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Comparative Analysis of 3D Perfusion Algorithm via Preoperative Computed Tomography (CT) Imaging and Intraoperative ICG in Robotic-Assisted Laparoscopic Partial Nephrectomy

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Introduction

Selective arterial clamping has been one of the maneuvers to preserve postoperative renal function in patients undergoing partial nephrectomy. It requires detailed knowledge of the patient's renal vasculature.

Objective:

To evaluate the effectiveness of a 3D perfusion algorithm using preoperative CT imaging compared to intraoperative ICG in assessing arterial perfusion for robotic-assisted laparoscopic partial nephrectomy.

Patients & Methods:

Preoperative CT images were reconstructed using **Fujifilm[™] 3D Synapse software** Version 6.4. These were compared with intraoperative images following ICG injection.

F/68 4cm exophytic tumor at left mid pole lateral surface. Selective arterial clamping of anterior segmental artery









volume of kidney: 26.4 cm² volume of kidney: 244.4 ml volume of cortex: 186.5 ml (76.3 %) t kidney: 38.9 ml (15.9 %)

M/67 1.5cm x 1.5cm exophytic tumor at left mid pole lateral surface. Selective arterial clamping of anterior segmental artery



ey: 58.9 cm² x: 50.2 cm² (85.1 %) kidney: 446.3 ml cortex: 416.3 ml (93.3 %) 0.6 ml (27.0 %) 16.3 ml (48.5 %)







<u>Possible use in the future</u>: multiple tumors





M/48 3.3cm Bosniak III left exophytic upper pole lesion and 1.5 cm left endophytic lower pole lesion

Other potential applications:

Patients with complex arterial anatomy, solitary anatomical/functional kidney, tumor lying at border of segmental artery perfusion





Conclusion: a reliable tool for guiding selective arterial clamping in partial nephrectomy,

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