Factors Affecting Urinary Calculi Treatment by Extracorporeal Shock Wave Lithotripsy

Abstract

Extracorporeal Shock Wave Lithotripsy (ESWL) is still the treatment of choice for most renal and upper ureteric stones; however, the outcome depends on multiple factors.

Aim: The objective of this study was to investigate the effects of stone density, as measured by Hounsfield Units (H.U) by non-contrast Computerized Tomography (CT), stone size and stone location on ESWL treatment outcome of urinary calculi.

Materials and Methods: 65 patients underwent clinical, biochemical and radiological assessments followed by ESWL treatment. Statistical analyses including chi-square, analysis of variance (ANOVA), correlation, regression were performed for statistical significance between ESWL treatment, stone fragmentation and stone density, size and location in the renal pelvis calyseal system.

Results: ESWL success rate was high (94%) for low density stones (< 500 Hounsfield units). In general, CT densities of 750 Hounsfield units or less were almost always successfully treated by ESWL. An inverse association between ESWL treatment outcome and stone size was also documented. CT stone density and stone size combined account for nearly 73% of the variation in the number of shock waves required to attain fragmentation. Stones located in lower calyceal area had less success rates.

Conclusion: Stone density measurement is helpful to predict the success of ESWL for urinary stones, stones with higher density, large size and lower location may better be managed by percutaneous nephrolithotomy.