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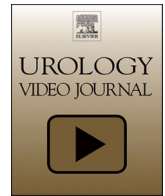
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Laser suction effect: Zero-basket technique for dusting ureteral stones with pulse modulation

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Laser suction effect: Zero-basket technique for dusting ureteral stones with pulse modulation

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Introduction and Objectives: In the laser suction effect, collapse of the vapor bubble leads to a change in pressure which produces a suction effect on the stone. In the Venturi effect, a vacuum is produced in front of the stone as the endoscope is withdrawn and the irrigating fluid helps push the stone out. During semi-rigid ureteroscopy (URS) and laser lithotripsy, it may be possible to use a combination of these two phenomena to help attract and evacuate stone fragments. In this video, we demonstrate our technique of dusting ureteral stones using pulse modulation for laser suction effect, along with Venturi effect, for evacuation of fragments without the need for basket retrieval.

Materials and Methods: We present three patients with distal to mid ureteral stones (7 to 12 mm) undergoing semi-rigid URS and laser lithotripsy. Dusting settings of low pulse energy and moderate frequency with pulse modulation (Moses Contact mode) using a 230 μm core fiber was used to treat the stones (P120Moses, Lumenis). Each stone was able to be broken into dust and small fragments, which were sequentially evacuated out of the ureter.

Results: Principles for this technique include: (1) Patient in reverse Trendelenburg position, (2) Semi-rigid ureteroscopy, (3) Safety guidewire, (4) Irrigation modulated by surgeon, (5) Low power (<10 W) 0.3 J x 30 Hz dusting settings, (6) Pulse modulation (Moses Contact mode) to reduce retropulsion and keep fragments close to fiber tip for laser suction effect, (7) Activating laser on center of stone, (8) Advancing scope beyond fragments and withdrawal of scope for Venturi effect and fragment expulsion, (9) Manipulation of guidewire to help tease fragments

out of ureteral orifice. In all three patients, the stone could be dusted and fragments expelled without the need for basketing. There were no complications and follow-up imaging showed no hydronephrosis or residual fragments.

Conclusions: We present a method of dusting stones in the ureter with the semirigid ureteroscope using low pulse energy (0.3 J), and moderate frequency (30 Hz). Use of pulse modulation aids this approach, by reducing retropulsion and keeping fragments close to the scope while withdrawing it out of the ureter. A combination of fluid irrigation and scope withdrawal helps evacuate fragments from the ureter without the use of a basket.

This video was approved for submission by the University of Michigan Institutional Review Board.

The video related to this article can be found online at: [doi:10.1016/j.urolvj.2021.100113](https://doi.org/10.1016/j.urolvj.2021.100113).

Declaration of Competing Interest

Khurshid Ghani reports a relationship with Lumenis Ltd that includes: consulting or advisory. Khurshid Ghani reports a relationship with Boston Scientific Corp that includes: consulting or advisory and funding grants. Khurshid Ghani reports a relationship with Olympus Corporation that includes: consulting or advisory. Khurshid Ghani reports a relationship with Coloplast Corp that includes: consulting or advisory.

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