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## **Efficacy of novel coaxial occlusion device to prevent stone migration during percutaneous nephrolithotomy (PCNL).**

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**Background:** PCNL is often preceded by placement of a ureteral catheter into the collecting system to perform retrograde pyelography (RPG), define pelvicalyceal anatomy, and distend the collecting system to facilitate percutaneous needle access. We tested the safety and efficacy of a new coaxial film-based 15 mm occlusion device, Coaxial Accordion (PercSys, Mountain View, CA), designed to facilitate RPG while simultaneously preventing stone migration during PCNL.

**Methods:** A retrospective review of our institutional PCNL database from January to July 2009 analyzed patient demographics, pre-operative imaging, and outcomes following PCNL with the coaxial device. Following cystoscopic placement of a guidewire, the device was passed into the collecting system and deployed at the UPJ. RPG was performed and the patients were placed in prone position. Contrast and/or saline were instilled as necessary during percutaneous access. PCNL was performed in standard fashion. Following conclusion of PCNL, the device was withdrawn in retrograde fashion.

**Results:** The device was deployed at the UPJ successfully in 14/14 patients (mean age 63.5) and was felt to enhance the ability of guidewires to bypass severely impacted stones. Initial RPG in supine position was performed successfully in 14/14 patients. RPG in prone position was performed successfully in 13/14 patients, with one failure due to kinking of the device shaft in a morbidly obese patient. During PCNL, fragments in the renal pelvis were extracted by ultrasonic lithotripsy and suction with no instances of stone migration into the ureter, even in patients with complete staghorn calculi (mean diameter 2.2 cm, largest 3.6 cm). The device was successfully undeployed and removed in 14/14 patients. Post-operative ureteral stents were placed in 13/14 patients, and nephrostomy tube placed in 11/14 patients. The mean length of stay was 26 hours (18-120) and the mean operative time was 135 minutes (110-170).

**Conclusion:** The new Coaxial Accordion 15 mm device is safe and efficacious for use in PCNL procedures and can improve outcomes by preventing antegrade stone fragment migration, improving stone-free rates, facilitating RPG, and decreasing operative time and length of stay.

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