



Selective sentinel lymph node dissection in head and neck cutaneous melanoma

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Sentinel lymph node biopsy accuracy and prognostic value in the head and neck region has been established. The article describes the current indications for the procedure, lymph node localization using lymphoscintigraphy and intra-operative blue dye injection, the surgical technique, and important recommendations to avoid complications in this very important anatomic region.

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Evolution of elective node dissections to sentinel lymph node biopsy; lymphoscintigraphy and technique

O'Brien et al¹ described the anatomically predicted drainage pattern of the head and neck in the hope that this would help guide more appropriate lymphadenectomies for head and neck cancers. Through clinical observation and the implementation of lymphoscintigraphy, the complexities of head and neck lymphatic drainage are better recognized, thus proving such models as O'Brien's unreliable.

Historically, occult metastases of head and neck melanomas were identified through elective node dissections. Factors such as tumor thickness, mitotic rate, ulceration, and anatomic location are known to be prognostic indicators, particularly with tumor staging.²

First described by Morton et al in 1992, sentinel lymph node biopsy (SLNB) has become a common staging procedure for cutaneous melanoma.^{3,4} Accurately predicting the status of the regional lymph node basin, a positive SLNB identifies a subset of patients who may benefit from com-

pletion lymphadenectomy and are candidates for adjuvant therapy and/or clinical trials.

Proximity of cranial nerves and ambiguous lymphatic drainage pose unique challenges to performing the SLNB procedure in the head and neck region.^{1,5,6} Two large series ($n = 3897$) have demonstrated higher recurrence rates in previously mapped negative nodal basins in the head and neck region relative to other anatomic regions, suggesting inferior SLNB accuracy.^{7,8} For long time, consistent correlation between SLNB status and overall survival was lacking in head and neck melanoma series.⁹⁻¹¹ Despite the general adoption of SLNB for extremity and truncal cutaneous melanoma, debate around SLNB accuracy and prognostic value in the head and neck region remained until Erman et al¹¹ published one of the largest single-institution series of head and neck melanoma patients demonstrating that SLNB accuracy and prognostic value in the head and neck region are indeed comparable with other sites.

Preoperative lymphoscintigraphy is required to define the regional lymph basin(s) that drain the primary site; to localize the predominant drainage channels leading to the basin(s); and to localize the number of sentinel lymph nodes (SLNs) within the basin(s) draining through separate lymphatic channels. The radiocolloid to be used will not be specified, as many agents are in common use. The radiocolloid in common use at our center is the sulfur-colloid injected intradermally on 4 sides of the primary or previous site of the primary tumor. The SLNs are marked externally on the skin of the subject. Dynamic lymphoscintigraphy is

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performed within 1 day of the wide excision and selective lymph node dissection, with initial images at 30-45 minutes and delayed images at 1-2 hours.

If 2 or more regional lymph node basins are identified by lymphoscintigraphy, intraoperative lymphatic mapping and selective lymph node dissection will be performed on both lymph node groups, as it has not been possible to predict which nodal group would be the site of metastases.

Lymphatic mapping and selective sentinel lymphadenectomy

The current indication for lymphatic mapping and SLNB at the Penn State Hershey Melanoma Center are as follows:

- Recommended for primary melanomas with Breslow >1 mm; offered for primary melanomas with Breslow 0.76-1 mm
- Clark \geq IV without clinically detected lymph node metastasis
- Mitotic rate \geq 1
- Presence of ulceration
- We discuss and may offer the procedure for selected patients with primary melanomas with Breslow <0.76 mm if young (\leq 45 years), with ulceration or mitotic rate >1; or in those patients with extensive regression (\geq 75%)

Patients undergo preoperative lymphoscintigraphy to identify the regional lymph basin at risk for metastases, and the radioactive individual lymph nodes should have the site of the SLN identified by markings on the skin. At the time of the surgical procedure, the patient should be positioned for easy access to the regional lymph node basin. They are usually positioned supine for melanomas on the head and neck. Patients with primary melanomas arising on the upper extremities or back should be positioned in the lateral decubitus for access to the axillary or posterior cervical lymph basins.

Lymphatic mapping with the blue dye is performed before wide local excision. In the head and neck region, 0.5-1.0 mL of isosulfan blue is injected intradermally with a 30-gauge needle around the site of the primary lesion or incision biopsy. After massage of the area for approximately 5 minutes, incision should be performed. In case a delay occurs beyond 30-45 minutes for any reason, reinjection should be performed due to a dye “washout”¹² (Figure 1).

An incision is made in the regional lymph basin of the expected lymphatic drainage, over the site of the SLN marked by preoperative lymphoscintigraphy and the operating gamma probe “hot” spot, and the incision is oriented for inclusion within a complete lymphadenectomy incision (Figure 2).

Incision of approximately 3 cm may be adequate in most cases—larger incisions should be used without reservation if improved exposure will diminish the risk of complication such as nerve injury (Figure 3).

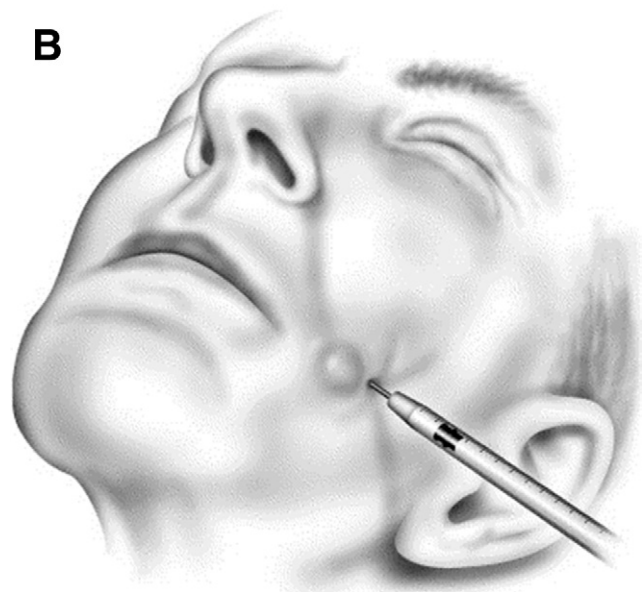


Figure 1 In the head and neck region, 0.5-1.0 mL of isosulfan blue is injected intradermally with a 30-gauge needle around the site of the primary lesion or incision biopsy. After approximately 5-10 minutes, incision should be performed. (Color version of figure is available online.)

Once the incision over the SLN has been made, usually an afferent blue lymphatic channel is found, which leads to the blue-stained node(s) (Figure 4).

Careful exploration of the surrounding tissue is necessary to identify any additional nodes and to distinguish them from the SLN(s). Special care needs to be taken in the selective dissection of SLNs in the parotid or spinal accessory nerve area. A nerve stimulator is helpful to guide the dissection to avoid nerve injury. Dissect the lymph node from the surrounding tissue bed. Dissection is facilitated by grasping the tissue adjacent the node (not the node itself), to not crush or tear the lymph node (Figure 5).

The probe is used to help identify the SLN. Nodes are labeled as “hot” in vivo if they are 3-fold or ex vivo if they are 6-fold more radioactive than background counts around the basin. Radioactive counts of the lymph node basin are taken once the nodes are removed to determine if any additional radioactive nodes are present (Figure 6).

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