

Presurgical SPECT/CT shows more cancer than current standard

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Startling data from an international multi-center trial provide growing evidence that sentinel node imaging is more effectively accomplished with hybrid functional imaging with single photon emission computed tomography and computed tomography (SPECT/CT) than with another molecular imaging technique called lymphoscintigraphy. This conclusion held after imaging a range of cancers displaying a variety of lymphatic drainage types associated with melanoma, an aggressive skin cancer; breast carcinoma; and malignancies of the pelvis, such as prostate and cervical cancer, say researchers at the Society of Nuclear Medicine and Molecular Imaging's 2014 Annual Meeting.

Lymph node imaging is an essential tool in the context of surgical resection, because [cancer](#) spreads first to the lymph nodes, specifically the sentinel lymph nodes, before navigating the bloodstream and developing new malignancies elsewhere in the body. Molecular imaging of these sentinel nodes provides a surgical map that can improve a patient's chances of becoming cancer free.

"We found significantly more [sentinel lymph node](#) involvement with SPECT/CT, which altered surgical planning for many of our patients—a finding that was repeated across all malignancies and clinical institutions," said Thomas N.B. Pascual, MD, co-author of the study and a research scientist from the section of nuclear medicine and diagnostic imaging and division of human health of the International Atomic Energy Agency in Vienna, Austria. "These results could potentially inform new clinical practice and shape appropriate use of SPECT/CT

imaging for patients selected for surgery."

Study findings showed that SPECT/CT [breast cancer](#) imaging caught 13 percent more cancerous sentinel nodes—2,165 nodes versus 1,892 using planar lymphoscintigraphy. The hybrid SPECT system also caught 11.5 percent more sentinel nodes when imaging for melanoma, with 602 versus 532 nodes detected. In addition, 29.2 percent more nodes were imaged using SPECT/CT to detect pelvic cancer—195 nodes found versus 138 with planar imaging.

Changes in surgical planning as dictated by SPECT/CT were substantial—16.9 percent of breast cancer surgeries underwent a change in management, 37 percent of surgeries for melanoma changed and 64.1 percent of surgical plans for pelvic cancer were changed due to detection of additional sentinel nodes. Calculated mismatch between sentinel nodes and lymphatic territories using the two imaging systems was gauged at 17 percent for [breast carcinoma](#), 11.2 percent for melanoma and 50 percent for pelvic imaging. The significantly higher mismatch in pelvic tumors was thought to be due to relatively deeper lymphatic drainage and location of pelvic sentinel nodes.

Cancers are a leading cause of death. The most recent data available shows that cancers were the cause of 8.2 million deaths worldwide in 2012, according to the World Health Organization. Annual cancer diagnoses are expected to increase more than 60 percent from 14 million in 2012 to 22 million within the next two decades. Lung, liver, stomach, colorectal and breast cancers cause the most cancer deaths each year.

More information: Scientific Paper 565: Amelia Jimenez-Heffernan, Hospital Juan Ramón Jiménez, Huelva, Spain; Annare Ellmann, Stellenbosch University and Tygerberg Hospital, Tygerberg, South Africa; Heitor Sado, University of Sao Paulo, Sao Paulo, Brazil; R. Parameswaran, Manipal Hospital, Bangalore, India; Rossana Pruzzo,

Fundación Arturo López Pérez, Santiago, Chile; Francesco Giammarile, Centre Hospitalier Lyon, Lyon, France; Paulo Almeida, Universidade Federal de Pernambuco, Recife, Brazil; Vincent Peter Magboo, University of Sto Tomas, Manila, Philippines, The Netherlands Cancer Institute, Amsterdam, Netherlands; Thomas NB Pascual, Section of Nuclear Medicine and Diagnostic Imaging, Division of Human Health, International Atomic Energy Agency, Vienna, Austria, "Prospective IAEA sentinel node trial on the value of SPECT/CT vs planar imaging in various malignancies," SNMMI's 61th Annual Meeting, June 7–11, 2014, St. Louis, Missouri.

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