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Stone size and J-J stent can be considered as predictors for stone fragmentation using extracorporeal shock wave lithotripsy

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Objectives: To evaluate the factors that may predict the success of extracorporeal shock wave lithotripsy (ESWL) for the treatment of urinary tract calculus.

Materials and Methods: The study included 430 consecutive patients with kidney and ureteral calculi at different levels and who were referred for ESWL between February 2007 and February 2008. ESWL was considered successful when there were no stones or only clinically insignificant residual fragments <4 mm within 2 to 8 weeks from the start of treatment. Stones that did not fragment after three ESWL sessions were considered ESWL failures. Success rate was correlated with patient characteristics, urinary tract conditions and stone features as well as the effect of ureteric stents. Factors found to be significant by univariate analysis were further analyzed using multivariate regression analysis.

Results: At 3 months follow-up, the overall ESWL success rate was 76.7% (330/430). Of the 430 patients, 160 (37.2%) had 1 session of ESWL, 92 (21.4%) had 2 sessions and 178 (41.4%) had 3 sessions, with 100 patients (23.3%) showing non-fragmentation of stones (ESWL failure) after 3 sessions of ESWL. Univariate analysis showed that success rate was associated with the absence of ureteric stents (81.4% vs 65.9%, $p < 0.000$), stone length ≤ 8 mm (88.7% vs 40.5%, $p < 0.000$), and stone width ≤ 8 mm (80.1% vs 56.1%, $p < 0.001$). Multivariate logistic regression showed that only two factors namely stone length ≥ 8 mm and J-J stent were risk factors of ESWL success. In contrast, other factors, including age, sex, stone number, prior ESWL, and hydrouretero-nephrosis, did not have a significant impact on ESWL success rate.

Conclusions: The success of ESWL in the treatment of urinary tract stones could be predicted by stone width and length and DJJ insertion. Other factors, including age, sex, nationality, number of stones, and ESWL before or hydrouretero-nephrosis, did not significantly affect success rate.

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