P048 Intra-operative flexible nephroscopy and laparoscopic robot-assisted pyelolithotomy for treatment of renal stones

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Introduction & Objectives: Robotic pyelolithotomy (RPL) may be an alternative to percutaneous nephrolithotomy (PCNL) or flexible ureteroscopy (fURS) to manage large kidney stones. RPL is considered when a great number of endourological procedures may be required (complex calculi; unfavorable collecting system anatomy; extremely morbid obesity; skeletal abnormalities), when previous procedures have failed or simultaneous management of other renal diseases are requested (i.e. uretero-pelvic junction obstruction, symptomatic renal cyst, renal mass). Aim of this study is to describe the RPL technique and its safety and efficacy in the treatment of complex renal stones often associated with other renal diseases.

Materials & Methods: We retrospectively reviewed our experience with RPL in 33 patients surgically treated between 05/2010 and 06/2018. All procedures were performed via a trans-peritoneal approach. Stone burden and location were assessed with a preoperative radiological evaluation. After pyelotomy, stones were removed by means of a robotic grasper; a flexible nephroscope was introduced through an assistant port and residual stones, if present, were extracted with graspers or basket catheters. In most cases, concurrent urinary disease was treated. Characteristics of patients and stones along with perioperative features - such as operative time, hospitalization, stone-free rate, and biochemical data - were recorded. Post-operative complications were reported according to the modified Clavien-Dindo classification system.

Results: 18 procedures (54.5%) were done on the right side and 15 (45.5%) on the left. The mean stone size was 31.7 mm (SD: 18.9 mm; IQR: 15-47). RPL was performed as unique procedure in 8 cases (24.2%); 21 (63.6%), 2 (6.1%), 1 (3.0%) and 1 (3.0%) underwent combined pyeloplasty for ureteropelvic junction obstruction, renal-cyst decortication for a symptomatic renal cyst, pyeloplasty plus renal cyst decortication, and partial nephrectomy for the presence of renal mass, respectively. Mean operative time was 208.6 minutes (SD: 74.6; IQR: 160-220). The mean estimated blood loss was <100 ml. No patient required post-operative transfusion. The median length of hospital stay was 6 days (SD: 5.1; IQR: 5-9 days). There was no significant change in preoperative and postoperative serum creatinine (p=0.92). The overall complication rate was 21.2% (Clavien 2 9.1%; 3a= 12.1%). The complete stone-free rate was 91.0%.

Conclusions: RPL with intraoperative flexible nephroscopy (IFN) is a feasible, efficient and safe procedure for selected patients with large renal stone burden. In particular, it allows treating a concomitant disease and the removal of stones with no damage to renal parenchyma, resulting in a lower risk of bleeding and nephron loss. Moreover, the complete removal of renal stone without fragmentation limits the risk of residual fragments (RFs) and IFN lets to increase the stone-free rate.