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Beyond the complexity of tumour excision during partial nephrectomy: Ideation and histopathological validation of the Surface-Intermediate-Base (SIB) margin score

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INTRODUCTION & OBJECTIVES: Tumour excision is a fundamental step during Partial Nephrectomy (PN), yet Resection Technique (RT) is rarely reported in current Nephron Sparing Surgery (NSS) literature. We recently proposed the Surface-Intermediate-Base (SIB) Margin score as a new classification model for standardized reporting of RT during NSS. The aim of the study is to validate the SIB model from a histopathological perspective.

MATERIAL & METHODS: Data were prospectively collected from a cohort of 40 patients undergoing NSS between June and September 2014 at a single Institution. The SIB score was assigned in the operating room by the surgeon. The Score Specific Areas (SSA) were outlined on a digital picture as anatomic landmarks for histopathological analysis. Two dedicated uropathologists inked the landmark areas and measured, in a blinded fashion, the maximum, minimum and mean thickness of Healthy Renal Margin (HRM) within the SSAs (360 overall histologic measures, Fig.1). The Mann-Whitney U-test was used to assess the correlation between the SIB visual definitions of RTs and the thickness of HRM at histopathological analysis.

RESULTS: The overall RT was classified as pure enucleation, hybrid enucleation and pure enucleoresection in 28 (70%), 7 (17%), 3 (7%) patients, respectively, while as hybrid enucleoresection and resection in 1(3%) patient each. At histopathological analysis, the maximum, minimum and mean thickness of HRM was significantly different among SSAs visually defined as enucleation (S=0: median 0,18mm (IQR 0,08-0,30), I or B = 0: median 0,20 mm (IQR 0,08-0,36)), enucleoresection (S=1: median 0,80mm (IQR 0,67-1,16),I, B = 1: median 0,88 mm (IQR 0,60-1,00)) and resection (S =1, I,B =2: median 2,95 mm (IQR 2,18-5,75) (Fig. 2) ($p < 0.001$).

CONCLUSIONS: The SIB Margin score is the first standardized reporting system to communicate RT during NSS.
Our study has proved the applicability of the model in a real-world clinical setting and provided robust histopathological validation of its utility.