

A giant bladder struvite stone in an adolescent boy

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Abstract A 14-year-old adolescent boy with a history of recurrent lower urinary tract infection presented with a complaint of lower abdominal pain. Renal ultrasonography revealed bilateral hydronephrosis and X-ray film revealed a huge pelvic mass measuring $10 \times 8 \times 6$ cm which filled the whole bladder. Open cystolithotomy was performed and magnesium ammonium phosphate (struvite) stone weighing 420 g was removed. Although a bladder stone is not rare, in the present report, the composition and the huge size of the stone determined in an adolescent patient is an interesting clinical entity. To the best of our knowledge, this is the largest struvite stone reported in an adolescent patient.

Keywords Bladder · Stone · Struvite · Adolescent

Introduction

The prevalence of bladder stone is 5% of all urinary system stones and they usually occur due to bladder outlet obstruction, neurogenic voiding dysfunction, urinary tract infection, or foreign bodies [1, 2]. In urological practice,

bladder stones are frequently determined in patients over 50 years old and the size is rarely huge [3]. In this report, we present a huge bladder struvite stone measuring $10 \times 8 \times 6$ cm and weighing 420 g in a 14-year-old adolescent boy.

Case report

A 14-year-old male patient has admitted to the medical unit with lower abdominal pain. The patient had a recurrent lower urinary tract infection history and lower urinary tract symptoms including macroscopic hematuria, dysuria, and frequent voidings for 6 months. There was no family history regarding urinary stone disease. Physical examination revealed mild tenderness. Hemogram showed leukocytosis, and blood urea nitrogen and serum creatinine levels were 9.39 mmol/L and 142 μ mol/L, respectively. Urine analysis showed leukocyturia and erythrocyturia. *Escherichia coli* growth was confirmed by urine culture. Bilateral moderate to severe hydronephrosis was determined by renal ultrasonography. X-ray film revealed a huge, round calcified mass measuring $10 \times 8 \times 6$ cm in size which filled the whole bladder in the pelvic region (Fig. 1).

After treating urinary tract infection with intravenous antibiotics chosen according to culture sensitivity, the patient underwent open cystolithotomy operation. An elliptical magnesium ammonium phosphate bladder stone weighing 420 g and measuring $10 \times 8 \times 6$ cm was delivered smoothly (Fig. 2). The composition of the stone was reported as “magnesium ammonium phosphate (struvite)”. Postoperative period was uneventful and bilateral hydronephrosis recovered to a normal level within 2 weeks. The voiding dysfunction disappeared at 3-month follow-up.

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Fig. 1 X-ray film revealed a huge, round calcified mass which filled whole bladder in the pelvic region



Fig. 2 Macroscopic view of the huge bladder struvite calculus

Discussion

Bladder stone is one of the most common stones of the urinary tract. Magnesium ammonium phosphate accounts for 10% of all urinary tract stones [4]. Bladder stones are commonly observed with renal or ureteral stones, however,

they may rarely occur without associated upper urinary tract stone as in our case [1].

Most stones are of mixed composition and if infection is present, struvite is the major constituent. Moreover, struvite stones are usually diagnosed in elder patients and the size is rarely huge [4]. Our patient's young age and the stone's huge size made our case interesting. In 2003, a huge bladder stone measuring $8 \times 10 \times 5$ cm and weighing 540 g was reported in a 24-year-old male patient [5]. Also, Wei et al. reported another huge bladder stone with a 11 cm diameter and 450 g weight in a 39-year-old man [6]. Another large bladder stone was reported in a 69-year-old man weighing 660 g [7].

Large cystine bladder stones diagnosed in childhood or adolescent period as a result of congenital metabolic disorder have been reported previously [5]. However, stones which are not related to metabolic disorder is an interesting finding in adolescent patients as seen in our case. To the best of our knowledge, our case is the largest bladder stone reported in an adolescent patient to date.

Bladder stone remains a clinical problem in both the developing and developed countries. The best treatment seems to be prevention by improving the life standards.

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