

CLINICAL REPORT

Eccrine Poroma: A Clinical-Dermoscopic Study of Seven Cases

Angela FERRARI¹, Pierluigi BUCCINI¹, Vitaliano SILIPO¹, Paola DE SIMONE¹, Giustino MARIANI¹, Samantha MARENDA¹, Johanna H. HAGMAN², Ada AMANTEA³, Chiara PANETTA³ and Caterina CATRICALÀ¹

¹Department of Dermatologic Oncology, Santa Maria and San Gallicano Dermatologic Institute – IFO of Rome, Rome, Italy; ²Department of Dermatology, Vasa Centralhospital, Vasa, Finland and ³Laboratory of Dermatopathology, Santa Maria and San Gallicano Dermatologic Institute – IFO of Rome, Rome, Italy

Eccrine poroma can mimic benign and malignant melanocytic and non-melanocytic lesions. To date, little is known about the dermoscopic features of this condition. Seven histopathologically proven cases of eccrine poroma were examined using dermoscopy by three independent dermatologists. Both glomerular and hairpin vessels were observed in 71% of cases, whereas linear irregular vessels were observed in 43% of cases. A white-to-pink halo surrounding the vessels and multiple pink-white structureless areas were also frequently found (in 86% and 71% of cases, respectively). Three dermoscopic “profiles” were identified, all characterized by the presence of a white-to-pink halo surrounding the vessels, as well as by the association of two additional different features, namely: glomerular vessels and pink-white structureless areas, glomerular and linear irregular vessels, hairpin vessels and linear irregular vessels. However, due to the small number of lesions studied so far, we suggest that these profiles should be considered as likely, but not definitely pathognomonic signs of eccrine poroma. Key words: eccrine poroma; dermoscopy; hypo/amelanotic skin tumours.

(Accepted October 27, 2008.)

Acta Derm Venereol 2009; 89: 160–164.

Angela Ferrari, Department of Dermatologic Oncology, Santa Maria and San Gallicano Institute – IFO of Rome, Via Elio Chianesi 53, IT-00144 Rome, Italy. E-mail: angiferrari@libero.it

Eccrine poroma (EP) is a benign adnexal tumour of the uppermost portion of the intra-epidermal eccrine duct and the acrosyringium. Clinically, it appears as a single slow-growing, symptomless, soft, well-circumscribed papule, plaque or nodule, pink-to-red in colour, with a surface ranging from smooth to verrucous, occasionally ulcerated. It commonly develops at the distal extremities, such as the feet (soles), hands (palms), and fingers (1, 2). However, multiple lesions, pigmented variants (commonly observed in the non-white population) and other anatomical sites of localization, including the neck, chest, forehead, nose and scalp, have also been reported (3–5). The clinical differential diagnosis includes, among others, basal cell carcinoma, squamous cell carcinoma, hypo- and amelanotic melanoma.

It has been widely reported that dermoscopy is useful for the differential diagnosis of pigmented skin lesions (6, 7). Blood vessel patterns found by dermoscopy yield additional information for the diagnosis of poorly pigmented or amelanotic skin tumours, although the diagnosis may be difficult. In these cases, the visibility of vascular structures strongly depends on the observer’s experience and on the examination technique, which should be performed using a large amount of contact liquid (preferably ultrasound gel) with little pressure applied on the tumour. In addition, although a significant connection usually exists between a peculiar vascular pattern and a specific tumour, different lesions may display similar vascular features, and a polymorphous vascular pattern may be a sign of both melanocytic and non-melanocytic malignancy. However, variations in this pattern, including different calibres of vessels, their regular or irregular distribution within the lesion, their focal or diffuse distribution, and their combination with additional different structures, may be helpful in making a differential diagnosis (7–10).

To date, only a few authors have described the dermoscopic features of EP (11–13).

In this study we describe the dermoscopic features observed in a series of cases of EP, and compare these findings with published reports.

MATERIALS AND METHODS

A retrospective study of the clinical and dermoscopic images of EP cases, selected from the database of pigmented and non-pigmented skin lesions collected at the Melanoma Unit of Santa Maria and San Gallicano Dermatological Institute in Rome, was performed between January 2002 and December 2007.

The lesions were obtained from seven white patients, six men and one woman, with a mean age of 43 (range 40–68) years. None of them had a previous history of melanoma or non-melanoma skin cancer. The patients presented to our clinic specifically for a lesion that had developed on the sole (4/7) or the groin (1/7). They reported that the onset of the lesion had taken place one or two years before our observation, followed by a slow growth, with modifications in size and shape. Among them, 3 patients complained of itching and occasional bleeding of the lesion. In 2 out of 7 patients, symptomless lesions, localized on the back, were occasionally observed during either a first visit, or a routine follow-up visit for the prevention of malignant skin tumours.

Dermoscopic analysis was carried out with a computerized digital imaging system, consisting of a videodermoscope with a fibre-optic probe connected to a video terminal with two

magnification lenses ($\times 20$ and $\times 50$) and a Pentium IV personal computer with 17-inch monitor (Videocap 200; DS-Medigroup, Milan, Italy). The dedicated software allows the storage of the clinical and dermoscopic images of the lesions and access to the patient's database, which includes information about the patient's history of melanoma and non-melanoma skin cancers and that of her or his family. The lesions were dermoscopically examined using a large amount of ultrasound gel and applying little pressure on the tumour. Each lesion was evaluated by three independent dermatologists (CC, PB, AF), experts in dermoscopy, for the presence of the following dermoscopic features: vascular pattern, pigmented structures and additional dermoscopic features (7): a specific feature was considered present when described by at least two out of three observers. Due to the small number of cases observed, we performed only a descriptive analysis, of the frequency of each variable, i.e. a specific dermoscopic feature, and concordance rate (namely: the percentage of cases characterized by the simultaneous presence or absence of two specific variables). In addition, we evaluated the association between each variable and different locations of the lesion.

All lesions were surgically excised and histopathologically examined in order to rule out a diagnosis of melanoma or non-melanoma skin cancer.

RESULTS

Seven histopathologically proven cases of EP were collected. At clinical examination, the lesions appeared as well-circumscribed papules, plaques and nodules, pink-to-reddish in colour, with a mean maximum diameter of 0.86 mm (range 0.8–1.4 mm). Clinical differential diagnosis included viral wart, seborrhoeic keratosis, haemangioma, adnexal tumour, keratoacanthoma, basal cell carcinoma and melanoma.

In Table I, the most commonly observed dermoscopic features are reported: glomerular and hairpin vessels (Fig. 1A, B, C, E) were the most frequently seen vascular structures, each of them being found in 5 out of 7 (71%) cases, followed by linear irregular vessels (Fig. 1C) which were found in 3 out of 7 (43%) cases. In 6 out of 7 (86%) cases, the vessels were surrounded by a halo, white-to-pink in colour. Multiple pink-white structureless areas were found in 5 out of 7 (71%) lesions; in 4 of these, their shape was round-to-oval (Fig. 1A–C). Occasionally, ulceration (28%) or erosion (14%), displaying an irregular haemorrhagic area (Fig. 1 B, C, E), a globular pattern (14%), characterized by reddish-white globule-like structures (Fig. 1D), arbori-

zing-like vessels (14%), and a blue-white ovoidal area (14%), were also observed (Fig. 1C). All lesions lacked any pigmented features of melanocytic lesions, such as pigment network, aggregated brown globules, blue-whitish veil and streaks. Four out of 7 (57%) lesions were characterized by a polymorphous vascular pattern, including at least two types of vessels, whereas 3 out of 7 (43%) cases featured a single vascular structure, i.e. either glomerular vessels or hairpin vessels. When the simultaneous presence or absence of two different variables (dermoscopic features) was considered, a concordance rate of 71.4% between glomerular vessels and multiple pink-white structureless areas, as well as between glomerular vessels and linear irregular vessels, and between hairpin vessels and linear irregular vessels was observed. Therefore, three dermoscopic "profiles" were identified, all characterized by the presence of a white-to-pink halo surrounding the vessels, as well as by the association of two additional different features (i.e. glomerular vessels and multiple pink-white structureless areas, glomerular vessels and linear irregular vessels, hairpin vessels and linear irregular vessels). In addition, when we analysed the association between variables and different locations, white-to-pink halo (100% vs. 50%), glomerular vessels (75% vs. 50%), multiple pink-white structureless areas (75% vs. 50%) and reddish-white globule-like structures (25% vs. 0%), were the most frequent dermoscopic features found on the sole, whereas hairpin vessels (100% vs. 50%) and linear irregular vessels (50% vs. 25%) were the ones most frequently observed on the back. The only lesion located on the groin showed multiple round-to-oval pink-white structureless areas and a polymorphous vascular pattern consisting of glomerular vessels, hairpin vessels and linear irregular vessels, all surrounded by a white-to-pink halo.

The histopathological examinations (not shown) showed symmetrical, sharply circumscribed anastomosing bands of small, monomorphic cuboidal epithelial cells, with intercellular bridges in continuity with the epidermis, with no peripheral nuclear palisading. The dermal papillae appeared swollen and filled with several dilated vessels with thickened walls, surrounded by a fibrinoid oedematous halo and were combined with peripheral lamellar fibroplasia. These findings seemed to be more pronounced on the sole than on the back.

Table I. *Dermoscopic features of a series of seven cases of eccrine poroma*

Patients (sex/age)	Location	White-to-pink halo	Pink-white structureless areas	Glomerular vessels	Hairpin vessels	Linear irregular vessels	Reddish-white globule-like structures
1 (M/56)	sole	+	+	+	–	–	–
2 (M/48)	sole	+	+	+	–	–	–
3 (M/40)	sole	+	+	+	+	+	–
4 (M/68)	sole	+	–	–	+	–	+
5 (M/60)	back	–	–	+	+	+	–
6 (M/52)	back	+	+	–	+	–	–
7 (F/51)	groin	+	+	+	+	+	–
Lesions, n (%)		6/7 (86)	5/7 (71)	5/7 (71)	5/7 (71)	3/7 (43)	1/7 (14)

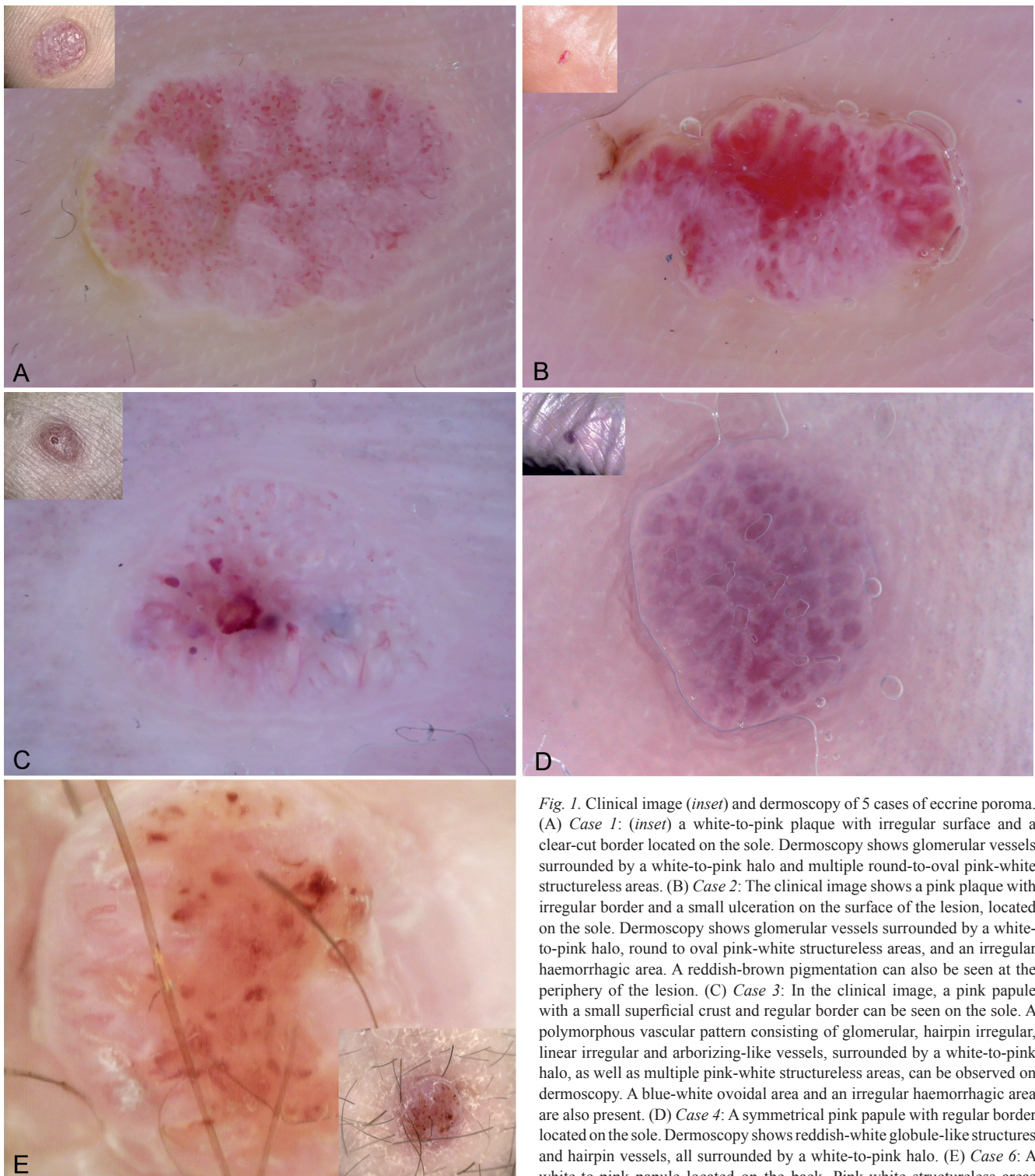


Fig. 1. Clinical image (*inset*) and dermoscopy of 5 cases of eccrine poroma. (A) *Case 1:* (*inset*) a white-to-pink plaque with irregular surface and a clear-cut border located on the sole. Dermoscopy shows glomerular vessels surrounded by a white-to-pink halo and multiple round-to-oval pink-white structureless areas. (B) *Case 2:* The clinical image shows a pink plaque with irregular border and a small ulceration on the surface of the lesion, located on the sole. Dermoscopy shows glomerular vessels surrounded by a white-to-pink halo, round to oval pink-white structureless areas, and an irregular haemorrhagic area. A reddish-brown pigmentation can also be seen at the periphery of the lesion. (C) *Case 3:* In the clinical image, a pink papule with a small superficial crust and regular border can be seen on the sole. A polymorphous vascular pattern consisting of glomerular, hairpin irregular, linear irregular and arborizing-like vessels, surrounded by a white-to-pink halo, as well as multiple pink-white structureless areas, can be observed on dermoscopy. A blue-white ovoidal area and an irregular haemorrhagic area are also present. (D) *Case 4:* A symmetrical pink papule with regular border located on the sole. Dermoscopy shows reddish-white globule-like structures and hairpin vessels, all surrounded by a white-to-pink halo. (E) *Case 6:* A white-to-pink papule located on the back. Pink-white structureless areas of irregular shape, haemorrhagic area, and hairpin vessels surrounded by a white-to-pink halo can be seen on dermoscopy.

DISCUSSION

To our knowledge, only three studies conducted so far have reported the dermoscopic features of eccrine poroma. Altamura et al. (11) published one case of eccrine poroma of the pubic region that simulated

amelanotic melanoma, both clinically and dermoscopically. In particular, a polymorphous vascular pattern, consisting of irregularly-shaped and irregularly-sized structures, pink-to-reddish in colour, and different types of vessels, (i.e. hairpin, dotted and linear irregular ones), was observed on dermoscopic examination.

Recently, Nicolino et al. (12) described two cases of EP that displayed two different patterns: one case featured a blue-white colour with an eccentric black blotch and hairpin vessels, whereas the second one was characterized by a polymorphous vascular pattern consisting of red lacunes, glomerular and linear vessels surrounded by a halo, pink-to-white in colour. Kuo & Ohara (13) described, for the first time, two cases of pigmented EP with dermoscopic features that mimicked those of pigmented basal cell carcinoma, such as blue-gray ovoid nests, blue-grey dots and arborizing vessels.

The EP lesions of our series were characterized by a vascular pattern, mostly observed over the entire surface of the tumour. Glomerular and hairpin vessels were the most frequently observed vascular structures, followed by linear irregular vessels, all surrounded by a white-to-pink halo. The reddish-white globule-like structures, occasionally seen in our series, mimicked milky-red globules/areas commonly found in melanoma, or red lacunes typical of vascular lesions (7, 10, 14). Most of our cases showed multiple round-to-oval pink-white structureless areas, reminiscent of the small multiple white scar-like patches recently found in dermatofibroma, a condition in which they have been described with a patchy distribution, combined with a delicate pigment network and related to a pronounced sclerotic fibrosis in the papillary dermis (15, 16). White-to-pink halo, the dermoscopic feature found most frequently in our cases of EP, was reminiscent of the whitish halo surrounding the vessels in keratinizing tumours and was considered to be a sign of keratinization (7, 8). However, in EP, the pink-white structureless areas and the white-to-pink halo were related to specific histopathological features, consisting of dermal lamellar fibroplasia and fibrinoid oedema surrounding several dilated vessels, respectively.

Ulceration, arborizing-like vessels and a blue-white ovoidal area observed in one of our cases of EP, mimicked some of the typical dermoscopic features of pigmented basal cell carcinoma, as also reported by Kuo & Ohara (13).

At dermoscopic analysis, the morphology and distribution of vascular structures inside the lesion may be the most important and crucial clues for the diagnosis of poorly or non-pigmented benign and malignant skin tumours. In particular, comma vessels are typical of dermal naevi, whereas arborizing vessels and crown vessels are found in basal cell carcinoma and sebaceous hyperplasia, respectively. Glomerular vessels, a variant configuration of dotted vessels, have been described as the peculiar dermoscopic vascular pattern of Bowen's disease, in which they are often distributed in clusters, mimicking the glomerular apparatus of the kidney, and combined with a scaly surface of the lesion (17).

Although hairpin vessels may be found in a variety of benign and malignant keratinizing lesions, such as seborrhoeic keratosis, viral wart, keratoacanthoma,

squamous cell carcinoma, as well as in thick melanoma, they differ in calibre, length and distribution in the different lesions. In particular, in seborrhoeic keratosis they are thin and regularly distributed within the lesion, commonly combined with specific criteria (namely: milia-like cysts and comedo-like openings); they are coarse and irregular, located at the periphery in keratoacanthoma, whose centre consists of a yellow keratin plug; instead, they are focally arranged in melanoma. In addition, in keratinizing tumours, the vessels are commonly surrounded by a whitish halo, which is absent in melanocytic lesions (7, 8).

Either a polymorphous atypical vascular pattern (linear irregular and dotted vessels) or dotted vessels alone, usually combined with a central veil, pink-to-white in colour, and/or milky red globules, and mostly located in an eccentric position at the edge of the lesion, have been described as the most frequent dermoscopic findings in hypo/amelanotic melanoma (8, 14, 18–21). Although the atypical vascular pattern and milky-red globules are highly specific for the diagnosis of melanoma, they have also been observed in other lesions, such as lichenoid benign keratosis, actinic keratosis, dermatofibroma, psoriasis, Bowen's disease, eccrine porocarcinoma, basal cell and squamous cell carcinoma, Clark naevus and Spitz naevus (9, 10, 14, 22, 23).

In conclusion, on the grounds of our observations, we believe that EP should be taken into consideration when making a dermoscopic differential diagnosis of hypo/amelanotic skin tumours. The three identified dermoscopic "profiles", all characterized by the presence of a white-to-pink halo surrounding the vessels, as well as by the association of two additional different features (i.e. glomerular vessels and multiple pink-white structureless areas, glomerular and linear irregular vessels, hairpin vessels and linear irregular vessels), may represent new dermoscopic evidence for the diagnosis of EP. In addition, on the grounds of our results, we suggest a different expression of dermoscopic criteria in relation to different locations, with a most frequent presentation of white-to-pink halo, glomerular vessels and multiple round-to-oval pink-white structureless areas in eccrine poroma lesions located on the sole, and hairpin vessels and linear irregular vessels in lesions observed on the back. However, due to the small number of lesions studied so far, we suggest that the afore-mentioned "profiles" should be considered as likely, but not definitely pathognomonic, signs of this benign neoplasm. A larger study, also including other hypo/amelanotic skin tumours, as well as a strong histopathological correlation with dermoscopic features should be conducted. Finally, since the polymorphous vascular pattern is a well-known sign of malignancy, we also emphasize that in all cases of doubtful lesions, a biopsy and histopathological examination should be performed.

ACKNOWLEDGEMENTS

We are indebted to Sperduti Isabella Biostatistic Unit, Regina Elena, National Cancer Institute – IFO of Rome, Italy.

The authors declare no conflicts of interest.

REFERENCES

1. Abenozza P, Ackerman AB. Neoplasm with eccrine differentiation. In: Ackerman B, editor. *Ackerman's histologic diagnosis of neoplastic skin disease*. Philadelphia, PA: Lea & Febiger, 1990: p. 113–185.
2. Johnson RC, Rosenmeier GJ, Keeling JH. A painful step. Eccrine poroma. *Arch Dermatol* 1992; 128: 1530–1533.
3. McCalmont TH. A call for logic in the classification of adnexal neoplasms. *Am J Dermatopathol* 1996; 18: 103–109.
4. Moore TO, Orman HL, Orman SK, Helm KF. Poromas of the head and neck. *J Am Acad Dermatol* 2001; 44: 48–52.
5. Lan CC, Yu HS, Wu CS. Pigmented eccrine poroma with enhanced endothelin-1 expression: implication for mechanism of hyperpigmentation. *Br J Dermatol* 2005; 152: 1070–1072.
6. Soyer HP, Argenziano G, Chimenti S, Ruocco V. Dermoscopy of pigmented skin lesions. *Eur J Dermatol* 2001; 11: 270–277.
7. Argenziano G, Soyer HP, Chimenti S, Talamini R, Corona R, Sera F, et al. Dermoscopy of pigmented skin lesions: results of a consensus meeting via the Internet. *J Am Acad Dermatol* 2003; 48: 679–693.
8. Kreuzsch JF. Vascular patterns in skin tumors. *Clin Dermatol* 2002; 20: 248–254.
9. Hohl RH. Pink lesions. *Clin Dermatol* 2002; 20: 289–296.
10. Argenziano G, Zalaudek I, Corona R, Sera F, Cicale L, Petrillo G, et al. Vascular structures in skin tumors: a dermoscopy study. *Arch Dermatol* 2004; 140: 1485–1489.
11. Altamura D, Piccolo D, Lozzi GP, Peris K. Eccrine poroma in an unusual site: a clinical and dermoscopic simulator of amelanotic melanoma. *J Am Acad Dermatol* 2005; 53: 539–541.
12. Nicolino R, Zalaudek I, Ferrara G, Annese P, Giorgio CM, Moscarella E, et al. Dermoscopy of eccrine poroma. *Dermatology* 2007; 215: 160–163.
13. Kuo H-W, Ohara K. Pigmented eccrine poroma: a report of two cases and study with dermoscopy. *Dermatol Surg* 2003; 29: 1076–1079.
14. Pizzichetta MA, Talamini R, Stanganelli I, Puddu P, Bono R, Argenziano G, et al. Amelanotic/hypomelanotic melanoma: clinical and dermoscopic features. *Br J Dermatol* 2004; 150: 1117–1124.
15. Karaarslan IK, Gencoglan G, Akalin T, Ozdemir F, Turkey I. Different dermoscopic faces of dermatofibromas. *J Am Acad Dermatol* 2007; 57: 401–406.
16. Zaballos P, Puig S, Llambrich A, Malvehy J. Dermoscopy of dermatofibromas. A prospective morphological study of 412 cases. *Arch Dermatol* 2008; 144: 75–83.
17. Zalaudek I, Argenziano G, Leinweber B, Citarella L, Hofmann-Wellenhof R, Malvehy J, et al. Dermoscopy of Bowen's disease. *Br J Dermatol* 2004; 150: 1112–1116.
18. Bono A, Maurichi A, Moglia D, Camerini T, Tragni G, Lualdi M, et al. Clinical and dermoscopic diagnosis of early amelanotic melanoma. *Melanoma Res* 2001; 20: 289–296.
19. Zalaudek I, Argenziano G, Kerl H, Soyer HP, Hofmann-Wellenhof R. Amelanotic/hypomelanotic melanoma: is dermoscopy useful for diagnosis? *J Deutsch Dermatolog Gesellschaft* 2003; 1: 369–373.
20. de Giorgi V, Sestini S, Massi D, Maio V, Giannotti B. Dermoscopy for “true amelanotic melanoma: a clinical dermoscopic-pathologic case study. *J Am Acad Dermatol* 2006; 54: 341–344.
21. Puig S, Argenziano G, Zalaudek I, Ferrara G, Palou J, Massi D, et al. Melanomas that failed dermoscopic detection: a combined clinicodermoscopic approach for not missing melanoma. *Derm Surg* 2007; 33: 1262–1273.
22. Blum A, Metzler G, Bauer J. Polymorphous vascular pattern in dermoscopy as a sign of malignant skin tumors: a case of an amelanotic melanoma and a porocarcinoma. *Dermatology* 2005; 210: 58–59.
23. Stolz W, Braun-Falco O, Bilek P, Landthaler M, Burgdorf WHC, Cognetta AB. Differential diagnosis of pigmented skin lesions. In: *Color atlas of dermatoscopy*. 2nd edn. Berlin, Germany: Blackwell, 2002: p. 42–57.