The Role of Sentinel Lymph Node Biopsies in Skin Cancer
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Editor’s Note: During the Scientific Plenary on Tuesday, September 13, at the College of American Pathologists’ annual meeting, three internationally known physicians will explore one of the most controversial topics in cancer treatment—the role of sentinel lymph node dissection in early-stage melanoma.

The controversy being debated during this session—Sentinel Lymph Node Dissection for Melanoma: Is the “Standard of Care” Ahead of the Evidence?—comes at a critical time in the national health care debate about what is the standard of care, what is evidence based, and what true value our medical interventions create for individuals and society. While the live session permits debate from both proponents and detractors of the procedure, below is important information about sentinel lymph node sampling for melanoma and other skin cancers. This article has been peer-reviewed by thought leaders in the field of melanoma diagnosis. Regardless of the controversy, the article below shares a pathologist’s perspective of what fellow members of the medical team need to know about what a sentinel node is, how it is processed and interpreted, and what treatment decisions may ensue from the information obtained.

Lymphatic tumor spread is well documented in several types of malignancies, including carcinomas of the breast and skin as well as malignant melanoma. Sentinel nodes, as the “first” nodes draining the tumor sites, typically are the first to demonstrate occult malignancy before spread occurs to remaining regional lymph nodes and to distant sites. First developed in the 1950s, the sentinel lymph node biopsy is a minimally invasive technique allowing for the detection of metastatic disease in a targeted fashion. The presence of tumor deposition in the sentinel lymph node can then be used to determine whether a patient would benefit from further lymph node exploration. This technique has helped to decrease the number of elective regional lymph node dissections, lessening overall patient morbidity.

For detection of metastatic skin malignancies such as melanoma, squamous cell carcinoma, and Merkel cell carcinoma, a dye and/or radiolabelled tracer substance is injected near the primary biopsy or excision site, enabling the surgeon to identify the sentinel lymph node. The sentinel node is removed and examined by the pathologist in a detailed and systematic fashion using multiple serial step sections. This process is often supplemented by immunohistochemical staining. Relative to a typical nodal exploration, the sentinel lymph node examination is thus more focused in terms of surgical selection and pathologic examination.

This methodology is useful in detecting clinically occult regional disease as well as improving overall survival. Some studies have demonstrated that patients with melanoma undergoing elective lymph node dissection have improved five- and 10-year survival rates, but there is ongoing debate as to the role of sentinel lymph node biopsy as a prognostic marker as well as the efficacy of completion lymphadenectomy in node positive patients. (See editor’s note above.) With regard to melanoma, sentinel lymph node biopsy is traditionally recommended in patients who have a higher risk for metastatic disease (increased tumor thickness, vertical growth phase, presence of angiolymphatic invasion, and ulceration).
Additionally, sentinel lymph node biopsy can be used to evaluate occult metastasis by other types of skin cancer including Merkel cell carcinoma. This neuroendocrine-derived tumor presents as a red, ulcerated lesion on the head, neck, or extremities of older individuals and is associated with a high rate of metastatic diseases and a rapid clinical course. While lymph nodes may be clinically negative, patients often demonstrate a high rate of regional lymph node recurrence if not treated for occult disease. These studies have determined that the use of sentinel lymph node biopsy and further lymph node dissection may help with short-term local nodal control.

In addition to the previously mentioned skin malignancies, investigators have also promoted the usage of sentinel lymph node biopsies in several other cutaneous lesions, including high-risk squamous cell carcinomas and appendageal tumors of the dermis (including apocrine and eccrine skin malignancies). In summation, sentinel lymph node biopsy in skin lesions provides a powerful tool in both disease detection and treatment, allowing for the identification of occult tumor deposits while avoiding unnecessary lymph node dissections and concurrent morbidity.

References