**PD37-06**

**THE IMPACT ON COST AND FREQUENCY OF URETEROSCOPE REPAIRS USING A BALL-TIPPED LASER FIBER FOR URETEROSCOPY**

Scott Johnson*, Daniel Lew, Carley Davis, Amy Guise, Milwaukee, WI

INTRODUCTION AND OBJECTIVES: Flexible ureteroscopy has become a standard for the treatment of small renal calculi. Ureteroscopic equipment has a well-documented limited lifespan prior to need for maintenance. The most common location and etiology of scope damage is due to passing or misdirecting a laser fiber in the working channel of a flexible ureteroscope. Conventional laser fibers utilize a blunt tip that can be difficult to pass through a deflected scope, and can potentially result in damage. A new laser fiber has become commercially available with a ball-shaped output tip. This is proposed to pass more easily through a fully deflected ureteroscope in anatraumatic manner. Our objective was to evaluate the use of this ball-tipped fiber and its effect on the incidence and cost of ureteroscope repairs.

METHODS: Our institution began using the single-use ball-tipped fibers in January 2013. We retrospectively reviewed the charts of the first 80 patients undergoing ureteroscopy with laser lithotripsy utilizing the ball-tipped laser fiber, and compared them to the 80 patients immediately prior to the switch, where a reusable blunt tip fiber was utilized. We collected basic patient demographics, as well as stone location, stone size, type of ureteroscope used, use of a ureteral access sheath, total operative time, and energy used for lithotripsy. Repair data of the flexible ureteroscopes, including cost and type of damage was obtained. Pertinent repair costs included those related to damaged working channels. A cost analysis was performed to see if decrease ureteroscope repair cost justified the increased cost of the single use ball-tipped fiber.

RESULTS: During the review period, 58 patients underwent flexible ureteroscopy with the traditional blunt tip laser fiber and 60 patients with the ball tip fiber. There was no significant difference in patient age, stone burden, or operative time between the two groups. During use of the blunt tip fiber there were 5 repairs to working channels, incurring a cost of $28,018, while 2 working channel repairs, costing $12,408 were attributed to use of the ball-tipped fiber. Accounting for the increased cost of the ball tipped fiber of $195 per use, it was associated with a net savings of $81.27 per case.

CONCLUSIONS: The use of a ball tipped laser fiber during flexible ureteroscopy with laser lithotripsy may be associated less frequent working channel repairs, and a modest cost savings.

Source of Funding: none

**PD37-07**

**IN VIVO AND EX VIVO COMPARISON OF OPTICS AND PERFORMANCE OF A NOVEL DUAL CHANNEL FIBEROPTIC URETEROSCOPE**

Achim Lusch*, Zhamshid Okhunov, Ramtin Khatipour, Ashleigh Mendenhall, Renai Yoon, Michael Del Junco, Jaime Landman, Orange, CA

INTRODUCTION AND OBJECTIVES: Vision during ureterscopic laser ablation of large kidney stones can be challenging due to the diminished flow during the procedure. Hence we evaluated and compared characteristics of a novel dual working channel fiberoptic ureteroscope [Cobra (Richard Wolf, Knittlingen, Germany)] to two single channel fiberoptic ureteroscopes and a single channel distal sensor ureteroscope [the Viper (Richard Wolf, Knittlingen, Germany)], the X2 (Karl Storz, Tuttingen, Germany) and the URF-V (Olympus America Inc., Center Valley, USA).

METHODS: The four ureterscopes (Cobra, Viper, X2, URF-V) were compared for active deflection, irrigation flow and optical characteristics. Each ureteroscope was evaluated with an empty working channel and with various accessories. We performed a porcine ureterscopy and measured the time for cleaning the middle calyx after injection of 10 cc’s of an standardized bloody solution (simulated bloody vision).

RESULTS: The URF-V showed a higher resolution [7.42 lines/mm] [p<0.0001] compared to the fiberoptic ureteroscopes. Among the fiberoptic ureteroscopes the Cobra had the highest resolution compared to Viper and X2 [4.86 vs. 4.35 vs. 3.56 lines/mm, p<0.0001]. The Cobra also showed a significant superior illumination at all distances [p<0.0001]. Grayscale distribution and color representation was identical for the fiberoptic ureteroscopes, whereas the URF-V provided superior color representation and a significant higher depth of field. The dual channel ureteroscope provided superior flow with empty working channel [86cc/min vs. 68cc/min [Viper] vs. 62.5cc/min [X2] vs. 62cc/min [URF-V], p<0.0001] and with various accessories in the working channel [p<0.0001]. With regards to deflection the Storz X2 and the Cobra provided superior deflection up and down with empty working channel and several accessories [p<0.0001], except for downward deflection with a guide wire and 3.2 F delta wire grasper, where the URF-V showed superior results. When evacuating a standardized bloody field, the Cobra provided significant shorter evacuation times compared to Viper, X2 and URF-V [36.6 sec. vs. 72 sec vs. 65.6 sec vs. 72.6 sec, p=0.0001].

CONCLUSIONS: In this in vitro porcine evaluation the dual channel ureteroscope demonstrated superior flow without and with various accessories. The additional working channel may improve vision and performance during challenging ureterscopic cases by providing an increased flow. The enhanced irrigation capabilities of the Cobra have to be balanced with a larger diameter of this ureteroscope.

Source of Funding: none

**PD37-08**

**THE ORCHESTRA – FINE TUNING THE HYDROPHILIC GUIDEWIRE**

Carl Sarkissian, Mohammad Omar*, Shubha De, Robert Brown, Manoj Monga, Cleveland, OH

INTRODUCTION AND OBJECTIVES: To evaluate a new hydrophilic guidewire for performance and safety by conducting an in vitro comparative analysis.

METHODS: The new Orchestra (0.035”, Coloplast, Humlebaek, Denmark) guidewire was compared to the regular (R) and stiff (S) Glide-wire (Terumo, Tokyo, Japan), evaluating tip flexibility, shaft stiffness, lubricity, and perforation force. A load cell (Series MR03-2, Mark-10, Copiague, NY) attached to a linear motion stage with a stepper motor was used to measure forces. Tip flexibility was determined by isolating the distal 5 cm portion of each guidewire and measuring the peak force required to compress a distance 2.5 cm while securing the tip in a small hole in a wooden block. Shaft buckling was determined by measuring the peak force to compress a 12 cm section of the shaft a distance of 5 cm. Perforation force was evaluated by stabilizing each wire in the dilator of a ureteral access sheath and measuring peak force required to perforate aluminum foil. Lubricity was measured by extracting each wire through simulated tissue at a constant speed, measuring average force over a 5 second period.

RESULTS: The Orchestra, Glideewire-R, and Glideewire-S performed similarly with regard to tip flexibility (p=0.62), with an average force of 0.18 ± 0.003 lbs, 0.19 ± 0.004 lbs, and 0.017 ± 0.003 lbs, respectively. Shaft stiffness was similar (p=0.34) between the Orchestra (0.26 ± 0.011 lbs) and Glideewire-S (0.25 ± 0.015 lbs), while the Glideewire-R (0.10 ± 0.005 lbs) was significantly less stiff (p=0.0001). The Orchestra had a higher perforation force (0.39 ± 0.06 lbs) than the Glideewire-R (0.29 ± 0.05 lbs, p<0.006), but not the Glideewire-S (0.34 ± 0.13 lbs, p=0.21) while the Glideewire-R and Glideewire-S had similar perforation forces (p=0.27). The Orchestra demonstrated the lowest frictional forces (0.053 ± 0.007 lbs), followed by the Glideewire-R (0.062 ± 0.005 lbs), and the Glideewire-S (0.074 ± 0.004 lbs), (p<0.036).

CONCLUSIONS: The Orchestra guidewire demonstrated similar safety and performance characteristics to the Glideewire-S, with a stiff shaft, flexible tip, while providing a more lubricious coating.