

### IS PERCUTANEOUS NEPHROLITHOTOMY A SAFE AND EFFECTIVE PROCEDURE FOR TREATMENT OF RENAL STONES IN CHILDREN?

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**INTRODUCTION & OBJECTIVES:** We report our long-term results of the percutaneous management of renal stone disease in children.

**MATERIAL & METHODS:** Percutaneous nephrolithotomy (PCNL) was performed in 30 children 1 to 17 years old (median age 12), including 14 boys (46.6%) and 16 girls (53.3%). There was a single obstructing calculus in 20 patients, while 10 had multiple calculi. The procedure was performed in 1 stage in 28 patients, and it was staged with preliminary nephrostomy in two cases. Complete anatomical and metabolic evaluation was performed in all cases. Patients were followed 1, 3 and 6 months postoperatively with a plain abdominal x-ray and renal ultrasound.

**RESULTS:** In 34 renal units a total of 43 PCNL procedures were performed. At presentation 15 children had flank and/or abdominal pain, 9 recurrent UTI, 2 gross hematuria, 1 calculus anuria, while 3 were asymptomatic. Seven patients had associated metabolic abnormalities. of the renal units 20 (58.8%) were stone-free after a single PCNL, and the remaining 14 with residual stones were treated with a second look PCNL (7) and extracorporeal shock-waves (12). An 88.2% overall stone-free rate was finally achieved. During follow up of 4 to 236 months (average 123.8 months) 2 patients had recurrence of renal stones and were successfully treated with a second PCNL; otherwise, no late complications were noted.

**CONCLUSIONS:** PCNL is a safe and effective procedure for managing paediatric renal calculi, when indicated. The minimally invasive nature of PCNL is a great issue in this age group because there is a high risk of stone recurrence that may lead to repeat intervention.

### THE EFFECT OF PREVIOUS IPSILATERAL OPEN STONE SURGERY ON PERCUTANEOUS NEPHROLITHOTOMY

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**INTRODUCTION & OBJECTIVES:** Previous laparoscopic herniorrhaphy might be considered as a possible disadvantage for percutaneous nephrolithotomy. In this study, we analysed the impact of previous ipsilateral open stone surgery on the outcome of percutaneous nephrolithotomy (PNL).

**MATERIAL & METHODS:** We reviewed 49 patients who underwent PNL and had previous history with ipsilateral open stone surgery (Group-1) and compared their outcome with 49 match-paired patients (according to stone volume) without previous surgery (Group-2). Perioperative parameters (operating time, blood donation, complications) and postoperative results (duration and amount of analgesic treatment, nephrostomy catheterization) were analysed.

**RESULTS:** According to the matched-pair algorithm, the three groups did not differ with respect of age ( $42.3 \pm 15.3$  vs.  $44.6 \pm 13.8$   $p=0.420$ ) and body mass index ( $26.1$ ,  $25.8$  and  $26.2$   $\text{kg/m}^2$ ,  $p=0.641$ ). In Group-1, 26 and 24 stones were located in the right and left kidney, while the location was 23 and 26 for right and left in Group-2. The mean operation times did not differ significantly between the two groups ( $99.1 \pm 49.1$  and  $93.1 \pm 47.1$  minutes,  $p=0.543$ ) as well as the mean nephrostomy time ( $1.1 \pm 0.8$  and  $1.9 \pm 1.1$  days,  $p=0.684$ ). There was no statistical significance in complication rate with 12% vs. 20% which were bleeding in 4 and 4, hydrothorax in 1 and 1 for Group-1 and -2, respectively. Ureteral tearing and hypothermia were the other complications in Group-1 and -2, respectively.

**CONCLUSIONS:** Previous ipsilateral open kidney stone surgery does not adversely affect the operative outcomes, functional results of PNL. However, preoperatively the patients should be counselled about this potential difficulty to achieve easily and correct kidney access due to perinephritic fibrosis and mechanical dilatation should be considered as an alternative approach in this situation.

### INTRA-OPERATIVE COMPLICATIONS IN PCNL. OBSERVATIONS OF A TEACHING CENTRE AFTER MORE THAN 1800 PROCEDURES

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**INTRODUCTION & OBJECTIVES:** Since it was introduced in the current practice, PCNL (and ESWL) tends to replace the open surgery in the treatment of renal stones. The aim of this study is to evaluate intraoperative incidents and complications after more than 1800 procedures completely performed in a single centre, from the point of view of an urological department which is a teaching centre in endourology.

**MATERIAL & METHODS:** In this study, we retrospectively analysed 1859 procedures (1770 completely performed) in a teaching centre between 1991 and 2004. We started with 40 procedures per year (in the first and the second year), thereafter a mean number of 150 procedures per year.

**RESULTS:** Indications for PCNL was: pelvic stones (36,6%), pelvic and calyceal stones (12,2%), calyceal stones (single or multiple) (16.5%), staghorn calculus (13.7%) and stones in clavated in uretero-pelvic junction (21%). Failure in performing PCNL (89 cases) was caused by impossible ureteral catheterization or inappropriate nephrostomy. These cases was solved as follows: open surgery (44 cases), PCNL (second approach) (32 cases) and ESWL (under protection of double J stent) in 13 cases. Intraoperative complications (149 cases – 8,4%) consisted in: perforation of pielocalyceal system (32 cases), severe intraoperative bleeding (39 cases), lost of nephrostomy trajet (20 cases), mobilisation of stone (during procedure) into inabordable calyceal groups (40 cases), unbreakable stones (2 cases), respiratory distress syndrome (6 cases). Incidents caused by equipment and devices were noted five times in this period. In 29 cases, PNL was followed by open surgery (15 cases for intraoperative incidents and 14 cases for unbreakable or unreachable calculi on PNL). Nephrectomy after PNL was noted in 4 cases, three times for severe bleeding and once for persistent urinary fistula. Mean hospitalization period was 7,5 days, with an average of 4,5 days after procedure. Stone free rate after PCNL as single procedure was 92,8%.

**CONCLUSIONS:** PCNL is an important method of treatment in urolithiasis. Even in a teaching centre, severe complications are relatively rare, even at the beginning of the learning curve, without significant morbidity or mortality after the procedure. Higher costs of devices are covered by shorter hospitalization and rapidly social and professional reinsertion.

### MANAGEMENT OF RESIDUAL RENAL STONE FRAGMENTS AFTER PERCUTANEOUS NEPHROLITHOTOMY: ABOUT 63 PATIENTS

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**INTRODUCTION & OBJECTIVES:** To determine clearance parameters of residual stone fragments after PCNL.

**MATERIAL & METHODS:** Between 1995 and 2003, 242 patients with renal stones were treated with PCNL.

We followed up 63 patients (26%) who had clinically insignificant residual fragments (CIRF) at the lower calyx 3 months after the PCNL. CIRF were defined as post-PCNL, no-obstructive, non-infectious, asymptomatic, residual fragments 5 mm or less in size. The follow-up period ranged from 18 to 96 months (37 months). All measurements were done by the same author and confirmed by another. The average size of the CIRF was assessed in two dimensions for their largest diameter. The stone burden was the sum product of these two diameters for all fragments.

Lower pole infundibular length and infundibulum width were respectively the narrowest diameter of the calyx and length as the distance from most distal point of the calyx harbouring the stone to the midpoint of lower lip of renal pelvis. The lower infundibulo-pelvic angle was measured using the method described by Sampaio.

The follow-up was done at 3-month intervals with clinical examinations, urinalysis, renal function tests, and KUB film.

Complete stone clearance was defined as stone-free and confirmed with IVP in all patients.

**RESULTS:** There were 39 males and 24 females with a mean age of 43 years (17-64). Residual stone were at the right kidney in 25 cases (36.7%). Spontaneous complete clearance was obtained in 36 patients (53%).

The stone burden was less than  $10\text{mm}^2$ , 10 to  $20\text{mm}^2$ , and larger than  $20\text{mm}^2$  in 9, 12, and 42 patients, respectively. Most of the patients with CIRF had one stone (19).

CIRF were stable or becoming clinically significant in 27 patients.

Comparing the two groups (stone free and persistent residual stones), prognostic parameters of CIRF clearance were: stone burden  $< 10\text{mm}^2$  ( $p<0.005$ ), fragments number  $< 6$  ( $p<0.005$ ), an infundibulo-pelvic angle  $> 90^\circ$  ( $p=0.0002$ ), calyx length  $< 20$  ( $p<0.003$ ) mm.

For those who developed complications, repeated ESWL was required in 8 patients, ureteroscopic stone removal in 3 cases, PCNL in two cases and partial nephrectomy in one case.

**CONCLUSIONS:** Patients with residual stone fragments after PCNL require close follow up and timely adjuvant therapy. We found that as the number and size of the residual fragments increased the risk of developing complications. An acute IPA and longer infundibulum are the most adverse factors for clearance.