NephCNN A Deep-Learning Framework for Vessel Segmentation in Nephrectomy Laparoscopic Videos

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BACKGROUND
Renal Cell Carcinoma (RCC) is one of the most common kidney cancer in adults (3% of adult cancers in Europe) [1].
Current therapeutic option consist in nephrectomy, the complete or partial removal of kidney tissue (95% 5-year survival rate) [2].
Robot-Assisted Partial Nephrectomy (RAPN) provide advantages over laparoscopic surgery in terms of health outcomes, safety, and costs [3].
Detecting critical structures, such as the renal artery, can increase surgery safety [4].

AIM
Low visibility could lead to accidents during surgery (e.g., unwanted vessel resection and bleeding due to surgical tools misplacement) [5].
Surgeons’ vision is hampered by:
– Small field of view
– Occlusion by surgical tools
– Reduced Manoeuvrability
This paper propose an automatic and fast renal artery segmentation from intra-operative RAPN videos.

METHODS

RESULTS

CONCLUSIONS AND FUTURE DEVELOPMENTS

REFERENCES