

Endourological treatment of lower urinary calculi in children

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Summary

Endourological treatment of lower urinary stones in children has been widely used in recent years. Twelve cases with lower urinary stones have undergone endourological manipulations in our department. Three ureteral stones were removed by basket catheter (ureteral stone extractor) via 11.5 F ureterorenoscope and the

remaining 7 bladder stones and 2 urethral stones were destroyed by electrohydropoltripsy (EHL) by using a pediatric cystoscope. The procedures were successful in all cases and no complications were observed.

Key words: Endourology, lower urinary calculi, electrohydropoltripsy (EHL)

Introduction

Urinary stone disease continues to be one of the most common pathologies encountered in both the adult and the pediatric age group in urology departments. Lower urinary tract calculi and especially bladder stones in the pediatric age group are seen frequently in developing countries where diets are deficient in high quality protein (2,3,4). Infection, stasis, and foreign bodies are also responsible for these stones. Endourological approach to lower urinary tract calculi was first performed in the late 18th century (2,5). Because of the lack of experience with these techniques in pediatric age group, many of the patients still undergo open surgery; however, endourological techniques and EHL are employed on an increasing basis for the treatment of adult urolithiasis in the recent years. In an attempt to overcome this problem for the pediatric urolithiasis, we performed endourological procedures for lower urinary tract stones.

Materials and Methods

Our group consists of 12 boys. Three patients with lower ureteral stones, 7 patients with bladder stones, and 2 patients who had stones in their urethra. The youngest patient was 3 and the oldest was 14 years old. The diagnosis was established via intravenous pyelography in all the cases. Those who had urinary infections were treated accordingly until a sterile urine was obtained before the intervention. All the interventions were carried

out under general anaesthesia by performing urethroscopy. 3,5 F or 5 F Riwoolith probe were administered to the "working channels" of the 13,5 F pediatric resectoscope and 14 F cystoscope during performing the operations. Care was taken not to fill the bladder completely. The probe was 0.1 placed to 0.2 cm away from the stone thus the optic end to the ureterorenoscope was preserved not to be damaged (8). Wolf Riwoolith instrument was used as EHL generator. Single pulse of one intensity was used for EHL; it was not very necessary to increase the intensity whenever needed. After the initial pulse, however multiple doses were given to the fragments in order to obtain the smallest fragments possible. The fragments of stones were removed from the bladder by the washout technique. The same methods were used in urethral stones after pushing the stones back to the bladder. Ureteral stones were removed by using Dormia or Segura basket catheter via 11 F or 12.5 F ureteroscope. A scout film of the urinary system was taken right after each procedure to determine any remaining stones.

Result

In all the cases which we performed EHL, the stones were completely disintegrated (Fig 1,2). Remaining fragments of the stones in the bladder passed out the urethra within a day without any problem. We observed that there were not any remaining fragments the day after the operations by taking the scout films of the urinary system. In all the cases of ureteral stones, the stones were removed by basket catheters without any complication. The longest intervention lasted 45 minutes where the shortest was only 10 minutes as the average of 28 minutes. The stones

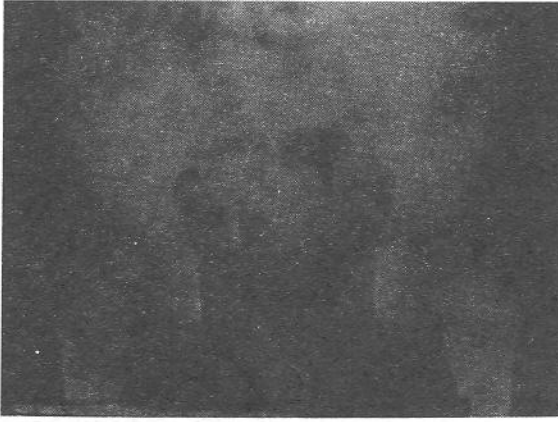


Fig 1: Plain X-ray film of a bladder stone.

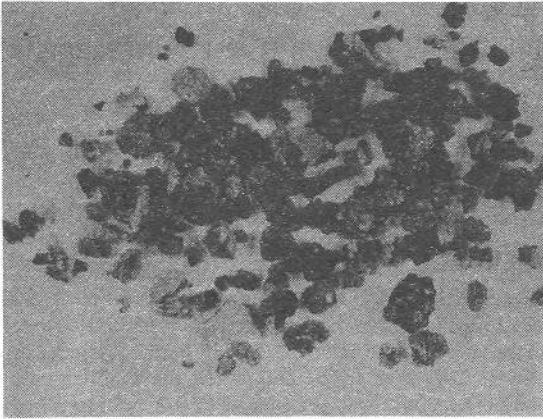


Fig 2: Stone fragments that are washed out the bladder after EHL.

were 1 to 2.5 cm in diameter. Biochemical analysis of the stones revealed that all had calcium phosphate as a common component which was complicated by urate and oxalate in two cases. There were no post-operative complication. Those who had been left in small stone fragments for spontaneous passage had slight dysuria that was easily controlled by analgesics. There was slight hematuria due to the endoscopic manipulation. All the patients received antibiotic therapy for three days following the procedures. No catheters for urinary drainage were used. Removal of the ureteral stones were done on out-patient basis. The remaining patients were hospitalised for 24-48 hours. The discharging criteria was the absence of a

stone in the scout film of the urinary system.

Discussion

The incidence of lower urinary tract stones is 15-20 % in pediatric urolithiasis (1,7). To the best of our knowledge, EHL has not been used yet for the treatment of vesical calculi in the pediatric age group in our country. There are many centers where lower urinary stones in children are still being treated by using classical open surgery methods. Endourological treatment of these calculi is a very good alternative and advantageous method in comparison to open surgery (4,6). The absence of an incision, the short duration of the operation the short post-operative period, the absence of an urethral catheter post-operatively are the main advantages. As the development of technology in endourology increases, we must be involved in by using this advancing technology. We believe that lack of experience performing endourology particularly in children will be overcome in the close future.

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