

Identification of 6 Sentinel Lymph Nodes in a Case of Malignant Melanoma on the Ungual Region of the Finger

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Abstract

We describe a case of malignant melanoma on the unguinal region of the index finger with which 6 sentinel lymph nodes were detected in the axillary basin. Of these nodes, 1 of 3 brachial nodes and 2 of 3 central axillary nodes showed micrometastasis. Additional lymph nodes obtained at the subsequent complete axillary lymph node dissection showed no metastasis. Identification of as many as 6 sentinel lymph nodes was ascribed to a single lymph trunk that would branch off to afferent lymphatics draining to each nodal group; however, a gamma probe may have detected radioactive tracer passing to the sequential nodes as well as that remaining in true sentinel nodes.

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Key words: sentinel lymph node, malignant melanoma, multiple, technetium phytate, identification

Introduction

Sentinel lymph node biopsy provides significant information about patients with early-stage malignant melanoma and improves the mortality rate among those who have metastasis to sentinel lymph nodes and subsequently undergo complete lymph node dissection¹. One or two nodes can usually be identified as sentinel nodes by means of the blue dye method². While techniques for sentinel lymph node biopsy have advanced, a greater number of identified sentinel nodes have been reported³. Herein we describe a case of malignant melanoma on the unguinal region of the index finger with 6 sentinel nodes detected in the axillary basin.

Case Report

A 73-year-old woman presented in September 2007 with pigmented lesion of the right index finger for 4 months. She had been well except for lung cancer that had been curatively treated with surgery in 2005. Physical examination revealed an ulcerated black nodule of the nail bed and hyponychium with light brown spots on the proximal nail fold and on the ventral aspect of the distal digit (**Fig. 1**). Physical examination did not reveal any lymphadenopathy. Biopsy of the fingertip lesion showed melanocytic proliferation that was histopathologically consistent with malignant melanoma. A computed tomography scan of the chest and a whole-body gallium scintigraphic scan

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Fig. 1 Clinical appearance

Physical examination revealed an ulcerated black nodule of the nail bed and hyponychium with light brown spots on the proximal nail fold and on the ventral aspect of the distal digit.

showed no significant findings except for postoperative changes of the lung cancer. Sentinel lymph node biopsy and amputation of the finger were scheduled. For sentinel node detection, 0.05 mL of technetium phytate (Techné[®] Phytate Kit, FUJIFILM RI Pharma Co., Tokyo, Japan) was injected with a 26-gauge needle into the dermis adjacent to the lesion at each of 4 sites: proximal to the dorsal and ventral spots and at the radial and the ulnar edges of the nodule. Then, 2% patent blue (Wako Pure Chemical Industries, Osaka, Japan) was injected in the same manner. Any “hot” nodes detected with a hand-held gamma probe (Navigator GPS, Radiation Monitoring Devices, Inc., Watertown, MA, USA) or blue-stained nodes were then identified as sentinel lymph nodes. Six lymph nodes were obtained from the axillary basin, i.e., 3 brachial nodes and 3 central axillary nodes, both of which are nodal groups of level I lymph nodes of the axillary basin. Radioactivity levels of the nodes were measured during 150 and 1,200 counts with the gamma probe. The extent of lymph node blue-staining was not recorded. The procedure was completed within 1 hour. Histopathological examination of the resected nodes stained with hematoxylin and eosin and immunohistochemical analysis with antibodies against Melan-45, HMB-45, and Kp-1 (CD-68) revealed that 1 of the 3 brachial nodes and 2 of the 3 central

axillary nodes showed metastasis (**Fig. 2**). A complete lymph node dissection of the axillary basin was then performed, and investigation of the 6 resected nodes did not show metastasis. As of the time of writing (October 2008), neither recurrence of the lesion nor metastasis has been found.

Discussion

Dermal lymphatics from a primary cutaneous lesion usually drain into 1 or 2 lymphatic trunks that flow to afferent lymphatics and each of the sentinel lymph nodes². In contrast, various lymphatic drainage patterns are observed, such as single lymphatic drainage that occasionally diverges into several afferent lymphatics which may lead to each of the sentinel lymph nodes⁴. Lymphatics draining to the axilla are especially complex because of the three-dimensional structure in combination with a multitude of lymphatic anatomic structures³.

Regarding the techniques of intraoperative lymphatic mapping and sentinel lymph node biopsy, in 1992, Morton and colleagues reported intradermal blue dye injection at the site of the lesion following an incision over the anticipated lymphatic drainage basin, and visual identification of the lymphatic channel and the draining node stained blue, which was consistent with the sentinel lymph node². They

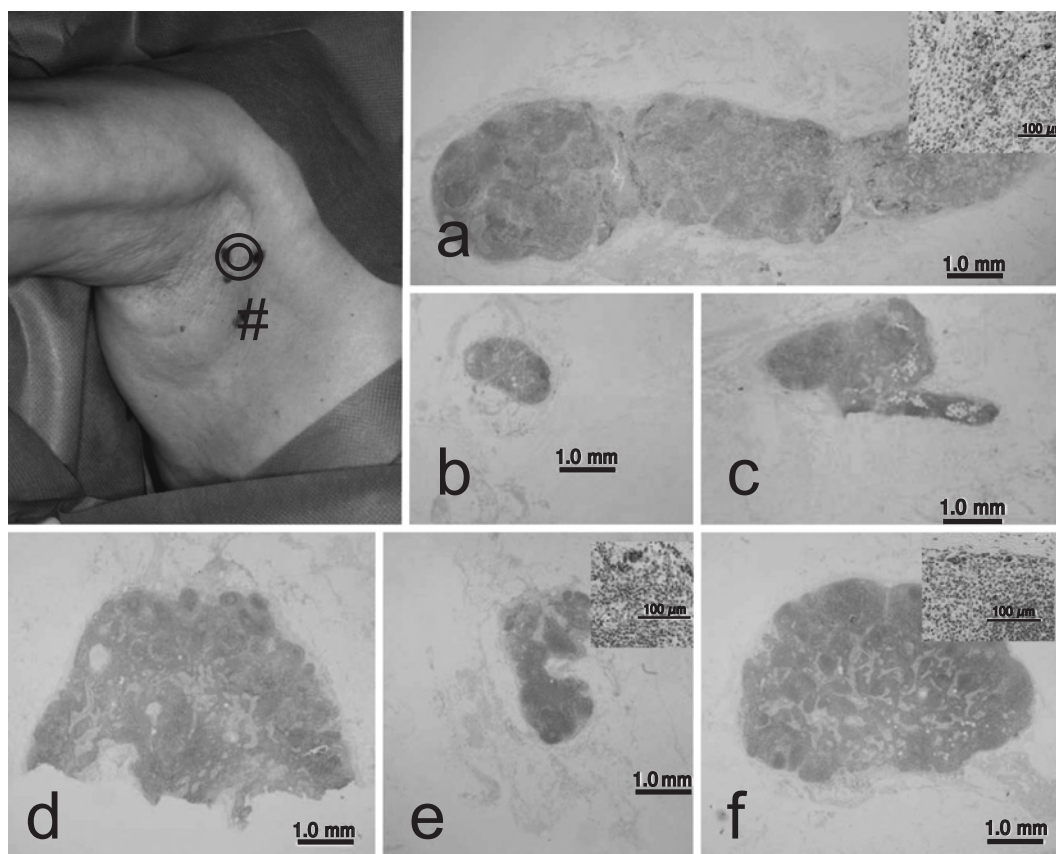


Fig. 2 Sentinel lymph nodes

Brachial lymph nodes (⊙) and central axillary lymph nodes (#) were indicated with a gamma probe (upper left). Immunohistopathological aspects of obtained brachial nodes (a, b, c) and central axillary nodes (d, e, f). (HMB-45, $\times 40$). Observed micrometastatic features are indicated in each frame in a, e, f. (HMB-45, $\times 400$).

used cutaneous lymphoscintigraphy in a limited manner to determine the areas of drainage of melanomas in ambiguous sites². In addition to the blue dye technique, introduction of a radioactive agent detected with a hand-held gamma probe has facilitated sentinel lymph node identification⁵. However, this method often indicates a greater number of sentinel lymph nodes, because it depends on the extent of the interval between injection of the tracers and the operation and on a variety of radioactive agents^{3,6}. The tracers pass through the true sentinel lymph nodes into the other nodes, which can be detected with a gamma probe, and as time passes a greater number of sentinel lymph nodes can be observed⁷, which is even more likely with the smaller particles^{7,8}. In general, however, variations between patients can often surpass the differences in the kinetic properties of radioactive agents⁷. Nevertheless, the greater number of sentinel

nodes may be inconsistent with the minimally invasive nature of sentinel lymph node biopsy⁹. To determine the proper number of true sentinel lymph nodes to be removed from among the multiple nodes detected, many investigators have adopted the 10% rule: any lymph nodes with radioactive count 10% or more higher than the hottest radioactive node and blue-stained nodes should be identified as sentinel lymph nodes¹⁰⁻¹².

In the present case, we quickly and uneventfully performed lymphatic mapping and sentinel lymph node biopsy with technetium phytate. In the presence of calcium, technetium phytate becomes a 100- to 1,000-nm-diameter colloid, which is a relatively large particle among the generally available radioactive tracers¹³. However, we identified as many as 6 nodes (3 brachial nodes and 3 central axillary nodes) and each nodal group contained both pathologically positive and

pathologically negative lymph nodes. Moreover, residual nodes did not show any metastases. These features suggest that 2 nodal groups, each of which must have contained true sentinel nodes, drained from a common lymphatic trunk, whereas radioactive tracer might have passed through to the sequential nodes in each nodal group. We also conclude that we should have obtained detailed records of visualization of blue staining and the three-dimensional relation of all lymph nodes identified as sentinel nodes, because such records could provide additional information.

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