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REVIEW

The role of ThinPrep cytology in the investigation of SLN status in patients with cutaneous melanoma

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ThinPrep cytology;
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Summary
Introduction: The sentinel lymph node (SLN) biopsy in melanoma assesses reliably the status of the regional lymph node basins, provides valuable prognostic information, facilitates early therapeutic lymphadenectomy and identifies patients who are candidates for different adjuvant treatments. The current study was designed to evaluate the feasibility of cytological specimens being placed in PreservCyt® as a practical collection methodology for performing evaluation of the SLN status in patients with melanomas.
Patients and methods: From January 2004 to December 2006, 70 patients with histologically confirmed cutaneous melanoma underwent intraoperative FNA biopsy of the SLN. After identification of the SLN(s), FNA biopsy of the SLN was performed with a 0.6 mm (23 gauge) diameter needle. All the SLNs specimens were examined (using light microscopy 40 × and 200 ×) by the same pathologist and cytopathologist, neither of had any knowledge of the medical history of the patient. The histological result of the excised SLN was considered as the final diagnosis.
Results: The unsatisfactory rate for TP cytology was 2.17%. Sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and overall accuracy (OA) for the TP technique were 92.31%, 100%, 100%, 97.06%, and 97.83%, respectively. Using TP cytology, there was greater intensity and distribution of the staining in comparison with immunohistochemistry.

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Discussion: The accuracy of TP technique in the evaluation of the SLN status is comparable to those of the histological evaluation, and could be of paramount importance for the preoperative planning of treatment.

Contents

Introduction

One of the most significant prognostic factors in cutaneous melanoma is the status of the regional lymph nodes, which is a critical determinant for patient prognosis and overall survival [1]. In the 1970s and 1980s, prophylactic lymphadenectomy was performed in the area of anatomical drainage of the primary melanotic lesion [2]. In the early 1990s, Morton et al. [3] introduced the concept of the sentinel lymph node (SLN) biopsy in melanoma, by which, the lymphatic drainage of a primary tumor should follow a specific pattern into a specific lymph node.

The SLN biopsy assesses reliably the status of the regional lymph node basins, provides valuable prognostic information, facilitates early therapeutic lymphadenectomy and identifies patients who are candidates for further adjuvant treatment [4]. Today, technetium 99m-labeled radioisotope and hand-held gamma probe in combination with blue dye are utilized by most centers. The reported rates of SLN detection with this combined technique ranged from 82% to 100%.

On the other hand, there are a few reports that have studied the role of fine needle aspiration (FNA) biopsy as a mean of preoperative regional lymph node staging in patients with melanoma [5,6]. Studies in patients with breast cancer have shown that FNA biopsy is an inexpensive and quick method of concentrating the cells of interest [7]. Among different types of pathology procedures, FNA biopsy, originally described more than 70 years ago, has become a very popular method for diagnosis of breast and thyroid lesions [8]. Recently, ThinPrep® (TP) (Cytyc Corp., Boxborough, MA) methodology has been introduced as an alternative to conventional smears.

TP is a Food and Drug Administration—approved method of cytopathologic specimens preparation that it uses a liquid-based collection system to prepare thin-layered slides. In this system, collected samples are placed in a buffered fixative (Cytolyt®). At the laboratory, the cell suspensions are centrifuged and resuspended in PreservCyt®, and then prepared as thin-layered slides using the ThinPrep processor®. Because the composition of Cytolyt® and Preservcyt® differs from other fixatives commonly used in pathology, such as 95% ethanol and 10% buffered formalin, the validity of TP as a diagnostic tool for the preoperative evaluation of the SLN status requires further study. During the last 5 years, TP cytology has merged as part of the diagnostic routine of our cytological laboratory. The current study was designed to evaluate the feasibility of cytological specimens being placed in PreservCyt® as a practical collection methodology for performing evaluation of the SLN status in patients with melanoma.

Patients and methods

Patients' population

From January 2004 to December 2006, 70 patients with histologically confirmed cutaneous melanoma underwent intraoperative FNA biopsy of the SLN. All the patients were referred to the 2nd Department of Propedeutic Surgery of Athens University and to the Department of Plastic Surgery of 'A Sygros' Hospital. Prior to surgery, they were all informed of our surgical treatment protocol and its potential complications.