Reflectance confocal microscopy of cutaneous melanoma. Correlation with dermoscopy and histopathology*

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DOI: http://dx.doi.org/10.1590/abd1806-4841.20153774

Abstract: In vivo Confocal Microscopy is a method for non-invasive, real-time visualization of microscopic structures and cellular details of the epidermis and dermis, which has a degree of resolution similar to that obtained with histology. We present a case of cutaneous melanoma in which diagnosis was aided by confocal microscopy examination. We also correlate the observed features with the dermoscopic and histopathological findings. Confocal microscopy proved to be an useful adjunct to dermoscopy, playing an important role as a method 'between clinical evaluation and histopathology'.
Keywords: Dermoscopy; Diagnosis; Melanoma; Confocal microscopy

INTRODUCTION

Cutaneous melonoma (CM) is the fastest growing cancer in the Caucasian population, and its incidence has increased significantly in recent years. The concern to make early diagnosis of CM possible stimulated the development of various non-invasive diagnostic techniques. The use of dermoscopy as an auxiliary diagnostic method has led to an improvement in diagnostic accuracy of melanoma, which increased to up to 90%.[1]

More recently, in vivo confocal microscopy (ICM), a technique that allows the visualization of microscopic structures and cellular details of the epidermis and superficial dermis, enabled the non-invasive obtention of images having a degree of resolution similar to that obtained with histology.

We describe a case of cutaneous melanoma in which diagnosis was aided by confocal microscopy examination. Moreover, we correlate the observed features with the dermoscopic and histopathological findings.

CASE REPORT

A 69-year-old female patient reported a 9-month history of a patch on the arm. Clinical examination revealed a brownish, hyperchromic, asymmetrical, 6-mm macule with irregular edges in the right deltoid region (Figure 1).

Dermoscopy showed that the lesion had an asymmetrical structure, and presented a variety of colors and structures (multi-components). The following specific features were identified: blurs, atypical pigment network with peripheral projections (pseudopods), pigmented globules and blue-gray pigmentation irregularly distributed in the lesion (Figure 2).

ICM revealed an epidermis with atypical "honeycomb" pattern, presence of round cells with bright cytoplasm and dark nucleus, and pagetoid dendritic cells (Figure 3). At the dermo-epidermal junction and papillary dermis, there were nests with heterogeneous brightness corresponding to the globules observed in dermoscopy (Figure 4). There were also large bright nucleated cells scattered in the papillary dermis, with-

Received on 16.06.2014
Approved by the Advisory Board and accepted for publication on 08.08.2014
* Study conducted at the Faculty of Medicine of ABC (FMABC) – Santo André (SP), Brazil.
Financial Support: None.
Conflict of Interest: None.

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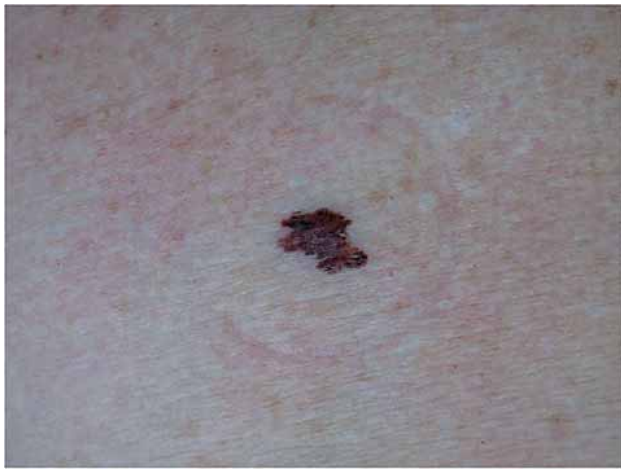

Figure 1: Brownish, hyperchromic, asymmetrical, 6-mm macule with irregular edges and variable colors in the right deltoid region

Figure 2: Dermatoscopy of the lesion. Global pattern: asymmetrical structure and varied colors and structures (multi-components). Specific features: blurs and atypical pigment network with peripheral projections (pseudopods). Pigmented cells irregularly distributed in the periphery of the lesion. Blue-gray irregularly distributed pigmentation

in the blue-gray veil area seen in dermoscopy (Figure 5). These findings corroborate the dermoscopic findings suggestive of malignancy, and suggest a probable diagnosis of melanoma.

Histopathology revealed neoplasia, characterized by the proliferation of atypical melanocytes spreading side-by-side and forming nests along and above the dermo-epidermal junction (Figure 6). We observed the presence of pagetoid cells in the epidermis (Figure 7) and the presence of small foci of tumor

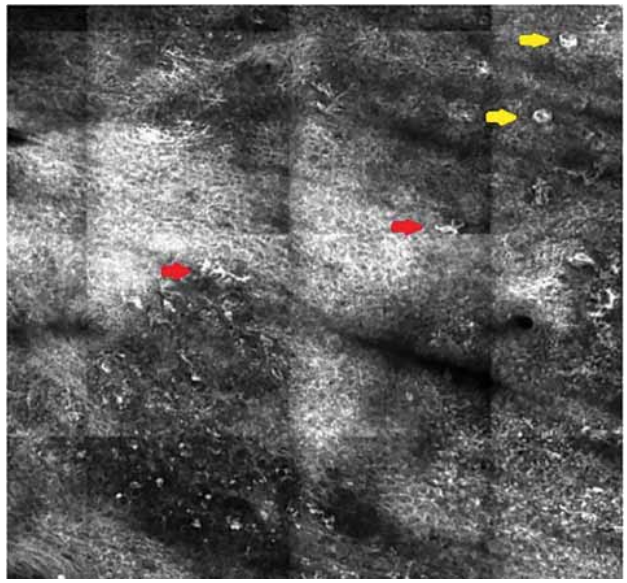

Figure 3: In vivo Confocal Microscopy: Atypical "honeycomb" pattern. Round cells with bright cytoplasm and dark nucleus (yellow arrow), and dendritic cells (red arrow) in the epidermis (pagetoid cells)

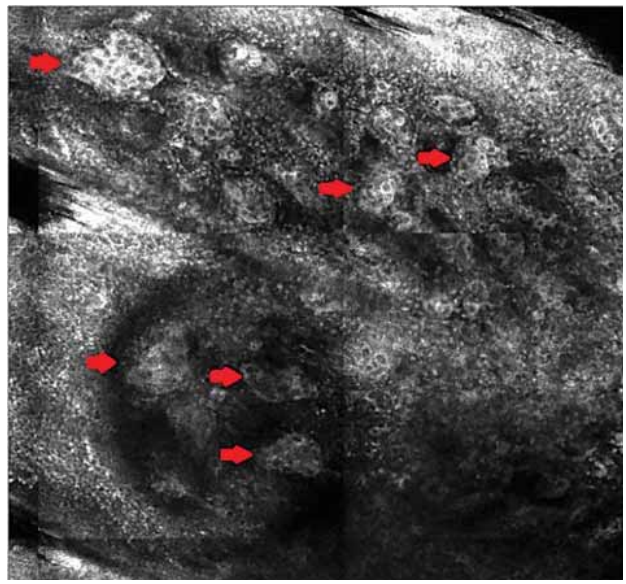

Figure 4: In vivo Confocal Microscopy: Presence of nests with heterogeneous brightness at the dermo-epidermal junction and papillary dermis (red arrow)

cells infiltrating the papillary dermis (melanophages) (Figure 8). Histopathologic examination revealed that it was a radial growth phase, extensive superficial melanoma (Breslow = 0.3 mm). In this case, it was possible to correlate the dermoscopic findings with the reflectance confocal microscopy and histopathological findings. (Figures 6,7 and 8)

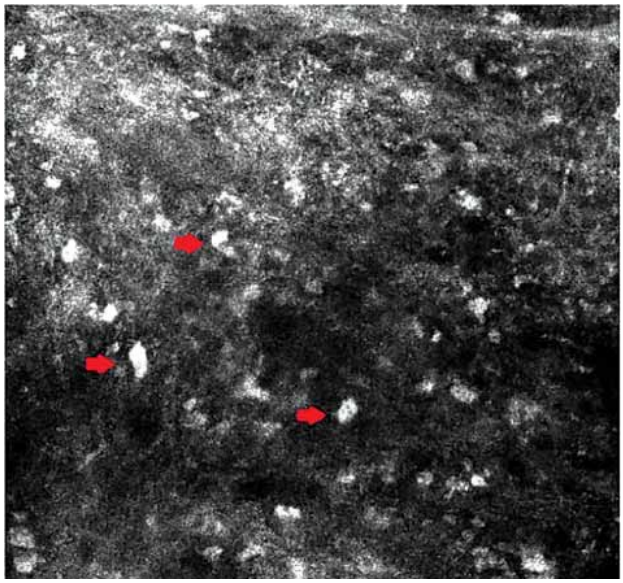

Figure 5: In vivo Confocal Microscopy: Bright cells dispersed in the dermis, corresponding to melanophages (red arrow)

DISCUSSION

In vivo Confocal Microscopy enables the visualization of the skin at cellular level and can be considered as a 'bridge' between histopathology and dermoscopy due to its high resolution. In this report of a case of CM it was possible to identify correlating patterns and features between the three methods.

Several authors have reported a diagnostic correlation between dermoscopy, histopathology and in vivo confocal microscopy of melanocytic lesions. [1-6]

As described in most studies and seen in the case reported here, the atypical pigment network observed in dermoscopy correlates with the basal cell strands creating an irregular mesh with variable brightness and dark central areas of different sizes and shapes seen in ICM.[1,2] In ICM, the presence of large cells with clear cytoplasm and dark nucleus in the epidermis correspond to the atypical pagetoid melanocytes observed in histopathology. Structures corresponding to pagetoid cells in dermoscopy are often not described as such in some studies, but rather as areas with pigmented asymmetric spots and blurs. [4,7]

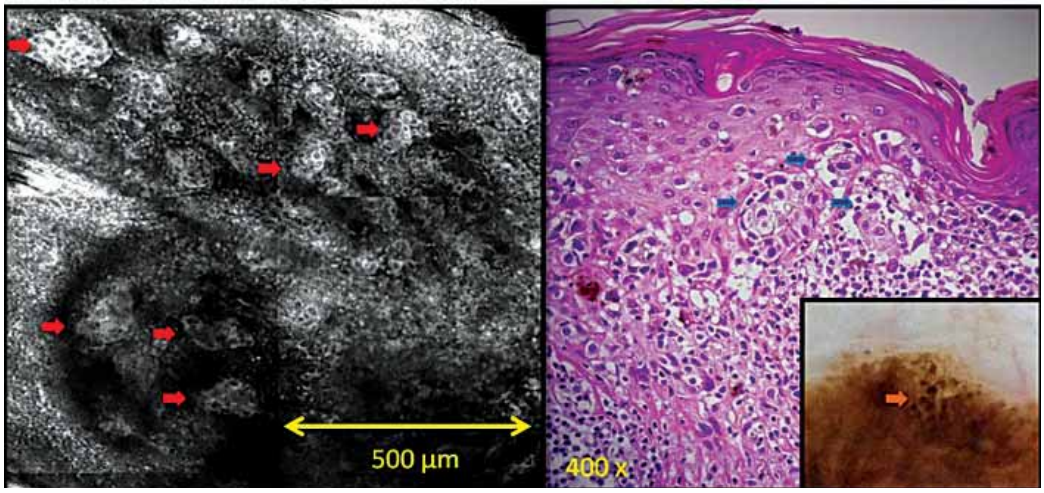

Figure 6: The heterogeneous nests of clear cells seen in ICM (red arrow) are seen in histopathology as a proliferation of atypical melanocytes arranged in irregular nests along the DEJ and papillary dermis (blue arrow)
In dermoscopy, they are seen as heterogeneous globules (orange arrow)

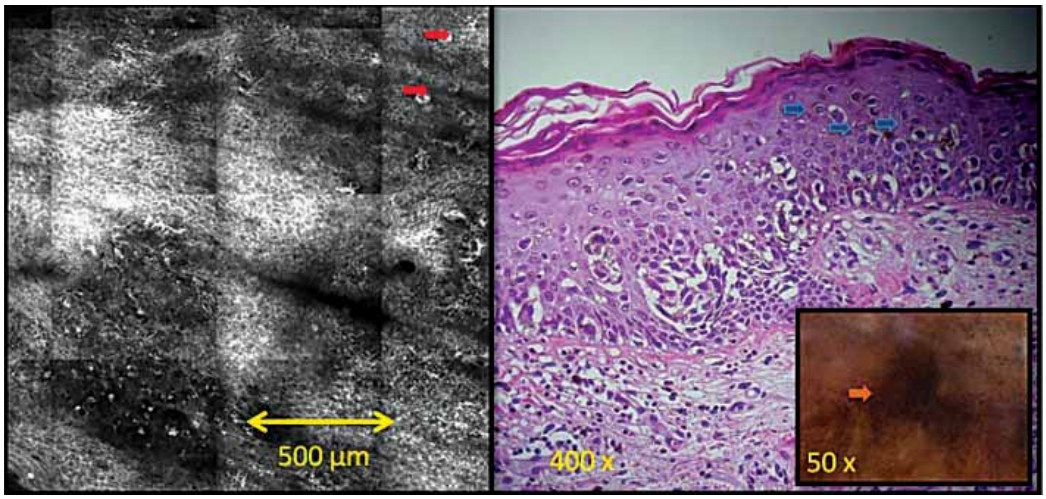

Figure 7:
In ICM, round cells with clear cytoplasm and dark nucleus located in the epidermis (red arrow) correspond to atypical pagetoid melanocytes (blue arrow) in histopathology. In dermoscopy they may be seen as blurs (orange arrow)

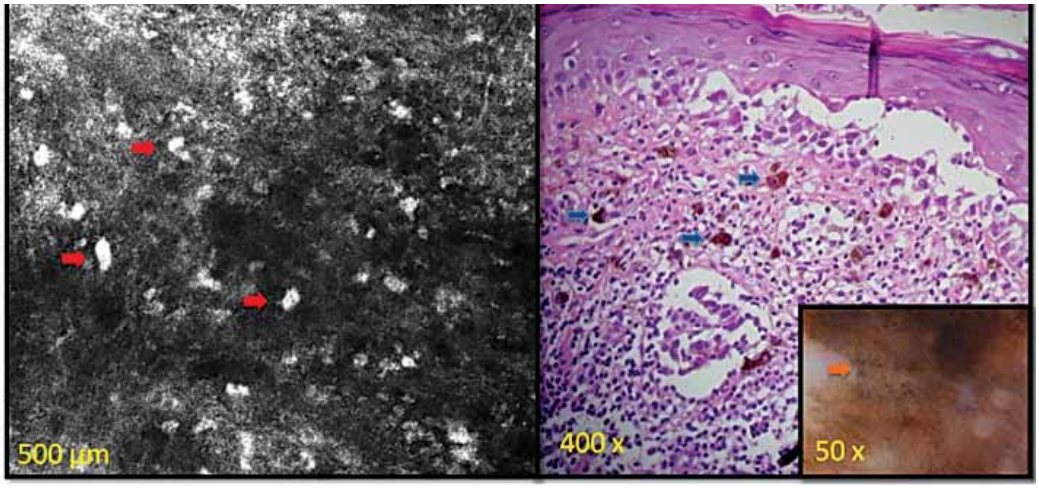

Figure 8:
In ICM, the large clear nucleated cells infliltrating the papillary dermis (red arrow) correspond to the melanophages in the papillary dermis (blue arrow) seen in histopathology. and to the blue-gray veil seen in dermoscopy (orange arrow)

Dermoscopy of the melanoma lesion showed heterogeneous and asymmetric globules, which were seen in ICM as irregular nests of poorly-defined clear cells with variable brightness at the dermo-epidermal junction and papillary dermis. The literature reports that these heterogeneous nests are present in most CM and that they correspond to the groups of pleomorphic atypical melanocytes seen in histology. [2,6,8]

The blue-gray veil seen in dermoscopy correlates to the presence of large clear nucleated cells infiltrating the papillary dermis observed in ICM. They also correspond to the melanophages invading the papillary dermis seen in histology.[1,2,4]

The improvement of diagnostic methods, such as ICM, makes the identification of melanomas that are still low-risk (Breslow <0.76mm), as in the case reported here, more frequent. The diagnosis of CM may achieve a sensitivity of 97.3% and a specificity of 72.3% in ICM. [9] The most commonly used criteria are the following: cytological atypia in the basal layer; loss of the oval shape of the papillae at the dermo-epidermal junction (DEJ); presence of rounded, bright cells in the superficial layers (pagetoid cells); heterogeneous confluent cell clusters in the papillary dermis and DEJ; and presence of nucleated cells within the papillary dermis. [5,10]

In conclusion, ICM shows good correlation with dermoscopy, aggregating cell morphology features before the histopathological examination is performed.❑

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How to cite this article: Rstom SA, Libório LS, Paschoal FM. Reflectance confocal microscopy of cutaneous melanoma. Correlation with dermoscopy and histopathology. An Bras Dermatol. 2015; 90(3):411-4.