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The effect of the components of the skin-to-stone distance on success of SWL

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Background: Few studies have addressed the effect of skin-to-stone distance (SSD) on the success of SWL. Nevertheless, the effect of the two components of SSD i.e. the fat (FSSD) and non-fat (NFSSD) components was not previously investigated.

Methods: In this prospective study, all patients (n=113) who had single radio-opaque kidney stones and underwent SWL for the first time between January 2006 and June 2007 were recruited. SSD, FSSD and NFSSD were measured by non-contrast CT scan at 0, 45 and 90 degrees and the average was calculated. The outcome was defined as successful (completely stone free or residual fragments ≤ 3 mm) or unsuccessful (residual fragments > 3 mm or complete failure of fragmentation).

Results: 69 (61%) patients had successful treatment. On univariate analysis, SSD, FSSD and NFSSD were significantly lower in the successful group compared to those in patients with unsuccessful outcome (71.9 ± 13.3 vs. 86.2 ± 25.1 mm ($P=0.001$), 27.2 ± 10.3 vs. 36.1 ± 17.3 mm ($P=0.011$) and 44.7 ± 7.2 vs. 50.1 ± 13.9 mm ($P=0.02$), respectively). The muscle component of the NFSSD was also lower in the successful group (21.5 ± 4.1 vs. 25.2 ± 10.0 mm, $P=0.01$).

On multivariate analysis, factors which independently predicted treatment success were SSD, stone attenuation and stone size but not the FSSD nor the NFSSD.

Conclusions: Although the total skin-to-stone appeared to be a significant predictor of SWL success, its fat and non-fat components did not independently predict the final outcome and only appeared to be important through their contribution to the total skin-to-stone distance.

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