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POD-05.01

External validation of S.T.O.N.E. nephrolithometry scoring system

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Introduction and Objectives: To perform external validation of the S.T.O.N.E. nephrolithometry scoring system for pre-operative assessment of percutaneous nephrolithotomy (PCNL) outcomes.

Materials and Methods: After obtaining institutional review board approval, all PCNLs performed from 2009 till 2013 at a tertiary referral centre were reviewed. The S.T.O.N.E. score was calculated and correlated with stone-free status, Estimated Blood Loss (EBL), operative time, length of hospital stay (LOS), and post-operative complications.

Results: A total of 155 PCNLs were included with 100 (64.5%) males and 55 (35.5%) females. The mean age was 54.9±1.2 years (17-85) with mean BMI of 26.9±0.5 kg/m² (17.2-51). The mean S.T.O.N.E. score was 7.67±0.1 (5-13) with mean stone volume of 609.8±48.4 mm³ (25-4030), mean Hounsfield Unit of 887.7±25.3 (222-1766), mean tract length of 97.3±1.9 mm (53-175), mean operative time of 100.1±2.8 min (60-240) and mean LOS of 4.2±0.3 days (1-18). The overall stone-free rate after the primary procedure was 71.6%. The S.T.O.N.E. score significantly impacted stone-free status (p=0.001) and EBL (p=0.003). In addition, there was significant correlation between the S.T.O.N.E. score and operative time (r=0.4; p<0.001) and LOS (r=0.3; p=0.001). Therefore, the higher the S.T.O.N.E. score, the longer the operative time, the higher the EBL, the longer the LOS, and the lower the chance of being stone-free. The overall complication rate after the primary procedure was 15.5%, which did not correlate with the S.T.O.N.E. score (p=0.9).

Conclusion: This study externally validates the S.T.O.N.E. nephrolithometry scoring system as a pre-operative assessment tool of PCNL outcomes. However, the S.T.O.N.E. score failed to predict post-operative complications, which may be related to other factors not included in the scoring system. These need to be further examined in future studies.

POD-05.02

Natural history, complications, and re-intervention rates of asymptomatic residual stone fragments post-ureteroscopy: A report from the EDGE Research Consortium

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Introduction and Objectives: Fragments 4mm or less that are non-obstructing and asymptomatic are termed "clinically insignificant residual fragments" (CIRFs); this designation is controversial due to high rates of re-intervention. Our objective was to examine the natural history, complication rates, and re-intervention rates of fragments following ureteroscopy.

Methods: Data from 6 centers was collected retrospectively from members of the Endourology Disease Group for Excellence (EDGE) in 232 patients who had residual fragments following ureteroscopy (URS) between 2006

and 2013. Patients with fragment(s) of any size post-procedure with at least one KUB X-ray, US, or CT within 12 months were studied. Outcomes measured were fragment location, size, growth, passage, complication rates, and re-intervention rates.

Results: Of the 232 subjects with fragments, 131 (56%) required no further intervention and remained asymptomatic, 34 (15%) developed complications requiring no intervention, and 67 (29%) required intervention. Fragments > 4mm were more likely to grow over time (p<0.001) and were associated with complications (p=0.039). Logistic regression shows the original stone size (p=0.0475) to be the only significant predictor of complication. Re-intervention was predictable based on the size (p=0.017) and location of fragments (p=0.02). There was a trend towards complication depending on the location of residual fragments (p=0.068) and re-intervention with older age (p=0.075). Kaplan-Meier analysis found that dusting the stone and larger residual fragments (>4mm) were more likely to require re-intervention (p=0.004). Re-interventions included URS (58), PCNL (4), and SWL (3).

Conclusions: This study suggests that fragment sizes > 4mm following ureteroscopy is associated with significantly higher rates of stone growth, complications, and need for re-intervention with at least one year of follow-up. Even for fragments less than 4mm, 28% underwent stone growth and 22% suffered a complication, challenging the traditional description of CIRF. Ensuring complete stone free status is the best way to reduce the rate of complications and interventions following ureteroscopy.

POD-05.03

The Wisconsin stone quality of life questionnaire: Baseline results from a prospective, longitudinal, multi-center validation study

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Introduction and Objectives: Decrements in the health-related quality of life (HRQOL) of stone patients are related to pain, urinary symptoms, and other social factors. The Wisconsin Stone Quality of Life (WiSQoL) questionnaire is a stone-specific measure. To test its generalizability, a consortium of North American stone centers offering medical management used the WiSQoL measure to assess HRQoL.

Methods: Adult patients completed the WiSQoL questionnaire at enrollment/baseline and will undergo longitudinal surveys to determine stone-related changes in HRQOL. Baseline WiSQoL scores were calculated and compared within the cohort. Stone-related medical and surgical data were gathered and pooled. Comparisons between those with/without current stones and between men/women were made. Patient factors related to WiSQoL scores were examined.

Results: IRB approval is maintained at all 8 sites. Anticipated longitudinal ethnic/race distribution is 15% black, 14% Hispanic/Latino, 11% Asian, and 2% Pacific Islander/ other. Patients (n=415) completed WiSQoL questionnaires. 1st-time stone formers comprise 29% of patients; women, 48%.

BMI is not different between sites (31.1 ± 8.5), nor is age (54 ± 14 y), number of stone events ($n=8 \pm 20$), or duration of stone disease (13.5 ± 13 y). Mean age of onset of stones was 40 y and number of stone events was 8. Most (55%) had stones at enrollment. Of these, 63% cited symptoms, and 25% had been to the ER in the past month. Patients with stones had lower HRQOL than those without, $P < 0.0001$; those "not sure" of their stone status did worse than those with no stones, $p = 0.002$. Women scored lower than men on 27 of 28 items ($p < 0.0001$). Items with marked gender differences related to missed work/family time, sleep perturbations, urinary urgency, and reduced freedom/ability to participate in social events ($P \leq 0.005$ for all). Patients with BMI > 30 had more urinary bother, difficulty following dietary recommendations for stone prevention, lower energy, and more fatigue.

Conclusions: Stone burden, symptoms, gender, and BMI were predictors of HRQOL in a broad cohort of stone formers. Based on these data, we predict the WiSQoL instrument will be generalizable and valuable to clinical practice, clinical trials, and outcomes research by providing a way to assess HRQOL at various stages of stone disease.

POD-05.04

Is intraureteral lidocaine the answer to post-ureteroscopy stent pain: Results of a double-blinded prospective randomized controlled trial

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Introduction and Objective: Every year tens of thousands of ureteral stents are placed for a multitude of clinical indications. However, stent and ureteral manipulation-related pain has been reported by up to 80% of patients undergoing ureteroscopy. Intravesicular alkalized Lidocaine has been shown to be effective in reducing bladder pain in previous studies. We plan to determine the efficacy of direct instillation of intraureteral Lidocaine in reducing pain and ureteral stent symptoms.

Methods: A prospective randomized double-blinded study of 41 patients was conducted. Patients who underwent ureteroscopy and ureteric stent placement were randomized to treatment with direct instillation of Lidocaine plus bicarbonate, or to control with normal saline plus bicarbonate. Patients completed pain scores on a 10-point visual analog scale at the 1h, 2h, 4h, 24h, 4 and 7-day time points. A medication diary and voiding questionnaire were also collected.

Results: Mean flank pain scores at the 1h were 2.2 vs. 1.8 in the treatment and placebo group respectively ($p = 0.84$). Interestingly, by the 4hr mark lower abdominal pain and flank pain scores favored the Lidocaine group (2.02 vs. 2.95 and 1.8 vs. 2.04 respectively, $p = 0.78$). This modest trend to treatment advantage was again seen one day after the stent was removed, with decreased flank pain (1.50 vs. 2.67, $p = 0.2$) and lower abdominal pain (1.63 vs. 2.51, $p = 0.32$). Patients also reported lower dysuria scores at all time points in the Lidocaine group, however not statistically significant. No difference was seen in pain medication use. There was no difference in complication rates or adverse affects between groups.

Conclusions: In this pilot study a novel administration technique of direct instillation of Lidocaine into the ureter appears safe and did show a modest advantage in pain and voiding symptoms scores. However, these findings should be interpreted with caution as no statistically significant results were observed.

POD-05.05

Clinical use of a patient decision-making aid for management decisions in acute stone patients: A shared decision making approach

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Introduction and Objectives: The dynamics of the patient-physician relationship have evolved in recent years with an increased emphasis on patient education and involvement in shared healthcare decision-making. Patient decision-making aids (PDMA's), tools intended to facilitate this process, are becoming increasingly popular. The aim of this study was

to evaluate the utility and applicability of PDMA's in the clinical setting when considering treatment options for urolithiasis.

Methods: Adult patients with evidence of urolithiasis on imaging were prospectively recruited from our urology clinics from September-November 2014 as part of a quality improvement project. PDMA's were developed to illustrate and compare the following treatment options: observation, medical expulsive therapy, ureteroscopy, shock wave lithotripsy or percutaneous nephrolithotomy. Urologists and advanced practice providers used the PDMA's during appointments to guide discussions of treatment options for each patient's individual clinical scenario. We assessed patients' satisfaction, involvement, and perception of making a more informed decision with the decision-making process utilizing the PDMA's via a questionnaire.

Results: Patients ($n=26$; 50% male) were 56.5 ± 13 years (range 30-81). The highest level of education was: junior high 4%, high school 31%, college 46%, and graduate school 19%. The vast majority felt that the PDMA's helped to make a more informed treatment decision (88.5%). Most patients (96.2%) reported that utilization of the PDMA's made them feel more involved in the decision-making process. The subjects reported that the information was presented in a balanced manner and included up-to-date scientific evidence.

Conclusions: In our study, patients reported that utilization of the PDMA's during their appointment assisted in making a more informed and shared treatment decision. Our providers found the administration of the aids in the clinical setting to be straightforward and allowed for a systematic and standardized way to educate patients on the treatment options for urolithiasis. Inclusion of PDMA's in patient encounters should be encouraged.

POD-05.06

Risk factors for postoperative complications after percutaneous nephrolithotomy in a tertiary referral centre

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Introduction and Objective: Percutaneous nephrolithotomy (PCNL) is considered the gold standard treatment for large kidney stones. Success is measured by the stone-free status and complication rates. A modification of the Clavien classification has been developed for PCNL. The objective of this study was to describe and analyze the rate of postoperative complications after PCNL according to the modified Clavien scoring system.

Methods: A retrospective analysis was performed using prospectively collected data from patients who underwent PCNL from 1990 to December 2013. Descriptive statistics were used to analyze patients' demographics, medical comorbidities and perioperative features. Complications were categorized according to the Clavien Score for PCNL. Mann-Whitney and 2 tests were used as appropriate. Logistic regression analysis was performed to search for prognostic factors associated with minor and major complications.

Results: A total of 2318 surgeries were included in the final analysis. Mean age of the population was 53.7 ± 15.15 years. Complete staghorn stones were noted in 14.8% of the cases. Multiple tracts were used in 8% of the cases. Lower pole access was used in 65.4% of cases, an interpolar tract was selected in 21.4% and upper pole access used in 13.2%. Stone-free rate at hospital discharge was 81.6%. The overall complication rate was 18.3%, with only 51 cases (2.2%) being categorized as major complications (Clavien $> 3a$). Patients with postoperative complications were statistically significantly older, with more comorbidities, with higher proportion of staghorn calculi or had longer operative time and hospital stay. Older age and upper pole access were prognostic predictors for major complications. Other factors such as history of urinary tract infections, body mass index, stone composition, previous PCNL performed at our centre and use of multiple tracts were not associated with postoperative complications.

Conclusions: At our centre, PCNL is an excellent option for complex kidney stone management with a low overall complication rate. Older age and upper pole access are significantly associated with an increased risk of a major complication.