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Aberrant sentinel nodes in malignant melanoma

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SUMMARY. The option of sentinel lymph node biopsy for patients with a cutaneous malignant melanoma has allowed an alternative to the traditional approaches to lymph node basin surgery. Lymphatic mapping usually identifies the sentinel node(s) in a recognised lymphatic basin, however aberrant nodes may occasionally be identified outside these areas. The notes of 100 consecutive patients with a localised cutaneous malignant melanoma, who had a sentinel lymph node biopsy in our unit, were reviewed. Lymphatic mapping identified three patients with aberrant sentinel lymph nodes. Failure to remove an aberrant sentinel lymph node harbouring metastatic melanoma may reduce significantly the chance of control or cure of the disease. In order to reduce this risk we advocate lymphatic mapping prior to surgical management of the draining lymph nodes of a cutaneous malignant melanoma. © 2000 The British Association of Plastic Surgeons

Keywords: malignant melanoma, lymph node, lymphatic mapping, aberrant nodes, sentinel node biopsy.

The ideal management of the regional lymph node basin in cutaneous malignant melanoma is as yet uncertain. The more traditional elective or delayed lymph node dissection may become obsolete if a survival benefit can be shown from studies of the efficacy of sentinel node biopsy and subsequent management.

The option of biopsy of the sentinel lymph node for patients with cutaneous malignant melanoma has allowed what may prove to be a more scientific approach to surgery of the draining lymph nodes. Instead of elective or delayed lymph node dissection, surgery dependent on evidence of metastatic disease in the sentinel node is offered to patients. Lymphatic mapping using patent blue V dye,[1] lymphoscintigraphy and a hand held gamma probe[2,3] has made identification of the sentinel node straightforward in most cases. Unlike most solid tumours, melanoma metastases usually progress in a predictable manner to draining lymph nodes in a specific lymphatic basin,[4] such as that of the cervical, supraclavicular, axillary, epitrochlear, inguinal or popliteal regions, but this may not always be the case. With increasing experience has come the knowledge that sentinel nodes are occasionally found outside recognised lymph node basins.[5] With an experienced radiologist performing lymphoscintigraphy and the use of a gamma probe and blue dye at surgery, these aberrant sentinel nodes can be identified. The most commonly reported site of the primary lesion likely to be drained by aberrant sentinel nodes is the trunk or, more specifically, the back.[6,7]

Methods

We reviewed the case notes of 100 consecutive patients with a localised malignant melanoma and no clinical evidence of lymphatic or distant metastasis (Stage I or II malignant melanoma – American Joint Committee on Cancer melanoma staging system). Each patient had a sentinel node biopsy between July 1997 and March 1999. The purpose of the review was to assess how often aberrant sentinel nodes were identified and to consider their significance.

Lymphoscintigraphy was performed on the morning of surgery. ^{99m}Tc nanocolloid was injected intradermally around the scar of the excision biopsy of the primary lesion and the skin overlying the site of lymph node uptake of ^{99m}Tc nanocolloid marked by the radiologist. Directed by the skin markings the gamma probe was used intraoperatively to identify the sentinel node or nodes, as focal areas with high count rates. Preoperatively, the surgeon injected 0.5 ml of patent blue V dye at the site of the excision biopsy of the primary lesion. Nodes with a high count rate and the first to show uptake of the blue dye were considered to be sentinel nodes and therefore excised. The nodes were examined for metastatic disease, both immunologically, for the presence of S100, HMB45, melan-A and tyrosinase, and histologically with haematoxylin and eosin staining. The sentinel node was considered to be aberrant if it was found outside a recognised lymphatic basin, in a subcutaneous or intra-muscular location. A sentinel node in the supraclavicular fossa, popliteal fossa or epitrochlear region was therefore not considered aberrant, as these are recognised lymphatic basins.

Results

In our review of 100 patients, three were found to have an aberrant sentinel lymph node. In each of these patients a sentinel node within a recognised lymphatic basin was also identified.

Table 1 Site of sentinel node in review of 100 patients

Site of primary lesion	*Patients (no.)*	*Sentinel node(s) within defined basin (no. of patients)*	*Sentinel node aberrant (no. of patients)*
Head and neck	17	16	0
Trunk	26	26	2
Upper limb	21	20	1
Lower limb	36	36	0
Total	100	98	3

The first of these patients was a 25-year-old caucasian who had had a malignant melanoma excised from the lateral aspect of the upper left arm, 0.9 mm in depth. Preoperative lymphoscintigraphy demonstrated two sentinel lymph nodes in the axilla. After preoperative blue dye injection, the two sentinel lymph nodes were identified in the axilla using the gamma probe; in one, afferent lymphatics were shown to contain blue dye, in the other no dye was seen. At the same time a third node was identified on the lateral chest wall and although this node had not been identified on lymphoscintigraphy, the fact that it contained blue dye confirmed that it was an aberrant sentinel node.

The second patient, a 22-year-old woman, had a malignant melanoma excised from the midline of the lumbar region of her back which proved to be 1.8 mm thick. Subsequent lymphoscintigraphy revealed a sentinel node in the left axilla and an aberrant sentinel node in the right flank. These findings were confirmed at operation using the gamma probe and blue dye. A further node, in the right axilla, was detected at lymphoscintigraphy and seen to be filling from the aberrant node of the right flank. This secondary node showed no evidence of dye uptake at operation but was detectable with the gamma probe.

The third patient, a 52-year-old man, had had an 8 mm thick melanoma excised from the left deltopectoral region. He had no evidence of lymphatic or systemic spread of the lesion. Lymphatic mapping identified two sentinel lymph nodes. The first (aberrant) node was found in the left deltopectoral groove and the second in the left axilla.

In each of these cases in which an aberrant sentinel node was identified by lymphatic mapping, histology of the excised tissue confirmed the presence of a lymph node.

In our review 2 of 26 patients with cutaneous melanoma of the trunk and 1 of 21 patients with a lesion of the upper limb were shown to have an aberrant sentinel node (see Table 1). In two patients a sentinel node could not be identified.

Discussion

The surgical management of the draining lymph nodes in patients with cutaneous malignant melanoma has long been controversial. The debate between those in favour of elective lymph node dissection of the predicted lymph node basin and those who support delayed dissection of clinically abnormal lymph node basins has resulted in a variety of prospective randomised trials. These trials have had contrasting conclusions on the efficacy[8] or inefficacy[9,10] of elective over delayed lymph node dissection. The advent of sentinel lymph node biopsy has added a new angle to the debate.

In our review of 100 patients three were shown to have unpredictable lymphatic drainage of a cutaneous malignant melanoma. In two of the patients the primary lesion was on the trunk, the third patient with aberrant lymphatic drainage from a lesion of the upper limb was more unusual.

An aberrant sentinel node may drain to an unexpected lymph node basin. If the aberrant sentinel node were shown to contain metastatic disease an alternative lymph node basin dissection than that expected would be required. During lymphoscintigraphy therefore, once an aberrant sentinel node has been identified, the secondary lymph nodes should also be localised, in order to be sure of the site of the draining lymph node basin(s).

This review has demonstrated that aberrant sentinel lymph nodes outside recognised lymphatic basins may be identified using the triple approach of lymphoscintigraphy, the intraoperative gamma probe and vital blue dye. It may be that some aberrant nodes are not detected by this triple approach, but without it no aberrant nodes would be likely to be identified until metastatic disease rendered them clinically detectable. Although as yet unproven, it would seem possible that failure to remove an aberrant sentinel lymph node harbouring metastatic melanoma would reduce the chance of control or cure of metastatic disease. In elective or delayed lymph node dissection without preoperative lymphatic mapping, a prediction of the course of lymphatic drainage and metastatic spread of a lesion is unlikely to include aberrant nodes. Lymphatic mapping prior to surgery would reduce the risk of failing to remove an aberrant sentinel lymph node. This may improve the chance of control or cure of the disease. Prior to any surgery of the draining lymph nodes therefore, whether a sentinel node biopsy or indeed an elective or delayed lymph node dissection, accurate lymphatic mapping is recommended so that aberrant sentinel nodes which may harbour metastatic disease are not missed.

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