

# Bladder Calculi with Hypospadias and Hypercalciuria: Case Report

## Hiperkalsiüri ve Hipospadiaslı Bir Olguda Mesane Taşı

Hakan ERDOĞAN,<sup>a</sup>  
Fatma Deniz AYGÜN,<sup>b</sup>  
Mesut KAÇAR,<sup>c</sup>  
Nizamettin KILIÇ<sup>c</sup>

Clinics of

<sup>a</sup>Pediatric Nephrology,

<sup>b</sup>Pediatrics,

Bursa Şevket Yılmaz Training and Research Hospital,

<sup>c</sup>Department of Pediatric Surgery, Uludag University Faculty of Medicine, Bursa

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Yazışma Adresi/Correspondence:

Hakan ERDOĞAN

Bursa Şevket Yılmaz Training and Research Hospital,

Clinic of Pediatric Nephrology, Bursa,

TÜRKİYE/TURKEY

drerdoganha@yahoo.com

**ABSTRACT** The incidence of nephrolithiasis, especially bladder calculi, is lower in childhood compared with adults; but pediatric nephrolithiasis is an important cause of morbidity and has various etiology. A 21 month male infant was admitted to our hospital with atypical position during micturition because of pain. In his history, he was operated because of penoscrotal hypospadias and meatal dilatation was done for meatal stenosis in 12 months old. He did not have urinary tract infection before, but in the last 3 months he was treated for febrile urinary tract infections for three times. On physical examination he had failure to thrive and poor weight gain. He had difficulty and pain during voiding and he could urinate only in right and downward position. X-Ray and ultrasonography revealed bladder calculi and in laboratory he had hypercalciuria. The calculi was removed with surgery and analysis revealed calcium oxalate stone.

**Key Words:** Urinary bladder calculi; hypercalciuria; hypospadias

**ÖZET** Çocukluk yaş grubunda üriner sistem taşları, özellikle mesane taşları erişkinlere göre daha az görülmekle beraber önemli oranda morbiditeye sahiptir ve çeşitli etiyolojik faktörlerle oluşurlar. 21 aylık erkek olgu son 2 aydır idrar yaptığı sırada değişik pozisyon alması ve beraberinde huzursuzluğu olması şikayeti ile başvurdu. Özgeçmişinde penoskrotal hipospadias sebebi ile opere edildiği, 12 aylık iken de üretral meatal stenozu sebebi ile meatal dilatasyonu yapıldığı öğrenildi. Daha önce idrar yolu enfeksiyonu geçirmediği ancak özellikle son 3 ay içerisinde 3 kez ateşli idrar yolu enfeksiyonu sebebiyle tedavi edildiği öğrenildi. Fizik muayenesinde ağırlık ve boy büyüme eğrilerinin altında bulundu. Özellikle işeme esnasında kendine sağ yana eğilerek özel pozisyon verdiği ve bu sırada ağladığı gözlemlendi. Ultrason ve direkt grafide mesane taşı saptanan olgunun, laboratuvar değerlendirmesinde hiperkalsiüri saptandı. Taşı cerrahi olarak çıkarılan olgunun taş analizi kalsiyum oksalat taşı olarak değerlendirildi.

**Anahtar Kelimeler:** Mesane taşları; hiperkalsiüri; hipospadias

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**N**ephrolithiasis, especially bladder calculi, is rare in children rather than adults but has an important morbidity.<sup>1</sup> In developed countries, the estimated prevalence of nephrolithiasis is 1-5% in pediatric age group and bladder calculi has very small percent among these.<sup>2</sup> This ratio increases up to 30% in poor socioeconomic areas. Bladder calculi is endemic in Middle East, Armenia, Indonesia, Taiwan and also in our country.<sup>3</sup> In children, renal stones are usually associated with metabolic or structural abnormality, but cultural and nutritonal factors can also be responsible. Herein, we report a male case with two calculi in bladder having

metabolic disorder of hypercalciuria and structural anomaly of hypospadias.

## CASE REPORT

21 month old boy presented with pain and abnormal position during voiding in last two month. In his history he was operated for hypospadias with Bracka's method in 2 and 9 months old and meatus dilatation was done for urethral meatus stenosis when he was 1 year old. He was born with the weight of 3000 grams and he did not have urinary tract infection before but in last 3 month he had 3 febrile urinary tract infection. He did not have family history. Urinary ultrasonography was normal before hypospadias and meatal dilatation operation.

On physical examination, his weight and height were below the third percentile (8700 g and 80 cm respectively), blood pressure was 85/60 mmHg. Urinary flow rate and pressure were normal. In laboratory tests the white cell count was 12.000/mm<sup>3</sup>, CRP was 12 mg/dL (normal 0-1 mg/dL), sedimentation rate was 50 mm/hour. In urine analysis density was 1014, pH was 6.5. He had leukocyturia (100 leucyto/microL), microhematuria (50 erythrocyte/microL) and proteinuria (+). Urine culture revealed *Proteus* as a count of 10<sup>5</sup> CFU/ml. Biochemical tests including liver, renal function and serum electrolyte levels were normal. PTH, 25 OH Vitamin D3 (Table 1) and arterial



FIGURE 1: Bladder Stones, X-Ray.



FIGURE 2: Bladder Stones of case, after surgery.

**TABLE 1:** Blood Biochemistry, PTH and 25 OH Vit D3 values of case.

Urea	26 mg/dl
Creatinin	0.6 mg/dl
Na	138 mEq/L
K	4 mEq/L
Cl	107 mEq/L
Ca	9.9 mg/dl
P	4.2 mg/dl
Mg	2.2 mg/dl
Uric Acid	1.8 mg/dl
ALP	107IU/L
Mg	2.2 mg/dl
PTH	60 pg/ml (N:10-65)
25 OH Vit D3	22 ng/ml (N:10-50)

blood gas were also normal. 24 hour urine calcium was 8 mg/kg/day, calcium/creatinin ratio in 3 days were 1.2, 1.5, 1.8, respectively. Urine magnesium, uric acid, citrate and amino acid levels were normal. X Ray and ultrasonography revealed 2 bladder calculi (Figure 1). The bladder stones was removed by operation and the metabolic analysis of stones were calcium-oxalate (Figure 2).

Bladder calculi were removed completely as a whole under general anesthesia with cystolithotomy procedure. Minimal invazive technique must be used in children because urinary system calculi can be recurrent. Although open surgical proce-

ture has disadvantages like prolonged hospitalisation, catheterisation, infection and scar formation, endoscopic method is difficult in children because of lack of urethral calibration and technical insufficiency. Because of these reasons we preferred open surgery. The stone was analysed with infrared spectroscopy.

Water replacement, salt restriction and potassium citrate was started. He was followed with ultrasonography for 2 years with 3-6 months interval.

## DISCUSSION

In Turkey, nephrolithiasis is increasingly recognized in pediatric age group. The prevalence of renal calculi is 14.8% in Turkey, this ratio is 2-8% in USA and 1-5% in Europe.<sup>1-4</sup> According to data published by Turkish Society of Nephrology in 2008, the rate of chronic renal failure due to nephrolithiasis is 3.3% among children. The incidence of renal calculi can also change among different regions of Turkey according to ethiological reasons.<sup>5</sup>

The rate of bladder calculi is also high among children in endemic countries, such as Turkey. A population based study of children in our country demonstrated that rate of bladder calculi is not as high as suspected. Alpay and colleagues demonstrated that the ratio of bladder calculi is 1.2% among 162 children with urolithiasis.<sup>4</sup>

Despite regional differences, the incidence of bladder stone is decreasing in Turkey. The changes in nutritional habit can be the cause of this decrease. But more epidemiologic studies must be performed to prove this assumption.

Nephrolithiasis is associated with various factors, including genetic and metabolic disorders, environmental and geographic conditions.<sup>3</sup> Metabolic disorders and urinary system abnormalities are also important risk factors.

Idiopathic hypercalciuria is the most common metabolic abnormality associated with pediatric urinary calculi. In different studies the incidence of hypercalciuria is about 30% to 69%.<sup>6</sup> Hypercalciuria also seems to be the most common metabolic abnormality in our country. Alpay and colleagues reported the rate of hypercalciuria as 33.8%.<sup>4</sup> The metabolic analysis of our patient revealed hypercalciuria. Urinary oxalate, citrate, magnesium, uric acid levels and urinary amino acid chromatography of the case were normal.

Renal and urinary tract anomalies also lead to calculi because of urinary stasis. Ureteropelvic junction stenosis,<sup>7</sup> horseshoe kidney,<sup>8</sup> polycystic kidney disease,<sup>9</sup> megaureter<sup>10</sup> are urinary system anomalies leading to nephrolithiasis. Especially bladder calculi due to bladder out obstruction is common in adults. There are very few reports of association between bladder out obstruction and bladder calculus, in children,<sup>11,12</sup> but coexistence of hypospadias and urethral meatal stenosis with bladder stone was not reported before. Our case had that rare association of hypospadias and urethral meatal stenosis leading to stasis. In addition to this structural anomaly, hypercalciuria of our patient was also the predisposing risk factor leading to bladder calculi.

Also pain and only in right and downward position during voiding seems to be interesting point of the case for 21 month old boy. He was trying to open distal urethra for urine flow by taking this position.

Because of the pain and weak flow of urine during voiding, the patient was trying to increase the flow of urine taking this position.

In the conclusion, nephrolithiasis and bladder calculi must be remembered in children having structural anomalies. The association of metabolic and anatomic disorders increase this probability. We reported this case because of this rare association and special voiding position.

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