The Feasibility of Sentinel Lymph Node Biopsy with a Multidisciplinary Cooperative Team Approach for the Management of Koreans with Cutaneous Malignant Melanoma

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INTRODUCTION

Primary cutaneous malignant melanoma was thought to be a disease of Western countries due to its fairly low incidence rate in Asian countries. Yet the incidence of malignant cutaneous melanoma has increased 3-fold worldwide since the early 1970s¹. It is significant that the incidence of melanoma has shown steady increments in countries such as Korea, Japan and China, although these increments are not as high as those in Western countries²,³. As the incidence rate is also increasing among Asians, the importance of making an early, accurate diagnosis and the proper management of malignant melanoma according to accurate staging has been emphasized. Among the main prognostic factors for primary melanoma of the skin, the status of the regional nodes, and particularly the number and burden of metastatic lymph nodes, is the most important prognostic factor. Various methods to detect micro- or macroscopic nodal metastasis have been investigated and scrutinized. The traditional method was to remove all the regional lymph nodes that drained the tumor and search for evidence of metastasis. However, this elective lymph node dissection incurs some risky and troublesome complications such as chronic lymphedema, nerve injury, deep vein thrombosis and...
thrombophlebitis. More importantly, only 20% of melanoma patients are diagnosed as having metastasis in the nodes that are harvested through elective dissection surgery. Biopsy of the first draining lymph node, the so-called sentinel lymph node biopsy (SLNB), has permitted selective lymph node assessments for regional metastasis. SLNB shows a relatively high accuracy rate of 99.1% by using blue dye plus a radiocolloid in regards to lymphatic mapping. This method is known to be useful, and especially for thin melanoma for accurate staging and to determine the postoperative adjuvant treatments.

SLNB is based on the hypothesis that hematogenous spreading follows lymphatic spreading, although there is some controversy about this. Lymphatic drainage from the primary tumor follows an orderly progression through the afferent lymphatic vessels into the SLN(s) before flowing into the non-SLN(s) in the regional lymphatic basin. It is generally thought that lymphatic metastasis does not create skip metastasis and consequently, the occurrence of negative results on SLNB means there is no metastasis of the regional nodal basin containing the SLN(s). For the SLNB technique, lymphoscintigraphy detects the SLN and biopsy of this node allows for accurate pathologic staging, and this makes it possible to achieve higher accuracy for melanoma staging than the accuracy of just the clinical staging in the era before SLNB. This procedure provides a direction for the appropriate management of melanoma, for example, deciding on whether or not to use adjuvant therapy.

In Korea, several reports regarding SLNB in the treatment of cutaneous malignant melanoma have been published. However, SLNB is not yet extensively performed in Korea, unlike that in western countries. This report focuses on the feasibility and morbidity of performing SLNB for patients with primary cutaneous melanoma, and particularly with the cooperation of the Departments of Dermatology, General Surgery and other departments in a university hospital setting.

MATERIALS AND METHODS

Patient selection

From March 2006 to February 2009, 54 patients were diagnosed as having primary cutaneous malignant melanoma in Kyungpook National University Hospital. In this group, 22 patients with cutaneous melanoma thicker than 1.01 mm (Breslow thickness) and no nodal and distant metastasis as assessed clinicoradiologically were enrolled in a prospective study at the Departments of Dermatology and General Surgery. The patients with melanoma thinner than 1.0 mm, but who had high risk factors like histopathological ulceration (T1b) or definite evidence of extensive regression were also enrolled in the study. One of the most important preoperative evaluations, PET-CT, was performed for all the patients to ensure that they had no distant metastasis.

Patients and methods

1) Patients (Table 1)

The clinicopathological characteristics, including the gender and age of the patients, the location of tumor, Breslow’s thickness and the laboratory and radiologic findings were evaluated. SLNB was conducted in 22 patients after the surgical procedure. Comparisons between the clinical staging and histopathological staging of the patients were evaluated.

2) Lymphoscintigraphy and sentinel lymph node biopsy

The detailed accounts for the SLNB procedure are provided as follows (Fig. 1). The patients underwent lymphoscintigraphy on the day or the day prior to the surgery in order to identify all the basins at risk and the SLN, as well as any possible interval nodes. A single dose of radioactive contrast (Tc99m) in normal saline was injected intradermally around the biopsy site with a 27-Gauge needle at two to four points, depending on the size of the cutaneous melanoma. Dynamic imaging, with using a low energy high resolution collimeter to visualize the lymph flow, was initiated immediately after tracer administration, and the imaging was continued for 20 min. Static scintigrams were subsequently acquired. A radioactive flood source was used to outline the body contour. Another set of static images was taken 2 hr later. All the possible lymph drainage regions were imaged (Fig. 1A). In regards to melanoma that was located in the upper extremities, with the exception of the lower extremities and trunk, an intradermal injection of 1~2 ml methylene blue was added just before draping the operation site, in addition to lymphoscintigraphy, to facilitate the detection of SLNs in the rather sophisticated axillary vault. With the patient positioned on the operating table, external counting with using a hand-held γ-probe was repeated to confirm the location of the SLN prior to the procedure (Fig. 1B). Different anesthetic methods were applied according to the site of the primary lesion. In regards to the groin area, local anesthesia alone was sufficient for SLNB, but SLNB was conducted in the axillary area under general anesthesia due to risk of intolerable pain during local anesthesia. In the case of primary melanoma lesions in the lower extremity, SLNB was done by dermatologists, but SLNB was done by general surgeons in the case of primary lesion in the upper extremity. After the skin