Laparoscopic vs. Open Partial Nephrectomy for T1 Renal Tumors: Evaluation of the Long-Term Oncologic and Functional Outcomes in 340 Patients

Introduction and Objective: Whereas open NSS represents the gold standard in the surgical therapy of T1 renal tumors, the refinement of intracorporeal suturing, and the availability of haemosealant substances, the laparoscopic approach has recently gained popularity for NSS. One crucial point in this respect remains warm ischaemia time (WIT), which can potentially affect short- and long-term renal function. The objective of the present study was to investigate if laparoscopic partial nephrectomy (LPN) presents the same surgical and oncological safety of open PN (OPN), without impairing the renal function, in the therapy of T1 renal tumors.
Materials and Methods: This was a retrospective single-centre study including 340 patients who underwent partial nephrectomy and who were matched for age, sex, body mass index, ASA score, tumor side and tumor characteristics providing comparative information on the surgical, oncological, and long-term renal function outcomes of laparoscopic and open NSS. There were 170 patients who underwent a LPN and 170 patients represented an historical control with OPN. Demographic data, peri- and postoperative variables, including operative duration, estimated blood loss, complications, hospital stay, renal function, histological tumor staging and grading, and metastasis rates were collected and analysed.
Results: The median operative duration for LPN and OPN was 145.3 ± 45.4 min and 155.2 ± 35.6 min, respectively (*P = 0.07*). The median warm ischaemia time was 11.7 ± 2.2 min in the LPN and 14.4±1.9 min in the OPN group (*P = 0.03*). During follow-up, the biochemical markers of glomerular filtration were completely normalized, showing the absence of renal injury and there was no statistically significant difference in glomerular filtration rate between the groups, with a median of 79.8 ± 3.0 mL/min/1.72m^2 for the LPN and 80.2± 2.7 mL/min/1.72m^2 for the OPN group at the 5-year follow-up. The 5-year overall survival and cancer-specific survival, calculated using the Kaplan–Meier method, were 94% and 91% in the LPN group, and 92% and 88% in the OPN group.
Conclusion: Laparoscopic and open partial nephrectomies provide similar long-term oncologic outcomes in the therapy of T1 renal cancer. Concerning the renal function, no damage to the kidney could be evidenced after LPN and OPN, with a complete normalization of renal function at the 5-year follow-up in both groups.