leads to the development of stromal hyperplasia. Thus, our findings indicate that IL-18 may act directly in the pathogenesis of BPH by inducing TSP-1 production from SMCs via Akt phosphorylation.

Source of Funding: none

MP19-20
A COMPARATIVE STUDY BETWEEN HOLMIUM LASER ENucleATION OF THE PROSTATE AND TRANURETHRAL RESECTION OF THE PROSTATE
Mohamed Eltayy*, Atef Hamouda, Gamal Morsi, Asyut, Egypt

INTRODUCTION AND OBJECTIVES: Background: This was a prospective randomized clinical trial to compare the safety and efficacy of holmium laser enucleation of prostate and transurethral resection of the prostate for surgical treatment of patients with bladder outlet obstruction due to benign prostatic hyperplasia.

METHODS: From December 2009 to October 2010, 60 consecutive patients with lower urinary tract obstruction (LUTs) due to BPH were randomized to either surgical treatment with HoLEP (group 1, n = 30) or standard TURP (group 2, N = 30). Preoperative assessments included American Urological Association (AUA) symptom score. Serum prostate-specific antigen, (PSA), post void residual urine volume (PVR), transrectal ultrasound (TRUS) and uroflowmetry. Perioperative parameters included total operating time, resected tissue weight, hemoglobin loss, presence or absence of blood transfusion, time of catheter removal, duration of hospital stay. Postoperative evaluations were conducted at 1, 3, 6, and 12 months.

RESULTS: Patients in the HOLEP group had shorter catheterization time, and hospital stay, but longer operating time. Mean hemoglobin loss was lower in the HOLEP group (0.900 ±0.419 g/dl versus 1.157 ±0.918g/dl). The follow up results up to 12 month regarding AUA symptom score, PVR urine volume and Q-max showed that both group were comparable. Complications were similar with 2 procedure with no sign fiancé difference.

CONCLUSIONS: HOLEP proved to be safe and highly effective technique for surgical treatment of bladder outlet obstruction due to BPH.

Source of Funding: NONE

Stone Disease: Basic Research I
Moderated Poster
Saturday, May 17, 2014 3:30 PM-5:30 PM

MP20-01
AURICLOSENE IRRIGATION SOLUTION PREVENTS ENCROUSTMENT BY CRYSTALLINE BIOFILM DUE TO PROTEUS MIRABILIS IN AN IN VITRO URINARY CATHETER PATENCY MODEL
Suriani Abdul Rani, Ramin (Ron) Najafi, Keith Bley, Emeryville, CA; William Costerton, Pittsburg, PA; David Stickler, Cardiff, United Kingdom; Bernard Churchill*, Los Angeles, CA; Dmitri Debabov, Emeryville, CA

INTRODUCTION AND OBJECTIVES: Long-term indwelling urinary catheters are susceptible to blockage due to formation of crystalline biofilms by urease-producing microorganisms such as Proteus mirabilis. An in vitro catheter biofilm model (CBM) was developed to compare current methods for maintaining urinary catheter patency. We compared various bladder irrigation solutions or antimicrobial-coated urinary catheters, versus a novel antimicrobial catheter irrigation solution containing auriclosene (N,N-dichloro-2,2-dimethyltaurine; formerly designated NVC-422).

METHODS: CBM units were fed artificial urine at 0.5 mL per min. The artificial bladder chamber was inoculated with 10^9 colony forming units (CFU) of P. mirabilis and biofilm was allowed to establish for 48 hours before daily treatments commenced. A single treatment consisted of two sequential 50 mL irrigations. Each irrigation was retained in the catheter for 15 min and then drained, with a 30 min washout period between the two irrigations. Experiments were conducted for up to 10 days or until catheter blockage. The pH of the effluent, CFU counts in the bladder chamber and the time to catheter blockage were recorded. The area of catheter encrustation was measured using Stereo Zoom imaging.

RESULTS: Inoculation of the CBM reactor with 10^9 CFU of P. mirabilis resulted in blockage of the urinary catheters within 5 days. The use of silver-hydrogel or nitrofurazone-coated catheters did not extend the period of catheter patency. Catheter irrigation with 0.25% acetic acid or isotonic saline blocked at the same rate as untreated catheters. Catheters irrigated with a citrate-buffered formulation of 0.2% auriclosene resulted in maintenance of catheter patency for 10 days and complete eradication of P. mirabilis and biofilm within one treatment day. In contrast, daily irrigations of infected catheters with 10 mM acetate-buffered saline (at pH 4) or Renacidin® Irrigation Solution had no effect on P. mirabilis colonization of the bladder chamber, even though catheter patency was maintained throughout 10-day studies.

CONCLUSIONS: Irrigation with the rapidly bactericidal antimicrobial auriclosene in a buffered acidic formulation - termed Auriclosene Irrigation Solution - significantly enhanced catheter patency in vitro versus other irrigation solutions and antimicrobial-coated urinary catheters. Clinical evaluation of Auriclosene Irrigation Solution is ongoing.

Source of Funding: NovaBay Pharmaceuticals, Inc.

MP20-02
CORRELATION BETWEEN CT DENSITY, BIOCHEMICAL STRUCTURE AND MICROCOMPOSITION OF URINARY STONES
Mohamed El-Naggar*, Al Ain, United Arab Emirates; Emad Elsobky, Abu Dhabi, United Arab Emirates; Sanjeev Mehta, Ahmadabad, India; Manoj Monga, Cleveland, OH

INTRODUCTION AND OBJECTIVES: CT has a role in determination of biochemical types of urinary stones. Heavy metals and trace elements contents are involved in stone microcomposition. This study was carried out to evaluate the relationship between CT density and both biochemical structure and micro elemental composition of urinary stones.

METHODS: 125 renal stones were collected after endoscopic open procedures. The mean CT density of the stones was assessed preoperatively. Each stone was pulverized and divided into 2 equal parts. One half was analyzed by Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES) to determine microelemental composition (22 elements/stone). Second half underwent Fourier Transform Infrared spectroscopy (FT-IR) to define the biochemical structure of the stones. Multivariate analysis and Pearson correlation were performed by SPSS software.

RESULTS: There were 69 males and 56 females, Age ranged from 8 to 83 years (mean ± SD 47.8 ± 14). Stone size ranged from 12 to 60 mms (mean ± SD 31.4 ± 13). CT scan density ranged from 230 to 1744 HU (mean ± SD 937.4 ± 424.7). 60 stones were above the mean CT density (937.4 HU) and 65 below the mean. Stones with high CT density (Ca Oxalate Monohydrate) showed significantly high concentration of: B, Ca and Pb (P <0.001, 0.001, 0.016 respectively), while stones with low CT density (Ca Oxalate Dihydrate, Uric acids and Ca Phosphate) had higher concentration of: Ba, Cu, and S (P 0.001, 0.022, 0.048 respectively).

Source of Funding: NovaBay Pharmaceuticals, Inc.
CONCLUSIONS: CT scan density was dependent on biochemical and elemental stone composition and the overall value was affected by concentration of different elements specially Ca, Ba, and B. There were significant differences in CT density of stone types due to many microelements, specially B, Ca, Mg, P and S. The significance of these trace elements in the pathophysiology of stone disease, and the clinical application of ICP-OES for stone microanalysis deserves further study.

Source of Funding: none

MP20-03
RENAI L PARENCHYMAL VOLUME DO ES NOT APPROXIMATE RENAL FUNCTION IN STONE FORMING PATIENTS
Timothy Durso*, Adam Kadlec, Gopal Gupta, Humberto Martinez-Suarez, Thomas Turk, Maywood, IL

INTRODUCTION AND OBJECTIVES: In healthy kidneys, renal parenchymal volume (RPV) correlates with renal function and anthropometric measurements such as body surface area. These same correlations for RPV among stone forming patients are less certain. 3-dimensional volume rendering (3DV) was used to investigate the relationship between RPV, renal function, and anthropometric measurements in stone forming patients.

METHODS: Age, gender, height, body weight, body mass index, and serum creatinine were recorded for 140 patients with a history of stone formation. Body surface area was calculated using the equation of Dubois and Dubois. Creatinine clearance and glomerular filtration rate were calculated using the Cockcroft-Gault equation and modification of diet in renal disease equation, respectively. RPV was measured using three-dimensional rendering from computed tomography scans. RPV was then assessed for correlations with measurements as stated earlier.

RESULTS: Mean total RPV in all patients was 342.8 ± 76.2 mL. RPV correlated positively with body weights and measures, but not with age (r = .074, p = .304). Mean RPV in men did not differ from women after indexing for body surface area (172.1 vs. 170.2 mL/m2, p = .854).

Patients aged 60 and older had smaller RPV indexed for body surface area than younger patients (161.1 vs. 175.7 mL/m2, p = .007). The only RPVs that correlated with kidney function were from patients older than 60. RPV in this population correlated positively with Cockcroft-Gault creatinine clearance (r = .447, p = .008).

CONCLUSIONS: In a population of patients with a history of stone formation, RPV correlates with anthropometric measurements and age, but not with renal function. Therefore, RPV is not an appropriate surrogate for renal function in stone forming patients.

Source of Funding: none

MP20-04
BALL-TIP HOLMIUM LASER FIBER MAY REDUCE FLEXIBLE URETEROSCOPE DAMAGE
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INTRODUCTION AND OBJECTIVES: Lower pole renal stones present a challenge for retrograde laser lithotripsy. Holmium laser fiber passage can damage the working channel of a fully flexed ureteroscope. A recently released ball-tip laser fiber (TracTip - Boston Scientific) features a modified tip to reduce scope trauma. We compared ureteroscope deflection and insertion forces of this ball tip to a standard laser fiber.

METHODS: Ureteroscope deflection was measured using a 200 μm ball-tip (BT) and standard fiber (SF) (Flexiva - Boston Scientific) with two fiber optic and one digital ureteroscope (URF-P5, URF-P6, URF-V - Olympus). The ureteroscopes were flexed/extended empty and with each fiber for 4 consecutive runs. Deflection angle was measured using AutoCAD software. Insertion force was measured in a ureteroscope sheath positioned in a 270° curve. The BT and SF fibers were advanced using a stage controller and a strain gauge measured force. ANOVA test was used to compare multiple groups and t-test was used for inter-group comparison with a Bonferroni correction as applicable.

RESULTS: Both fibers caused reduced but equivalent reduction (10-30%) in ureteroscope flexion/extension in all three models with no statistical difference (Figure 1). Four virgin fibers and ureteroscope sheaths were used to test insertion force of each fiber. The maximum and average insertion force for the SF was 998 ± 394 mN and 603 ± 163 mN respectively. The BT insertion forces were approximately 1/3 of the SF; 304 ± 31 mN maximum and 213 ± 31 mN mean insertion force (p = 0.040, 0.025 respectively). One SF fiber caused significant damage to the sheath and could not be advanced completely (Figure 2).

CONCLUSIONS: The ball-tip fiber has markedly reduced force of insertion in a deflected ureteroscope without compromising maneuverability compared to a standard laser fiber. Minimal investment in the ball-tip fiber may result in cost savings by reducing working channel damage and increasing ureteroscope longevity.

Source of Funding: Boston Scientific Industry Grant