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Search Sentinel Lymph Node in Melanoma: SPECT/CT Added Value. A Case Report

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Abstract

The clinical case deals with a patient who after removal of a pigmented and ulcerated skin lesion obtains histopathological diagnosis of skin melanoma with dermal infiltration for a thickness of 6mm and with Breslow level IV. The location of the primitive tumor was at the right inguinal region more precisely in the overlap region. In the search for the sentinel lymph node essential for proper staging of the disease, the integration and interpretation of preoperative static lymphoscintigraphy with SPECT/TC technique was of fundamental importance.

Keywords: Melanoma; Sentinel lymphnode; SPECT/CT

Introduction

The incidence of cutaneous melanoma has increased by about 3 times in the last 30-40 years, with an incidence rate higher than any other tumor. It is the sixth tumor most common in men and seventh in women. It mainly affects younger patients and especially the white population. The probability of contract the disease is 1 out of 37 in men and 1 in 56 in women. 5-10% of the melanomas are hereditary. In Europe, the incidence of the disease is 4-18 cases per 100,000 inhabitants, while in Australia the ratio is 40 to 100,000. At the time of diagnosis, 84% of melanomas are localized, 8% already have regional metastases (lymph nodes) and 4% already show metastasis at a distance. In 4% of cases, primary origin is unknown. In the presence of early diagnosis, the survival possibilities are 90% [1]. There are many factors that determine both the ability of melanoma to cause metastasis and the possibility of patient survival, the main determinant being the histopathological thickness of the tumor determined according to Breslow. The Breslow index is measured from the epidermal surface or from the base of the eruption. Patients with 1mm thick melanomas have 20% mortality at 10 years, while patients with tumors > 4 mm have a 50% mortality rate of 10 years [2,3]. The presence of lymph node metastases is also a determining factor in survival, decreasing their survival rate by about a half. As the disease spreads by lymphatic lymph nodes, the number of lymph nodes involved, and the extent of metastatic lymph node involvement are the two most important prognostic factors [4,5].

Case Presentation

A 75-year-old woman was subjected to cutaneous flap (5x3.4 cm) with intensely pigmented, detected and ulcerated lesions in the right over pubic region. Histopathological diagnosis revealed the presence of a surface diffusion melanoma, infiltrating the reticular dermis (Clark level IV and 6mm thickness according to Breslow) and a maximum mitotic index of 8x10 HPF (pT4b). A planar lymphoscintigraphy was performed to map the melanoma skin site to visualize lymphatic drainage and detect and localize sentinel lymph nodes in order to detect the stage of disease. Lymphoscintigraphy was performed following the subcutaneous administration of colloidal human albumin particles (diameter ≤ 80nm) labeled with 99mTC injecting in two sites at the extremities of the cutaneous scar. The images were acquired with hybrid gamma-camera SPECT/CT (Infinia Hawkeye 4 - GE). Static planar images of the basin region and thoracic region have been acquired to evaluate the direction of lymphatic flow and location lymphnodes drainage 30' after the administration. Planar imaging was integrated by a SPECT/CT acquisition in the basin region because the inguinal sentinel lymph node was not exactly identifiable in the static acquisition due to the masking presence of radioactivity present in the nearby injection sites. The SPECT images in fusion with CT allowed us to locate anatomically close to the inguinal ligament adjacent to the inguinal surface ring the sentinel lymph node (Figure 1). The surgeon performed the enlargement of the skin surface potentially infiltrated by primitive neoplasia and the dissection of the sentinel

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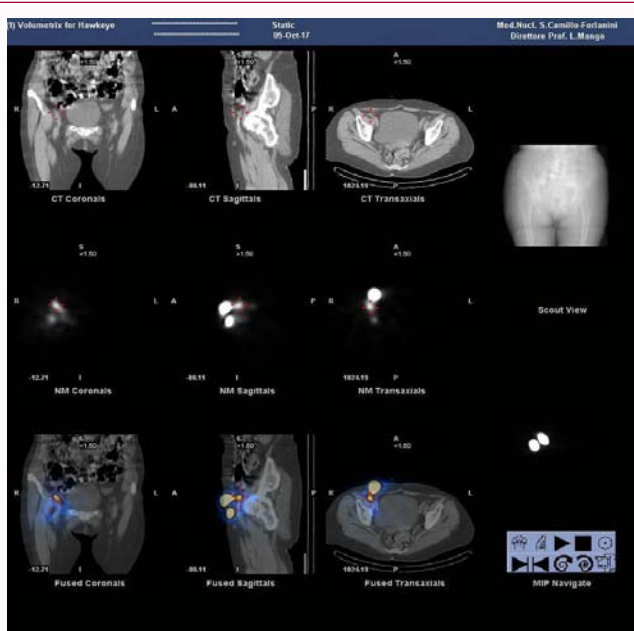


Figure 1:



Figure 2:

lymph node (Figure 2 and 3) about 6 hours after the execution of the lymphoscintigraphy. The removal of the sentinel lymph node, performed through the guidance of a radiopharmaceutical surgery probe with the consultant of the nuclear physician who performed the lymphoscintigraphy, was only possible by following the map provided by the SPECT/CT images.

Discussion

Sentinel lymph node biopsy is a reliable method of staging in various cancers, such as breast cancer, melanomas, and squamous head and neck carcinomas. Lymphoscintigraphy is an indispensable prerequisite for the preoperative location of the sentinel lymph node and for the subsequent biopsy. The minimally invasive sentinel lymph node biopsy reduces the morbidity associated with lymph node dissection, facilitates an appropriate therapeutic choice, and in many cases provides important prognostic information [6-7]. Several studies documented the ability to improve both the sensitivity and the specificity of lymphoscintigraphy by means of SPECT/CT hybrid imaging. The technique, in fact, improves diagnostic accuracy by allowing a proper anatomical location of the sentinel lymph node and the display of sentinel lymph nodes not identified by the planar



Figure 3:

scintigraphic technique, particularly if it is near the injection site [8-10]. In our case, lymphoscintigraphy performed only with planar technique did not carefully locate the site of the sentinel lymph node, because adjacent and exactly underlying the primitive lesion. The SPECT/CT technique has therefore been able to improve the anatomical definition, improve resolution and accurately measure the depth of the “hot” lymph node as compared to the skin plan. The advantage of using hybrid technique [11] has also facilitated the detection, isolation and removal of sentinel lymph nodes during surgery, favoring the operation of the surgeon assisted by the nuclear physician.

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