Factors Affecting Stone-Free Rate after SWL: Relationship with Inflammation

Introduction and Objective: We assessed factors, including presence of pyuria or leukocytosis, which would affect the stone free rate after shock wave lithotripsy (SWL).
Materials and methods: Between Jan 2004 and Dec 2008, 392 patients had SWL in situ for proximal ureteral calculus; they were reviewed retrospectively. Patients requiring simultaneous treatment of kidney stone, placement of a double pigtail stent, or percutaneous pigtail nephrostomy tube were excluded. Also, patients with radiolucent stone, multiple ureteral stones and who had SWL more than 3 times but no significant change found on plain radiography were excluded. The patients followed up with plain radiography. The size of a calculus was calculated by adding the major axis and the minor axis of the stone on plain radiography and dividing the sum into two. The renal function index used was MDRD (Modification of Diet in Renal Disease) GFR. Stone free status was defined as no visible stone fragments on a plain abdominal film at 1 month after SWL. Univariate and multivariate analysis were performed on known several factors especially including the presence of pyuria and WBC count, that might affect the stone-free rate.
Results: Average stone free rate for proximal ureteral calculi was 80.1%. The stone free rate was 82.3% in patients without pyuria and 69.5% in those with pyuria (P=0.02). In addition, the stone free rate was 88.2% in patients with normal range WBC count and 48.1% in those with leukocytosis (WBC count≥10000) (P<0.001). On univariate and multivariate analysis, stone size (OR: 0.729(0.622-0.853), p<0.001), eGFR (OR: 1.086(1.056–1.118), P<0.001), leukocytosis (OR: 0.128(0.062-0.267), P<0.001), and the presence of pyuria (OR: 0.383(0.176-0.832), P=0.015) were significant factors for stone free rate after SWL. On Comparison of ROC curves, there were no significant differences among stone size, eGFR, and leukocytosis, but there was significant difference in the presence of pyuris.
Conclusions: A stone size of 5mm, eGFR ≥60.66 and leukocysotis (≥7740) were significant predictors affecting the stone-free rate after SWL for proximal ureteral stone. Also, the presence of pyuria is one of the predictors for stone-free rate after SWL.