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Perinephric fat surface density (PnFSD) significantly predicts surgical complexity and perioperative outcomes of robot-assisted partial nephrectomy (RAPN)

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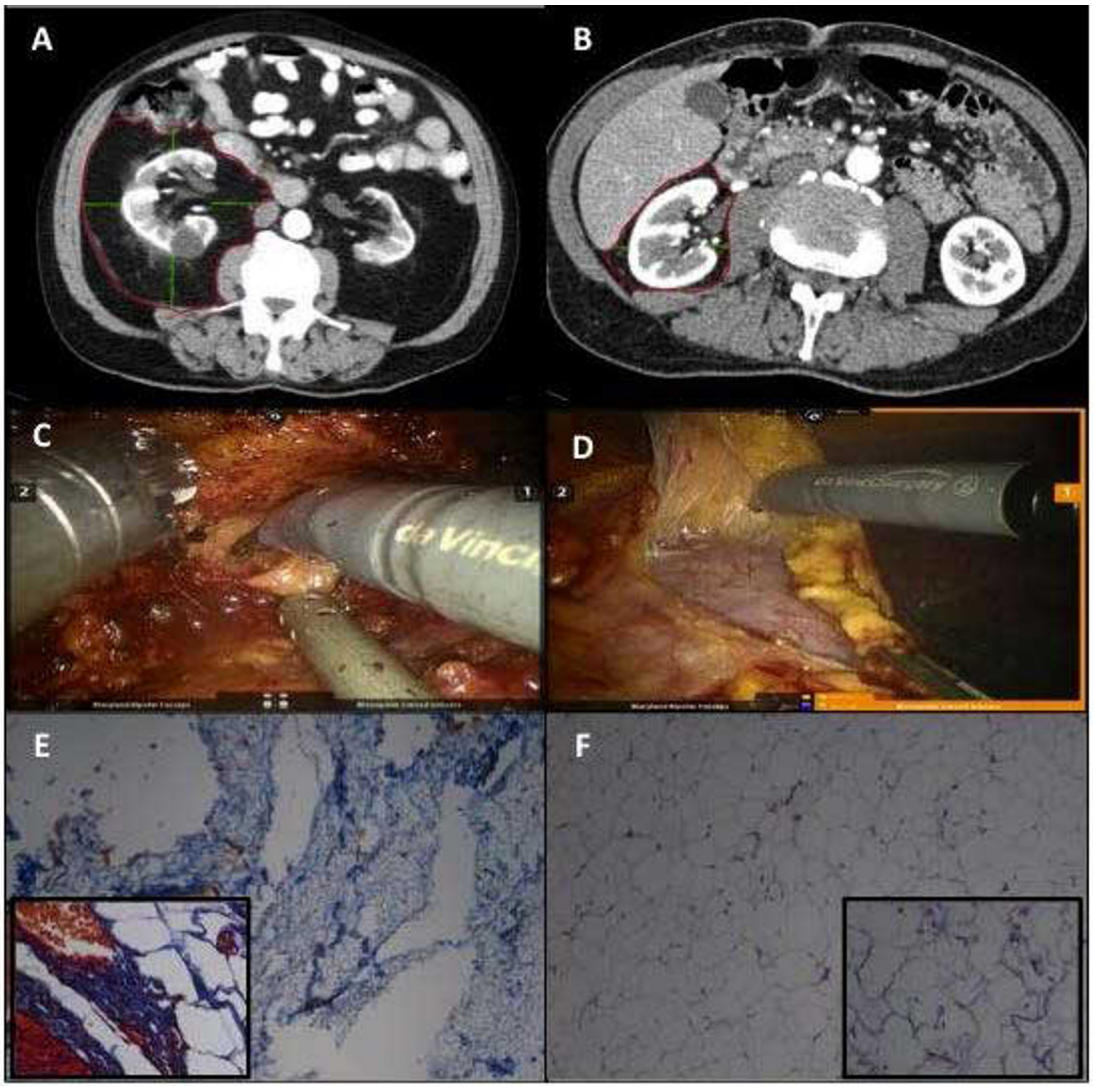
INTRODUCTION & OBJECTIVES: Perirenal fat (PF) is a critical variable during RAPN. Nonetheless, standardized evaluation of its characteristics at preoperative imaging is lacking. The aim of the study is to evaluate the PnFSD as a predictor of operative complexity judged by the surgeon and perioperative outcomes after RAPN and to correlate PnFSD with histopathologically detected PF fibrosis (PFFb).

MATERIAL & METHODS: Data were prospectively collected from a cohort of patients undergoing RAPN at a single Institution. On axial preoperative CT slice centered on the renal hilum, two dedicated radiologists calculated the PnFSD with a specific software in a blinded fashion. A specific region of interest was manually drawn (Figure 1A,B); then, the PnFSD was measured in the direct, arterial and venous phases. On the same slice, degree of perirenal fat stranding (PFS) and mean perirenal fat thickness (PFT) were recorded. Complexity of PF dissection (Figure 1C,D) was categorized by the surgeon as non-difficult or difficult. A sample of PF, away from the tumour, was sent to histopathological analysis. PFFb was evaluated by two dedicated pathologists using the Mallory-Azan coloration (Figure 1E,F) in a blinded fashion. For univariate analysis, the Mann-Whitney test and the Spearman correlation coefficient were used, as appropriate, to assess the correlation between PnFSD and radiological, surgical and histological variables.

RESULTS: 46 patients with available preoperative imaging were eligible for the study. Median PnFSD value was 5316,1 (IQR 3976,9-7569,0). At univariate analysis, PnFSD was significantly correlated with age at surgery (p=0,045), male gender (p=0,005), PFS (p=0,0313), PFT (p<0,0001), console time (p=0,012), EBL (p=0,026), surgical complications rate (p=0,049) and LOS (p=0,029). A correlation trend was found between PnFSD and BMI (p=0,076). There was no significant correlation between PnFSD and CCI (p=0,294), tumour size (p=0,347), RENAL score (p=0,152), WIT (p=0,12), positive surgical margins rate (p=0,531), tumour nature (p=0,438) and pathological T stage (p=0,67). Surgical judgement of PF dissection difficulty and degree of PFFb were not significantly correlated with PnFSD (p=0,12 and 0,648, respectively).

CONCLUSIONS: The PnFSD significantly predicts operative complexity metrics and perioperative outcomes after RAPN. Therefore, it could be a useful parameter to build a new preoperative nomogram to predict perioperative outcomes after RAPN.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