

## An Egg Shape Bladder Stone in a Young Child

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**Abstract-** This is the presentation of a 19-month-old female admitted for recurrent lower urinary tract infection. Renal ultrasound and computed tomography showed a round bladder stone with no associated abnormality. Open cystolithotomy was performed, and a large bladder stone, measured 3.2 x 2 x 3.2 cm, and composed of magnesium ammonium phosphate (struvite) was removed. To the best of our research, this is the youngest patient, involved with a large struvite bladder stone.

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### Introduction

Bladder stone (BS) is the most common form of lower urinary tract stones, which comprises 5% of all urinary tract stones, and 1.5% of all cases admitted to the urology clinics. They are more common in men and patients over 50-year-old (1-3).

BS is more common in inhabitant children of endemic and developing regions, mostly in the setting of low-protein diet, poor socioeconomic condition, dehydration, and infection. However, the incidence of vesical stone is higher among adults living in nonendemic areas, which is usually associated with bladder outlet obstruction, foreign bodies such as fragments of a ruptured Foley catheter, sutures, and tapes or meshes, neurogenic bladder, chronic bacteriuria, bladder reconstruction, bladder diverticula, genetic or metabolic disorders, and upper tract stones (3-6).

BSs are usually small and originate from the upper urinary tract. Giant or massive BS (more than 100 g) is a rare condition, which is usually seen in men with an underlying urologic disorder (4,6). This is the presentation of a young child with a large struvite BS, presented with recurrent urinary tract infections.

### Case Report

A 19-month-old female patient was admitted to the nephrology clinic for recurrent lower urinary tract infections with macroscopic hematuria, dysuria, frequent

voiding, and narrow urine stream for 1 year. The patient had no history of medical or surgical disorders. She had a history of renal stones in her relatives. Laboratory exam revealed normal renal function (blood urea nitrogen; 18 mg/dl, creatinine; 0.7 mg/dl), microscopic hematuria and pyuria. *Escherichia coli* was isolated in urine culture. The urine biochemistry profile was normal.

Ultrasonography and MRI showed a large round BS, measured 3.2 x 2 x 3.2 cm, with no hydronephrosis and associated upper tract stone (Figure 1).



Figure 1. An egg shape bladder stone

Urinary tract infection was treated with intravenous antibiotics based on culture sensitivity. In addition, open cystolithotomy was performed, which removed a round BS, measured 3.2 x 2.3 x 3.2 cm (Figure 2), and composed of magnesium ammonium phosphate (struvite). The postoperative period was uneventful, and the patient had no symptoms after 1 year follow up, with no further stone formation. Informed consent was obtained from the patient's legal guardians.

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**Figure 2.** A 3.2 x 3.0 x 2.5 cm bladder stone composed of magnesium ammonium phosphate (struvite)

## Discussion

Giant BS is a rare entity in recent urologic practice. The history of BS back more than 7000 years in an Egyptian human (4). This is the presentation of a struvite BS in a young child, with no underlying predisposing risk factor. To our research, this is the largest struvite BS, reported in a young child.

Diagnosis of BS is generally made during the evaluation of obstructive or irritating voiding symptoms, such as persistent lower urinary tract symptoms, hematuria, recurrent urinary tract infections, or urinary retention (4,6).

In addition, obstructive renal failure might rarely occur in untreated impacted stones, impacted stones, with mechanical compression of ureteral orifices or intravesical obstruction (6,7). However, giant vesical calculi might rarely present with a few symptoms. Urinalysis is usually positive for nitrite, leukocyte esterase, and blood in these patients (7).

Based on associated urinary tract infection, the majority of BSs have mixed composition (1,7). Accordingly, struvite (ammonium magnesium phosphate) and calcium oxalate are commonly found in these patients with and without urinary tract infection (7). In addition, calcium oxalate and uric acid stones are prevalent in these patients (6).

Single BSs are commonly associated with renal or ureteral stones. However, multiple stones are more prevalent in patients with urinary retention (6). Our patient had no associated upper urinary tract stone, which has also been reported previously (1,3-4).

Diagnosis is usually made by imaging studies, including conventional radiography, ultrasound, and computed tomography (7). However, cystoscopy is the gold standard approach for definite diagnosis (3).

Elimination of infection and relieving of obstruction are the essential therapeutic modalities in these patients (3). In addition, cystolithotomy, endoscopic or percutaneous cystolithotripsy, and extracorporeal shock wave lithotripsy are optional surgical approaches for the management of BSs (6).

However, cystolithotomy is the preferred surgical method of giant bladder stone, which removes the whole stone, and reduces the possibility of female vesico-vaginal fistula (7).

A unique point of this patient was the absence of any anatomic, functional, or metabolic risk factors for BS formation, which have also been reported in some of the previous studies (2-4).

In conclusion, this presentation indicates that large BS might occur even in infants and young children with no metabolic or anatomic abnormality.

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