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ROLE OF PREOPERATIVE 3D RENDERING FOR MINIMALLY INVASIVE PARENCHYMA SPARING LIVER RESECTIONS

Roberto MONTALTI*, Gianluca ROMPIANESI, Francesca PEGORARO, Mariano GIGLIO, Giuseppe DE SIMONE, Pietro VENETUCCI, Roberto TROISI

Department Of Public Health, Federico II University, Naples, Italy, ITALY

Background : 3D rendering (3DR) seems the most promising approach to plan surgical strategies. The study aimed to compare the results of anatomical minimally invasive liver resections (MILS) in patients with 3DR versus conventional 2D CT-scan.

Methods : We performed 118 3DR for various indications; the patients underwent a preoperative tri-phasic CT-scan and rendered with Synapse3D® Software. Fifty-six patients undergoing MILS with pre-operative 3DR were compared to a similar cohort of 127 patients undergoing conventional pre-operative planning with 2D CT-scan using the propensity score matching (PSM) analysis.

Results : The 3DR mandated pre-operative surgical plan variations in 33.9% cases, contraindicated surgery in 12.7%, providing a new surgical indication in 5.9% previously excluded cases. PSM identified 47 patients in both groups with comparable results in terms of conversion rates, blood loss, blood transfusions, parenchymal R1-margins, grade ≥ 3 Clavien-Dindo complications, 90-days mortality, and hospital stay respectively in 3DR and conventional 2D. Operative time was significantly increased in the 3DR group (405 vs. 343 min, $p=0.020$) while vascular R1-margin was higher in 3DR vs 2D group (25.5% and 8.5%, $p=0.055$).

Conclusions : 3DR may help in surgical planning increasing resectability rate, major vessels' preservation, and reducing unnecessary laparotomies, especially in case of challenging and parenchyma-preserving MILS.

Corresponding Author : **Roberto MONTALTI** (robertomontalti@yahoo.it)