

patients with "steinstrasse" after ESWL. In these patients no ureteral stent was placed prior to the procedure.

**Conclusions:** PCNLT is the first line treatment option for staghorn lithiasis. It provides high stone-free rate with short postoperative hospital stay and low complications rate. SWL is successfully used as a secondary procedure for complete debulking of residual calculi.

### S103

#### **Outcome of percutaneous management of staghorn calculi: can the access number be predicted?**

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**Introduction and Objectives:** To investigate the outcome of percutaneous nephrolithotomy (PCNL) in the management of staghorn calculi and to assess whether we can predict the required access number for success or not.

**Material and Methods:** Between October 2002 and January 2009, the records of 413 patients with staghorn calculi who underwent percutaneous nephrolithotomy were reviewed retrospectively. Of the 413 patients, 223 (54%) had complete and 190 (46%) partial staghorn calculi. Intravenous urography and/or CT were performed in all patients. A total 244 (59%) patients were managed by single access (group 1), and 169 (41%) patients underwent multiple accesses, the number ranging from 2 to 6 (group 2). Both groups were compared in terms of per-operative findings and post-operative outcomes. Patients and stone-related factor affecting the number of accesses performed were analyzed.

**Results:** The mean number of percutaneous access was  $2.42 \pm 0.74$  (range 2-6) in group 2. Mean duration of fluoroscopy and operation times were significantly longer in group 2 ( $p < 0.002$ ,  $p < 0.0001$ , respectively). Supracostal access was required in 30.7% in group 2, and in 6.9% in group 1 ( $p = 0.001$ ). Success was achieved in 70.1% in group 1 and in 81.1% for group 2 after one session of PNL ( $p = 0.012$ ). The most common complications were bleeding for both groups and it is higher in group-2 ( $p < 0.0001$ ). Neither the stone size nor the degree of hydronephrosis could predict the number of accesses but the incidence previous open surgery was higher in group 2 ( $p < 0.008$ ).

**Conclusions:** PCNL with multiple accesses is a highly successful alternative with considerable complication rates in the management staghorn calculi. Our results further indicated that only the history of previous open surgery predicted the need for multiple accesses.

### S104

#### **Nomogram for prediction of fever after PCNL**

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**Introduction and Objectives:** The exact mechanism of fever and urosepsis after percutaneous procedures has not been established. This research studied the frequency of fever after percutaneous nephrolithotomy (PCNL) and the risk factors.

**Material and Methods:** In this prospective study, 150 patients have been included. In all patients, after standard diagnostic workup and according to guidelines, PCNL was done. All patients received antibiotic treatment between day 1 and day 2. Before scheduled PCNL all patients had sterile urine. Age of the patient, previous urinary infection, type of stone, presence of nephrostomy tube and number of tracks have been analyzed.

**Results:** The frequency of fever after PCNL was 14% ( $n = 21$ ). The mean durations of hospitalization in patients with and without fever were  $5.4 \pm 2.3$  and  $3.4 \pm 1.7$  days, respectively ( $p = 0.001$ ). In logistic regression analysis, positive urine culture, type of stone (staghorn) and presence of nephrostomy tube have been independently related to post-operative fever with classification accuracy of 90% and AUC of 0.7199. In Naive Bayes model, that except above includes and number of tracks, classification accuracy was 87.3% but AUC was 0.7222.

**Conclusions:** Fever after PCNL can be predicted in the most of patients. Both models offer very good prediction of fever after PCNL and can be used as a good prognostic tool in everyday practice.

### S105

#### **Does stone burden and degree of hydronephrosis affect success of shock wave lithotripsy in pediatric patients?**

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**Introduction and Objectives:** To evaluate success of shock wave lithotripsy (SWL) with a third generation SWL machine and to determine the relation between stone burden and the degree of hydronephrosis in children with urinary stones.

**Material and Methods:** Two hundred and sixty children with urinary system stones were treated with Siemens Lithostar Modularis Uro-Plus. The patients were divided into three groups according to stone burden (group 1:  $< 100 \text{ mm}^2$ ; group 2:  $101 - 200 \text{ mm}^2$ ; and group 3:  $> 200 \text{ mm}^2$ ) and four groups (group 0: absent; group 1: mild; group 2: moderate; and group 3: severe) according to the degree of hydronephrosis. These groups were compared in terms of the success rate of SWL.

**Results:** Two hundred and seventy-nine renoureteral units of 260 patients were treated at 402 SWL sessions. In all patients the average stone burden was  $98.2 \text{ mm}^2$  (range, 11-525). The overall success rate was 87.5%. According to stone burden, the success rate was 93.1% in group 1, 85.5% in group 2 and 60% in group 3 ( $p < 0.001$ ). According to the degree of hydronephrosis, the success rate was 93.8% in group 0, 89.6% in group 1, 73.3% in group 2, and 64.3% in group 3 ( $p < 0.001$ ). The average energy, number of shockwaves, number of sessions, re-treatment rate, auxiliary procedure rate, and overall efficacy quotient were 1.76 units, 2260, 1.4, 33%, 8.2%, and 0.62 respectively.

**Conclusions:** SWL is an effective treatment method in selected patient groups in pediatric age. However, percutaneous nephrolithotomy can be the first alternative for stones larger than  $200 \text{ mm}^2$ . It should also be kept in mind that the success rate of SWL decreases when the degree of hydronephrosis increases.

### S106

#### **Changes of plasma $\beta$ -endorphin and ACTH levels during ESWL treatment**

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**Introduction and Objectives:** To measure plasma levels of  $\beta$ -endorphin and ACTH, and to correlate their values with pain intensity in patients undergoing ESWL.

**Material and Methods:** 25 patients who hadn't previously undergone ESWL treatment were enrolled into this study. All stones were completely radioopaque at plain x-ray film and localized in renal pelvis. Their diameters were  $\leq 20 \text{ mm}$ . 2000 shock waves were given on the Pck Stolith ESWL machine. Plasma levels of  $\beta$ -endorphin and ACTH were measured before and 10 min, 30 min after the beginning of the treatment. Pain intensity was scored using 10-points the Visual Analog Scale after the end of the ESWL treatment.

**Results:** A statistical difference was obtained between the plasma levels of  $\beta$ -endorphin at 0, 10 and 30 min of ESWL treatment ( $p=0.002$ ,  $p<0.05$  Friedman test). A statistical difference was not obtained between the plasma levels of ACTH at 0, 10 and 30 min of ESWL treatment ( $p=0.698$ ,  $p>0.05$  Friedman test). Between 10 and 30 min plasma levels of  $\beta$ -endorphin level were not found to be significantly different ( $p=0.397$ ,  $p>0.05$  Wilcoxon test). A moderate positive correlation was determined between 10 min  $\beta$ -endorphin levels and VAS scores ( $p=0.01$ ,  $p<0.05$  Friedman test).

**Conclusions:** Stress and pain caused by ESWL can be much better evaluated by  $\beta$ -endorphin rather than ACTH.

#### S107

##### ESWL monotherapy as primary modality of treating upper urethral stones

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**Introduction and Objectives:** Objectives: to present our experience with shock wave lithotripsy (ESWL) as a primary modality of treatment for upper urethral stones.

**Material and Methods:** From January 2006–June 2008 84 patients with upper ureteric stones were treated with ESWL as the primary modality with Siemens-Compact lithotripter. Aged 16–71 years old, male-female, ratio 2, 1–1, stone size 7–12 mm, pyuria was 0/84, clinical infections, 5/84, pre ESWL double J stenting 0/84, intavenous sedation 84/84, duration of symptoms under 4 weeks 28/84, after 4 weeks 56/84, stone size less than 10 mm 63/84, more than 10 mm 21/84/ The patients were examined with sonography, intravenous urography, BUN,creatinin, microscopic urine examination.

**Results:** The clearance rate was 96% for stones less than 10 mm and 85% for stones larger than 10 mm

**Conclusions:** ESWL as monotherapy has best results (overall success rate was 95%) when the stones were less than 10 mm, minimal analgesia is required with modern lithotripters.

#### S108

##### Omnice Tocas in complex treatment of urolithiasis

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**Introduction and Objectives:** To conduct a randomized trial and determine the role of Omnice Tocas (Tamsulosin hydrochloride) as adjuvant therapy for the extracorporeal shockwave lithotripsy (ESWL) of kidney and ureter stones.

**Material and Methods:** From 02.2006 to 04.2007 were included 248 patients, of them 186 completed a full survey and were treated statistically, of them 121 were men and 65 women at mean age  $52\pm 21$  d. 77 ureter stones with medium size  $9\pm 4$  millimeters and 109 kidney stones with average size  $13\pm 7$  millimeters were lithotripped. Patients were randomized into two groups: Group A – patients treated with standard medications after ESWL: antibiotic, Prednisolon – 20 mg / 24 h for ten days and Diclofenac sodium in case of severe pain. Group B – patients received medication from Group A, but also Tamsulosin – 0.4 mg / 24 h was added for one month. All patients were followed for 4, 8, 12 weeks by KUB plain film combined with ultrasonography. The main values by which were compared the two groups were: ESWL efficiency, frequency of renal colic, time needed for elimination of the fragments, frequency of rehospitalisations, side effects.

**Results:** In the group of patients taking Tamsulosin, there was significantly better and faster elimination rate of stone fragments, that's why only for the first month 73.4% of them practically completely eliminated the stone fragments, while the group of patients receiving only corticosteroids, the value

reaching only 55.9% and  $p<0.001$ . Only 6.8 percent of patients taking Tamsulosin, needed rehospitalisations unlike the other group of which 21.7% –  $p<0.001$  were rehospitalised. In the group taking Tamsulosin renal colic was observed in 24.6% of the patients, opposed to the group receiving only corticosteroids – 68.4% –  $p<0.05$ . We have not observed side effects leading to discontinuation of the treatment.

**Conclusions:** From the conducted comparative analysis of the different parameters in the two randomized groups clearly show out the benefits of adjuvant drug therapy after ESWL, where patients besides standard treatment with corticosteroids and analgesics additionally take Tamsulosin.

#### S109

##### Ureterolithotripsy with the Stonebreaker™ system

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**Introduction and Objectives:** To estimate the safety and efficacy of the Stonebreaker™ portable, cordless, pneumatic lithotripter for intra-corporeal lithotripsy of ureteral stones.

**Material and Methods:** Ninety-six ureteral stone disease patients, six of which were ESWL failures, were prospectively included in this study during an 18-month period. Stone number and position, number of shocks required for stone fragmentation to size sufficient for removal, as well as operative time were recorded for each patient. Lithotripsy was performed through a semi-rigid ureteroscope under epidural anesthesia.

**Results:** One hundred and four stones were treated in our patient population. Upper, mid and lower ureteral stones were located in 9 (8.6%), 27 (26.0%) and 68 (65.4%) patients respectively. Mean stone size was 1.8 cm (0.7–3.4). Mean number of shocks delivered was 29 (12–76). Stone fragmentation was achieved in all patients, including ESWL failures. Repeat ureterolithotripsy and renal ESWL due to stone migration were performed in four and three patients respectively. No evidence of ureteral trauma due to the lithotripsy was noted. All patients remained stone-free at a three month follow-up.

**Conclusions:** Stonebreaker™ lithotripsy represents a safe, effective procedure with a short learning-curve for the treatment of ureteral stone disease.

#### S110

##### Ureteroscopy in the management of pediatric ureteral stones

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**Introduction and Objectives:** To evaluate efficiency and reliability of ureteroscopy in the management of pediatric ureteral stones.

**Material and Methods:** A retrospective review was performed for patients (31 male, 30 female) at median age 8.1 years (range, 6 months–16 years) who underwent rigid ureteroscopy between August 1998–March 2009. 7.5 Fr–9 Fr rigid ureteroscopy was performed to 66 cases in 61 patients, thus, 5 patients were bilateral. Stone localizations were 7 in proximal, 9 in middle and 50 in distal ureter.

**Results:** Average stone size was 8.22 mm (range, 4–20). Average operation time was 32.65 minutes (range, 15–100). No hydronephrosis was detected in 15 cases where minimal hydronephrosis was detected in 14, moderate in 16 and severe in 21 cases. In 31 cases, stones were extracted by basket catheter and pneumatic lithotripter was used in 35 cases. Initial ureteral balloon dilatation was performed to 5 cases. Double J (DJ) catheter was inserted in 36 patients. In 2 patients postoperative high fever occurred and hospitalization