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Creation of a fluid chamber with the Accordion device increases fragmentation during ureteral ESWL: *in vitro* and *ex vivo* results.

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Introduction: A fluid-filled chamber is postulated to increase cavitation during ESWL, which increases stone fragmentation. The objective of this study was to measure fragmentation efficacy during use of a stone device that forms such a chamber.

Methods: *In vitro* model: stones (UltraCal-30) were advanced into an artificial ureter and placed in the focusing cup of a Modulith SLX (Storz Medical) filled with deionized water. A single ESWL session (energy level 9 for 1000 shocks) was applied with either a 10 mm Accordion device (PercSys) distal to the stone or no device present in five replications. *Ex vivo* model: stones were advanced within an explanted porcine ureter and placed upon the treatment head of a Compact Delta (Dornier), sandwiched between pouches of saline. A clinical cycle of ESWL (total of 2400 shocks) was replicated three times each with either a 10 mm Accordion device immediately distal to the stone or no device present. Fragmentation coefficient (FC) was determined as $FC = 100(\text{Weight}_{\text{initial}} - \text{Weight}_{\text{following}}) / \text{Weight}_{\text{initial}}$. Significance was determined using Student's *t*-Test.

Results: Mean FC following a single application was 63 with an Accordion device distal to the stone versus 47 without the device ($p=0.04$) in the *in vitro* model. The sessions in excised ureters resulted in an FC of 33 with the device present versus only 9 without the device ($p=0.008$).

Conclusion: Tenting tissue away from the stone surface by the Accordion device created a fluid interface in both simulated ureters and excised porcine ureters and significantly increased the fragmentation coefficient of ESWL.

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