MINIMALLY INVASIVE APPROACH TO THE TREATMENT OF UROLITHIASIS

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Objective of the study: To conduct a comparative assessment of the clinical outcomes of percutaneous nephrolithotripsy (PCNL) performed in the prone and supine positions, with particular attention to operative duration, blood loss, hospital stay, stone-free rate, and perioperative complications.

Materials and Methods: The study included 72 patients divided into two groups according to their intraoperative position. Group I consisted of 37 patients who underwent PCNL in the prone position, while Group II included 35 patients operated on in the supine position. The inclusion criteria were the presence of one or more renal pelvic stones exceeding 2.5 cm in diameter, the possibility of performing the procedure through a single percutaneous access, a body mass index (BMI) below 30 kg/m², and the absence of contraindications to prone-position PCNL. The groups were compared according to sex, age, BMI, stone size, and surgical position. The mean stone diameter was 3.2 cm (range: 2.5–4.8 cm) in Group I and 3.0 cm (range: 2.7–4.5 cm) in Group II. The evaluated parameters included operative time, estimated blood loss, length of hospital stay, and the incidence of intraoperative and postoperative complications.

Results: The mean operative time was 68 minutes (range: 55–140 minutes) in the prone-position group and 43 minutes (range: 25–120 minutes) in the supine-position group. Mean blood loss was 246 ml and 230 ml, respectively. The average hospital stay was 4.7 days in Group I and 4.6 days in Group II. The stone-free rates were 91.8% and 91.4%, respectively, while the complication rates were 13.5% and 14.2%. No statistically significant differences were identified between the groups in terms of stone-free rate, blood loss, or duration of hospitalization. However, operative time was significantly shorter in patients undergoing PCNL in the supine position. No cases of severe bleeding requiring blood transfusion or injury to adjacent organs were recorded.

An important technical consideration was the relatively lower intrarenal pelvic pressure observed during supine PCNL. In patients with staghorn calculi, however, the supine approach may present additional technical challenges due to limitations in achieving intercostal access to the collecting system and restricted instrument maneuverability. In cases requiring upper-pole access through the tenth intercostal space, preoperative multislice computed tomography (MSCT) of the lower thoracic region, in addition to renal imaging, may help identify the pleural boundaries and determine a safer puncture trajectory.

Conclusion: Both prone and supine PCNL demonstrated comparable stone-free rates and overall complication frequencies. No statistically significant differences were found in blood loss or hospital stay. The principal advantage of the supine approach was a significantly shorter operative time. The choice of patient position should be individualized, taking into account stone configuration, renal anatomy, the planned percutaneous access route, and the surgeon's experience.

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