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Digital dermoscopy analysis in the diagnosis of acral and nail melanocytic tumors

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Abstract

Digital dermoscopy (epiluminiscence microscopy) is a technology for in vivo imaging of the skin used for the differentiation of pigmented skin lesions. Melanocytic tumors and pigmentations of the nails and acral skin regions represent differential diagnostic problems that can hardly be evaluated with the naked eye, especially at an early stage. Two patients with a total of three very suspicious lesions underwent dermoscopy. Clinical diagnoses were as follows: subungual hemorrhage, plantar wart (previously treated as a plantar wart several times) and acral melanoma. Dermoscopy increased the suspicion to: subungual melanoma, acral amelanotic melanoma and acral nevus, respectively. Histologic examination has verified the following diagnoses: subungual melanoma, acral lentiginous melanoma and acral junctional nevus. Dermoscopic examination of pigmented structures on the above-mentioned sites is a very useful adjunct in establishing accurate diagnosis that can help in differentiating benign from malignant lesions.

Plantar and subungual melanomas, compared with other lower extremity melanomas, are very difficult to diagnose, especially at an early stage (1, 2). Numerous studies have shown that in case of atypical presentation of acral melanoma, benign types are more frequently diagnosed (2-5).

Melanomas, nevi and pigmented lesions in the acral regions, represent an important clinical diagnostic problem related to their specific location, hindered dermoscopy examination and different interpretation criteria in regard to those applied for skin lesions on other sites (6).

Dermoscopy (epiluminiscence microscopy (ELM), *in vivo* surface skin microscopy, dermatoscopy, and videodermatoscopy) is a non-invasive diagnostic technique which provides visualization of structures under the skin surface, thus opening a whole new world of colors and structures, invisible with the naked eye (7-13). Dermoscopy is used for early diagnosis of melanocytic lesions, especially for the diagnosis of cutaneous melanoma (6-15). Also, it enables differentiation of benign and malignant pigmented skin lesions: pigmented basal cell carcinoma, seborrheic keratosis, dermatofibroma, as well as vascular and some other non-melanocytic lesions. Today, dermoscopy is a routine technique in Europe, and with growing number of practitioners using it in other countries (14).

Patients and methods

This paper presents two patients with a total of three lesions at the above-mentioned localities. Dermoscopy examination of these three lesions enabled further correct diagnosis and treatment.

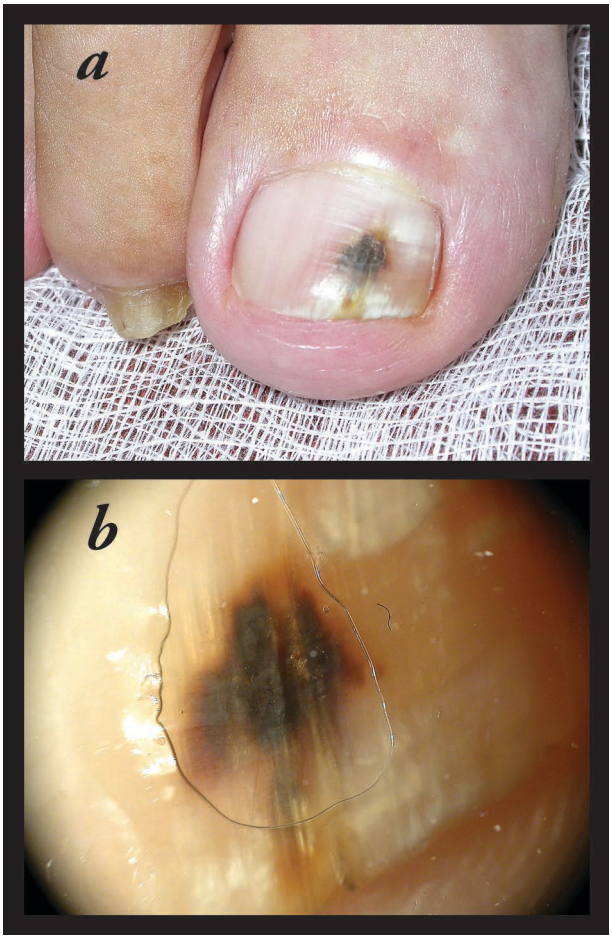

Figure 1. Subungual lesion: a) clinical appearance; b) dermoscopy

Dermoscopic images presented in this paper were obtained using the Heine Delta 10 Dermatoscope and immersion oil, 4 megapixel digital camera, Pentium IV computer and a Samsung Syncmaster 959NF monitor. The initial 10-fold magnification was raised to 60 x.

Patient No. 1

Clinical features

A female, aged 61 years, was referred for a toenail pigmentation on the right foot observed 5 months earlier. No trauma was recalled by the patient. Family and personal history for melanoma and skin cancer were negative. A dark diffuse pigmentation appeared on the great toenail 6x5 mm in size (Figure 1a).

Digital dermoscopy

Dermoscopy revealed an irregular pigmented lines, uneven in color and spacing, and some disrupted parallelisms on a brown background. The colors of the pigmented lines were: pale and dark brown, blue-grey and black (Figure 1b). There were no elements for subungual hematoma. The lesion was suspicious for subungual melanoma.

Histopathology

Histopathology confirmed an acral lentiginous melanoma.

Patient No. 2

Clinical features

A female, aged 83 years, was examined for two lesions on the left foot (Figure 2a). One lesion was located on the heel. A plantar wart was diagnosed by a dermatologist and cryotherapy with keratolytic therapy was applied. Within five weeks, two curettages were performed, and after the second curettage**,** light bleeding occurred. The patient was re-examined on the third appointment and referred to surgery because another lesion on the arch of the foot was considered to be an acral melanoma. The examination

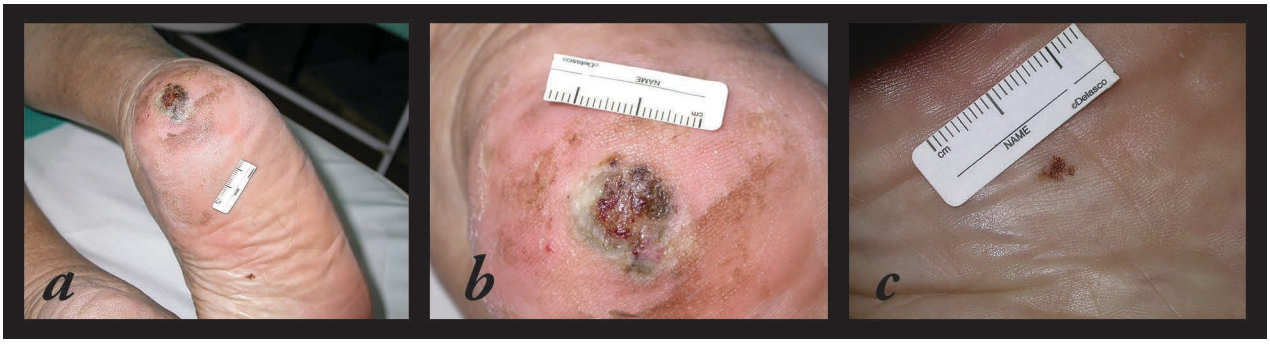

Figure 2. Plantar lesions on the same foot: a) heel and the arch; b) heel; c) arch.

in our institution revealed a heel lesion, was 19 mm in diameter. The lesion had a few smaller ulcerations with hematoma around them and black and bluish-black pigmentation on the edge (Figure 2b). The pigmented tumor on the arch of the foot was 6 mm in diameter with marked asymmetry (Figure 2c). Family and personal history for melanoma and skin cancer were negative.

Digital dermoscopy

a) Dermoscopy revealed a fresh hemorrhage and a few crusts in the center of the lesion on the heel. Abundant dark pigment might have been related to hemosiderin, but also to melanin pigmentation. On the very edge of the lesion, pigment that followed the ridges of the skin surface was observed (Figure 3a). This was the clue to suspect acral melanoma.

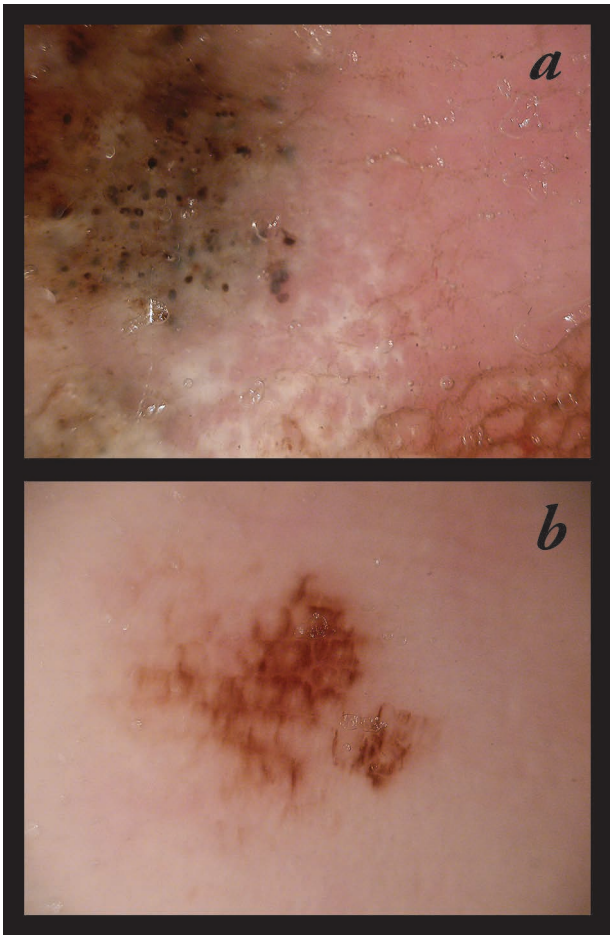

Figure 3. Dermoscopic examination of the plantar lesions on the same foot: a) heel; b) arch

b) A ladder type melanin pigment was observed on dermoscopy of the lesion on the arch of the foot. Eccrine glands ostia were visible without obliteration (Figure 3b). After dermoscopic examination, acral melanocytic nevus was suspected.

Histopathology

a) Lesion on the heel presented an acral lentiginous melanoma, Breslow thickness of 1.43 mm, Clark level III/IV with 7 mitoses per square millimetre, with lymphocytic infiltration of „brisk"-type with regression**:** large, atypical melanocytes were distributed mostly along the basal layer of the epidermis (lentiginous pattern); irregular nests at the dermal-epidermal junction and infiltrations by rare single cells were present in the upper epidermis (Pagetoid distribution) (hematoxylin-eosin stain, original magnification 100x) (Figure 4).

b) Lesion on the arch of the foot pathohistologically presented a lentiginous junctional

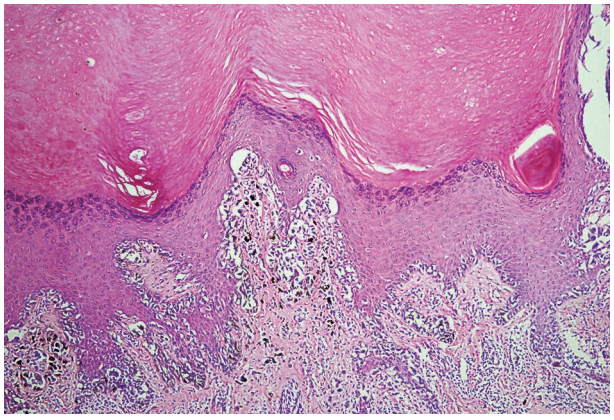

Figure 4. Histolopathology of the acral melanoma on the heel presenting lentiginous and nest-type of radial growth phase (hematoxylin and eosin x100)

melanocytic nevus.

Discussion

Acral melanoma is an anatomical term for melanoma located on the palms, soles and subungual regions. On the other hand, the frequently used term „acral lentiginous melanoma" as a synonym, includes histological specific subtypes of melanoma which is characterized by marked acanthosis, elongation of rete ridges, as well as lentiginous proliferation of atypical melanocytes in epidermis (16). So, acral melanomas

comprise both acral lentiginous melanomas, as well as superficial spreading melanomas and nodular melanomas that may develop in acral sites. Acral lentiginous melanoma is the most frequent histological subtype in acral locations (1, 3). Comparing to growing incidence of other subtypes of melanomas (17) the incidence of acral and acral lentiginous melanomas has not changed for many years (18). The total number of acquired melanocytic nevi is a significant risk factor for nonacral melanoma, but not for the acral type (18). The appearance of acral lentiginous melanoma is associated with worse prognosis, because it is often more advanced at the time of diagnosis (1, 19, 20). Acral melanomas are rare: they represent 1-3% of all melanoma cases in Caucasians (21). It presents a diagnostic challenge, disregarding whether worse prognosis of acral melanoma is connected to late diagnosis in advanced stage, or it is a tumor with more aggressive biological features. Increased mortality associated with acral melanoma requirers earlier and better diagnostics (22).

In the first patient, suspicion of subungual melanoma was established based on dermoscopic features which are characteristic for subungual melanoma - brown background and longitudinal lines of irregular thickness, spacing and coloration (23). Although several clinical criteria for early diagnosis of subungual melanoma have been proposed (24), none of the suggested clinical criteria or a combination with symptoms are significant to avoid unnecessary painful biopsies of the nail matrix that may leave dystrophic scars (25). It is especially important in the case of benign lesions and pigmentations. For now, the only improvement considering preoperative diagnosis has been achieved with dermoscopic examination. It sholud be used not only for subungual melanoma, but also for subungual hematoma, nevus, drug induced pigmentation, subungual lentigo and ethnic type of pigmentation (23).

After establishing a benign lesion (e.g. plantar wart) on the heel, aggressive treatment was performed in the second patient (22). Thick melanomas frequently occur on acral locations with an average thickness of 3.03 mm (2) and 3.31 mm (22). Breslow thickness of melanoma in our patient was 1.43 mm, which is lower than the average in the literature. It is also a fact that the existence of another lesion - acral nevus that was suspected to be a melanoma, proposed the idea of dermoscopic examination. Based on dermoscopy, suspicions of acral melanoma on the heel and nevus on the sole were confirmed. Dermoscopic criteria for acral pigmented lesions were precisely defined. Acral melanoma is dermoscopically characterized by a pigmentation that follows the ridges of the skin, or it has a non-specific pigment pattern (6, 26), whereas benign acral nevus is characterized by pigment within the sulci or it has characteristic fibrillar, globular or some other regular pigment pattern (6, 26).

The ABCD (A - asymmetry, B - border, C - colour and D - diameter) rule was introduced into the clinical diagnostics of melanoma in the eighties (7-9). Still, sensitivity of clinical diagnosis according to the ABCD rule was 65-80% and even lower in small diameter melanomas (less than 5 mm) (7-9). Small melanomas often have homogenous color and regular shape, and therefore a minimum of 25-30% of melanomas still escape clinical diagnosis (27). Addition of the E criterion (E - enlargement) has raised the sensitivity of ABCDE rule by 3-8% (10). Further steps in improving the diagnosis of melanoma have been taken to visualize the structures under the skin surface e.g. structures that were not visible by the naked eye. Introduction of dermoscopy has increased the sensitivity in melanoma diagnosis by 10-27% comparing to the sensitivity of clinical ABCD criteria (7-9).

Dermoscopy has limitations, especially in the case of very early stage melanomas without developed dermoscopic characteristics (28, 29) and false positive and false negative results (30). Because of that, dermoscopy cannot replace the gold standard – histology, but results of meta analyses point to more accurate diagnosis with the use of dermoscopy (31). Dermoscopy should be performed by experienced persons, since better sensitivity and specificity is gained, while less experienced examiners show poor results (11-13).

Dermoscopy was introduced by the Ministry

of Health, as a new, highly specialized service in the Serbian health system in September 2005. New technologies and instruments for *in vivo* melanoma diagnosis are being developed in the world. There are great expectations, not only from new dermatoscopes, but also from devices for multispectral skin analysis, confocal scanning laser microscopy, ultrasound, even experimental use of nuclear magnetic resonance (15). It is a realistic expectation that in the future, preoperative diagnosis of melanoma, melanocytic and non-melanocytic lesions, will be improved.

Conclusion

There is a need for more precise methods for the evaluation of pigmented lesions in acral locations. According to the results of numerous studies published in the last two decades, digital dermoscopy has found its place in the diagnosis of pigmented skin lesions, especially melanocytic lesions and melanomas. Our positive experience might be an example for wider employment of dermoscopy, especially digital dermoscopy, in our country.

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Digitalna dermoskopija u dijagnozi melanocitnih tumora noktiju i akralnih delova tela

Sažetak

Uvod: Digitalna dermoskopija (epiluminiscentna mikroskopija) je in vivo mikroskopija kože koja omogućava diferencijaciju pigmentnih lezija kože. Melanocitni tumori i pigmentacije noktiju i akralnih delova tela predstavljaju diferencijalno-dijagnostički problem koji se teško prepoznaje golim okom, posebno u ranom stadijumu.

Prikaz 2 slučaja. Ovo je prikaz dve bolesnice koje su podvrgnute dermoskopiji zbog ukupno 3 veoma sumnjive lezije. Njihove kliničke dijagnoze bile su sledeće: subungualni hematom, plantarna bradavica (prethodno lečena kao takva u nekoliko navrata) i akralni melanom. Dermoskopijom se došlo do sledećih rezultata: subungualni melanom, akralni amelanocitni melanom i akralni nevus. Histološkom analizom postavljene su sledeće dijagnoze: subungualni melanom, akralni lentiginozni melanom i akralni lentiginozni junkcioni nevus.

Zaključak: Dermoskopski pregled pigmentnih struktura na gore navedenim lokalizacijama veoma je korisna dodatna metoda u postavljanju tačne dijagnoze koja može da se koristi u diferencijaciji benignih i malignih lezija.

