Large stone clearance in 2-year-old child with staghorn and calyceal stones using SWL monotherapy

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KEY WORDS

shockwave lithotripsy (SWL) ◗ staghorn stones

ABSTRACT

Treatment of pediatric urolithiasis requires a thorough metabolic and urological evaluation on an individual basis.
The objective of our case report was to determine the efficiency and the role of shockwave lithotripsy (SWL) in the treatment of pediatric urolithiasis.
In this case report we reported our own experience in the management of staghorn and calyceal stones in both kidneys with SWL.
In our case, clearance of multiple staghorn stones and a calyceal stone was obtained without any complications after 7 sessions of SWL over 2 months.

INTRODUCTION

Standard guidelines in management of urolithiasis might be made applicable to patients of extreme ages [1]. Despite its relatively uncommon incidence, the management of urinary stones in children poses a specific challenge to the urologist [2].

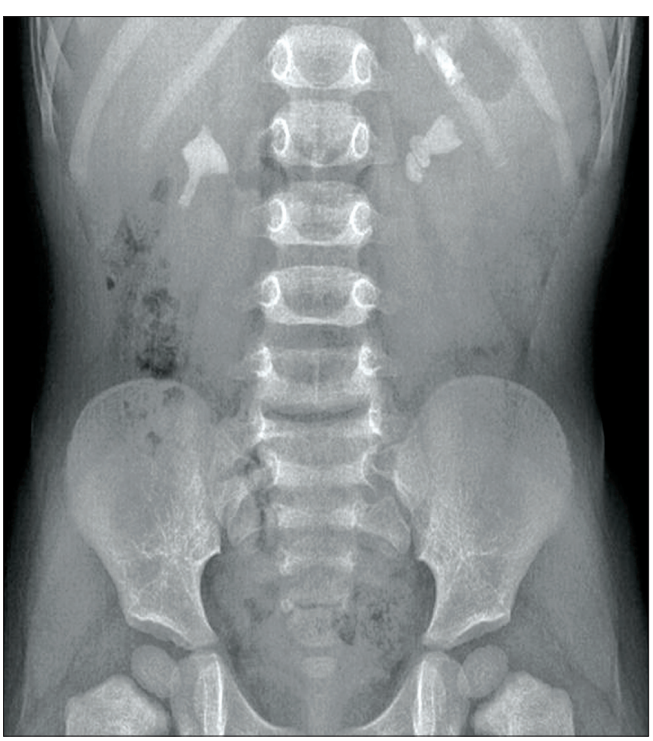

Fig. 1. Child with Stag horn stones.

The objective of our case report was to show whether shock wave lithotripsy (SWL) is a safe technique for treatment of pediatric urolithiasis.

In this case report we describe our own experience in the management of different and multiple calculi in a 2-year-old child presenting with staghorn and calyceal stones in both kidneys.

CASE REPORT

A 2-year-old male child presenting with recurrent urinary tract infections and hematuria for more than one year was treated with antibiotics by a pediatrician and was referred to our department of pediatrics. A thorough medical history and clinical examination as well as a plain X-ray and ultrasonography were performed. Plain X-ray, ultrasonography, and intravenous pyelogram all showed a staghorn stone in the right kidney (18 mm) and a staghorn (18 mm) and calyceal stone (7 mm) in the left kidney.

We performed a SWL treatment with the aim of stone clearance and prevention of stone recurrence in both kidneys. Placement of a stent was not considered.

SWL was performed under general anesthesia and antibiotic treatment.

We began our treatment on the left kidney with 4 sessions of SWL, which involved 8000 shock waves (SW) in all (7000 SW for renal calculi and 1000 SW for ureteral stone, see figure 1), followed by clearance on the left side. While the right staghorn stone required only 3 sessions of SWL, which totaled 6000 SW (5000 SW for staghorn stone, 1000 SW for its fragments in ureter, see figure 2). However, after the 2nd session, our patient developed fever that required drainage of the right kidney. Analyses of the stones

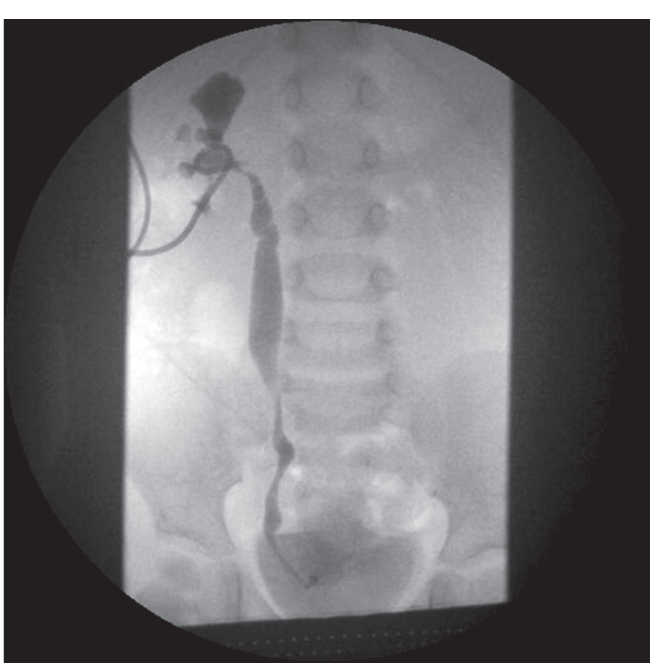

Fig. 2. Child after treatment and stone clearance.

revealed infected stones, however, urologic work-up did not detect any predisposing factor.

Cephalosporin was prescribed prophylactically in light of the infected stones.

The metabolic and urological evaluations of this child were normal.

The last follow-up, 18 months after treatment, showed a healthy, asymptomatic stone-free child with normal renal function and the absence of urinary tract infection with no sign of hypertension.

DISCUSSION

The parents of this child were presented with several treatment options, which included: percutaneous nephrolitholapaxy, SWL, and a combination of both. They choose the treatment with SWL.

Ng reported that SWL is well tolerated in children and age does not affect treatment outcome in patients with urinary stones [1]. Our patient tolerated SWL well and stone clearance was successfully achieved after treatment.

Hammad reported that pediatric SWL appears to be more efficient for the renal pelvis stones when compared to calyceal stones [2]. In our patient, SWL was efficient in the renal pelvis stones as well as the calyceal stone.

While Charalambous recommended nephrolithotomy for staghorn stones, we achieved staghorn stone clearance in both kidneys with SWL [3].

Raza used percutaneous nephrolithotripsy (PCNL) as the primary treatment for staghorn stones, but our results prompt us to recommend SWL as the primary treatment for staghorn calculi smaller than 20 mm [5].

D´Addessi reported that stone-free rates in pediatric SWL exceed 70-100% at 3 months. He explained this occurrence to be due to the following factors: 1 – lesser length of the child's ureter; 2 – pediatric ureter is more elastic and distensible, which facilitates passage of stone fragments and prevents impaction; and 3 – the small body of the child allows the shock waves to be transmitted with little loss of energy [2].

According to Wadhwa, SWL is an effective modality to treat pediatric upper urinary tract stones, especially when the stone burden is less than 20 mm because larger stones are associated with poorer results. In our case, SWL was effective in the treatment of upper urinary tract and lower ureter stones when stone burden was less than 20 mm [6].

Lahme reported that SWL can be performed only if focus size and treatment facilities are adapted to the size of the child, which was a factor that was applicable in our patient [7].

According to Shouman et al., the placement of a stent is not a prerequisite for success of treatment, hence, we did not consider ureter stenting [8].

In our case, the clearance of staghorn stones and a calyceal stone was achieved without any complications after 7 sessions of SWL over 2 months.

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