**PP-02**

*In vitro evaluation of the UroNet® stone fragment retriever for PCNL*

K.A. Healy, R.C. Cleary, D.H. Bagley  
*Department of Urology, Thomas Jefferson University, Philadelphia, PA, USA*

**Background & Purpose:** Percutaneous nephrolithotomy (PCNL) is the typical treatment for large renal stone burdens. Various lithotripters and accessory devices may be utilized to fragment and extract calculi. Traditionally, use of 2- and 3-prong graspers has been the mainstay for stone removal during PCNL. The UroNet® retriever (US Endoscopy) employs a new method of stone removal. This study aims to compare the efficiency, reliability, and overall user satisfaction of the UroNet® retriever to three contemporary competitors.

**Materials & Methods:** Nine participants from three experience levels (novice, intermediate, expert) completed a thirty minute in vitro rigid percutaneous nephrolithotomy simulation using four stone retrieval devices (Cook Perc NCircle®, Bard Dimension® articulating basket, Bard Flatwire® basket, and US Endoscopy UroNet® retriever). Twelve beads of varying sizes were extracted from the previously described calyceal model in three separate trials. Efficiency, errors, and satisfaction were evaluated.

**Results:** Across all experience levels, the UroNet® retriever had the shortest time to remove all beads (69.8 seconds), fewest in and out movements (6.5), and highest number of beads removed per attempt (1.8). Perc NCircle® performed second best, with 76.8 seconds, 9.1 movements, and 1.3 beads, respectively. Compared to the Perc NCircle®, the UroNet® was found to be superior in terms of the number of in and out movements (p=0.013) and number of beads retrieved per attempt (p=0.007) using two-tailed student t-test analysis. UroNet® and Perc NCircle® received similar satisfaction scores (7.8 and 7.9, p>0.05), which were significantly different from the Bard Dimension® (6.2, p=0.013) and Flatwire® baskets (2.0, p<0.00002). The number of beads dropped was not significantly different between the four devices.

**Discussion:** While currently available lithotripters are effective for debulking large renal calculi during PCNL, small to medium-sized fragments commonly remain and require removal. Stone clearance may be achieved using a highly efficient and versatile stone retrieval device. Beads ranging from 2mm to 8mm were efficiently removed from the in vitro calyceal model. The UroNet® excelled at grasping the 2 and 4mm beads in particular. During PCNL, the ideal use for this stone retrieval device appears to be following lithotripsy with multiple small to medium-sized fragments that otherwise can prove difficult or cumbersome to remove.

**Conclusions:** The UroNet® stone retriever demonstrated the highest efficiency. Overall user satisfaction was equivalent between the UroNet® and Perc NCircle®. The ideal clinical application of the UroNet® is multiple small to medium-sized stone fragments in a calyx.

**References:**
