

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

### C81

#### 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.

### C82

#### 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.

### C83

#### 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