SC57 Hemorrhagic complications of partial nephrectomy: Single center experience

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Aim of the study: Postoperative hemorrhage is a possible and often serious complication of partial nephrectomy (PN) for kidney cancer. This study aims to estimate the incidence of hemorrhagic complications in the postoperative period in patients undergoing PN for renal cancers and to identify some possible predictors among the preoperative and intraoperative data. We also analyzed the incidence and predictors of other surgical complications.
Materials and methods: We collected data from 380 patients with renal masses who underwent partial nephrectomy with open or robotic approach at the Padua University Hospital between Jan 2012–Jul 2017. We collected patients and tumor characteristics (dimension, side and site), pre and post-operative hemoglobin level, creatinine and eGFR, intraoperative data such as warm ischemia time (WIT), estimated blood loss (EBL) and the need for intraoperative blood transfusions. Length of hospital stay (LOS) and complications according to Clavien Grade during hospitalization and within 90 days, were also recorded. Postoperative hemorrhagic complications were described as any hemorrhagic event requiring blood transfusion, re-hospitalization, surgical and/or interventional radiology management. The ANOVA, Kruskal-Wallis, Chi-squared and the Fisher's exact test were used as appropriate. The Pearson correlation (for parametric data) and the Spearman's rank correlation (for non-parametric data) were used with the SPSS statistical package.
Results: In this study, the incidence of postoperative hemorrhagic complications within 90 days was 5.6%. Subjects who experienced those complications had higher median WIT (20 min vs 15 min) ($p = 0.01$), and higher EBL (650 ml vs 300 ml) ($p = 0.01$). In turn EBL appears to correlate with the maximum tumor size at clinical imaging and pathological specimen ($p = 0.000$ and $p = 0.007$ respectively), vascular clamping ($p = 0.03$), ASA score ($p = 0.006$), transfusions rate ($p = 0.000$) and LOS ($p = 0.000$). In all these cases a linear association between intraoperative blood loss and the considered variables was found. Among 20 patients with hemorrhagic complications, 10 were successfully treated with arterial embolization and one with surgical re-intervention and hemostasis, while the other were treated with blood transfusions only. Patients with non-hemorrhagic complications had preoperative creatinine levels significantly higher than those who did not present any complications after surgery (median = 0.86 mg/dL vs 0.77 mg/dL, $p = 0.007$) and more commonly suffered from hypertension ($p = 0.003$).
Discussion: In our study the incidence of postoperative hemorrhagic complications was 5.6%. EBL and WIT were predictors of postoperative hemorrhagic complications. Increased tumor size, WIT and ASA scores correlate with increased EBL. We have also identified hypertension and preoperative creatinine levels as predictors of postoperative complications other than hemorrhagic.

SC58 Perioperative morbidity of open, laparoscopic and robotic partial nephrectomy: A prospective multicenter observational study (RECORd2)

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Aim of the study: Surgical technique may affect the perioperative morbidity of partial nephrectomy. We aimed to compare the perioperative outcomes of open, laparoscopic and robotic partial nephrectomy in a prospective observational study.
Materials and methods: Data of 2,340 kidney cancer patients treated with NSS for cT1 renal tumors were extracted from the RECORd2 database, a prospective observational multicenter national-based collaborative project. We built a multivariable model to assess the relationship between surgical technique and surgical margins, ischemia time and postoperative complications. Moreover, we examined the probability to achieve a modified trifecta (negative margins, warm ischemia time <25 minutes and no Clavien-Dindo ≥2 complications) for each surgical approach.
Results: In the overall population, laparoscopic and robotic techniques were associated with significantly lower rate of Clavien-Dindo ≥2 complications than that of open surgery (both $p > 0.059$). The warm ischemia time was longer for the robotic technique when compared to open surgery (OR: 3.92; 95%CI: 2.59, 5.26; $p < 0.0001$) and laparoscopy (OR: 2.61, 95%CI: 1.48, 3.75; $p = 0.0001$). Positive margins rate did not differ between the groups (all $p \geq 0.06$). The probability to achieve a positive trifecta was not affected by surgical technique in the overall population (all $p \geq 0.059$). In PADUA <10 lesions, patients treated robotically had higher probability to achieve a positive trifecta when compared to those treated by open surgery (OR: 1.68; 95%CI: 1.10, 2.56; $p = 0.016$) and laparoscopy (OR: 1.41; 95%CI: 0.99, 2.01; $p = 0.057$).
Discussion: Robotic partial nephrectomy had lower perioperative morbidity than open and laparoscopic surgery for PADUA <10 masses. In anatomical complex lesions the difference between the approaches is not clinically meaningful.

SC59 Perioperative complications after partial nephrectomy for complex renal tumors: A prospective multicenter observational study (RECORd 2 project)

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Aim of the study: Partial Nephrectomy (PN) represents the standard treatment for localized renal tumors, although it can be challenging in case of anatomically complex masses. Aim of the present study is to report the perioperative complications of PN for complex masses (PADUA score > =10) in a large multicenter prospective observational study.
Materials and methods: We prospectively evaluated 4308 patients who had surgical treatment for renal tumors between January 2013 and December 2016 at 26 urological Italian Centers (RECORd 2 project). All pre-operative features and intra and post-operative data were recorded. Postoperative complications occurring within 30 days of surgery were graded using the modified Clavien-Dindo scale. Univariate and multivariate logistic regression analyses for surgical complication were performed.
Results: Overall, 410 patients undergone PN for complex masses were evaluated for the final analyses. The American Society of Anesthesiologists physical status (ASA PS) score was 2 (IQR 2–3). Median pre-operative hemoglobin was 14.2 g/dL (IQR 13.0–15.0). Clinical T1b and T2 were 43.4% and 9.5% of the cases. PADUA score was 11, 12 and 13 in 34.9%, 13.4% and 0.7% of patients. Overall, 45.9%, 18.8% and 35.4% of patients underwent open, laparoscopic and robotic PN, respectively. Enucleation was performed in 29.3% of patients. Intraoperative complications occurred in 15 (3.7%) patients, including 2 cases of conversions from a laparoscopic to an open approach. Postoperative surgical complications were recorded in 60 (14.6%) of patients: 6.8% were Clavien 2 and 4.4% Clavien 3. Medical

complications occurred in 14.6% of patients. No Clavien 4–5 complications were reported. At multivariable analysis, preoperative hemoglobin (OR 0.70, 95%CI 0.57–0.85 p < 0.001) and open (OR 3.91, 95%CI 1.74–8.77 p < 0.001) vs robotic surgical approach were found to be the only predictors of postoperative surgical complications.
Discussion: In a large contemporary series, PN for complex renal masses is a safe and feasible technique with an acceptable rate of perioperative complications. The robotic approach, when compared to open approach, seems to be protective for the development of complications and may widen the indications to PN. Assessment of long term functional and oncologic outcomes of these patients is needed.

SC60 Effects of learning curve on perioperative outcomes after robot-assisted partial nephrectomy of an experienced robotic surgeon

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Aim of the study: To determine the impact of learning-curve (LC) on surgical outcomes of patients treated with robotic partial nephrectomy (RAPN) for localized renal masses (stage ≤ cT2a).
Materials and methods: We retrospectively evaluated 128 consecutive patients who underwent RAPN for clinically localized renal cell carcinoma (RCC) at single tertiary center between February 2015 and February 2019. We selected 115 RAPN performed by a single surgeon experienced in renal surgery who approached robot-assisted laparoscopic surgery after a modular training in robotic surgery (consisting in: observation of surgical procedures, console training with simulators, performing procedures on ex-vivo models, assistance and training to the operating table and operating console with 40 surgical steps in increasing difficulty supervised by an expert tutor). Complete data were obtained about clinical characteristic, perioperative creatinine clearance ([CC], estimated using Cockcroft.Gault formula), tumor complexity (described according PADUA and RENAL score, furthermore stratified in risk groups), postoperative complication ([PC], graded according the Clavien-Dindo classification [CDC]), histologic type and surgical margins (SM) status. Trifecta was defined as the contemporarily achievement of warm ischemia time (WIT) ≤20 min, no positive SM and absence of PC. We subdivided the cohort in three consecutive groups with an equal subdivision of patients (38 patients in first group vs 38 patients in second group vs 39 patients in third group), reflecting the gradual progression in the LC. First, we compared clinical and pathological outcomes between groups. Second, we analyzed how the LC impacted on trifecta achievement, operation time (OT) and WIT.
Results: The three groups were comparable in terms of demographics and preoperative clinical characteristics. Mean OT was 257,6 min (range 165–410) in first group, while it was 213.6 min (range 120–290) and 187.0 min (range 90–365) respectively in second and third group (p < 0.001). Mean estimated intraoperative blood loss was 296 mL (range 90–700), 228 mL (range 100–700) and 235 mL (range 40–500) respectively in first, second and third group (p = 0.08). We observed a significant difference between pre and post-operative CC (at 24 hour after surgery), with mean reduction of –14.8 mL/min/1.73 m2 in first group, vs –8.3 mL/min/1.73 m2 and –6.8 mL/min/1.73 m2 of second and third group, respectively (p = 0.047). In second and third groups we observed lower PC rate than in first group (13.2% vs 10.3% vs 31.6%, p = 0.03), no difference were noted after stratifying for CDC (p = 0.14). Mean WIT (excluding clampless approach procedures) was 14.6 min (range 5–30) in first group, 15.0 min (range 7–26) in second group and 12.5 min (range 5.0–23.0) in third group, with a difference in proximity of statistical significance (p = 0.08). Trifecta rate was 68.4% vs 81.6% vs 82.1% respectively in first, second and third group (p = 0.27).

Fig 1 – Warm ischemia time (stratified in clampless, 1-20 min and < 20 min) distribution between groups.

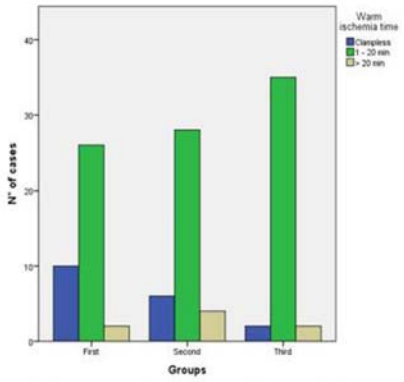

Fig 2 – Box graph of operation time distribution between groups.

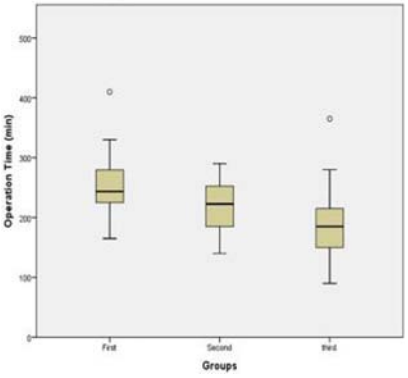

Fig 3 – Box graph of ischemia time distribution between groups.

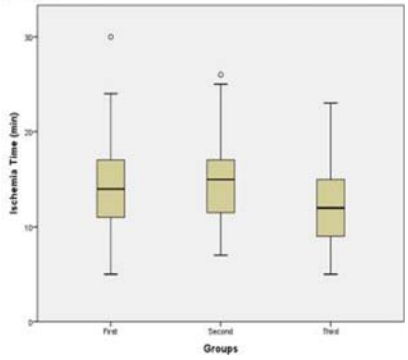

Fig 4 – Representation of the trifecta achievement distribution between groups