STONES

REDUCING RADIATION DURING PCNL

Duane Baldwin and colleagues at the Loma Linda University School of Medicine have devised a low-dose fluoroscopy protocol for percutaneous nephrostolithotomy (PCNL) that reduces fluoroscopy time by 80.9% with no detrimental effects on success rates, operative time or complications. “Our work provides some very simple steps that can be taken to dramatically reduce radiation exposure to the patient, the staff and the surgeon,” Baldwin told *Nature Reviews Urology*.

Concerns have been amassing for some time over the increasing utilization of fluoroscopy and, therefore, exposure to ionizing radiation. Patients with urolithiasis are especially affected because they often undergo repeated imaging examinations. Patients with large stones are at additional risk if they receive PCNL.

Baldwin and his team have previously developed protocols to reduce radiation exposure during CT, ureteroscopy and stent placement and now they have extended their expertise to PCNL. The suggested protocol includes use of visual and tactile cues rather than fluoroscopy cues, fixed lowered values of mAs and kVp (factors that affect radiographic density), use of a laser-guided C-arm, use of single pulse-per-second fluoroscopy and a designated technician to ensure accurate and precise positioning of the C-arm beam.

Researchers compared the outcomes of 40 patients who underwent PCNL before implementation of the low-dose fluoroscopy protocol with 40 post-protocol patients. Fluoroscopy time was reduced from 175.6 seconds to 33.7 seconds with the new protocol (80.9%; $P < 0.001$), with no changes in success rate (defined as absence of fragments ≤ 4 mm; 65.0% versus 67.5%, $P = 0.813$), operative time (148.8 min versus 145.6 min, $P = 0.668$), or complication rate (12.5% versus 10.0%, $P = 0.723$). Moreover, hospital stay was significantly shorter with the new protocol (3.9 days versus 3.6 days, $P = 0.027$).

This study suggests that limitation of radiation exposure is certainly achievable for PCNL without affecting outcomes. “This protocol may act as a starting point to allow many other surgeons to further refine and reduce radiation exposure during these procedures,” says Baldwin.

Sarah Payton

Original article Blair, B. *et al.* Reduced fluoroscopy protocol for percutaneous nephrostolithotomy: feasibility, outcomes, and effects on fluoroscopy time. *J. Urol.* doi:10.1016/j.juro.2013.05.114