Docket #: S24-093

Spinner Device for Kidney Stone and Dust Removal

Researchers at Stanford University have developed a novel kidney stone extraction device that can be used during ureteroscopy to simultaneously remove kidney stone fragments and dust without affecting renal pressure.

Kidney stones are clusters of minerals and salts that form in the urinary tract, potentially causing severe pain from urinary tract obstruction, renal injury, or infections. During ureteroscopy, an endoscope is inserted through the urethra to break up larger stones with lasers or ultrasound. Fragments are either retrieved or, if small, allowed to pass naturally. Unfortunately, residual fragments and dust often cause recurrent symptomatic obstruction and stone regrowth. Therefore, there is a critical need for a more efficient clearance method. In response, vacuum-assisted sheaths have been recently introduced. However, they remove renal fluid along with the debris, necessitating fluid infusion to sustain the renal pressure.

Stanford researchers at the Zhao Lab have designed a safer and more efficient kidney stone fragments and dusts extraction device that can be used together with kidney stone breaking devices. Their device is based on rotation to manipulate the flow and create a vortex that provides a localized suction towards the device to capture the stone fragments and dusts in the device. Unlike the vacuum-assisted device, this device avoids the risk of collapsing the kidney due to irregularly reduced intrarenal pressure.

Stage of Development
Proof of concept – in vitro data

Applications

- Kidney stone removal

Advantages

- Complete clearance of stones of varying sizes
- Reduced treatment time
- Reduced risk of recurrence

Patents

- Published Application: WO2025212668

Innovators

- Renee Zhao
- Qi Li

Licensing Contact

Seth Rodgers

Licensing Manager, Life Sciences

Email