A preoperative nomogram to predict major complications after robot assisted partial nephrectomy

Zine-Eddine KHIJHI 1, Benoît PEYRONNET 1, Jean-Christophe BERNHARD 2, Neil S. KOCHER 1, Christophe VAESSENE 6, Nicolas DOUMERCH 4, Benjamin PRADERE 5, Thomas SEIGEN 6, Jean-Baptiste BEAUVIL 6, Grégory VERHOEST 1, Mathieu ROUMIGUIÉ 6, Alexandre DE LA TAILLE 7, Franck BRUYERE 8, Morgane ROUPRET 1, Arnaud MEJEAN 1, Romain MATHEU 1, Shahshoh SHARIAT 7, Jay D. RAMAN 3 and Karim BENSAH 1
The members of the French Committee of Urologic Oncology (CCAFU)

OBJECTIVES
• To develop a preoperative multivariable decision-making tool to predict the occurrence of a major complication within 30-days of robotic partial nephrectomy.

PATIENTS AND METHODS
• We retrospectively reviewed the data of patients with clinically localized renal tumor who underwent RPN at seven academic medical centers between 2010 and 2017.
• Preoperative clinical, laboratory, radiological and comorbidity indices were collected.
• Complications occurring within 30-days of surgery were graded using the modified Clavien-Dindo scale.
• A multivariable logistic regression model was fitted to predict the occurrence of a major complication within 30-days of robotic partial nephrectomy.
• A nomogram was created from the multivariate model with internal validation using the bootstrapping technique.

RESULTS
• 1342 patients were included.
• 326 patients (24%) had a complication including 189 (14%) ≤ grade 2 and 137 (10%) ≥ grade 3. There were 7 (1%) deaths within 30 days of RPN.
• In multivariate analysis, male gender, CCI, ECOG PS, hospital volume and RENAL score were significant predictors of major complications.
• The nomogram is shown in figure 1. For example, a man (4.4 pts) with an ECOG performance status of 1 (3 pts), CCI of 6 (4.7 pts), an intermediate tumor (4.2 points), and operated at a low volume hospital (9.2 pts) will have a total of 25.5 points which means a 40% risk of major complication.

CHARACTERISTICS OF THE STUDY POPULATION

CONCLUSIONS
• RENAL score, CCI, gender, ECOG PS and hospital volume were the most important predictive factors of major complications after RPN.
• We developed a nomogram based on these factors to identify patients with a high probability of major complications.
• We believe this nomogram can help treatment decision making and patient counseling.