Research Article

Interval Sentinel Lymph Nodes: An Unusual Localization in Patients with Cutaneous Melanoma

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Background. Recent studies have demonstrated that there exists a great variation in the lymphatic drainage in patients with malignant melanoma. Some patients have drainage to lymph nodes outside of conventional nodal basins. The lymph nodes that exist between a primary melanoma and its regional nodal basin are defined “interval nodes”. Interval node occurs in a small minority of patients with forearm melanoma. We report our experience of the Melanoma Unit of University Hospital Spedali Civili Brescia, Italy.

Methods. Lymphatic mapping using cutaneous lymphoscintigraphy (LS) has become a standard preoperative diagnostic procedure to locate the sentinel lymph nodes (SLNs) in cutaneous melanoma. We used LS to identify sentinel lymph nodes biopsy (SLNB) in 480 patients. Results. From over 2100 patients affected by cutaneous melanoma, we identified 2 interval nodes in 480 patients with SLNB. The melanomas were both located in the left forearm. The interval nodes were also both located in the left arm. Conclusion. The combination of preoperative LS and intraoperative hand-held gamma detecting probe plays a remarkable role in identifying these uncommon lymph node locations. Knowledge of the unusual drainage patterns will help to ensure the accuracy and the completeness of sentinel nodes identification.

1. Introduction

Recent studies have demonstrated that there exists a great variation in the lymphatic drainage among patients with malignant melanoma [1–11]. While most melanomas show lymphatic drainage to usual nodal basins (axillary, inguinal, and cervical regions), some patients also have drainage to lymph nodes outside these regions [5, 6, 9, 12]. Lymphatic nodes in the area between the primary melanoma and the regional basins are called “in-transit nodes”, “interval nodes”, or “interval sentinel lymph nodes”, and by definition are also SLNs [2–5, 9, 10].

We describe our experience at the Melanoma Unit of University Hospital Spedali Civili Brescia, Italy.

2. Materials and Methods

A retrospective study was performed considering 480 patients selected from over 2100 Caucasian patients affected by cutaneous melanoma with SLNB. These patients were followed up by the Melanoma Unit of University Hospital Spedali Civili Brescia, Italy. All patients gave an informed consent to be entered into the database. They were staged with the use of American Joint Committee on Cancer (AJCC) staging classification [13–15]. The combination of preoperative LS and intraoperative hand-held gamma detecting probe allows detection of the SLNs in 99,0% of the patients with malignant melanoma [5, 6, 9, 16].
Case 1. A 26-year-old Caucasian man in good general health, presented to our clinic in July 2010 with an asymptomatic irregular hyperpigmented lesion of 5 × 5 mm dimension, situated in the left forearm. Both the anamnestic information and the clinical and dermatoscopic characteristic of the lesion provided the basis for the diagnosis of melanoma. We performed an excision of the pigmented lesion, and the histological examination showed it to be a melanoma: Breslow thickness was 2.6 mm, mitoses were 2/mm (2), and ulceration was absent.

Clinical examination and preoperative total-body computed tomography (TC Total Body), and lymph nodes ultrasonography showed no lymph node or visceral metastases. In conformity with the AJCC Classification [14], we performed a wide reexcision of the melanoma scar and an SLNB. The LS showed two focal areas of increased uptake at the left mid-arm and in the left axilla (Figures 2(a) and 2(b)). No metastases were identified by the histological examination of the sentinel nodes excised, and thus the patient was sent to a regular followup.

The nodes were not palpable on the medial side of the upper arm.

Case 2. A 63-year-old white female in good general health came to our attention for an asymptomatic irregular hyperpigmented lesion with dimensions 1 × 0.8 cm, situated in the left forearm. The anamnestic information and the dermatoscopic characteristics indicated that it could be a thick melanoma. We performed a surgical excision, and the subsequent histological examination showed it to be a melanoma: Breslow thickness was 2.3 mm, mitoses were 2/mm (2), and ulceration was absent.

Clinical examination, preoperative total-body computed tomography (TC Total Body), and lymph nodes ultrasonography showed no lymph node or visceral metastases. In conformity with the AJCC Classification [14], we performed a wide reexcision of the melanoma scar and an SLNB. The LS showed two focal areas of increased uptake at the left mid-arm and in the left axilla (Figures 2(a) and 2(b)). No metastases were identified by the histological examination of the sentinel nodes excised, and thus the patient was sent to a regular followup.

4. Conclusions

Recent studies have demonstrated that there exists a great variation in the lymphatic drainage between patients with malignant melanoma [1–11, 18–20]. Although most melanomas exhibit lymphatic drainage to conventional nodal basins (i.e., the cervical, axillary, and inguinal nodes), some patients show drainage to lymph nodes outside of these basins [5, 9–11, 20]. The lymph nodes that exist between a primary melanoma and its regional nodal basin are termed “interval nodes” [5, 11, 20]. The incidence of metastatic in-transit nodes was between 14% and 22% [5, 21]. Interval nodes were more common in melanoma of the trunk than in those of the lower limbs [5, 21].

Although this interval nodes positivity is uncommon, the literature has showed that in more than 85% of cases reported with a metastatic disease in the interval node, this is often the only site of nodal metastasis [5, 11].

Interval SLN can be reliably detected only by detailed preoperative LS and the intraoperative use of a handheld gamma probe. We identified two upper arm interval nodes in 480 patients submitted to SLNB for primary cutaneous melanoma at Spedali Civili di Brescia, Center Melanoma Unit.

Both the interval nodes were located in the left arm.

We would like to underline that lymph nodes can be observed in unusual localization, not only in areas with well-known drainage to regional lymph nodes. LS plays a remarkable role in identifying these uncommon lymph node locations. Knowledge of the unusual drainage patterns
outlined in this paper will help to ensure the accuracy and the completeness of sentinel nodes identification.

References

[1] D. L. Morton, D. R. Wen, J. H. Wong et al., “Technical details of intraoperative lymphatic mapping for early stage melanoma,” Archives of Surgery, vol. 127, no. 4, pp. 392–399, 1992.

[2] K. M. Mcmasters, R. Dirk Noyes, D. S. Reintgen et al., “Lessons learned from the sunbelt melanoma trial,” Journal of Surgical Oncology, vol. 86, no. 4, pp. 212–223, 2004.

[3] S. P. Bagaria, M. B. Faries, and D. L. Morton, “Sentinel node biopsy in melanoma: technical considerations of the procedure as performed at the John Wayne Cancer Institute,” Journal of Surgical Oncology, vol. 101, no. 8, pp. 669–676, 2010.

[4] H. Uhara, M. Takata, and T. Saida, “Sentinel lymph node biopsy in Japan,” International Journal of Clinical Oncology, vol. 14, no. 6, pp. 490–496, 2009.

[5] K. M. Mcmasters, C. Chao, S. Wong et al., “Interval sentinel lymph nodes in melanoma,” Archives of Surgery, vol. 137, no. 5, pp. 543–549, 2002.

[6] A. Silverio, M. McRae, S. Ariyan, and D. Narayan, “Management of the difficult sentinel lymph node in patients with primary cutaneous melanoma,” Annals of Plastic Surgery, vol. 65, no. 4, pp. 418–424, 2010.

[7] D. L. Morton, J. F. Thompson, M. D. Alistair et al., “Sentinel-node biopsy or nodal observation in melanoma,” New England Journal of Medicine, vol. 355, no. 13, pp. 1307–1317, 2006.

[8] Y. Xing, B. D. Badgwell, M. I. Ross et al., “Lymph node ratio predicts disease-specific survival in melanoma patients,” Cancer, vol. 115, no. 11, pp. 2505–2513, 2009.

[9] R. F. Uren, R. Howman-Giles, J. F. Thompson et al., “Interval nodes: the forgotten sentinel nodes in patients with melanoma,” Archives of Surgery, vol. 135, no. 10, pp. 1168–1172, 2000.

[10] J. F. Thompson, R. F. Uren, H. M. Shaw et al., “Location of sentinel lymph nodes in patients with cutaneous melanoma: new insights into lymphatic anatomy,” Journal of the American College of Surgeons, vol. 189, no. 2, pp. 195–204, 1999.

[11] S. Vidal-Sicart, F. Pons, S. Fuertes et al., “Is the identification of in-transit sentinel lymph nodes in malignant melanoma patients really necessary?” European Journal of Nuclear Medicine and Molecular Imaging, vol. 31, no. 7, pp. 945–949, 2004.

[12] M. Lens, “Sentinel lymph node biopsy in melanoma patients,” JEADV, vol. 24, no. 9, pp. 1005–1012, 2010.

[13] A. M. Manganoni, C. Farisoglio, F. Facchetti, E. Simoncini, and P. G. Calzavara Pinton, “Sentinel lymph node biopsy in melanoma: assessment of risk,” Annals of Surgical Oncology, vol. 15, no. 9, p. 2626, 2008.

[14] C. M. Balch, J. E. Gershenwald, S. I. Soong et al., “Final version of 2009 AJCC melanoma staging and classification,” Journal of Clinical Oncology, vol. 27, no. 36, pp. 6199–6206, 2009.

[15] J. E. Gershenwald, S. I. Soong, and C. M. Balch, “2010 TNM staging system for cutaneous melanoma...and beyond,” Annals of Surgical Oncology, vol. 17, pp. 1475–1477, 2010.

[16] B. Vučetić, S. A. Rogan, A. Balenović et al., “The role of preoperative lymphoscintigraphy in surgery planning for sentinel lymph node biopsy in malignant melanoma,” Wiener Klinische Wochenschrift, vol. 118, no. 9-10, pp. 286–293, 2006.

[17] S. Vidal-Sicart, F. Pons, J. Piulachs, T. Castel, I. Palou, and R. Herranz, “Mid-arm sentinel lymph nodes showing surprising drainage from a malignant melanoma in the forearm,” Clinical Nuclear Medicine, vol. 23, no. 5, pp. 273–274, 1998.

[18] J. Norman, C. W. Cruse, C. Espinosa et al., “Redefinition of cutaneous lymphatic drainage with the use of lymphoscintigraphy for malignant melanoma,” American Journal of Surgery, vol. 162, no. 5, pp. 432–437, 1991.

[19] R. F. Uren, R. B. Howman-Giles, J. F. Thompson, H. M. Shaw, and W. H. McCarthy, “Lymphatic drainage from periumbilical skin to internal mammary nodes,” Clinical Nuclear Medicine, vol. 20, no. 3, pp. 254–255, 1995.

[20] G. K. Roozendaal, J. D. H. De Vries, D. Van Poll et al., “Sentinel nodes outside lymph node basins in patients with melanoma,” British Journal of Surgery, vol. 88, no. 2, pp. 305–308, 2001.

[21] T. Matsumoto, S. Shibata, S. Y asue et al., “Interval sentinel lymph nodes in patients with cutaneous melanoma: a single-institution study in Japan,” Journal of Dermatology, vol. 37, no. 7, pp. 629–634, 2010.