

Laparoendoscopic Single-Site Partial Nephrectomy with Early Unclamped Technique: Evaluation of the Surgical Outcomes and of the Effects on Renal Function

Introduction and Objective: Since its initial clinical use in urology, there has been an increasing enthusiasm and a growing interest for the laparoendoscopic single site surgery (LESS). All extirpative and reconstructive urological procedures have been described. However, LESS-partial nephrectomy (PN) represents one of the most complex procedures.

Material and Methods: As of February 2011, a prospective analysis of the patients who underwent LESS-PN was done. Patients were strictly selected on the basis of a single, exophytic, cortical, small renal mass (≤ 4.0 cm). Demographic data, perioperative and postoperative variables, including operative time, estimated blood loss (EBL), warm ischemia time (WIT), length of stay (LOS), haemoglobin decrease, postoperative pain evaluated based on a visual analogue scale score (VAS) at the discharge, incision length, renal function, pathologic results and tumor size were recorded and analyzed. All tumors were classified according to the 'preoperative aspects and dimensions used for an anatomical' (PADUA) classification. The function of the kidney was evaluated by measuring serum creatinine and serum cystatin C levels (biochemical markers of glomerular filtration). Moreover, to improve the quality and validity of the study, we also evaluated, GFR preoperatively, at 24 h after surgery and at 1-month follow-up. GFR was calculated using the CKD-EPI (Chronic Kidney Disease Epidemiology Collaboration) formula.

Results: The median operative time was 137.4 ± 16.4 min with a median estimated EBL of 113 ± 32 ml and the median WIT resulted in 11.1 ± 2.4 min using an early unclamped technique. In all cases no intraoperative and postoperative complication occurred. Postoperatively, the operated kidney did not experience any alterations in perfusion by doppler-sonography without increases in biochemical markers of glomerular filtration. Moreover, the pre-and postoperative (1-month follow-up) glomerular filtration rate (GFR) did not differ significantly from each other. The median PADUA-score: 7.1 ± 0.3 and pathology revealed 4 T1a clear cell, 1 oncocytoma and 1 chromophobe renal cell cancers and negative surgical margins were reported in all patients. Median LOS was 4.7 ± 1.1 days.

Conclusions: LESS-PN with early unclamped technique in well-selected patients affected by renal cancer can be performed without increased risks for the patients and for the renal function.