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Fully robotic retroperitoneal lymph node dissection- a fusion of technologies – video vignette

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Supporting information: video

Dear Editor,

Retroperitoneal lymph node dissection (RPLND) is technically challenging with an overall morbidity of 17–33%. We present an illustrative case of malignant RPLND following curative resection of colorectal cancer using the fusion of robotic surgery and 3D-modelling in preoperative planning and in intraoperative integration of these models to aid precision dissection.

Using 3D Slicer (version 4.10; Harvard, US, 2019), standard patient CT imaging was reconstructed in 3D. The node and aorta to its bifurcation were further highlighted and superimposed on the 3D-reconstruction. Using the Da Vinci (Intuitive Surgical, CA, USA) Xi model, the TilePro input port was accessed via HDMI output to DVI input cable.

Informed consent was obtained and the patient positioned in the modified lithotomy position. Four robotic ports and one assistant port were inserted. The robot was docked to the patient's left. Following adhesiolysis, small bowel loops were reflected superiorly. The parietal peritoneum over the right common iliac artery (CIA) was dissected up to the aortic bifurcation using the monopolar energy device. The left CIA and both ureters were identified and preserved.

True to the 3D-reconstruction, this revealed the malignant node at the bifurcation which was sharply dissected, aided by live intraoperative referencing to the 3D-reconstruction which could be manipulated by wireless mouse through the Surgeon Console. This was particularly useful in guiding the establishment of a plane between the node and anterior aortic wall where dense fibrosis was encountered. The specimen was removed in an Endocatch. Operative time was 150 min and estimated blood loss <50ml.

This innovative case highlights cutting-edge 3D-modelling as an invaluable adjunct in the preoperative planning of technically challenging cases in robotic surgery.