualization - MWA, DMS; Data curation - MWA, ADS; Materials - MWA, DMS; Formal Analysis - MWA, GRA; Investigation - MWA, GRA; Methodology - MWA, GRA; Supervision - DMS; Writing original draft - MWA, GRA, YUA; Writing, review, and editing - MWA, GRA, DMS, YUA

#### Guarantor

Doddy M. Soebadi

#### Research registration number

1. Name of the registry: Not required
2. Unique identifying number or registration ID: Not required
3. Hyperlink to your specific registration (must be publicly accessible and will be checked): Not required

#### Conflict of interest statement

The authors declare that there is no conflict of interest.

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