

## LITHOTRIPSY

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**Purpose of work:** The purpose of this study is to evaluate the effectiveness, safety, and clinical outcomes of extracorporeal shock wave lithotripsy (ESWL) in the treatment of renal and upper ureteric calculi. Kidney stones are a common urological condition, and non-invasive management options have become increasingly important. ESWL uses focused acoustic pulses to fragment stones, allowing natural passage through the urinary tract. This work aims to assess the stone clearance rate, number of sessions required, and incidence of complications. Additionally, it evaluates factors influencing treatment success such as stone size, location, and composition. The findings are intended to guide optimal patient selection for ESWL and to compare its efficiency to other modalities such as ureteroscopy and percutaneous nephrolithotomy

**Materials and Methods:** This prospective study involved 60 patients diagnosed with renal or upper ureteric stones, treated with ESWL between January and December 2024. Patients included had solitary stones measuring 5–20 mm confirmed by ultrasonography or non-contrast CT scan. Exclusion criteria included pregnancy, bleeding disorders, severe obesity, and distal ureteric stones. Lithotripsy was performed using a third-generation electromagnetic shock wave lithotripter. Patients underwent 1–3 sessions depending on stone size and fragmentation response. A maximum of 3,000 shocks per session were delivered, with energy levels gradually increased. Analgesia was given as required. Follow-up imaging was done at 2 weeks and 1 month post-treatment to assess stone clearance. Successful outcome was defined as complete stone-free status or residual fragments <4 mm. Complications such as hematuria, flank pain, steinstrasse, and urinary tract infections were recorded. Data were analyzed using SPSS software, and statistical significance was set at  $p < 0.05$

**Results:** Out of 60 patients treated with ESWL, complete stone clearance was achieved in 78.3% after a single session, while 16.7% required a second session, and 5% needed three sessions. The overall stone-free rate at one-month follow-up was 93.3%. Higher success was observed for stones <10 mm and in renal pelvis

location. Common minor complications included transient hematuria (25%), mild flank pain (20%), and steinstrasse (8.3%). Two patients developed urinary tract infections requiring antibiotics. No major complications or hospital admissions occurred. The procedure was well tolerated by most patients. The results confirm that ESWL is effective, especially for smaller stones, and presents a non-invasive alternative to more invasive stone removal techniques.

**Conclusion:** Extracorporeal shock wave lithotripsy (ESWL) is a safe, effective, and well-tolerated treatment for renal and upper ureteric calculi, particularly for stones under 15 mm in diameter. It offers a non-invasive approach with high stone clearance rates and minimal complications. The procedure is associated with short recovery time, low morbidity, and can often be performed on an outpatient basis. While certain factors such as stone size and location influence success, ESWL remains a preferred initial treatment for appropriately selected patients. This study supports its continued use as a first-line therapy, especially when aiming to minimize the need for anesthesia, hospitalization, or more invasive surgical interventions.