

Evaluation of Outcome of Upper Ureteric Stone Management by ESWL: A Study in Dhaka, Bangladesh

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Abstract

Objective: To evaluate the outcome of extracorporeal shock wave lithotripsy (ESWL) for the management of upper ureteral stones. **Materials and methods:** This prospective observational study assessed 42 patients who underwent ESWL from March 1, 2009 to June 30, 2010 in the National Institute of Kidney Diseases and Urology, Dhaka. The stone size, success rate, and postoperative complications were evaluated. A successful outcome was defined as the patient being stone-free on radiography 1 month after treatment. **Results:** Out of 42 patients, 34 had stone size more than 1 cm and the remaining had stone size less than 1 cm. Stone clearance rate after single session was 36 (85.7%). Immediate complications included fever in 14 and severe hematuria in 6 patients. Almost 50% developed urinary tract infection, and steinstrasse was observed in 2 patients. More than 90% of the patients exhibited complete clearance of stone after single session after 3 months of intervention. There was no ureteral injury and no patient developed stricture. **Conclusion:** For management of selective sized upper ureteric stone, ESWL is superior to other minimally invasive procedures like ureterorenoscopy + intracorporeal pneumatic lithotripsy (ICPL) considering greater stone clearance, less complications, and non-invasiveness

Key words: upper ureter, ESWL, URS, stone clearance

INTRODUCTION

Ureteric stone disease is a common urological problem throughout the world. Over the last two decades management of urinary stone disease has radically changed. Open surgery has been replaced by minimally invasive and non-invasive procedures, mainly extracorporeal shock wave lithotripsy (ESWL) and ureterorenoscopy (URS) with lithotripsy.¹⁻³ There is controversy as to which therapy is better suited for the management. While treating with ESWL, patients can be dealt as outpatient basis; treatment can be performed using analgesics/sedatives without anesthesia and with minimum complications. On the other hand, treatment with other modalities such as ureterorenoscopy requires admission of the patients prior to the procedure, anesthesia during the procedure, and also requires prolonged hospital stay. ESWL is considered the first line of treatment for stones less than 1 cm whereas for larger stones there are some doubts about its role.⁴

MATERIALS AND METHODS

It was a prospective observational study conducted in the Department of Urology, National Institute of Kidney Diseases and Urology (NIKDU) from March 1, 2009 to June 30, 2010. Patients attending outpatient department with upper ureteric stone were chosen for ESWL. Total 42 patients were included in study consecutively. All the patients were preoperatively evaluated with plain X-ray of kidney-ureter-bladder (KUB), ultrasonogram, intravenous urogram, and urinalysis including culture and sensitivity.

Inclusion criteria

- Good renal function, well excretion on both sides
- Stone size 8 mm–1.5 cm
- No distal ureteral obstruction

Exclusion criteria

- Stone with infection
- Multiple ureteric stones
- Renal failure
- Impacted stone
- Diabetes and other co-morbidities

Patients were treated using Storz Modulith SLX+C-MX under intravenous sedation/analgesia. Patients were discharged few hours after the procedure with advice to come for follow up at 1 and 3 months and then yearly. During the first follow up for each patient history was taken, urine examination and plain X-ray KUB region were done to check stone clearance. During second visit at 3 months, urine examination, plain X-ray, and ultrasonography of KUB region were done to find out any residual stone. The stone size, success rate, and postoperative complications were evaluated.

RESULTS

Mean age of the study population was 38.6 ± 10.8 years, which included 36 males and 6 females. Out of 42 patients, 34 had stone size more than 1 cm and the remainder had stone size less than 1 cm. Average size of the stones was 0.92 sq cm. Stone clearance rate after single session was 36 (85.7%). Immediate complications included fever in 14, severe hematuria in 6 patients. Almost 50% developed UTI. Steinstrasse was observed in two patients. Hospital stay was $2.8 \text{ hours} \pm 0.4 \text{ hours}$. More than 90% of the patients exhibited complete clearance of stone after single session after 3 months of intervention. There was no ureteral injury and no patient developed stricture.

DISCUSSION

ESWL is now established as the first line of treatment for small upper ureteral calculi and is least invasive.⁴ Stone clearance after this treatment approach was 90% or more with variable re-treatment rate.^{4–8} Clearance depends mostly on stone size and composition.⁹ The size of stones in our study was well within acceptable range for successful outcome.^{10,11} Stone clearance in our study was 85.7% after 1 month and 90.5% after 3 months following single session. The success rate in our series seems to be higher than many other series.^{8,10,12,13} It can be explicable by the fact that the stones were relatively smaller, single, and non-impacted in our series.

Complications are not uncommon after using ESWL including flank pain, hematuria, and urinary infection.^{7,13} However in comparison to ureteroscopy, complications are less severe.^{8,14} Fever occurred in 14 (33.3%) and severe hematuria in 8 (21.3%) cases in our series. Twenty (47.6%) patients developed urinary tract infections and 2 (4.8%) cases developed steinstrasse after 1 month.

CONCLUSION

For the management of upper ureteric stone, ESWL is a good option among the minimally invasive/non-invasive procedures including ureterorenoscopy with lithotripsy considering its greater stone clearance, less complications, and non-invasiveness.

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