EP010 — Three dimensional printing assisted laparoscopic partial nephrectomy for patients with renal cancer

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Introduction & Objectives: To predict the feasibility and utility of 3D-LPN, we retrospectively collected clinical data and outcomes to compare the clinical effectiveness of 3D-assisted laparoscopic partial nephrectomy.

Materials & Methods: This was a retrospective analysis of data collected from all patients who underwent LPN with or without 3D physical model assisted from January 2016 and February 2018. Demographic characteristics, operative data and clinical outcomes from the procedure were collected and compared.

Results: Data were available from 127 patients of whom 69 were operated on using 3D-LPN and 58 were operated on using traditional LPN. The 3D model assisted and laparoscopic partial nephrectomy groups were equivalent in terms of age, gender, body mass index, anesthesiologists status, R.E.N.A.L score and surgical approach, respectively. Comparison of clinical metrics indicated that no difference between groups in operative time, estimated intra-/postoperative blood losses, increased creatinine level and complications, respectively ($P>0.05$). Warm ischemia time was statistically significantly shorter in 3D-LPN ($P<0.05$), while surgery waiting time was long for 3D-LPN vs LPN ($P<0.05$). Subgroup analysis based on complexity indicated that for complex tumor 3D-LPN significantly shorter warm ischemic time and lesser intraoperative blood loss than traditional LPN. Intra-and postoperative hospital complication rates were similar for 3D-LPN and traditional LPN (8.7% vs 13.7%).

Conclusions: 3D physical model is a technically safe and efficient tool to assist laparoscopic partial nephrectomy, offering the advantages of shorter warm ischemia time and less intraoperative blood loss, especially for complex renal tumor.