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The Effectiveness of Extracorporeal Shock Wave in Pediatric Renal Stones

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Abstract

Introduction: Renal stones are endemic in low income countries among children below 15 years old. This should not be underestimated due to high association with other morbidity and highly recurrence rate when compared with adults.

Objective: To explore the Effectiveness of Extracorporeal Shock Wave in Pediatric Renal Stones.

Methodology: Study the case of a child girl reported with renal stone, clinical and laboratory data were obtained, Radiological investigations as US and CT were done. The patient underwent dj stent, then patient received one session of Extracorporeal Shock Wave 4000 us guided storz ESWL Lithotripsy for urinary Stones then uralyt-u pediatric dose and allopurinol 100 mg once daily then start to passing stones gravels.

Results: Follow up by CT for the patient after 3 months revealed no stone, renal scan split function from 12% to 18%.

Conclusion: Renal stones could be presented even among pediatric group even with negative family history.

Ultrasound is the first choice imaging modality for diagnosis of suspected renal stones; CT could be used for follow up. Dihydroxyadenine stones could be missed during routine diagnosis of renal stones so imaging is mandatory and stones analysis should be done.

Keywords: Extracorporeal Shock Wave; Pediatric Renal Stones; Urolithiasis

Introduction

Renal stones are endemic in low income countries among children below 15 years old. This should not be underestimated due to high association with other morbidity and highly recurrence rate when compared with adults [1].

The consistency of urolithiasis composed of different organic and inorganic biominerals with amorphous or crystalline structure [2]. Stones’ composition comprises nearly of 40% to 65% of calcium oxalate, 14% to 30% of calcium phosphate, 10% to 20% of struvite, 5% to 10% of cystine, and 1% to 4% of uric acid. Rare comprise of xanthine, or 2,8-dihydroxyadenine [3].

Case Presentation

The case of a child girl reported with renal stone who was the single sibling of her family, no previous medical problems except for recurrent urinary tract infection. Negative family history of urolithiasis was noted, presented with flank pain.

Laboratory examination revealed the following: hemoglobin: 18.3 g/dl, white blood cell count, 6300/mL, MCV: 65.03 FL, MCH: 19.88 PG, serum phosphorus: 5.1 mg/dL, serum calcium 10.2 mg/dL, serum uric acid: 3.7 mg/dL and serum creatinine: 0.53 mg/dL. Urine analysis showed; hematuria, slightly turbid urine, pH: 6, 24 hr urine volume 1000 ml/day and 24 hr urinary protein excretion: 231 mg/day. Microbiology report revealed no bacterial growth.

Urine Ultrasonography (US) and abdominal Computed Tomography (CT) showed multiple stones in the right kidney of different sizes causing mild hydronephrosis and mild renal atrophic changes with grade I nephropathy. Dimercaptosuccinic acid scan revealed good and uniform cortical...
in up to 90% of children with urolithiasis. Positive family history is difficult to break, with smooth surface, and faint yellow color [6]. Friable with an irregular surface whereas urate stones are hard and chemical reactivity. While 2,8-dihydroxyadenine stones are soft and from uric acid stones which are also radiolucent and have identical chemical and ultraviolet spectrophotometry and/or X-ray crystallography. Birefringent Maltese cross pattern as seen under polarized light microscopy represent either lipid particles, DHA crystals, or starch (latex gloves) [10].

By searching in data bases and health records, this is the first case to be reported in a child from Kingdom of Saudi Arabia. Possible Causes of under reporting due to the lack of awareness of this disorder or inadequate patients evaluation for renal stones, or missed diagnosis where DHA crystals in urine analysis are confused with urate or oxalate, and the wrong diagnosis of radiolucent DHA stones as uric acid stones [11].

The 2,8-dihydroxyadenine (DHA) stones are rare forms of urolithiasis that occurs in patients with Adenine Phosphoribosyl Transferase (APRT) deficiency. Standard chemical and thermogravimetric analysis does not differentiate DHA stones from uric acid or xanthine stones, and either infrared or ultraviolet spectroscopy is required to make the diagnosis [12].

**Conclusion**

Renal stones could be presented even among pediatric group even with negative family history.

Ultrasound is the first choice imaging modality for diagnosis of suspected renal stones; CT could be used for follow up. Dihydroxyadenine stones could be missed during routine diagnosis of renal stones so imaging is mandatory and stones analysis should be done.

**References**


