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**Correlation of vasoconstriction and kidney protection during shock wave lithotripsy**

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Kidney injury in lithotripsy can lead to long-term adverse effects, so minimizing injury is beneficial. We have found that injury is significantly reduced when shock wave (SW) administration is halted briefly- 3-minutes-early in treatment. Previous studies have shown that SWs stimulate renal blood vessels to constrict. Therefore, we tested the idea that vasoconstriction mediates SW-induced protection of the kidney. Doppler ultrasound was used to measure resistive index (RI), a ratio of systolic and diastolic velocities, indicating vasoconstriction. RI was determined for single intralobar arteries in targeted porcine kidneys treated by standard versus protection protocols (2,000SW, uninterrupted vs 500SW-3-min pause-2,000SW) using a Dornier-HM3 lithotripter (2Hz, 24kV). Significant differences in RI from baseline within a group and between groups at various time points were determined using mixed-effect models for repeated measures with Holm's step-down method for multiple comparison adjustment. All animals had similar baselines. Sham pigs (no-SWs) showed no significant change in RI. The protection protocol produced a significant rise ( $p < 0.05$ ,  $n=8$ ) in RI 15 minutes into treatment, while the standard protocol did not yield a significant rise ( $p < 0.05$ ,  $n=7$ ) until 45 minutes after treatment. Thus, the treatment protocol shown to protect against injury, induces early vasoconstriction. [NIH-DK43881, NSBRI-SMS00402]