Lymph node dissection during robotic radical prostatectomy for prostate cancer with ICG-fluorescence guidance

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Introduction & Objectives: Extended pelvic lymph node (LN) dissection (ePLND) is the standard nodal staging procedure for prostate cancer (PCa). Some metastatic LNs could be located out of the template area and might be missed during operation. Enlarging the template could decrease the rate of missed metastatic LNs while might increase the rate of morbidity. Sentinel lymph node dissection is not a routine procedure for PCa. The visualization of the lymphatics of the prostate by the near-infrared-fluorescence technology with indocyanine green (ICG) might detect the metastatic LNs that are located particularly out of the template area. The aim of the present study was to investigate whether visualization of the lymphatic drainage of the prostate with ICG usage contributes to ePLND in robotic PCa surgery.

Materials & Methods: Surgical procedures were performed by one robotic surgeon with a transperitoneal approach using Da Vinci Xi Robotic System. During abdominal port placement interventional radiologist performed transrectal ultrasound and injected 1 cc ICG into each prostate peripheral lobe via transperineal route (5 mg ICG diluted with 2 mL distilled water). After switching to Firefly mode, first LNs reflecting green color were excised and then the template of ePLND was performed.

Results: We included 25 patients who underwent robotic radical prostatectomy (RARP) with ICG-guided ePLND. Overall, 9 (36%) of the 25 patients had metastatic LN involvement. On node base analysis, total 509 LNs were dissected and 122 of which were fluorescence active. 20 (4%) of 509 LNs were metastatic. Nine (45%) of 20 metastatic lymph nodes were ICG+. On patient based analysis, 8 (88.89%) of pN+ patients were ICG+. Besides, in three (33.33%) of pN+ patients, 68Ga-labeled prostate-specific membrane antigen ligand using positron emission computed tomography (Ga68 PSMA-PET/CT) detected positive LN preoperatively.

Conclusions: Including ICG guidance to the ePLND might increase the possibility of detecting metastatic LNs during RARP. ICG could be used as an adjunctive method to support preoperative Ga68 PSMA-PET/CT in detecting metastatic LNs.