

ICG-targeted template lymph node dissection in prostate cancer patients

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Epublication [WebSurg.com](http://websurg.com), Jun 2021;21(06). URL: <http://websurg.com/doi/vd01en6314>

Sentinel lymph node biopsy is successfully used in the treatment of diseases such as breast cancer, penile cancer, and melanoma. For prostate cancer, it is difficult to identify clear single sentinel nodes, but they can be a part of lymph node groups which can be visualized using ICG/NIR technology. The objective of our work is to refine the technique of intraprostatic ICG injection, laparoscopic identification of ICG-positive lymph nodes, and their removal during radical prostatectomy. To achieve ICG/NIR technology, we used Verdyne (25mg) Indocyanine green, Diagnostic Green, IMAGE1 S™ 4K Rubina™ KARL STORZ equipment. After the induction of general anesthesia ICG solution, 2.5mg/mL is injected into the area of the MRI-identified tumor and sextant biopsy areas of the prostate (2.5mL per lobe). The positioning of the patient and trocar set-up are standard for a transperitoneal laparoscopic prostatectomy. Using the 25 to 30-degree Trendelenburg position, intestinal loops are moved cranially to expose the field of the common iliac vessels where lymph node luminescence is determined. An incision of the peritoneum along the iliac vessels is performed. Careful 'en bloc' excision of fluorescent lymph nodes should be performed. To prevent the further spread of ICG in the lymphatic system, the surgery is started at the cranial boarder of the dissection field and continued caudally. Multiple collateral lymphatic vessels around the node are sealed, using bipolar coagulation or an ultrasonic scalpel. Dissection is then completed, avoiding direct capture of node tissue, as well as its damage. This technique prevents the spread of ICG and chaotic luminescence of the surrounding tissue due to ICG leakage.

Conclusion: ICG/NIR laparoscopic visualization is a feasible and effective method to detect lymph node groups draining the prostate, and more specifically prostate cancer. The sentinel nodes are included in the caudal part of these lymph node packages.