

N95**Heavy metals in stones and urine of stone formers**

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Introduction and Objectives: The formation of the stones is a complicated process that results from combination of factors in which the main phenomenon is the supersaturation of some compounds in urine that might crystallize forming solid concretions. This process is affected by the lack of crystallization inhibitors, the presence of crystallization promoters and some morpho-anatomic factors. The presence and role of heavy metals in lithogenesis is debated and little definitive information has been presented linking the presence or absence of selected metals in the stones and urine to the pathogenesis of the disease. The goal of this pilot study was to investigate the distribution of heavy metals in stones and urine of stone formers in order to evaluate their possible role in lithogenesis.

Material and Methods: Material was collected from 116 patients treated due to symptomatic upper urinary tract lithiasis. Mean age was 54.4 years (min 19, max 80). Stones were obtained after PCNL, URSL, ureterolithotomy or nephrectomies. Each stone was analyzed together with urine from 24-hour sample for heavy metals determination. The specimens were mineralized in microwave oven ETHOS (Milestone, Connecticut, USA). The analysis was performed with atomic absorption spectrometer (ICP-OES) Optima 5300 DV (Perkin Elmer, Massachusetts, USA) according to Polish Standard PN-EN ISO 11885. Results were described in terms of mean, standard deviation, median and 25th-75th percentile with W Shapiro-Wilk test. Correlation analysis was performed using Spearman's rang test. A value of $p < 0.05$ was considered significant.

Results: Following parameters were statistically significant among analyzed:

- strong negative correlation between the concentration of zinc in stones and the content of calcium oxalate,
- strong positive correlation between the concentration of zinc in stones and the content of calcium phosphate and magnesium phosphate,
- negative correlation between the concentration of chrome in stones and the content of magnesium phosphate,
- negative link between the concentration of zinc, vanadium, molybdenum and copper in stones and the content of uric acid.

Strong correlations were also seen in following metallic elements analyzed in urine and stones:

- positive link between the concentration of nickel, chromium, molybdenum, cobalt and vanadium both in urine and stones,
- negative link in case of cadmium.

Conclusions:

1. The preliminary results of our studies confirms the conclusions of other authors about the potential role of some metals as inhibitors or promoters of crystallization process in urinary tract. This deals with such an elements as zinc, copper and chromium.
2. In order to thoroughly evaluate the relationship between the distribution of particular heavy metals in urine and stones of stone formers further studies on larger group are needed.
3. The question about the role and influence of heavy metals elements on lithogenesis is still to be answered.

N96**Urethral pull-through operation for posterior urethral stricture: Outcomes of a 20-year experience**

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Introduction and Objectives: We present technique and long-term results of the urethral pull-through operation for posttraumatic posterior urethral stricture.

Material and Methods: A total of 73 patients with posterior urethral stricture resulting from pelvic fracture injury underwent the urethral pull-through operation at our institute from August 1989 to March 2009. Patient age was 6 to 75 years (mean 31.2). Stricture length was 1.5 to 3.2 cm (mean 2.1). In 36 patients (49.3%) previous management with open or endoscopic procedures had failed. Follow-up included symptomatic and urinary flow rate evaluation, which was performed 6 and 12 months after the urethral pull-through operation in all patients and thereafter when needed, and urethrography and/or urethroscopy in patients with voiding symptoms.

Results: Patients were followed for 12 to 120 months (mean 62.5). During that period 58 patients were symptom-free and required no further procedures. The maximal flow rate in each case was greater than 12 ml per second. Recurrent stricture developed in 15 patients. All treatment failures occurred within the first 6 months postoperatively. Failed repairs were successfully managed by endoscopically in 10 patients and by open reconstruction in 5 patients a primary success rate of 96.5% and a final success rate of 100%. All patients were continent. Erectile dysfunction was noted postoperatively in 7 patients (9.5%). There was no chordee, penile shortening or urethral diverticula.

Conclusions: The urethral pull-through operation is effective for the surgical treatment of posterior urethral stricture even after multiple prior procedures.

N97**Calcium phosphate stone morphology: plain radiographic findings and interobserver variabilities**

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Introduction and Objectives: Visual appearance of pure calcium phosphate (CaP) urinary stones by its morphology from plain radiographs(KUB),were investigated.

Material and Methods: We reviewed patients with urinary stone disease who underwent stone surgery.Among cases with crystallographically analyzed stones; 60 patients with pure CaP renal or ureteral stones (greater than 1 cm) were selected.Two endourologists and a uroradiologist familiar with the radiographic patterns of different types of pure stones were invited separately,to evaluate pretreatment KUB.

Results: Four different radiographic patterns were identified mainly with the assistance of previous studies.Smooth edged,homogenous stones with denser opacity were included in Group 1. Stones with irregular edges and stippled border were included in Group 2. Relatively uniform stones with radial striations and moderate density were decided to form Group 3. Calculi with the least radiodensity and loosely aggregated with a lacy structure were included in Group 4. Overall, 68.9% of CaP calculi were included in Groups 1 and 2 by all participants. Best concordance between endourologists and the uroradiologist was demonstrated in the evaluation of smaller calculi (<150 mm²).

Conclusions: On KUB, CaP urinary calculi were mostly seen as dense relatively homogenous stones and sometimes with stippled borders. With the increase in pretreatment stone size, interobserver and interdisciplinary variabilities increased.

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Pain perception during shock wave lithotripsy (SWL): Does it correlate with patient and stone characteristics?

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Introduction and Objectives: The purpose of this study was to investigate the correlation of various clinical parameters (number of shock wave lithotripsy [SWL] session, body mass index [BMI], patient age, gender and stone characteristics) with the pain perception during SWL procedure.

Material and Methods: According to our inclusion criteria, a total of 88 patients who underwent 165 SWL sessions for renal or ureteral stones in our institution were included. The degree of pain perception during the procedure was evaluated with 10-point visual analog scale.

Results: A significant p value was reached when a cut-off value for stone burden, was taken as 100 mm². Mean pain scores during the SWL procedures were affected by gender and the number of SWL session. However, it was not affected by laterality, patient age, BMI, and location of stone.

Conclusions: In summary, it seems that patient comfort is better during a first SWL session for renal or ureteral stones with stone burden of less than 100 mm². In addition, severity of pain during a SWL treatment may be better tolerated in male population.

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Comparison of the analgesic effects of dexketoprofen and diclofenac during shockwave lithotripsy: A randomized, double-blind clinical trial

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Introduction and Objectives: This prospective, randomized and double-blind clinical study aimed to assess the analgesic efficacy of single dose intramuscular (i.m.) injection of dexketoprofen (Group DE) compared with single dose i.m. injection of diclofenac (Group DI) in patients undergoing shockwave lithotripsy (SWL) procedure

Material and Methods: A total of 70 males with single renal or ureteric stones were randomly separated into two groups. The 40 males in Group DI received 75 mg i.m. diclofenac sodium and 30 males in Group DE received 50 mg i.m. dexketoprofen trometamol 30 minutes before SWL. A 10-point visual analog scale was used to evaluate pain.

Results: The age, body mass index and mean stone burden were comparable between two groups ($p > 0.05$). Mean visual analog scale score for Group DE was statistically lower compared with the score for Group DI ($p = 0.02$). In 34 (85%) of the 40 males in Group DI, the SWL procedure was performed with no, minor or tolerable pain. But, in Group DE, 28 (93.3%) out of 30 cases evaluated the pain severity as no, minor or tolerable ($p = 0.01$). No major/minor adverse effects were observed in Group DI, whereas in 1 patient in Group DE, dyspepsia after injection was noticed ($p = 0.423$).

Conclusions: The severity of SWL related pain was significantly better tolerated with dexketoprofen trometamol. During a SWL

procedure, analgesic efficacy of dexketoprofen was greater than that of diclofenac sodium. Although statistically insignificant, a little increased risk for gastric irritation was noticed with dexketoprofen.

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The alternative technique of ureterointestinal anastomosis with antireflux protection

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Introduction and Objectives: Intestinal neobladder with low pressure is method of choice for urinary diversion after radical cystectomy. Ureterointestinal anastomosis is a critical element of any surgical procedure employing intestinal segment for urine derivation. It should be technically easily execute, applicable for normally and dilated ureter, with minimum of stenosis-risk occurrence, accessible for endoscopy. Main complications in region of ureterointestinal anastomosis (UIA) are strictures (8-17%), urinary reflux (2-15%) and pyelonephritis (11-13%). To achieve protection of the upper urinary tract in patients with neobladder we designed and clinically applied the subserosal invagination (SSI) method, a new antireflux ureterointestinal reimplantation technique. We present the operative procedure and comparative results.

Material and Methods: After ureters mobilization spatulation and intubation with soft ureteral catheter are performed. Ureter and neobladder are anastomosed with "anchor" sutures by "back to side" type. The neobladder wall is sutured over the ureter by sero-serosal sutures. We created an orthotopic ileal neobladder after radical cystectomy in 99 patients for bladder cancer with 4 different types of uretero-intestinal anastomosis. The comparative study included 4 groups according to these types: 1 - UIA without antireflux protection, 2 - UIA with antireflux protection by SSI, 3 - UIA by subserosal extramural tunnel type, 4 - UIA by submucosal implantation type (LeDuc). Evaluation included clinical, radiological, laboratory, urodynamic and endoscopic evaluations. Mean follow-up was 34 months.

Results: Reflux was reported in 11/23 cases (23.9%) for 1 group, 1/32 (1.6%) for 2 group, 1/17 (2.9%) for 3 group and 5/27 (9.3%) for 4 group. Strictures were reported in 6/23 cases (13.0%) for 1 group, 1/32 (1.6%) for 2 group, 5/17 (14.7%) for 3 group and 8/27 (14.8%) for 4 group. Accessible for endoscopy of the ureters orifices after 3 months of surgery was possible in 34.8% for 1 group, 88.5% for 2, 75.0% for 3, and 23.5% for 4.

Conclusions: The ureterointestinal anastomosis by subserosal invagination type has the optimal antireflux protection. It is associated with low risk of stricture occurrence and ensure high endoscopic visualization.

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The analysis of the way of the treatment of staghorn stones in a kidney

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Introduction and Objectives: The problem of selecting a method in renal staghorn calculus treatment so as to provide the best results for patients is of great importance. There are several approved methods of staghorn stone crushing, such as PCNL, ESWL and URS with holmium laser and traditional open surgery. The selection depends on many essential factors.

Material and Methods: The treatment methods of consecutive 43 patients who were treated due to renal staghorn calculi