CASE REPORT

Naevus-associated lentigo maligna: coincidence or continuum?

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Abstract
Despite the high frequency of intradermal facial nevi in adults, the development of lentigo maligna (LM) within a pre-existing nevus is considered exceptionally rare. Herein we describe an emblematic case of nevus associated facial LM and discuss whether such "collision" is coincidental or a consequence of malignant transformation. Hippokratia 2011; 15 (4): 373-375

Key words: dermoscopy, melanoma, lentigo maligna, nevus, nevus-associated melano

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Evidence suggest that two extreme ends among the spectrum of melanocytic skin tumours have a significant predilection for adult facial skin, namely, intradermal naevi (Miescher type) and melanoma in situ (lentigo maligna type; LM) [1].

Besides their common anatomic predilection, these tumours differ significantly in their clinical and histopathologic features. Intradermal nevi are clinically elevated, dome-shaped lesions, histopathologically characterized by melanocytes located in the dermis. In contrast, LM is flat with melanocytes located within the epidermis[1,2].

Despite the high frequency of intradermal facial naevi in adults, the association of LM with facial intradermal naevus is considered exceptionally rare according to the published literature[3] and our personal experience. Herein we present the clinical, dermoscopic, reflectance confocal and histopathologic findings of an intradermal naevus-associated LM on the face and discuss whether this "collision" is coincidental or may represent the consequence of a malignant transformation.

Case report

A 58 year-old woman presented at our melanoma unit because she noticed a recent change of a long-standing mole on her left cheek. The patient denied having noticed the naevus since birth but she was sure about its presence since she was 20 years of age. On physical examination, the lesion appeared as a solitary, small, irregularly pigmented nodule with an eccentric, flat grey-brown area (Figure. 1a) on an otherwise normal skin without prominent signs of sun-damage (i.e., absence of solar lentigines and actinic keratoses).

Dermoscopically, irregularly distributed, thickened greyish lines and circles around the hair follicle openings (i.e., annular-granular structures) were seen, together with scattered grey dots over a light-brown background. These features were highly suggestive of an early LM (Figure. 1b);[4] however, the presence of an elevated part was somewhat conflicting and prompted us to perform further examination using reflectance confocal microscopy (RCM).

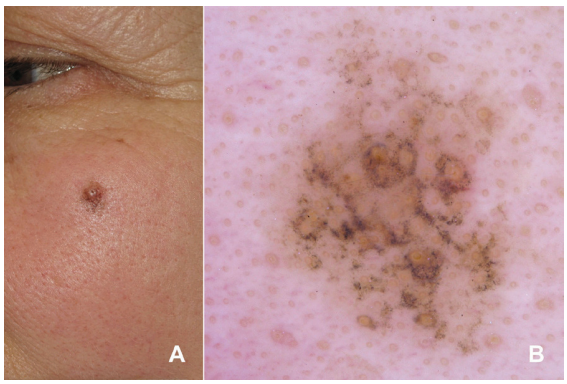

Figure 1: (A) Clinical close-up picture reveals a small, irregular pigmented nodule with a flat gray portion at the lower pole. The surrounding skin does not show prominent signs of sun damage. (B) Dermoscopic view discloses thickened grayish lines and circles around the hair follicle openings and scattered gray dots over a light-brown background.

Under RCM, "cord-like" rete ridges were seen at the level of the dermo-epidermal junction corresponding to a proliferation of atypical cells with heterogeneous reflectance. These cords were responsible for the "medusa-like" aspect typically found in the mosaic image of LM (Figure. 2a).[5] The RCM mosaic image at the spinous level revealed the presence of numerous bright dendritic cells, mostly located around the hair follicles, corresponding to atypical melanocytes (Figure. 2b). In the upper dermis some dense and homogeneous cell nests, suggesting the presence of a naevus component (Figure. 2c),[6] were also appreciated.

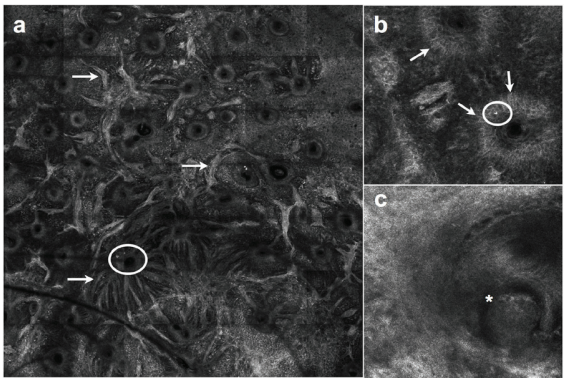

Figure 2: (a) RCM mosaic image at the level of the dermal epidermal junction. Cord-like rete ridges (arrows) are seen around the hair follicles (circle). These branching and elongated structures are composed by aggregates of atypical cells, indicating a junctional proliferation of atypical melanocytes. (b) RCM basic image at the level of the spinous layer, shows dendritic cells (arrows) and roundish cells (circle) infiltrating the hair follicles. (c) RCM basic image at the level of the upper dermis shows a dense and homogeneous nest of melanocytes (asterisk).

Based on these findings, a pre-operative diagnosis of naevus-associated melanoma in situ was made and the tumour was excised. Subsequent histopathologic examination revealed a LM overlying an otherwise banal appearing intradermal naevus of the Miescher type (Figure. 3).

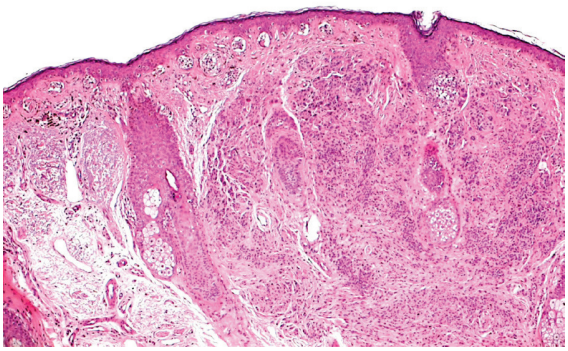

Figure 3: Histopathologic examination exhibits a proliferation of atypical melanocytes arranged in solitary units and small roundish nests along the basal layer of the epidermis. Solar elastosis and nests and cords of naevus cells around the skin appendages can be recognized in the dermis (4x magnification, H&E stain).

Discussion

The "traditional" model of melanoma progression suggests that this tumour develops through a stepwise malignant transformation process, from a common naevus to a dysplastic naevus and, finally, to melanoma in situ, which eventually becomes invasive with the potential to metastasise[7].

Mounting evidence contradicts this model as most melanomas develop de novo, while only a negligible number of naevi will ever progress towards melanoma[8,9]. Moreover, when a melanoma arises in a pre-existing naevus, the associated naevus will turn out, in most cases, to be a common naevus, often showing congenital-like features and no evidence of "dysplastic" features[10,11]. As a consequence, this model is increasingly abandoned by clinicians and researchers and replaced by new concepts[12,13].

Yet, there is no doubt that a certain proportion of melanomas may arise within a naevus. The most well documented risk of malignant transformation belongs to large congenital melanocytic naevi, whereas the risk of small congenital naevi and acquired naevi is exceedingly low[10,11]. Estimations suggest that the annual transformation rate of a single naevus into melanoma ranges from 0.0005% or less (i.e.1 in 200,000) under the age of 40 years, to 0.003% (about 1 in 33,000) in men older than 60 years[8]. Thus, the risk of any particular naevus becoming melanoma is very low, especially in younger individuals.

When melanoma develops in association with a pre-existing naevus, this occurs more frequently on the trunk of young adults with high naevus count. Conversely, older age, chronic sun-exposure but not a high number of naevi are well-known risk factors for de novo melanoma, LM type. As a consequence, one may conclude that the association between an intradermal naevus and LM in our patient is merely coincidentally.

An alternative explanation has been set forth by Tsao and co-workers[8], who proposed that the individual risk of a naevus transforming into melanoma increases with the increasing age of the naevus. Accordingly, one may assume that the older gets a person, the higher will be the risk for the development of naevus-associated melanoma.

As mentioned before, the epidemiological data do not support this view, as naevus-associated melanomas are more frequent in young adults than in elderly. Thus the question raises, how the Tsao theory can explain these epidemiological data. To answer to this question, one has to keep in mind that naevi are dynamic proliferations that appear and disappear throughout lifetime; remarkably, also the naevus patterns are age-dependent. In several studies investigating age-related naevus patterns in dermoscopy, dermal naevi typified by globular pattern were found more frequently in children and elderly, whereas a greater proportion of lentiginous-junctional naevi with reticular pattern were seen in adults[14].

These age-related differences in naevus pattern

among different age groups have led to the hypothesis that naevogenesis follows 2 distinct pathways[15]. The first, the constitutional pathway, gives rise to predominantly dermal derived naevi, which appear during childhood and usually persist for most of the lifetime. The second, the acquired pathway, is responsible for the development of flat, mainly intraepithelial naevi, which appear around puberty and usually undergo spontaneous involution after the 5th decade of life.

Taking into account that intradermal naevi develop about 15 years earlier and persist for a longer period than intraepithelial acquired naevi, makes it reasonable that they may represent the "advanced aged" naevus types as proposed by Tsao et al. owing a certain increased risk of malignant transformation, even in younger individuals[8].

In conclusion, the question remains open whether the association between naevus and melanoma is a casual or causal event. In our estimation, the risk of a single naevus transforming into a melanoma is exceedingly low. However, it seems reasonable to hypothesize, according to the Tsao theory, that most of the risk belongs to dermal naevi because of their advanced age.

Conflicts of interest: None to disclose

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