

the lithiasis on the pyelocaliceal structure (no dilatation 25, hydronephrosis 50, hydrocalicosis 22).

Results: The rate of success of the method was 76.28%. Intraoperative complications (23 – 23.72%) consisted in: failure of puncture – 9 cases; important bleeding – 7 cases; remaining stone fragments – 7 cases. Postoperative complications (19 – 19.58%) were represented by: lumbar haematoma – 4, lumbar urinary fistula – 6 and acute pyelonephritis – 9.

Conclusions: Percutaneous nephrolithotomy represents an important treatment method for urolithiasis on congenital malformed kidney, effective with a correct preoperative evaluation and when is performed by an experienced surgeon.

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PNL on solitary kidney – a 10 years experience

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Introduction and Objectives: The treatment of the lithiasis developed on solitary kidney (congenital, surgical or functional) can be difficult, especially by the important postoperative complications (hemorrhage or infections), which can put in danger the patients' life. For the stones >15 mm in diameter, the PNL represent the main treatment method.

Material and Methods: Between January 1999 and June 2008, 143 patients with urolithiasis developed on unique kidney were treated using PNL. The stones dimensions were between 15 and 70 mm. At all the patients the puncture was fluoroscopic and the fragmentation was ballistic and using ultrasound (sonotrod).

Results: The general stone-free rate was 90.2%; 91 patients needed one PNL session. At 20 patients (all with stones >30 mm), 2 or more PNL sessions were necessary. At 28 patients, the treatment was completed using ESWL. The complications rate was 9.8 %, the 2 most important were bleeding and infections. No patient needed surgical treatment for hemorrhage. All the patients were checked at every 6 months (ultrasound examination and blood and urine samples). 24 patients developed new calculi, these being solved by PNL 10 and ESWL (with JJ stent) 14.

Conclusions: PNL represents, according to our experience the most efficient treatment method for calculi >15 mm. The lithiasis developed on unique kidney needs supplementary peri- and postoperative precautions and the postoperative evaluations must be very rigorous in order to prevent recidives.

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ESWL for treatment of lower pole caliceal stone

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Introduction and Objectives: Dornier Compact Delta is electromagnetic lithotripter designed with modules. ESWL makes it possible to treat most patients suffering from this disease, minimizing complications and side effects of treatment. The localisation of calculus is done with ultrasound and XR imaging. The goal of stone treatment is to use a less morbid, minimally invasive and effective modality.

Optimal treatment of lower pole caliceal stone still controversial. The aim of our study was to determine the efficacy and safe of ESWL in patients with lower pole caliceal stone.

Material and Methods: We retrospectively analysed the charts and radiology films of patients who had ESWL for lower pole caliceal stone. For ESWL we use Dornier Compact Delta Lithotripter D. After the lithotripsy we followed patients at one and at three month and thereafter according to stone receding to stone residu. To the patients was given diclofenac supp. 20 min priory to treatment, for pain control during shock wave lithotripsy was given sedo-analgesia. The procedure was done

with ultrasound, the patient in the supine position and no more than 3000 shock wave were delivered, 60 shots per minute were applied using the maximal level of energy. Two hours after the procedure, the patients were released home. After ESWL combined with oral hydratation plus 12 degree inversion.

Results: Between April 2004 and June 2009, 267 patients (128 males and 139 females) were treated with ESWL because of lower caliceal stone large 6–25 mm. The mean age male of patients was 38.74 (from 8 to 64) females 40.27 (from 16 to 73) patients had stones in the lower caliceal stone. The average stone-free after single treatments 124, after second 34 after third 14, after fourth 4. The time between two season one month. In 9 patients ESWL failed. Complications haemathoma occur in one cases, clinical uroinfect occurred in 3 patients.

Conclusions: ESWL appears to be an effective first-line treatment for lower pole caliceal stone. Our results showing good results in fragmentation and clearance of the stones in lower caliceal stone low adverse effects. Patients with SWPL greater than 100 mm are more likely to fail treatment.

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Results of ESWL treatment for residual stones after primary PNL approach in struvite staghorn lithiasis

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Introduction and Objectives: Multiple renal access tracts may increase the morbidity of PNL treatment in staghorn lithiasis. For this reason, PNL followed by ESWL, for residual stones is a recommended treatment method in staghorn lithiasis. The aim of our study was to determine if ESWL treatment for residual struvite stones, after primary PNL approach is associated with significant stone free rate, justifying this combined therapy.

Material and Methods: Over a period of six years, a number of 157 struvite staghorn calculi were treated in our hospital. The stones were either complete or had only one empty caliceal group (type A and type B in Moores-O'Boyle classification). First line treatment was PNL. For residual stones, defined as fragments larger than 5 mm, ESWL was used as combined approach. Failure of ESWL was followed by second PNL, the so-called sandwich therapy. The stone free rates associated with combined approach (PNL+ESWL) and those associated with sandwich therapy (PNL+ESWL+PNL) were determined. Complication rates associated with the first and second PNL were registered separately.

Results: 26 patients were stone free after a single PNL tract access. Single session multi-tract PNL was used in 82 patients to obtain the stone free status. Single session PNL was associated with a stone free rate of 69% (108 patients). In the remaining 49 cases, the nephrostomy tube was left in place and ESWL was used for residual stones treatment. At least two ESWL treatment sessions were performed. The size of residual stones vary between 0.9 cm and 1.8 cm. 29 stones were placed in the upper pole and the rest in the middle calyx. In 6 cases the stone free status was achieved following ESWL, meaning a stone free rate of this combined approach (PNL+ESWL) of 72.5%. ESWL increased the overall stone free rate with 3.5%. A second session PNL was performed for the remaining 43 patients, the method being successful in 21 patients. The second PNL increased the overall stone free rate with 13% up to 82%. The overall stone free rate of the sandwich therapy was 86%. Complication rates associated with the second PNL were insignificant.

Conclusions: Results of ESWL treatment for residual stones after primary PNL approach in struvite staghorn lithiasis are disappointing. When compared with second PNL treatment approach, ESWL treatment for residual struvite stones, after

primary PNL approach, is associated with very low stone free rates. Therefore, justifying this combined therapy (PNL+ESWL) for struvite staghorn calculi is difficult

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Classification of percutaneous nephrolithotomy complications using the modified Clavien grading system

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Introduction and Objectives: To report the complications after or during percutaneous nephrolithotomy (PNL), according to modified Clavien grading system.

Material and Methods: A total of 911 PNLs were performed between 2006 and 2008 in our clinic, and charts were retrospectively reviewed focusing on complications observed. PNL was performed in 697 cases (76.5%), ureteroscopy followed by PNL in 110 cases (12.07%) and tubeless PNL in 104 cases (11.42%). The stone free rate achieved at 3 months postoperative was 90.56% – 825 patients. According to the modified Clavien classification system, complications were stratified into five grades. Kidney and ureteral stones treated with PNL were also classified as simple (432 – 47.42%) and complex (479 – 52.58%) and complications rates were compared.

Results: A total of 285 complications were observed in 259 (28.43%) patients. There were 48 grade 1 (5.26%), 144 grade 2 (15.8%), 54 grade 3a (5.92%), 28 grade 3b (3.07%), 6 grade 4a (0.66%) and 2 grade 4b (0.22%) complications, and 3 deaths – grade 5 (0.33%). Most of the complications were related to bleeding and urine leakage. Grade 2 and 3a complications were significantly more common in patients with complex renal stones.

Conclusions: A graded classification scheme for reporting the complications of PNL may be useful for monitoring and reporting outcomes, but for more accurate data it is necessary a prospective study.

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Urinary calculus and artificial sample fragmentation during Er:YAG and Ho:YAG lithotripsy in vitro

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Introduction and Objectives: Laser-assisted lithotripsy is routinely used minimally invasive method in the clinical urological practices. The Holmium:YAG laser is the most recent addition. This laser based on the Yttrium-Aluminium-Garnet crystal with the source element Holmium emits beam of the wavelength of 2100 nm. More perspective and effective seems to be Erbium:YAG laser generating radiation of the wavelength of 2940 nm with higher water absorption.

Material and Methods: We compared the Ho:YAG and Er:YAG laser desintegration of the human calculi and the artificial plaster sample. In vitro we tested the routinely clinically used Coherent Versa Pulse Ho:YAG laser operating in free running regime, repetition rate of 5 Hz, radiation delivered by the 365 micron optical fibre and the laboratory flash-lamp pumped Ho:YAG and Er:YAG laser, repetition rate of 1 Hz, radiation delivered by the COP/Ag hollow waveguide sealed with fused silica cap. The stones of the known composition – whewellite,

urinary acid dihydrate and the cubic plaster sample were irradiated at varying energy ranging from 25 mJ to 250 mJ in the Er:YAG laser and from 50 mJ to the clinical setting of 1500 mJ in the Ho:YAG laser. The perforation rate was measured according to the crater width, depth and number of pulses needed for the sample perforation at the variable energy.

Results: The optical microscope crater measuring in lower energy applications and the number of pulses counting in the sample perforation in higher energy applications showed the higher perforation rate of the Er:YAG laser radiation. We achieved almost twice higher efficiency in the human calculus and the artificial sample perforation and disruption.

Conclusions: The Er:YAG laser is superior to the Ho:YAG laser for more efficient lithotripsy. In the relation with the documented more precise soft tissue cut and less surrounding tissue damage would be the ideal laser equipment for clinical urological use. The only limit is the cost of the flexible fibre.

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Working hard in a small-volume center: Our experiences with percutaneous nephrolithotomy

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Introduction and Objectives: Percutaneous nephrolithotomy (PCNL) is recognized as treatment option for staghorn, larger stones or after failed ESWL therapy. It is a very specific procedure that requires special equipment, instruments and training. We will present our results as presentation that such procedure is well done and can be a part of a small-volume center "menu".

Material and Methods: First PCNL was performed at our department in 1986, but from 1994 till present day we usually perform about a 15 PCNL per year and so far a 239 patients were treated with PCNL, within that number are 22 cases of patients with multiple PCNL. We do a single channel PCNL, with rigid instruments and we use electrokinetic as modality for fragmentation (rarely ultrasound probe). Only 165 medical histories were present for analysis due to loosing medical histories (war damage to archives) and since a number of patients was from other states. Average age of our patients was 53.9 years (min: 23, max: 78) and was almost same for both sexes. Males were slightly predominant (ratio to female 1.13), and left side was affected in 52.4%, with one case of bilateral PCNL. Average diameter of stones was 3.48 cm, but 51 stones were staghorn stones affecting at least 2/3 of collecting system. Mean anesthesia time was 130 minutes (min: 45, max: 360). Significant co-morbidity was present in 60.4% of patients, and 19.5% of them had previous pyelo-nephrolithotomy.

Results: Placement of JJ stent was found to be necessary in 40.5% of patients and stents were removed at first control check-up. ESWL prior to PCNL was done in 50.6% (we do have tendency to do a bimodal-therapy) and in 45.7% of patients after PCNL. Numbers for ureterorenoscopy were much smaller: prior to PCNL in 4.8% and after in 13.4% (mostly as salvage procedure for urethral fragments). Complications were noted in 31.7% cases: fever (more than 1 day) in 52 patients (32.1%), transfusion in 11 patients (6.8%), Stein-Strasse (treated with URS) in 4 patients, conversion to open-procedure in 3 patients and one nephrectomy (due to AV fistula, unable to do sclerosation). No injury to adherent organs or mortality was recorded. Overall stone free rate was 73.8% (modified 83.1% in those in whom a bimodal therapy was done).

Conclusions: Although our SFR is slightly smaller, one must bear in mind a large number of staghorn stones. Also we do have limited resources, so we don't use laser or flexible instruments, but we do like a bimodal-therapy. However, our complication rates were as reported or even better, with practically no major