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Dermoscopic features of a primary scalp melanoma and its cutaneous metastases

Running title: Scalp melanoma with simultaneous cutaneous metastases

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Cutaneous melanoma metastases (CMM) occur frequently in the natural history of melanoma, but the simultaneous occurrence of CMM with its primary lesion has so far been reported once, in a case of primary choroidal and cutaneous melanomas. [1] We describe an unusual case of the simultaneous occurrence of cutaneous metastases from a primary scalp amelanotic melanoma.

A 44-year-old man presented with multiple growing, pigmented papules and plaques on his scalp and trunk, first noticed approximately 3 months earlier. Dermoscopically, these lesions showed globular, multicomponent and pseudo-lacunar pattern suggestive of cutaneous metastases.

A careful inspection of the scalp revealed a 1.5 cm firm, skin-coloured, ulcerated nodule on the vertex, partially covered by hair and yellowish-brown crust (Fig. 1a). Dermoscopically, the lesion had a structureless pattern with white shiny structures (Fig. 1b). There also was a polymorphous vascular pattern of dotted, linear (irregular, hairpin, coiled, and helical), and arborizing vessels with milky-red globules. In addition, the right part of the lesion had a reddish-orange haemorrhagic crust from ulceration (Fig. 1b).

Considering the patient's medical history and the lesions' dermoscopic features, we made a diagnosis of primary scalp amelanotic melanoma with simultaneous CMM. The lesion on the vertex (Fig. 1a) and one on the left upper trunk (Fig. 1e) were excised. The histopathological examination of the scalp lesion revealed an ulcerated, polypoid cutaneous melanoma composed of atypical pigmented epithelioid cells, with a dense lymphoid infiltrate at the lesion base (Figs. 1c, d). It was a Clark level IV tumour, with a Breslow thickness of 4.7 mm and mitotic index >5/mm^2, without evident neoplastic vascular invasion. Instead, the left upper trunk lesion had sharp delimitation and relatively preserved symmetry. Atypical melanocytes were rare at the dermo-epidermal junction and tumour cells filled the papillary dermis (Figs. 1g, h). These features were consistent with the trunk lesion being a metastasis.

Immunohistochemical analysis showed that the neoplastic cells expressed HMB45, MITF1, BCL2, CD117/c-kit, p53, and Ki67, in the primary and putative secondary lesions to the same extent (not shown). Mutational analysis revealed a V600E mutation in the *BRAF* gene (c.1799T>A) in both lesions. PET/CT did not reveal suspicious hypermetabolic lesions in internal organs. The patient received the combined treatment with the B-Raf inhibitor dabrafenib and MEK inhibitor trametinib. After 18 months, there was complete remission of all CMM

In this case, clinical-dermoscopic whole body skin examination, including a scalp inspection, allowed us to diagnose a difficult amelanotic nodular melanoma of the scalp. Clinically, the nodule on the vertex could have gone unnoticed because it was a skin-coloured lesion that was covered by hair and simulated a dermal naevus. However, its dermoscopic pattern was completely different from that of scalp dermal naevi; these latter have a globular pattern frequently associated with central hypopigmentation ("eclipse naevi") or perifollicular hypopigmentation. [2]

Dermoscopy helped identify not only CMM [3] but also the primary scalp amelanotic nodular melanoma thanks to visualization of polymorphous vessels and milky-red globules associated with melanoma diagnosis. [4] However, the analysis of these features does not lead to a specific diagnosis.

The use of reflectance confocal microscopy (RCM) could increase the accuracy of dermoscopic diagnosis of scalp melanoma because RCM features of this latter are similar to those of melanomas on other sites.[5] The limitations for the RCM examination on the scalp are the presence of hair and the scalp convexity require the use of handheld confocal microscope which allows to scan the lesion but only in small fields of view preventing the visualization of the entire lesion.[5]

Total body examination, including the scalp, may facilitate the early diagnosis of scalp melanoma, possibly improving its prognosis.

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Figure legend

Figure 1. Clinical, dermoscopic e histological images of primary amelanotic nodular melanoma of the scalp, and a cutaneous melanoma metastasis.

(a-d) Lesion on the vertex of the scalp. (a) The clinical image shows a skin-coloured, symmetrical, nodular lesion, covered by hair and a yellowish-brown crust from ulceration. (b) The dermoscopic image of the same lesion reveals a structureless pattern with white shiny lines and areas, and a polymorphous vascular pattern with dotted, linear (irregular, hairpin, coiled, and helical) and arborizing vessels, and milky-red areas and globules. The globules are poorly demarcated polygonal structures, often containing atypical central vessels, separated from each other by blurred shiny white lines. A haemorrhagic crust from ulceration is seen in the right part of the lesion. Histopathological analysis (c, d) shows atypical pigmented epithelioid cells with obvious pagetoid intraepidermal spread. No evidence of neoplastic vascular invasion. A dense lymphoid infiltrate is present within the lesion. H&E, Original magnification 100x (b) and 200x (c).

(e-h) Lesion on the left upper trunk. (e) Clinically, the lesion is a firm dark brown papule with darker central pigmentation and regular borders. (f) The dermoscopic image of same lesion shows a pseudo-lacunar pattern with irregular, unfocused reddish-blue clods separated from each other by blurred whitish- blue lines. In addition, there is a bluish-white veil, some irregular brown globules and peripheral polymorphous vessels combined with milky-red globules. Histopathological analysis (g, h) reveals sharp delimitation and relatively preserved symmetry. Atypical melanocytes are rare at the dermo-epidermal junction and tumor cells fill the papillary dermis. A slight lymphoid infiltrate is present at the base of the lesion. These features are consistent with a metastatic lesion. H&E, Original magnifications, 50x (e) and 200x (f).