

second-look PCNL and 15 (38%) Shock Wave Lithotripsy. No perioperative complications were seen.

Conclusions: PCNL is safe and effective for treatment of staghorn kidney stones in geriatric patients, however, additional treatment modalities can be needed.

S100

Long term renal function and stone recurrence after percutaneous nephrolithotomy in patients with renal insufficiency

B. Kuzgunbay*, U. Gul, T. Turunc, H. Ozkardes, O. Yacyiöglu.
Baskent University, Dept. of Urology, Ankara, Turkey

Introduction and Objectives: We analyzed long-term results after percutaneous nephrolithotomy (PCNL) in patients with impaired renal function (IRF).

Material and Methods: Nineteen (6.3%) of 300 patients who underwent PCNL had serum creatinine values above 1.4 mg/dl before surgery and were considered to have IRF. Success rate of operation, recurrence rate and renal function status were evaluated.

Results: Mean follow-up time was 51.1±10.1 months. Three patients were lost to follow-up, 16 patients completed the study. The results of the operation were stone free in 50%, clinically insignificant residual fragments in 25% and clinically significant residual fragments in 25% of the patients. Mean serum creatinine value was 2.30±0.56 mg/dl before surgery and 2.67±1.41 mg/dl at the end of follow-up (p=0.386). Creatinine values decreased to normal range in six patients (37.5%). Six patients (37.5%) had stable renal function (creatinine: 1.4–4 mg/dl). Creatinine values increased (>4 mg/dl) in four patients (25%) who required renal replacement therapy. Three new patients progressed to end-stage renal failure. These three had insulin dependent Type II diabetes mellitus and one also had solitary kidney and atherosclerosis. Two patients (12.5%) had recurrences, one of these had hypercalciuria and the other had infection stone.

Conclusions: Our results indicate that most patients presenting with kidney-stone disease and renal insufficiency experience improvement or stabilization of renal function after PCNL. Patients with solitary kidney and those with conditions such as diabetes and atherosclerosis might be at greater risk for deterioration of renal function. Patients with metabolic abnormalities and infection stones might be at higher risk for recurrence.

S101

Ultrasound guided percutaneous pneumatic lithotripsy

V. Radojevic¹*, N. Jeremic², S. Tomovic², B. Vavic², A. Milosevic².
¹CHC, Dept. of Urology, Belgrade, Serbia; ²CHC "Zvezdara", Dept. of Urology, Belgrade, Serbia

Introduction and Objectives: The aim of this article is to introduce our initial experience in ultrasound guided percutaneous lithotripsy

Material and Methods: From september 2008 to june 2009, we performed this procedure on 18 patients with massive renal calculus, who had failed previously combined retrograde intrarenal lithotripsy and ESWL. Our decision to use this access instead of radiological was influenced with lack of conditions on our department for latter. Twelve patients were in standard lumbotomy position and 4 patients were in modified supine position. Before each procedure, we placed ureteral catheter Ch 5 in ipsilateral ureter for arteficial dilatation of pyelocaliceal system and for protective drainage during postoperative care. After introducing puncture needle through dilatated calices, we continued with placement of guidewire, than ballon dilatator (COOK-which were insufflated on 18 mm Hg) or we used telescopic dilators for making a working channell. After this procedure we introduced Amplatz and finally

nephroscope Ch 28(Olympus). Lithotripsies were performed with pneumatic lithotriptor, using lithovac aspiration and several kind of forcepses.

Results: Average duration of procedures were about 130 minutes. In 16 patients we had complete desintegration and extraction of fragments. In 2 patients we could not reach calices and calculi. There were no need for blood tranfusions or conversion to open procedures. In 2 patients we had intraperitoneal brekthrough of irrigation fluid, which was evacuated by peritoneofix. We left Foley catheter Ch 18 as a nephrostomy tube in all patients. We did not have major early or late complications in other 14 patients.

Conclusions: Ultrasound guided percutaneous lithotripsy is feasible, reproducibile, safe and acceptable for urologist because there is no risk of x-ray adverse effects, but very demanding. Urologist must be patient and skilled in ultrasound percutaneous and endourological procedures.

S102

Percutaneous nephrolithotripsy and shockwave lithotripsy in the treatment of staghorn kidney lithiasis

K. Petkova*, I. Saltirov, T. Petkov. *Military Medical Academy, Dept. of Urology and Nephrology, Sofia, Bulgaria*

Introduction and Objectives: To investigate the efficacy and safety of percutaneous nephrolithotripsy (PCNLT) as monotherapy and in combination with shockwave lithotripsy (SWL) in the treatment of staghorn kidney lithiasis.

Material and Methods: For a 3 year period (July 2003 – July 2006), 513 patients underwent PCNLT, 225 of which were treated for staghorn stones. 142 (63.1%) were treated with PCNLT as monotherapy. In 57 (25.3%) of cases PCNLT was followed by SWL of residual stone fragments. 26 (11.5%) patients underwent so-called sandwich therapy – PCNLT+ESWL+PCNLT. In most cases a rigid 27 Ch nephroscope Olympus (Germany) was used for endoscopic lithotripsy. Flexible nephroscope Olympus (Germany) was used in 15 patients (6.6%) during the first stage of PCNLT and in 12 patients (5.3%) during the second stage. Lithostar Multiline (Siemens, Germany) was used for SWL. SWL was performed with 4000–6000 shock waves with power from 19 kV to 21 kV, after placement of double JJ ureteral stent. This method was used in 83 patients (36.8%), 11 of whom (13.2%) required two sessions of SWL. Of all patients, treated with SWL, 26 had a large number of stone fragments, as well as stones larger than 4 mm in diameter. This necessitated the use of PCNLT for debulking of those fragments through the existing nephrostomy tract and the patients were discharged from the hospital without nephrostomy tube. The patients with ureteral stent inserted prior to SWL were discharged from the hospital with the stent, which was removed after the elimination of most stone fragments. Patients follow-up at the first, third and sixth month included plain abdominal radiography and ultrasonography to demonstrate elimination of stone fragments. The final stone-free status was assessed by plain abdominal film, intravenous urography and ultrasonography.

Results: The age, sex, stone size, presence of positive urine culture and grade of dilation of renal collecting system in the three groups of patients were statistically similar. 86% of patients in the first group, treated with PCNLT as monotherapy were stone free after the procedure. In the second group (PCNLT+SWL) the stone-free rate was 89% and in the third group (PCNLT+ESWL+PCNLT) – 90%. In general the overall success rate was 88.3% and the average postoperative hospital stay – 5.3 days. No complications such as disturbances of electrolyte balance or major bleeding, requiring surgical treatment, were observed. In 4 cases a 250 to 400 ml Er concentrate transfusion was necessary. 5 ureterorenoscopies (2.2%) were performed in

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?

T. Akman, E. Sari, M. Binbay, E. Yuruk*, A.K. Tepeler, Y. Berberoglu, A.Y. Muslumanoglu, A. Tefekli. *Haseki Teaching and Research Hospital, Dept. of Urology, Istanbul, Turkey*

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 ± 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

M. Bazardzanovic¹*, S. Tomovic², N. Jeremic², I. Vukovic³.
¹Regional Medical Center Mostar, Dept. of Urology, Mostar, Bosnia and Herzegovina; ²Clinical Hospital Center Zvezdara, Dept. of Urology, Belgrade, Serbia; ³Clinical Center Serbia, Dept. of Urology, Belgrade, Serbia

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 ± 2.3 and 3.4 ± 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?

T. Turunc*, M. Gonen, B. Kuzgunbay, U.T. Bilgilişoy, A. Dirim, M.I. Tekin, H. Ozkardes. *Baskent University, Dept. of Urology, Ankara, Turkey*

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 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 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 β -endorphin and ACTH levels during ESWL treatment

M. Sunay*, A. Karabulut, M. Dadalı, L. Emir, D. Erol. *Ankara Training and Research Hospital, Ministry of Health, 1st Clinic of Urology, Ankara, Turkey*

Introduction and Objectives: To measure plasma levels of β -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 β -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.