

VISUALISATION OF VESSELS THROUGH MULTI-SPECTRAL DERMOSCOPY MIGHT AID IN DIFFERENTIATING ATYPICAL NEVI AND MELANOMA

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BACKGROUND

The role of dermoscopy and recognition of vascular patterns in the early detection of melanoma is undisputed (1). Nevertheless, the interpretation of these vascular structures sometimes remains challenging. As increased vascularization is fundamental for tumor growth, previous research using optical coherence tomography (OCT) confirmed the association between vascular pattern, malignancy and Breslow index (2,3). We conducted a study of the vasculature of clinically suspicious melanocytic lesions by means of a handheld dermatoscope with multi-spectral imaging, emitting narrowband light of different wavelengths (Barco Demetra®). Since light is absorbed by the skin chromophores at different wavelengths, the visualisation of (de)oxygenated blood in skin is theoretically ameliorated by emitting light within a wavelength of 400 to 800 nm. The results are images with an increased blood vessel contrast (blood contrast maps).

METHODS

Eighty-seven suspicious melanocytic lesions with histological confirmation - for which blood contrast maps were available - were selected. 15 lesions were excluded from the detailed evaluation as no visualisation of vessels was possible due to hyperpigmentation or poor image quality. 1 lesion did not show any blood vessels.

The images accentuating blood in skin, called blood contrast maps of 41 low-risk lesions (low-moderate dysplasia) and 30 high-risk lesions (11 high-grade dysplastic nevi and 19 melanomas (7 in situ, 9 thin melanomas (Breslow < 1mm), 3 thick melanomas (Breslow ≥ 1mm))) were evaluated.

Blood vessel patterns were classified in 3 categories: diffuse enhancement (with little dots), diffuse enhancement with homogenous pattern of dots and diffuse enhancement with different vessel patterns.

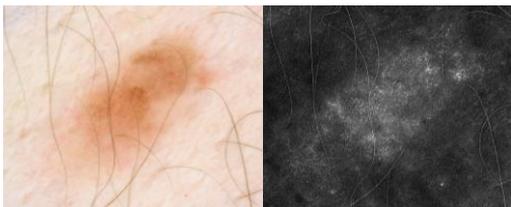


Fig. 1: dermoscopic picture and blood contrast map in a high-grade dysplastic nevus where the vasculature is accentuated in the blood contrast map, showing a diffuse enhancement and different vessel structures (dotted, linear, curved)

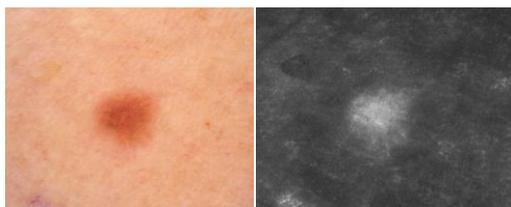


Fig. 2: dermoscopic picture and blood contrast map of a low-grade dysplastic nevus with diffuse enhancement and homogenous dotted pattern

RESULTS

A diffuse enhancement with an eventual little amount of dots, was observed in 22 low/moderate-grade dysplastic nevi, 2 high-grade dysplastic nevi and 3 melanomas. A diffuse enhancement in combination with a homogenous dotted vessel pattern was seen in 11 low/moderate-grade dysplastic nevi, 2 high-grade dysplastic nevi and 4 melanomas. Eventually, a diffuse enhancement in combination with different vessel patterns were seen in 8 low/moderate-grade dysplastic nevi, 7 high-grade dysplastic nevi and 12 melanomas. Therefore, the share of high-risk lesions is 18,5% in lesions with diffuse enhancement on blood contrast maps and an eventual little amount of dots, 35,6% if the blood contrast maps show diffuse enhancement with a homogenous pattern of dots and 70,4% of the lesions with diffuse enhancement and different vessel patterns (linear, curved, dotted) were high-risk lesions.

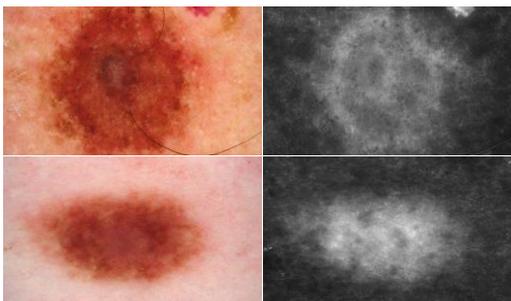


Fig. 3: dermoscopic pictures and blood contrast maps of moderate-grade dysplastic nevi, showing a diffuse enhancement with little amount of dots

CONCLUSION

Using multi-spectral imaging on histologically confirmed melanocytic lesions, we found that the diffusely enhanced lesions with or without homogenous dotted pattern was most often observed in low-risk nevi whereas lesions of which the vasculature was diffusely enhanced in combination with multiple vessel patterns were predominantly seen in high-risk lesions. These preliminary findings are similar to previously reported data based on OCT evaluation (1,2). Our data suggest multispectral images can help analyse the vascular pattern in difficult pink to moderately pigmented melanocytic lesions. Further research is warranted to further explore vessel patterns and the beneficial role of multi-spectral imaging in differentiating melanoma and clinically atypical nevi.

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