Dermatology Practical & Conceptual

Correspondence of Optical Super-High Magnification Dermoscopy with Histopathology of Melanocytic Lesions

Joanna Pogorzelska-Dyrbuś[1], Stefania Guida[2,3], Giulia Radi[4], Renato Rossi[5], Aimilios Lallas[6], Elisa Cinotti[7]

1 "Estevita" Specialist Medical Practice, Tychy, Poland
2 School of Medicine, Vita-Salute San Raffaele University, Milan, Italy
3 Dermatology Clinic, IRCCS San Raffaele Hospital, Milan, Italy
4 Azienda Sanitaria Territoriale Pesaro-Urbino, Pesaro, Italy
5 Department of Dermatology, Skin Center Senigallia, Ancona, Italy
6 First Department of Dermatology, School of Medicine, Faculty of Health Sciences, Aristotle University, Thessaloniki, Greece
7 Dermatology Unit, Department of Medical, Surgical and Neurological Sciences, University of Siena, Siena, Italy

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Corresponding Author: Joanna Pogorzelska-Dyrbuś, MD PhD, "Estevita"Specialist Medical Practice,43-100 Tychy, Poland. Phone:+48604 542 643. E-mail: jpogorzelskadyrbus@gmail.com

Introduction

Melanocytic nevi represent a wide spectrum of lesions with various histological and clinical morphology. Optical super-high magnification dermoscopy (OSHMD), reaching up to ×400 magnification of dermoscopic images, enables the observation of peculiar structures not visible with conventional dermoscopy [1,2]. The aim of this letter is to report preliminary observations related to the correspondence of OSHMD images with histopathology of melanocytic lesions. All participants provided an informed consent for the assessment of their skin lesions and the anonymized publication of the dermoscopic images.

Case Presentation

Dermal nevi (DN) show different features according to the degree of pigmentation. In slightly pigmented dermal nevi, OSHMD reveals numerous brown roundish structures with a darker rim and an internal lighter part (Figure 1A) corresponding to melanocytes in histopathology (Figure 1B). In darker pigmented DN, in addition to these roundish structures, purple multi-shaped larger pigmented structures are observed, histopathologically corresponding to melanophages (Figure 1, C and D).

Although located in the dermis, melanocytes of DN are visible under OSHMD because junctional melanocytes

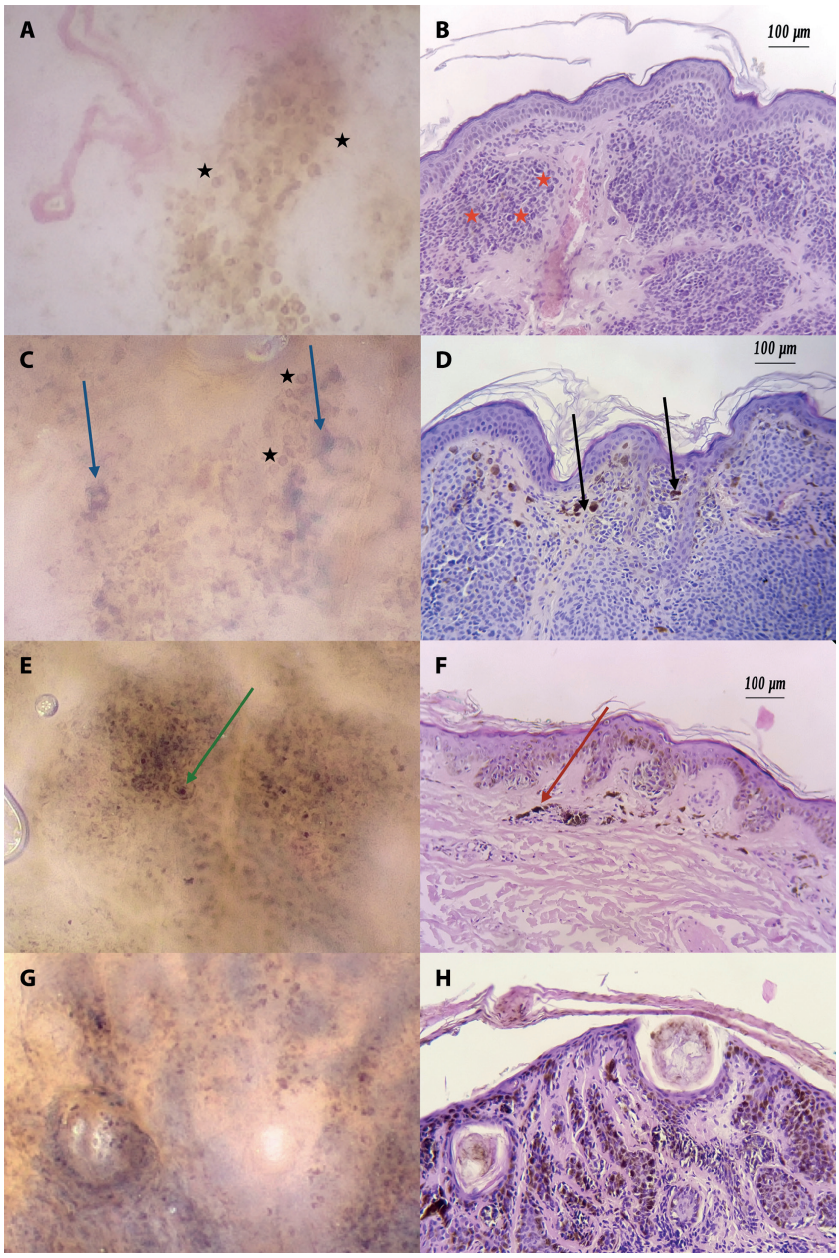

Figure 1. Correspondence between optical super-high magnification dermoscopy (OSHMD) and histopathology images of the pigmented nevi. (A) OSHMD dermal nevi (DN): numerous brown roundish structures with a darker rim and an internal lighter part (black asterisks). (B) Histopathology of DN: melanocytes visible in histopathology corresponding to the roundish structures visible in OSHMD (red asterisks). (C) OSHMD of a more pigmented DN: in addition to the roundish structures (black asterisks), purple multi-shaped larger pigmented structures are visible (blue arrows). (D) Histopathology of more pigmented DN: melanophages visible in histopathology corresponding to purple multi-shaped larger pigmented structures visible in OSHMD (black arrows). (E) OSHMD of junctional nevi (JN): many pigmented polygonal and roundish structures corresponding to keratinocytes and melanocytes. (F) Histopathology of JN: melanophages visible in the superficial dermis (red arrow). (G) OSHMD of compound nevi (CN): numerous pigmented cells (the majority probably corresponding to keratinocytes). (H) Histopathology of CN corresponding to OSHMD image.

are not activated therefore the epidermis is not pigmented, enabling the visualization of underlying melanocytes. The lighter center of melanocytes corresponds to the presence of a large nucleus.

In junctional nevi (JN), OSHMD shows many pigmented polygonal and roundish structures (Figure 1E), histopathologically corresponding to either keratinocyte and melanocytes (Figure 1F), which are difficult to distinguish with

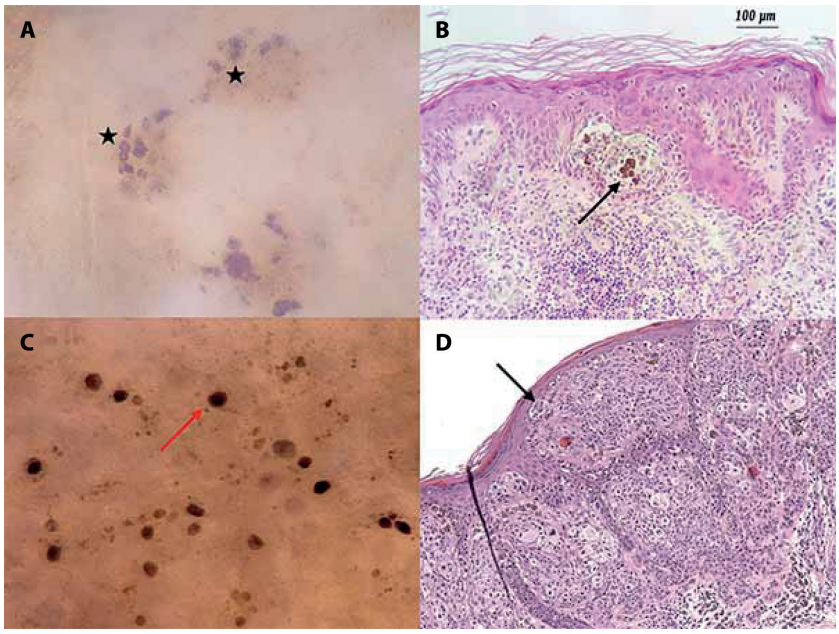

Figure 2. Correspondence between optical super-high magnification dermoscopy (OSHMD) and histopathology images of the atypical nevus and melanoma. (A) OSHMD image of atypical nevi (AN): a few grouped melanocytes, larger than round typical melanocytes, also spindle-shaped (black asterisks). (B) Histopathology of AN: atypical melanocytes (black arrow) corresponding to spindle-shaped structure in OSHMD. (C) OSHMD of melanoma (MM): atypical melanocytes larger and heterogeneous in shape and size than in benign lesions, generally seen as unevenly scattered across the lesion. These atypical melanocytes can be either spindle-shaped or round (red arrow). (D) Histopathology of MM: atypical melanocytes (black arrow) corresponding to large, scattered and heterogeneous pigmented cells in OSHMD.

OSHMD. Morphologically, keratinocytes and melanocytes are similar in size and have a diameter of 10-20 µm and 7 µm respectively [3,4]. In JN, activated junctional melanocytes produce a large quantity of melanin which is transferred to the surrounding keratinocytes. We assume that most of the pigmented cells observed under OSHMD of JN are pigmented keratinocytes because of their abundance.

In JN, it is also possible to observe melanophages under OSHMD, seen as purple structures, larger than keratinocytes and normal melanocytes, diffusely filled with melanin without a lighter central part. Melanophages in junctional nevi are histopathologically found in the superficial dermis (Figure 1F).

Compound nevi (CN) are similar to JN under OSHMD. Numerous pigmented cells are visible, the majority most probably corresponding to keratinocytes (Figure 1, G and H).

Atypical nevi (AN): In atypical nevi, some of the melanocytes are larger and, thus, distinguishable from keratinocytes under OSHMD. According to our observations, atypical melanocytes can be either round or spindle-shaped under OSHMD (Figure 2, A and B).

Melanoma (MM): As in atypical nevi, melanocytes in melanoma are larger and heterogeneous in shape and size, as previously described by Cinotti et al [5]. Moreover, they are generally seen as unevenly scattered in the lesion (Figure 2, C and D).

Conclusions

Since OSHMD enables the visualization of pigmented structures in overlapping layers of the skin, the characteristics of epidermis, such as increased thickness and pigmentation, may impair the visualization of underlying structures. Irregularity of shape and distribution of structures in OSHMD as well as in histology should be considered suspicious for melanoma.

These preliminary results provide interesting iconographic information related to typical findings in benign and malignant melanocytic lesions and their histopathologic correlations, although they should be confirmed by larger studies. Therefore, further studies should be performed to elaborate if OSHMD could be useful in distinguishing benign from suspicious melanocytic lesions.

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