Factors Affecting Robotic Converted to Radical Nephrectomy: A Retrospective Multi-Institutional Study in the Michigan Urologic Surgery Improvement Collaborative (MUSIC)

Michael Rudoff*, Madison Heights, MI, Ji Qi, Anna Johnson, Mahin Mirza, Ann Arbor, MI, Craig Rogers, Detroit, MI, Brian Lane, Grand Rapids, MI, David Wenzler, Southfield, MI, for the Michigan Urological Surgery Improvement Collaborative, Ann Arbor, MI

INTRODUCTION AND OBJECTIVE: Robot-assisted partial nephrectomy (RPN) has become a common approach for surgical management of T1a renal masses. Previous studies are primarily from tertiary referral centers. We sought to identify factors affecting conversion of robotic in a multi-institutional setting and to assess if patients with masses amenable to RPN would have a change in outcome compared to tertiary referral centers.

METHODS: We retrospectively identified 324 patients who underwent attempted RPN between 2016 – 2019 at multiple centers, all of which are part of the MUSIC database. Patient characteristics such as body mass index (BMI), Charlson comorbidity index, age, pre-operative creatinine, and presence of chronic kidney disease (CKD) were collected. Data regarding the tumor, such as R.E.N.A.L. score, tumor size, and final pathology results were also examined. These data and perioperative outcome were then compared between converted and non-converted cases.

RESULTS: The overall conversion rate was 4.6% (15 of 324 cases). Patient age, BMI, Charlson comorbidity index, pre-operative creatinine, and presence of chronic kidney disease did not significantly impact the rate of conversion. Tumor location was the main reason for conversion, accounting for 11/15 (73.3%) of conversions. Difficult dissection, blood loss, and tumor invading critical structures were also reasons for conversion. Increasing tumor size (4.6 vs 2.7cm, p <0.01) was an independent factor for conversion. R.E.N.A.L. score was reported in 75 cases. In reported cases, increasing R.E.N.A.L score was associated with increased rate of conversion. Converted cases final pathology revealed fat invasion 33% (5/15), Gerota fascia invasion 6.7% (1/15), renal vein invasion 13.3% (2/15), and direct extension to adrenal 6.7% (1/15).

CONCLUSIONS: In a multi-institutional setting, the rate of robotic partial converted to radical nephrectomy was 4.6%. This is consistent with the average rate of conversion at tertiary referral centers in previously reported literature. In our study, increasing tumor size and tumor complexity using R.E.N.A.L. score were the main predictors of conversion.

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