

ROBOT-ASSISTED VERSUS OPEN PARTIAL NEPHRECTOMY. A MATCHED-PAIR ANALYSIS OF AN INTERNATIONAL MULTICENTER SERIES

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Aim of the study

Only few studies compared the results of the gold standard treatment of cT1 renal cell carcinoma (RCC), with the standard mini-invasive alternative, providing conflicting results. Our aim was to compare the perioperative, pathological and functional outcomes in a large multicenter series of patients who underwent open partial nephrectomy (OPN) or robot-assisted partial nephrectomy (RAPN) for suspected renal tumors.

Materials and methods

This was a retrospective, multicenter, international, matched-pair analysis comparing patients who underwent RAPN or OPN for suspected renal cell carcinoma (RCC), extracted from the preliminary analysis of the Registry of Conservative Renal surgery database (RECORD Project) that collected data from 19 different centres (368 patients), promoted by the 'Leading Urological No profit foundation Advanced research' (LUNA) of the Italian Society of Urology (SIU) and from a multicentre, international database collecting cases treated in four high-volume referral centres of robotic surgery (415 patients). The propensity score was calculated for each patient using multivariable logistic regression based upon the following covariates: age, clinical tumor size, longitudinal location (upper or inferior poles vs middle pole) and tumor exophytic rate (< 50% exophytic vs others). The matching was in a 1:1 ratio for the surgical approach and included 200 patients in each arm.

Results

The mean warm ischemia time (WIT) was shorter in the OPN group than in the RAPN group (15.4 ± 5.9 vs 19.2 ± 7.3 min; $P < 0.001$). Conversely, the median (interquartile range, IQR) estimated blood loss (EBL) was 150 (100 - 300) mL in the OPN group and 100 (50 - 150) mL in the RAPN group ($P < 0.001$). There were no differences in operative time ($p=0.18$) and the intraoperative complication rate ($p=0.31$) between the approaches. Postoperative complications were recorded in 43 (21.5%) patients who underwent OPN and in 28 (14%) who received RAPN ($p=0.02$). Moreover, major complications (grade 3-4) were reported in nine (4.5%) patients after OPN and in nine (4.5%) after RAPN. Positive margins were detected in nine (5.5%) patients after OPN and in nine (5.7%) after RAPN ($p=0.98$). The mean \pm SD 3-month estimated glomerular filtration rate declined by 16.6 ± 18.1 mL/min from preoperative value in the OPN group and by 16.4 ± 22.9 mL/min in the RAPN group ($p=0.28$).

Discussion

RAPN can achieve equivalent perioperative, early oncological and functional outcomes as OPN. Moreover, RAPN is a less invasive approach, offering a lower risk of bleeding and postoperative complications than OPN.

Conclusions

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ROBOT-ASSISTED PARTIAL NEPHRECTOMY FOR RENAL TUMORS WITH RENAL NEPHROMETRY SCORE ≥ 10 : PERIOPERATIVE OUTCOMES FROM A LARGE MULTICENTRE INTERNATIONAL DATASET (VAITIKUUTI GLOBAL QUALITY INITIATIVE ON ROBOTIC UROLOGIC SURGERY)

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Aim of the study

Robot-assisted partial nephrectomy (RAPN) has been shown to be a safe and effective minimally invasive treatment for small renal tumors. Anatomical classification systems have been developed to better define the surgical challenge of renal tumors and predict the risk of complications, longer warm ischemia times (WIT) and positive surgical margins (PSMs). At present, limited data from small and mainly single-institutional series are available on the outcomes of RAPN for renal tumors with very high surgical challenge.

Materials and methods

81 patients who underwent RAPN between October 2006 and July 2013 for a renal tumor with a RENAL nephrometry score ≥ 10 were identified from a multi-institutional retrospective database including 1011 cases of RAPN from 9 tertiary robotic centres in Europe, North America, India and Australia. Intraoperative outcomes, pathological outcomes and complications were assessed. Complications were graded according to the Clavien-Dindo classification system.

Results

Median age of patients was 56 years and the average Charlson comorbidity score was 2 (IQR 0-3). Median tumor size was 45 mm (IQR 33-55, range 21-110). The tumors were cT1a, cT1b and cT2 in 28 (34.6%), 43 (53.1%) and 10 cases (12.3%), respectively. Sixty masses (74%) had a RENAL score 10, 19 (23.5%) had a RENAL score 11 and 2 (2.5%) had a RENAL score 12. Median operative time was 220 minutes (IQR 152-259). Median estimated blood loss and WIT were 100 ml (IQR 100-250) and 22 minutes (IQR 16-28), respectively. Five intraoperative complications occurred (6.2%). Postoperative complications were observed in 15 cases (18.5%) and 6 (7.4%) were Clavien grade ≥ 3 . Hospital stay was on average 3 days (IQR 1-5). A benign pathology was found in 10 cases (12.3%). Six tumors (7.4%) were pT3a at final pathology and positive surgical margins were detected in 2 cases (2.5%).

Discussion

mm

Conclusions

RAPN for renal tumors with a RENAL score ≥ 10 is feasible with limited blood loss and an acceptable complication and positive surgical margin rate in centres with advanced robotic expertise. A longer than typical operative time and WIT are due to the high surgical challenge of these lesions.