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Case Report

Urethral calculus with a recurrent acute urinary retention in a male child aged 11 years: A case report ☆,☆☆

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ABSTRACT

Urolithiasis is the presence of a stone anywhere in the urinary tract, it is commonly seen in adult patients and rare in children, especially when it is associated with acute urinary retention. In children, history is not suggestive and not specific; diagnosis is made by exclusion, and imaging studies often get the findings as incidental. In this case, the clinical presentation made early diagnosis quite difficult. The management of urethral calculi varies according to the site, size, associated urethral pathology, and available resources. It becomes an emergency when it causes acute urinary obstruction, urethral bleeding, or pain.

We present a case report of an 11-year-old male with a history of 3 episodes of acute urinary retention secondary to urethral obstruction by calculi. The period between 1 episode and the next was observed to be approximately 1 year, with no logical explanation.

Urethral calculus in children is less frequent than in adults worldwide. Urethral calculi are either formed in the native urethra or migrate from the upper urinary tract. Urgent urinary diversion and removal of the calculus with minimal urethral trauma is the recommended treatment.

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Introduction

Urethral calculi causing acute urinary retention is uncommon in children, representing only 1%-2% of all calculi affecting the urinary tract [1]. Urinary stones can cause obstruction to the normal flow of urine at any level of the lower urinary tract. In Europe, the prevalence of urolithiasis varies from 5% to 9% [2]. A prevalence of 2% of stones located in the urethra was reported in a study in Cameroon, a sub-Sahara country, and no study was done about urethral calculus in children in East Africa, Uganda inclusive [3].

Acute urine retention is a painful inability to pass urine that is relieved by bladder drainage and is usually caused by prostatic diseases, and urethral strictures [4]. Urethral calculus, an uncommon cause of urine retention, is either formed in the native urethra or migrated from the upper urinary tract. The anterior urethra is the most frequent site of obstruction [5].

The predisposing factor is multifactorial, including genetic inheritance, nutrition, metabolic, anatomical abnormalities, urinary tract infection, environmental factors, and stone-inducing drugs such as sulphonamides. The condition is more often associated with metabolic abnormalities including hypercalciuria [4,5], hypocitraturia, hyperoxaluria, hyperuricosuria, and cystinuria. Children are not able to express complaints such as flank pain, and typical clinical features are urine retention, irritability, and signs of infection [4]. Although challenging, the diagnosis and decision-making on treatments should be based on a thorough evaluation of the underlying risk factors, therefore avoiding recurrence [4].

We are reporting a case of recurrent urine retention in an 11-year-old male with large urethral calculi, who underwent extraction of the stone in 2 parts. This case report has been reported in line with the SCARE 2020 criteria [6].

Case presentation

An 11-year-old male, was admitted to the emergency unit of Kampala International University Teaching Hospital at Ishaka, Western Uganda with the main complaint of inability to pass urine for several hours.

The symptoms started 12 hours prior admission, described as decreased volume of urine followed by dribbling and associated lower abdominal distention with penile pain.

This was the third time he presented with these symptoms. The first was in November 2020, while the second was in November 2021. He had not used any predisposing drugs, and the family has no history of urolithiasis. He is not known to have sickle-cell disease or asthma. These symptoms are not associated with any history of hematuria. Prior to the first episode 2 years earlier, he had had normal urine flow since birth. The 2 previous episodes of urine retention for the last 2 years each occurring in November, had been managed at other hospitals by urethral catheterization, and a stone extraction respectively. This time, he presented in November 2022 with similar complaints and a palpable hard mass in the penile urethra.

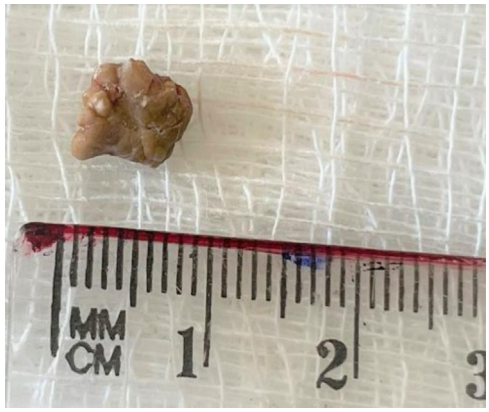

Fig. 1 – Hard mass, a stone removed in the urethra.

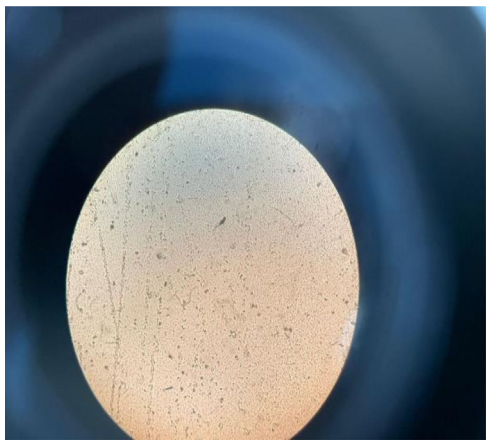

Fig. 2 – Microscope showing calcium oxalate crystal.

His circumcision at 7 years was uneventful. There was no family history of calculus. No history of fever and hematuria nor of trauma, but has had episodes of painful micturition, possibly suggesting urethritis.

Physical examination revealed an ill-looking, irritable boy in distress from penile pain. The supra Pubic region was distended, tensed, and tender. Penile examination revealed an edematous and hyperemic glans penis. A palpable hard mass was in a closed region of spongy urethra above the fossa navicularis, obstructing the external meatus.

A diagnosis of acute urine retention secondary to an impacted urethral calculus was made.

Calculus extraction

Under local anesthesia (Lidocaine) infiltrated circumferentially at the root of the penis, a calculus was gently milked out of his penile urethra to allow relief of the retention. This was done with the use of K-Y lubricant gel that was instilled in the urethra to ease its movement (Fig. 1).

On urinalysis, no leukocytosis but calcium oxalate crystal was seen on a microscope (Fig. 2).

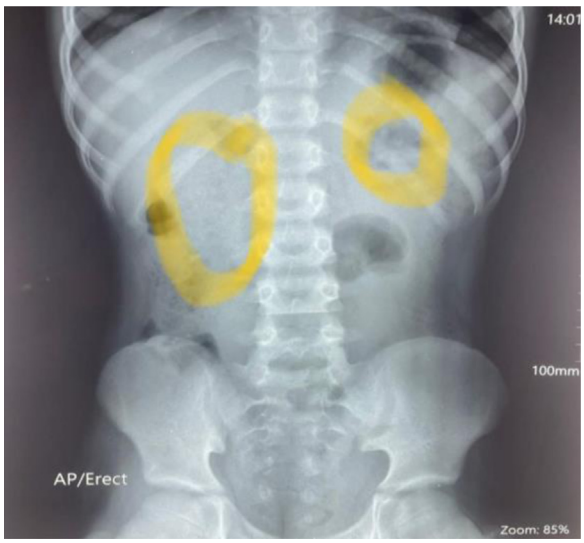

Fig. 3 – Multiple calcifications on erect abdominal X-ray.

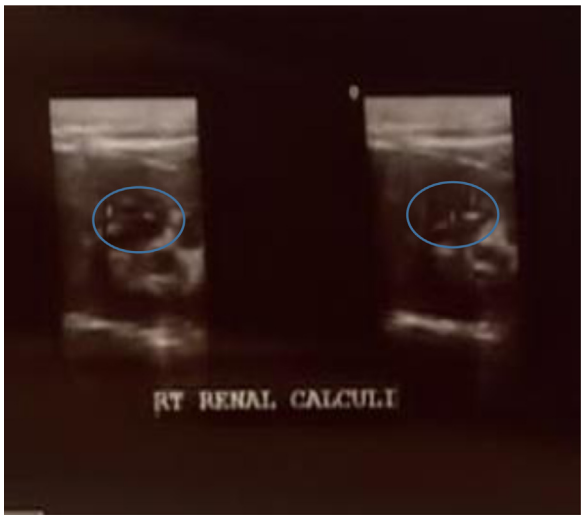

Fig. 4 – Small size nephrolithiasis in the right kidney.

We found also multiple calcifications on erect abdominal radiography at the right and left kidney (Fig. 3), and more stones at the right kidney.

An abdominal ultrasound scan revealed bilateral multiple small nephrolithiasis at the right and left kidneys, both on the lower poles (Fig. 4).

After removing the stones, the patient passed urine normally, and a urethral catheter size 12, was left in situ. Urine samples were taken for laboratory studies to rule out urinary tract infection. The patient was hydrated and a recommendation to increase intake of water daily was made. A follow-up after 2 months was done in the urology clinic, and the patient reported good progress so far. The next follow-up is planned after 8 months, and 1 year, with imaging studies, under the care of the urologist.

The urology clinic notes

This patient was reviewed by the urologist.

Noted the history of recurrence of the episodes of acute urinary retention due to urethral calculi. The imaging studies are suggestive of bilateral nephrolithiasis. This increases the possibility that the calculi in the patient's urethra descended from the kidneys.

There is a need to consider excluding metabolic diseases like hypercalciuria, hypocitraturia, cystinuria, and hyperoxaluria. To be reviewed at 3-month intervals in the urology clinic, further investigations done, and later, planned for lithotripsy to reduce the nephrolithiasis. Advised to drink plenty of water daily.

Discussion

Urinary tract calculi commonly affect the kidney, ureter, and bladder. Urethral calculi are rare, representing 1%-2% of all calculi affecting the urinary tract [2]. Urinalysis of this patient was performed and revealed positive calcium oxalate and uric acid. Urethral stones account for 0.3% of all urolithiasis in the pediatric age group. These stones are mainly constituted of urates and or triple (Ammonium, Magnesium, and Calcium) phosphates [3], which is not similar to our case.

Stones have varying compositions of salts, where the most commonly found in children are calcium oxalate stones, followed by calcium phosphate [7]. There are 2 types of urethral calculi/stones namely primary (formed within the urethra due to some anatomical defect) or secondary when stones from the upper urinary tract or bladder get lodged into the urethra [7], as was our case. According to the imaging findings of our patient, it is evident that calculus could have descended from the 2 kidneys and got arrested in the urethra.

Symptoms of children with urethral stones are dysuria, irritability, abdominal colic, passing of stones, macroscopic hematuria, penile edema, enuresis, vomiting, and anorexia [5]. Typical clinical features are urinary retention, irritability, and signs of infection [4]. The same with our case, the patient presented with acute urinary retention, penile edema, and a palpated stone in the anterior urethra.

After stabilization of the patient, in the presence of urethral calculi, plain abdominal radiography, and ultrasound scan may help to identify the stones and assess the impact of late obstruction on the upper urinary tract [3]. In our case, plain abdominal radiography revealed multiple calcifications, abdominal ultrasound scan showed multiple small bilateral nephrolithiasis without hydronephrosis on both sides. The most common location of stones is the lower pole of the kidney [8]. As seen in this case, in the right kidney [9].

The predisposing factor is multifactorial, including nutrition, anatomical abnormalities, urinary tract infection, environmental factors, and stone-inducing drugs, but it is more often associated with metabolic abnormalities including hypercalciuria, hypocitraturia, hyperoxaluria, hyperuricosuria, and cystinuria [3], in our case there is no anatomical abnormality, but the urine analysis revealed calcium oxalate crystals.

The factors which determine the approach in the management of urethral stones include the size and location of the stone, associated structural anomalies, and the available facilities to milk it. Small stones can easily be milked out through the urethral meatus after lubrication with xylocaine jelly, but this carries the potential risk of mucosal injury and the subsequent development of urethral stricture [10]. In our case, the stone was milked out in 2 parts due to its large size [11].

As in our case, preventing the recurrence of stones is as important as removing them from the system. The first step in the treatment is to increase fluid intake [12]. Upon diagnosis, the pain can be reduced using analgesic and antispasmodic treatments. In general, small stones (<4-5 mm) are asymptomatic and pass spontaneously [11,12].

The diagnosis for our patient was entirely clinical in this study. The 11-year-old male presented with sudden onset urine retention with an antecedent history of 2 same episodes and lower urinary symptoms prior to admission and the stone was visible on the external urethral meatus during the penile examination.

We opted for a local extraction under local anesthesia and removal in 2 parts, this is an option for management in a low-resource country where facilities for lithotripsy are not commonly available. The patient was later reviewed by the urologist, whose decision was to subject him to percutaneous nephrolithtripsy at a later date.

Conclusion

Renal calculus in children is less frequent than in adults worldwide. Urethral calculi are either formed in the urethra or migrate from the upper urinary tract. The combination of an ultrasound scan and a plain abdominal X-ray not only permits the location of calculi but also appreciates the impact of late obstruction on the upper urinary tract and the management. Urgent urinary diversion and removal of the calculus with minimal urethral trauma is the recommended treatment, and if possible milk the stone out to relieve the patient. Follow-up of this patient by the urology clinic and consideration of other forms of treatment including percutaneous nephrolithotripsy is a better option.

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Authors' contributions

HSB and JBM managed the patient and wrote the first draft. HMK, IE and AK helped in editing and reviewing the paper. All authors read and approved the final version to be published.

Ethical approval

Not applicable

Research registration

Not applicable

Provenance and peer review

Not commissioned, externally peer-reviewed.

Patient consent

Written informed consent was obtained from the parent (father) for publication of this case report. A copy of the written consent is available and attached in related file.

REFERENCES

[1] Babatunde KH, Ahmad B, Musliu Adetola T, Jerry GM, Nuhu Y. An impacted urethral stone: a rare cause of acute urinary retention in women—case report. Afr J Urol 2021;27:138.
[2] Sorokin I, Mamoulakis C, Miyazawa K, Rodgers A, Talati J, Lotan Y. Epidemiology of stone disease across the world. World J Urol 2017;35:1301–20.
[3] Muhammed A, Abubakar A. Pathophysiology and management of urinary retention in men. Arch Int Surg 2012;2(2):63–9.
[4] Ba F, Sebahat G, Poyrazo H, Dü R. Urolithiasis in infants: evaluation of risk factors. 2012
[5] Akhtar J, Ahmed S, Zamir N. Management of impacted urethral stones in children. J Coll Physicians Surg Pak 2012;22(8):510–13.
[6] Agha RA, Franchi T, Sohrabi C, Mathew Gfor the SCARE Group. The SCARE 2020 Guideline: updating consensus Surgical CAse REport (SCARE) guidelines. Int J Surg 2020;84:226–30.
[7] Mbouché LO, Andzé GO, Makon ASN, Bob DN, Tamufor EN, Amenglé AL, et al. Case report acute urinary retention in the male child from urethral calculi: a report of three cases. Case Rep Urol 2019;2019:5762139.
[8] Sheth KR, White JT, Perez-orozco AF, Debolske ND, Hyde CR, Geistkemper C, et al. Evaluating natural history and follow up strategies for non-obstructive urolithiasis in pediatric population. Front Pediatr 2018;6(November):10–15.
[9] Rahman F, Akter Luna S, Jesmin T, Roy RR. Nephrocalcinosis in children: a review. Paediatr Neph J 2018;3(1):38–47.
[10] Sungur M, Baykam M, Calışkan S, Lokman U. Urethral calculi: a rare cause of acute urinary retention in women. Turk J Emerg Med 2018;18(4):170–1.
[11] El-Sharif AE, Prasad K. Treatment of urethral stones by retrograde manipulation and extracorporeal shockwave lithotripsy. Br J Urol 1995;76:761–4.
[12] Telli O, Hamdi N, Bagcı U, Demirbas A, Hascicek AM, Soygur T, et al. What happens to asymptomatic lower pole kidney stones smaller than 10 mm in children during watchful waiting? Pediatr Nephrol 2017;32:853–7.