Sentinel lymph node biopsy in cases of skin melanoma: initial experiences at a center in northeastern Brazil

Linfonodo sentinela em melanoma: experiência inicial de um centro do nordeste brasileiro

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Abstract: The incidence of skin melanoma is increasing worldwide. The presence of lymph node metastasis is the most important prognostic factor of this disease, the thicker the lesion the greater the likelihood of lymph node involvement. Approximately 20% of patients with Breslow depth 1-4 mm have lymph node metastasis. Sentinel lymph node biopsy is standard procedure in the management of patients with skin melanoma, reflecting progress in the treatment of this disease since this procedure avoids an unnecessary radical lymphadenectomy, thus reducing the morbidity of treatment. This paper describes a series of cases involving sentinel lymph node biopsy in melanoma patients in Teresina, Piauí, Brazil between 2008 and 2009.
Keywords: Medical oncology; Melanoma; Radionuclide imaging; Sentinel lymph node biopsy; Skin neoplasms

Resumo: A incidência do melanoma cutâneo é crescente em todo o mundo. A presença de metástases em linfonodos é o mais importante fator prognóstico, sendo que a probabilidade de envolvimento linfonodal é maior nas lesões de maior espessura, ocorrendo em 20% dos pacientes com Breslow, de 1 a 4mm. A pesquisa do linfonodo sentinela já é padrão em melanoma e representou um avanço no tratamento da doença, por evitar linfonodectomias radicais desnecessárias, diminuindo a morbidade do tratamento. Apresentamos uma série de casos de pesquisa de linfonodo sentinela em pacientes com melanoma, em Teresina-Piauí, nos anos de 2008 e 2009.
Palavras-chave: Biópsia de linfonodo sentinela; Cintilografia; Melanoma; Neoplasias cutâneas; Oncologia

The presence of metastases in lymph nodes is the most important prognostic factor in patients with melanoma. As confirmed in the case of other solid tumors, dissemination occurs principally through the lymphatic system following an orderly progression. [1] The sentinel lymph node (SLN), the first lymph node in the chain to receive drainage, permits a prediction to be made of the state of the entire chain of lymph nodes. Lymphatic mapping prior to surgery and selective lymphadenectomy of marked lymph nodes was first described by Morton in 1992 and is currently standard practice in the case of melanomas with Breslow depth > 1 mm or, irrespective of depth, for those with other characteristics such as Clark level > III or ulceration. [1-4]

Biopsy of the SLN represents a significant advantage since the procedure is less invasive. Only 20% of individuals with a Breslow depth of 1-4 mm develop metastases. Greater accuracy in staging the disease and in the prognostic data obtained from SLN

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mapping explains the rapid acceptance and dissemination of this technique by the medical community, since it avoids performing unnecessary lymphadenectomies. [5]

Preoperative lymphoscintigraphy, performed 6-18 hours prior to surgery, constitutes a fundamental step in investigating the SLN. It reveals the pathway of each lymph node chain, its respective area of drainage and the location and quantity of SLN, information that is fundamental to the surgeon. The likelihood of correctly identifying the location of the SLN in patients with melanoma is approximately 98%. [2,6]

An observational, descriptive, retrospective study was conducted, following approval by the Internal Review Board of the Federal University of Piauí, to evaluate the drainage pattern and anatomopathological reports of patients with melanoma who had been submitted to lymphoscintigraphy at a nuclear medicine unit in Teresina, Piauí between 2008 and 2009.

Table 1: Distribution and characteristics of melanomas in patients who were submitted to lymphoscintigraphy at a nuclear medicine unit in Teresina, Piauí between 2008 and 2009

Category	Males		Females		Total	
	n	%	n	%	n	%
Patients	5	56	4	44	9	100
Age group (years)						
0 - 60	1	20	1	25	2	22
> 60	4	80	3	75	7	78
Site						
Trunk	2	40	1	25	3	33
Head/neck	0	0	0	0	0	0
Upper limbs	2	40	1	25	3	33
Lower limbs	1	20	2	50	3	33
Histological type						
Superficial spreading	2	40	1	25	3	33
Lentigo maligna	1	20	0	0	1	11
Nodular	2	40	2	50	4	44
Acral lentiginous	0	0	1	25	1	11
Thickness						
< 1	1	20	0	0	1	11
1 – 2	2	40	1	25	3	33
2 – 4	2	20	1	25	3	33
> 4	0	0	2	50	2	22
Clark level						
I	0	0	0	0	0	0
II	0	0	0	0	0	0
III	3	60	2	50	5	56
IV	2	40	1	25	3	33
V	0	0	1	25	1	11
Growth phase	1	20	4	100	5	56
Histopathological regression	1	20	1	25	2	22
Ulceration	1	20	2	50	3	33
Positive surgical margins	1	20	0	0	1	11
Mitotic index > 6 mitoses/HPF	0	0	1	25	1	11

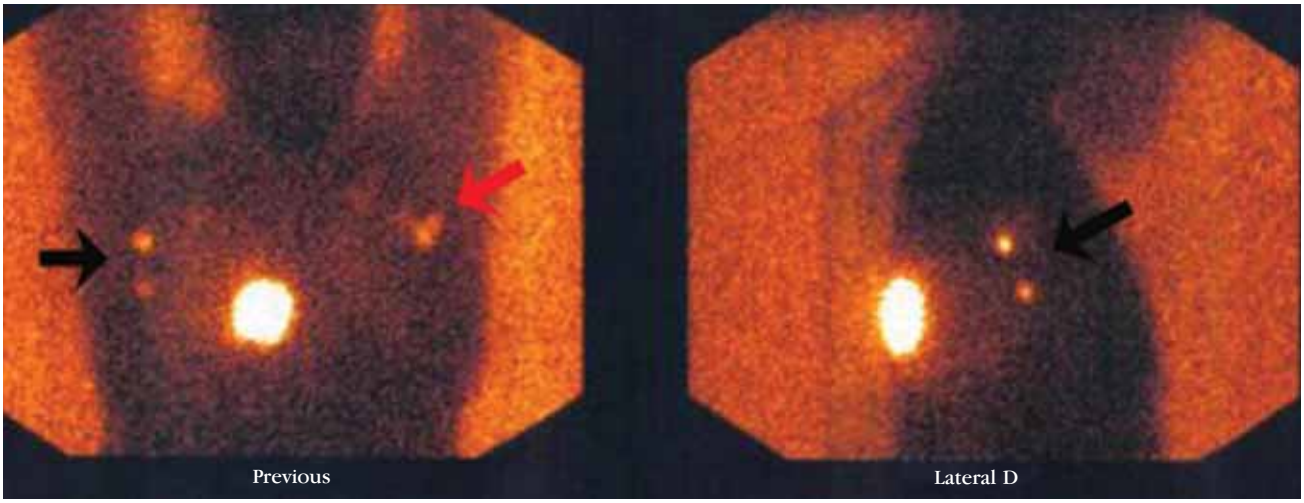

Figure 1: Preoperative lymphoscintigraphy in a patient with a melanoma located on the trunk with drainage to the right (black arrow) and left (red arrow) axillary lymph nodes

Of the twelve patients with melanoma who underwent lymphoscintigraphy within the study period, three were excluded because confirmatory anatomopathology reports were unavailable. Although the study was conducted in one of the only two referral centers in which this exam is performed, the small sample size found may be associated with the low number of new cases of melanoma, fewer than 15 cases in men and 20 in women, estimated for the year of 2010 in the state of Piauí according to the Brazilian National Cancer Institute (INCA). [7]

Of the patients included in this study, 5 were men and 4 were women (Table 1). Only 2 individuals (22%) were under 60 years of age. Mean age was 66.4 years (range 55-82 years). The lesions were uniformly distributed on the trunk (33%), upper limbs (33%) and lower limbs (33%). In all cases, the physician responsible for the patient was an oncological surgeon.

With respect to microstaging and Clark levels, 5 individuals (56%) had Clark level III, 3 (33%) had level IV and 1 patient (11%) had level V. Breslow depth was between 0 and 1 mm in 1 individual (11%), between 1 and 2 mm in 3 patients (33%), between 2 and 3 mm in 3 (33%) and > 4 mm in 2 patients (22%). Mean Breslow depth was 3.9 mm (standard error 1.58 mm).

The most prevalent histology pattern was the nodular type (n=4; 44%), followed by the superficial spreading type (n=3; 33%). The lentigo maligna type and the acral lentiginous type were found in only one individual each (11%). The nodular and acral lentiginous types are generally associated with poorer prognosis and consequently with a greater Breslow depth. [8] In the present sample, a mean depth of 6.4 mm was found in the nodular type and 3 mm in the only case of acral lentiginous melanoma. The mean depth in the cases of superficial spreading melanoma was 1.9 mm and 0.5 mm in the cases of the lentigo maligna type.

The vertical growth phase was present in five individuals (56%), while in 2 patients (22%), histopathological regression was found. In 3 patients (33%), ulceration was present; in 1 individual (11%) the surgical margins were positive; and in another (11%) the mitotic index was > 6 mitoses/high-power field (HPF). All these factors are associated with poorer prognosis. [1,8]

The number of SLN identified at preoperative lymphoscintigraphy ranged from 1 to 5, with a mean of 1.89 per patient. In four individuals (44%), only one SLN was found, while in another four patients (44%), two SLN were found, and in one patient (11%), more than two SLN were found. With respect to the number of lymph node chains receiving drainage, in 7 individuals (78%) only one was present, whereas in two patients (22%) more than one was found and in one of these patients bilateral drainage was found (to the right and left axillary chains) (Figure 1). According to the literature, ambiguous drainage is more common in lesions located on the head, neck and trunk. [9] The existence of ambiguous drainage in itself justifies the importance of the use of preoperative lymphoscintigraphy.

A frozen section procedure was performed on the SLN in 5 individuals (56%). Various studies have advised against the use of this procedure, since the positivity of metastases is only detected in 55% of SLN. Material may be lost in the freezing process, negatively affecting diagnosis made by hematoxylin-eosin staining or immunohistochemistry. [2,10] In the present study, there was no discrepancy between the results of the frozen section procedures and histopathology and

with respect to lymph node status. All the SLN were neoplasia-free, meaning that unnecessary lymphadenectomies were avoided.

One of the great advantages of SLN mapping for the pathologist is the possibility of performing histological analysis with the smallest possible tissue sample. The use of immunohistochemistry (HMB-45, MELAN-A, S-100) and polymerase chain reaction (PCR) increases the likelihood of finding micrometastases. [2,10] Immunohistochemistry with antibodies against the S-100 and HMB-45 antigens increases sensitivity in the detection of metastases by around 14%. [5] These techniques, however, are not routinely available in the institutes analyzed and were not, therefore, performed in any of the cases in this study. ❑

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