

The PADUA Score as a Predictor for Intraoperative Complications: A Study on Partial Nephrectomy in Open versus Laparoscopic Approach

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Abstract

Introduction: The Preoperative Aspects and Dimensions Used for Anatomical Classification (PADUA) score was developed based on an algorithm incorporating anatomical characteristics and renal tumor size to predict surgical risk and perioperative complications in patients undergoing open nephrectomy. For the current study, we extended the application of the PADUA score to laparoscopic partial nephrectomy and analyzed the outcomes.

Materials and Methods: Our study was based on a retrospective analysis of 94 patients who underwent partial nephrectomy at the Urology Department of Prof. Th. Burghel Clinical Hospital between 2020 and 2024. Two groups were analyzed: the first included 44 cases (54.5% male) treated laparoscopically (38 via transperitoneal and 6 via retroperitoneal approach), and the second included 50 cases (54% male) treated with open surgery via a lumbar approach.

Results: The mean age of patients in the open (OPN) and laparoscopic (LPN) groups was 64 and 61.2 years, respectively. We analyzed three variables in relation to the PADUA score: ischemia time, operative time, and body mass index (BMI). In the laparoscopic group, no correlation was found between ischemia time and operative time ($p=0.655$ and $p=0.686$, respectively). Similarly, no correlation was observed in the open group ($p=0.882$ and $p=0.787$, respectively). The PADUA score was significantly correlated with BMI in the laparoscopic group ($p=0.023$), but not in the open group ($p=0.202$). Regarding complications, the PADUA score was significantly associated with postoperative complications in the laparoscopic group ($p=0.013$), but not in the open group ($p=0.287$).

Conclusion: The PADUA score was used to assess the complexity of renal tumor resection using both open and laparoscopic approaches. Our study demonstrated that a higher BMI is associated with a higher PADUA score, suggesting that obesity may increase the complexity of the laparoscopic approach in partial nephrectomy. Furthermore, in the laparoscopic group, a high PADUA score was significantly correlated with the occurrence of postoperative complications.

Keywords: laparoscopic, PADUA score, partial nephrectomy, complications