THREE-DIMENSIONAL NAVIGATOR FOR ROBOT-ASSISTED EXCISION OF RETROPERITONEAL NON-ORGAN TUMORS USING MDCT VOLUME RENDERING
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BACKGROUND: We were unable to locate publications (PubMed) concerning the use of volume rendering and three-dimensional navigator for robot-assisted surgery of retroperitoneal non-organ tumors.

PURPOSE: We evaluated the efficacy of a three-dimensional (3-D) navigator in modeling and forming surgery plan for robot-assisted excision of retroperitoneal non-organ tumors. We also compared 3-D navigator’s findings with videos obtained during operation.

MATERIALS AND METHODS: Two patients with tumors located in retroperitoneal space underwent 256-MDCT scan examination (Brilliance iCT, Phillips). Post-processing was performed on Brilliance Workspace Portal. The 3-D navigator was created using volume rendering technique. Operations were performed using da Vinci Surgical System (da Vinci S).

RESULTS: Following considerations of surgical intervention were planned based on 3-D navigator: robotic ports’ location; virtual visualization of surgical field; updating of syntopy in reference to surrounding organs and large vessels; planning additional surgical procedures (ureteral stenting, endovascular artery occlusion).

The concordance between 3-D navigator and real robot-assisted excision of retroperitoneal nonorgan tumors was achieved.

CONCLUSIONS: Virtual modeling in planning of operation using 3-D navigator, in our opinion, may decrease an operation time, optimize robotic port localization and validate requirement of additional surgical procedures.