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Percutaneous nephrolithotomy versus extracorporeal shockwaves lithotripsy for treatment of a 20-30 mm single renal pelvis stone

M. Hassan, A.R. El-Nahas, K.Z. Sheir, N.A. El-Tabey, A.M. El-Assmy, A.A. Shokeir
Urology Department, Urology and Nephrology Center, Mansoura University, Mansoura, Egypt

Objective: To compare the efficacy, safety and cost of extracorporeal shockwaves lithotripsy (SWL) and percutaneous nephrolithotomy (PNL) in treatment of a 20-30 mm single renal pelvis stone.

Patients and Methods: The electronic records of patients who were treated by PNL or SWL for a 20-30 mm single renal pelvis stone between January 2006 and December 2012 were retrospectively reviewed. Patients aged <18 years, who had branched stone, advanced hydronephrosis, solitary kidney, anatomical renal abnormality, or had received treatment for this stone within the past 6 months were excluded. Patients' criteria (age, sex, BMI) and the stone characters (side, stone length, surface area, attenuation value and skin to stone distance) were compared between both groups. Re-treatment rate, the need for secondary procedures, success, complications and the total costs were calculated and compared.

Results: The study included 337 patients with mean age 49.3 ± 12.2 years (20-81); 167 patients were treated by SWL while 170 patients were treated by PNL. Re-treatment rate (75% versus 5%), need for secondary procedures (25% versus 4.7%) and total number of procedures (3 versus 1) were significantly higher in the SWL patients ($P < 0.001$). The success rate was significantly higher in PNL patients (95% versus 75%, $P < 0.001$). The incidence of complications was significantly higher in PNL group (13% versus 6.6%, $P = 0.050$). The total cost was significantly higher for PNL (1120 versus 490 \$US, $P < 0.001$).

Conclusions: For treatment of a single renal pelvis stone of 20-30 mm, PNL was proved to be more effective than SWL. However, SWL was associated with lesser complications and lower cost.