

Lymphoscintigraphy of melanoma: Lymphatic channel activity guides localization of sentinel lymph nodes, and gamma camera imaging/counting confirms presence of radiotracer in excised nodes

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Lymphoscintigraphy has become a standard preoperative procedure to map the cutaneous lymphatic channel for progression of nodal metastasis of melanoma of the skin. Lymphoscintigraphy was employed to visualize lymphatic channels as a guide to identify sentinel lymph nodes (SLNs). Excised tissue was imaged with a gamma camera to verify the findings of presurgical lymphoscintigraphy. Percent counts of SLN(s) among the total counts of the excised melanoma tumor or scar tissue and SLN(s) were calculated.

Methods: Eleven patients with cutaneous melanoma received four to ten intradermal injections of Tc-99m sulfur colloid at equal distances around the melanoma site. Images were made immediately after injection: 1 minute per image for 15 min; and then 5 minutes or 1,000,000 counts per image for 30 min. After surgery, the excised melanoma tumor or scar and SLN(s) were imaged/counted with a gamma camera. Percent counts of SLNs among the total counts of the excised melanoma tumor or scar tissue and SLNs were calculated. To validate the specimen count accuracy, an experimental phantom study was done.

Results: Linear lymphatic channels were identified between the injected sites and the SLNs in each patient. Gamma camera images demonstrated radioactivity in the SLNs of all patients, verifying the lymphoscintigraphy findings. Uptake in the SLNs of ten of the eleven patients ranged from 0.4 to 7.2% (mean 2.2%) of the total counts in excised tissue. We noted that a node with lower uptake should not be ignored because a lower percent of SLN activity does not necessarily rule out existing metastasis. In two of eleven patients, histopathologic showed metastases. One patient's melanoma on the middle back had lymphatic channel activity directed to both axillae. The results of the phantom study validated accuracy of our specimen counts.

Conclusions: Because linear lymphatic channels existed between lymph nodes and the injected sites in all eleven patients, these lymphatic channels could be used as a guide for localizing SLNs. The SLNs indicated by presurgical lymphoscintigraphy were verified by postoperative gamma camera imaging, and radiotracer localization in the SLNs averaged 2.2%.

Key words: melanoma, lymphoscintigraphy, sentinel node, lymph node, Tc-99m sulfur colloid, phantom study