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Dermoscopic and Clinical Features of Cutaneous Melanoma: A Retrospective Study

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Abstract

Background: Melanoma is one of the tumors whose incidence and mortality have risen more rapidly during the last few decades in the caucasians worldwide.

Material and Methods: Twenty one cutaneous melanomas in 21 patients were evaluated retrospectively. The preoperative diagnosis was based on clinical criteria according to ABCD rule and dermoscopic criteria according to two stage diagnostic method. All melanomas were confirmed by histopathologically. All melanomas evaluated the presence or absence of global and local dermoscopic patterns as defined by the Consensus Meeting on Dermoscopy held via Internet.

Results: The 21 lesions were obtained from 14 men (age range: 19-87; mean age: 59.1) and 7 women (age range: 24-87; mean age: 63.4) ranging in age from 19 to 87 years (mean age: 60.6). There was a predilection of melanomas for the face (8 of 21; 38%). Lesions were suspected to be malignant in all cases (100%) according to the clinical ABCD criteria. The most common histological type was superficial spreading melanoma (8; 38%) followed by nodular melanoma (7; 33.3%). Fifteen of the melanomas were invasive; six were in-situ melanomas. In all cases, lesions presented melanoma-specific dermoscopic patterns. In global dermoscopic features, multicomponent pattern was observed in 7 (33.3%) of the melanomas, although other patterns were also found.

Conclusion: In our case series, we evaluate dermoscopic pattern analysis which was melanoma specific in all cases. But the true percentage of unremarkable melanomas is greater because some melanomas were resected with no clinical suspicion and without dermoscopic analysis. According to these findings, dermoscopy should be performed in all lesions with positive history or clinical suspicion or before excision even if there is no clinical suspicion.

Introduction

Melanoma is one of the tumors whose incidence and mortality have risen more rapidly during the last few decades in the caucasians worldwide [1]. Early diagnosis of melanoma is a key objective. It can be diagnosed 65% to 80% by clinically using the ABCD (asymmetry, border, color, and diameter) rule [2]. However, in the beginning of some melanomas, clinical appearance is lack all or most of the features of the ABCD and even if an expert eye can leave it out of account.

Dermoscopy is a simple, in vivo, and non-invasive technique that can be used for the diagnosis of pigmented cutaneous lesions and enhance the clinical diagnosis of melanoma by 5-30% [3, 4]. It can enable us to visualize submicroscopic structures that are not seen

Table 1. Clinicopathologic Characteristics of Our Cases

Variable	Frequency	%
Sex		
Male	14	66.6
Female	7	33.3
Site		
Face	8	38
Back	5	23.8
Trunk	4	19
Acral	3	14.3
Extremity	1	5
ABCD criterias		
Presence	16	76
Absent	5	24
Size		
<10 mm	4	19
>10 mm	17	81
Elavation		
Flat	8	38
Palpable	4	19
Nodular	9	42
Type		
SSM	8	38
NM	7	33.3
LMM	4	19
AcralM	2	9.6
Breslow thickness		
<1 mm	8	38
>1 mm	13	62
Clark level		
I	4	19
II	4	19
III	6	28.6
IV	4	19
V	3	14.3
Ulceration		
Absent	15	71.4
Present	6	28.6
Nevus		
Absent	16	76
Present	5	24

Table 2. Dermoscopic Characteristics of Our Series

Variables	Frequency	%
Dermoscopic criteria presence	21	100
Global pattern		
Multicomponent	7	33.3
Reticular	6	28.6
Non-specific	3	14.3
Reticuloglobular	2	9.5
Reticulohomogeneous	1	4.8
Homogeneous	1	4.8
Paralel ridge	1	4.8
Color		
Brown	9	42.8
Black	4	19
Blue-gray	3	14.3
White	3	14.3
Red	2	9.5
Atypical pigment network		
Absent	9	42.8
Present	12	57.2
Irregular dots		
Absent	13	61.9
Present	8	38.1
Irregular globules		
Absent	12	57.2
Present	9	42.8
Irregular streaks		
Absent	11	52.4
Present	10	47.6
Hypopigmentation		
Absent	8	38.1
Present	13	61.9
50% regression		
Absent	14	66.6
Present	7	33.3
Blueish-veil		
Absent	11	52.4
Present	10	47.6

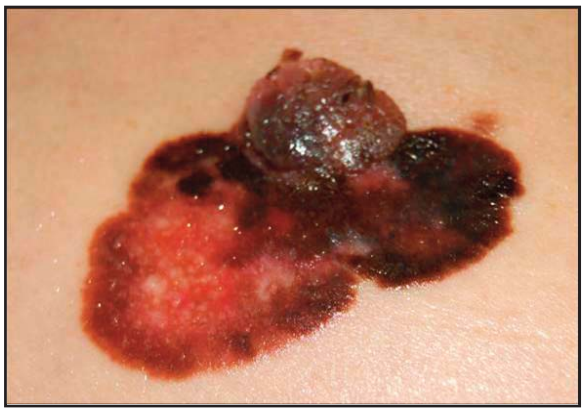

Figure 1A. A case of representative of multicomponent melanoma

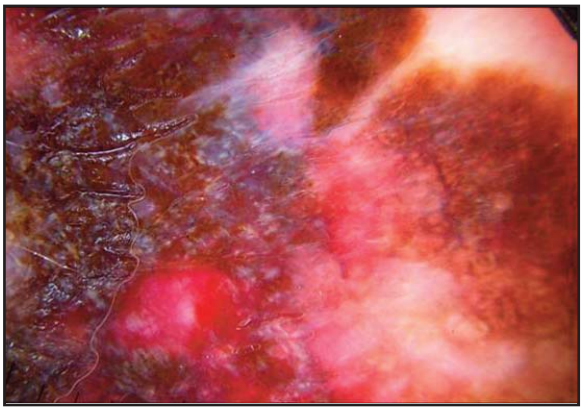

Figure 1B. Dermoscopic view of irregular pigmented network and color variation.

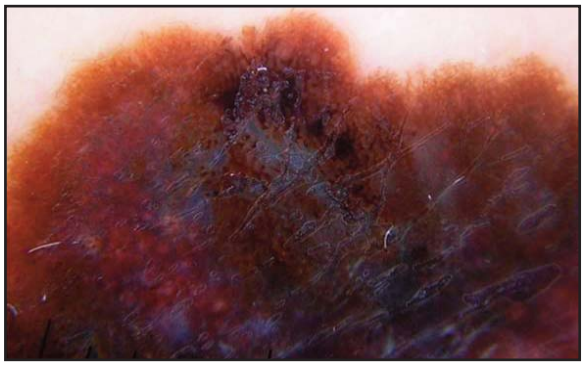

Figure 1C. Dermoscopic view of irregular pigmented network, irregular dots and globules, regression areas, blue-gray veil

by naked eye. It is based on the identification of colors and structures that show a surprisingly strong histopathological correlation. Dermoscopic structures and terminology has standardized by the Consensus Meeting on Dermoscopy and two stage dermoscopic diagnostic method designed to define whether a pigmented lesion is melanocytic or non-melanocytic in first step and, in the second step, if the lesion is melanocytic, this method define its malignant potential by using 4 different algorithms (pattern analysis, 7-point checklist, Menzies method, ABCD rule) [**5**].

In this cross-sectional retrospective study, the aim was to evaluate the dermoscopic features of cutaneous melanomas diagnosed by clinically, dermoscopily and histopathologically.

Material and Methods

Twenty one cutaneous melanomas in 21 patients who were attended to Gülhane Military Medical Academy, School of Medicine, Department of Dermatology between January 2007 and June 2010 were evaluated retrospectively. The preoperative diagnosis was based on clinical criteria according to ABCD rule and dermoscopic criteria according to two stage diagnostic method. All melanomas were confirmed by histopathologically. The clinical characteristics (age, sex, localization, size), dermoscopic features and histopathological characteristics (histologic type, Breslow thickness, Clark level, ulcerations and nevus) were recorded and all melanomas photographed by dermoscopy.

Dermoscopic images of all the melanomas obtained at the examination using dermoscopy system (Photofinder®; Bad Birnbach, Germany) and all images captured with a digital camera (Nikon® DSLR D50; Nikon, Tokyo, Japan) equipped with a dermoscopic device (Dermlite® II Pro; 3Gen, San Juan Capistrano, CA, USA). All melanomas evaluated the presence or absence of global and local dermoscopic patterns as defined by the Consensus Meeting on Dermoscopy held via Internet.

Clinicopathologic and dermoscopic structures are analyzed by descriptive statistics in order to define frequencies of these variables.

Results

The 21 lesions were obtained from 14 men (age range: 19-87; mean age: 59.1) and 7 women (age range: 24-87; mean age: 63.4) ranging in age from 19 to 87 years (mean age: 60.6). There was a predilection of melanomas for the face (8 of 21; 38%)

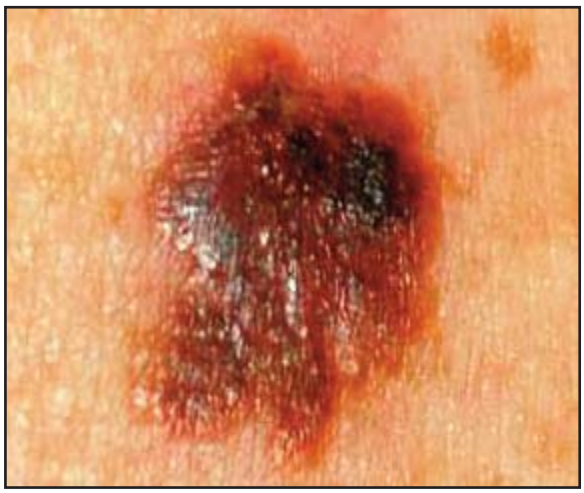

Figure 2A. A case of multicomponent melanoma with superficial spreading melanoma

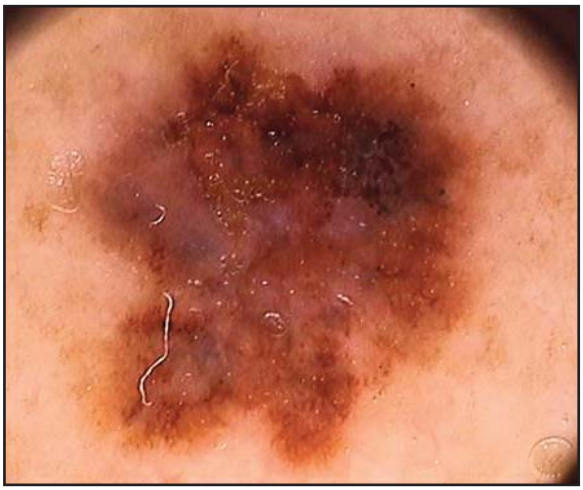

Figure 2B. Dermoscopic view

and followed by back (5 of 21; 23.8%), trunk (4 of 21; 19%), acral region (3 of 21; 14.3%) and extremities (1 of 21; 5%). Lesions were suspected to be malignant in all cases (100%) according to the clinical ABCD criteria.

The most common histological type was superficial spreading melanoma (8; 38%) followed by nodular (7; 33.3%), lentigo maligna melanoma (4; 19%) and acral melanoma (2; 9.5%). Fifteen of the melanomas were invasive; six were in-situ melanomas. Eight of them were <1 mm and 13 were >1 mm in Breslow thickness (**Table 1**).

In all cases, lesions presented melanoma-specific dermoscopic patterns. In global dermoscopic features, multicomponent pattern was observed in 7 (33.3%) of the melanomas, although other patterns were also found like reticular (6; 28.6%), non-specific (3; 14.3%), reticuloglobular (2; 9.5%), reticulohomogeneous (1; 4.8%), homogeneous (1; 4.8%), and parallel ridge (1; 4.8%) patterns. In local characteristics, we observed hypopigmented areas (61.9%), atypical pigment network (57.2%), irregular streaks (47.6%), blue-grayish veil (47.6%), irregular globules (42.8%), irregular dots (38.1%) and regression structures (33.3 %) (**Table 2**) (**Figures 1A, B and C, 2A and B, 3A and B, 4A and B**).

Discussion

Melanoma is one of the tumors whose incidence and mortality have risen more rapidly during the last few decades in the world. It is currently the fifth most frequently diagnosed cancer in men and the sixth most frequent diagnosed cancer in woman in the United States [**6**]. Early diagnosis of melanoma is a key objective and improvements in art of diagnostic technology during the last 25 years enabled us to establish more acquired melanoma diagnosis [**7,8**]. Dermoscopy is a simple, in vivo, and non-invasive technique that can be used for the diagnosis of melanocytic or non-melanocytic pigmented lesions [**9**]. This diagnostic technology enabled us to visualize submicroscopic structures with strong histopathological correlation that are not seen by naked eye. In a meta-analysis performed by *Vestergaard* et al. demonstrate that, dermoscopy has a superior diagnostic accuracy than naked-eye examination with a 15.6 times higher odds ratio [**10**].

Our aim was to evaluate the dermoscopic features of cutaneous melanomas diagnosed by clinically, dermoscopily and histopathologically. We analyzed the dermoscopic characteristics of 21 primary cutaneous melanomas of which 8 were thin and 13 were thick melanomas. There was a predilection of melanomas for the face (8 of 21; 38%) and followed by back (5 of 21; 23.8%), trunk (4 of 21; 19%), acral region (3 of 21; 14.3%) and extremities (1 of 21; 5%) in our series. In the basis of melanoma, there is a female predominance in the incidence of melanoma on the lower limb and a male predominance in the incidence of melanoma on the trunk [**11**]. According to these results, we also observed more melanomas on trunk and back due to male predominance in our case series.

In our study, the most common histological type was superficial spreading melanoma (8;

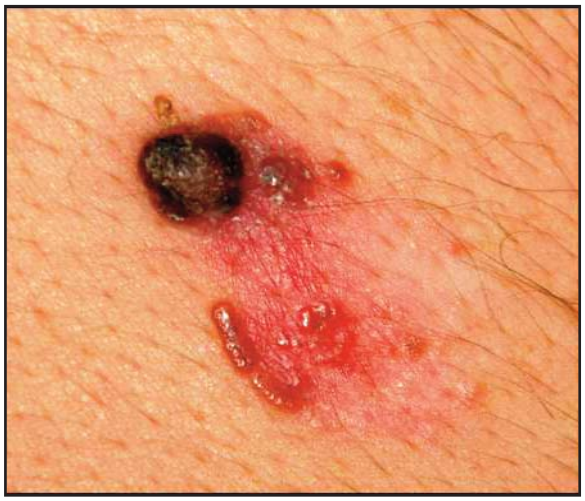

Figure 3A. A case of nodular melanoma on a back of a patient

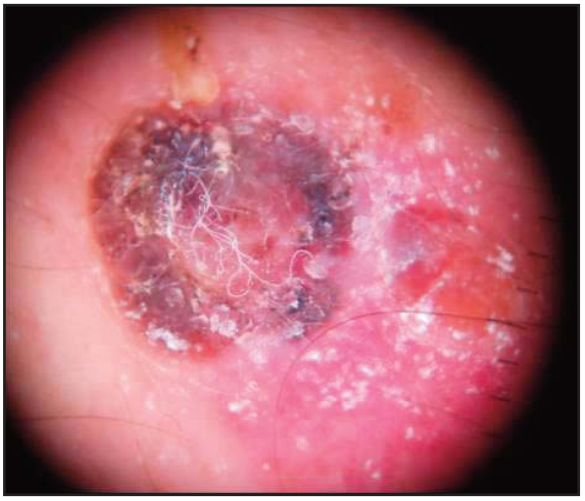

Figure 3B. Dermoscopic view

38%) followed by nodular melanoma (7; 33.3%), lentigo maligna melanoma (4; 19%) and acral melanoma (2; 9.5%). But histological types of melanomas are changing according to ethnic differences among patients. *Cormier* et al. investigated these differences in US population and reported that superficial spreading melanoma was the most common histologic subtype for all races/ethnicities including white, Hispanic, African American, American Indian and Asian/Pacific islander [**12**]. They also emphasized that acral lentiginous melanoma was more common in African American and Asian/Pacific islander. These results are supported by a recent study conducted by *Chi* et al. in Chinese population. They evaluated 522 patients with melanoma and reported that they observed 218 cases (41.8%) of acral lentiginous melanoma (ALM), 118 (22.6%) of mucosal melanoma (MCM), 103 (19.7%) of nodular melanoma (NM), 33 (6.3%) of superficial spreading melan oma (SSM), 47 (9%) of unclassifiable disease, 3 (0.6%) of lentigo maligna melanoma (LMM) in ethnic Chinese [**13**].

In dermoscopic evaluation, pattern analysis enabled us to recognize dermoscopic structures (global or local) that were melanoma specific in all (100%) cases. In a recent study, *Troya-Martin* et al. [**14**] found the melanoma specific findings in 93% of their cases. They emphasized that the true percentage of unremarkable melanomas is greater because of melanomas that were resected with no clinical suspicion and without dermoscopic analyze did not included in their study. Differences between two studies could be explained by two factors. First, we didn't perform enough dermoscopy without any clinical suspicion and second, we hadn't analyzed enough number of melanomas to encounter unremarkable melanoma.

As for global dermoscopic characteristics, the multicomponent pattern was the most common presentation, reported in 7 (33.3%) of our cases (**Figures 1A, B and C**). Multicomponent pattern is defined by presence of three or more distinct structures within the same lesion. Although it is also observed in benign lesions, these structures tend to be atypical or irregular with asymmetric distribution in melanomas [**15**]. *Troya-Martin* et al. [**14**]. also implies that multicomponent pattern was the most common pattern and their proportion (71%) was much higher than our results. These variable results could be explained by two differences between these studies. In our study we have more facial and acral lesions than their study (52.3% versus 15.5%) which reduce to encounter a multicomponent pattern in lesions. Second, in another point of view, they didn't clarified if they observed reticulohomogeneous or reticuloglobular patterns which could be over diagnosed as multicomponent pattern. In another study *Carrera* et al. investigated dermoscopic structures of early stage melanomas and reported that they didn't encounter any multicomponent pattern in their case series [**16**]. It can be assumed that melanoma is starting to form

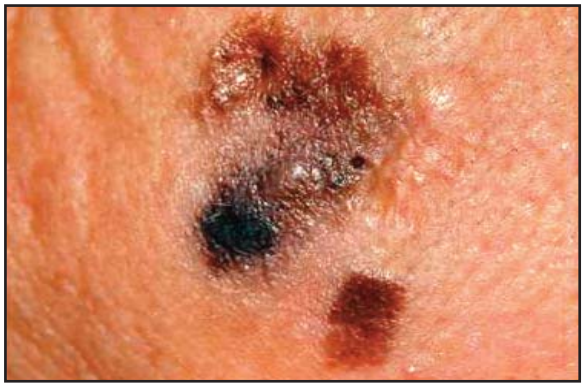

Figure 4A. A pigmented lesion of LMM on the face

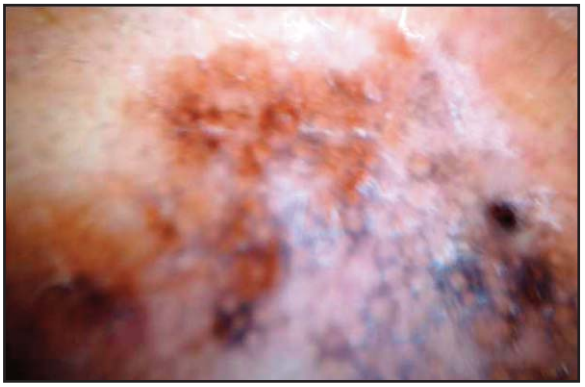

Figure 4B. Pigmented lesion showing a pseudonetwork with slate gray rhomboidal structures, and annular-granular structures

a multicomponent pattern by advancing to higher stages. Another study conducted by *Rubegni* et al. also support our results by demonstrating that melanomas greater than 1 mm thick had a great randomness in the disposition of pattern components than melanomas less than 1 mm thick [**17**]. Cases with different global dermoscopic patterns from our study were demonstrated (**Figures 2A and B, 3A and B, 4A and B**).

Non-specific global patterns were seen approximately 7-8% of the melanomas [**14, 18**]. Our data support these result with a higher proportion (14.3%) due to side specific differences of dermoscopic features as mentioned before. *Carrera* et al. also mentioned that non-specific global patterns seen 13% of early stage melanomas [**16**]. According to these studies, all clinical suspicious lesions with non-specific global patterns should be resected for histopathologic evaluation to exclude melanoma.

Besides global patterns, local dermoscopic features are very helpful to make diagnosis of melanomas. One of the most pronounced local dermoscopic features was atypical pigment network which was observed 57.2% of melanomas in our case series. Like our results, *Troya-Martin* et al. [**14**] reported that they observed this feature 57% of their case series. Atypical network is characterized by a prominent, irregular mesh-like network of variable sized, broadened, and hyperpigmented lines, with often an abrupt cut-off at the periphery [**19**]. These mesh like structures developed by melanocytic pigmentation or melanin in keratinocyte along the rete ridges. Although atypical network is observed in both melanomas and dysplastic nevi, thick and irregular mesh like structures with an abrupt cut off are more prominent in melanomas [**14, 15**]

Irregular globules and dots are brown or black spherical or ovoid structures with variable diameters. According to their size, structures less than 0.1 mm referred as dots, and structures greater than 0.1 mm referred as globules [**15**]. In our study, we observed irregular globules and dots in 42.8% and 38.1% of melanomas, respectively. Dots represent localized pigment accumulation in the epidermis. In benign lesions, dots tend to be in central position and are regular in size, shape, and distribution. In dysplastic nevi or melanomas, they also occur in the periphery or near the edge of the lesion, vary in size and shape with irregular distribution [**19**]. Globules represent nests of pigmented cells within the dermal papillae. In benign lesions, globules are regular in size and shape and quite evenly distributed, but in melanomas they tend to vary in size, color, and shape, and they are irregularly distributed and frequently found in the periphery of lesions [**19,20**]. According to these structural properties, irregular dots and globules near the edge of the lesion should be considered as high risk for melanoma.

Streaks are brown to black radially and symmetrically or asymmetrically arranged parallel linear and tapered pigmentary extensions occurring at the edges of the lesions [**19**]. Although it is also observed in benign lesions like Spitz/Reed nevus, these structures tend to be irregular distribution in melanomas. Irregular streaks may be a very subtle feature

in melanomas with a specificity up to 96% [**19**]. Histologically, streaks represent radially orientated nests of pigmented melanocytes within the epidermis and the dermoepidermal junction, with a prominent transepidermal melanin extension [**19**]. Although it was reported as an uncommon structure in melanomas, we observed irregular streaks in 47.6% of our melanomas [**14**]. According to these results, it could be assumed that irregular streaks considered as high risk for melanoma in our clinic and dermoscopy was performed more frequently in melanocytic lesions with these structures. Our findings suggested that, suspicious melanocytic lesions with irregular streaks should be considered as high risk for melanoma.

Blueish-veil is an irregularly marginated, confluent blue pigmentation with overlying, white, ground-glass haze [**15**]. Histologically, bluish-veil represents compact aggregation of pigmented tumor cells in the superficial dermis in combination with compact orthokeratosis, acanthosis and hypergranulosis [**15**]. We observed blueish-veil in 47.6% of the melanomas in our series. Like our results, *Troya-Martin* et al. [**14**]. reported that they identified this feature 42% of their series. Although it has been reported in nonmelanocytic lesions, this structure is very characteristic for melanomas [**21**]. For instance, *Ferrari* et al. reported that they observed blueish-veil in all their cases consist of limited number of patients with vulvar melanomas [**22**].

In dermoscopy, hypopigmentation refers pigment decreasing within a melanocytic lesion. In benign lesions this feature is regular and symmetrically located, but in melanomas hypopigmentation have an irregular distribution and tend to be located at the periphery [**15, 19**]. Although *Troya-Martin* et al. [**14**] identified this structure 86% of their series, we observed in 61.9% of our melanomas. In order to explain these differences and identify real frequency of this structure in melanomas, case series with large number of melanomas required.

Regression areas are white scar-like depigmentation which is often combined with blue-gray peripheral zone and peppering.2 Although regression structure in melanocytic lesions is suggestive of melanoma, it is also observed benign lesions or nonmelanocytic lesions [**14**]. Histopathologically this structure represents, irregularly distributed fibrosis secondary to infiltration of tumor nests by inflammatory cells, melanin incontinence, and dilated capillaries within a thickened papillary dermis [**19**]. According to pathogenesis, this structure could be underestimated histologically, but in lesions with more than 50% regression area histologic correlation is more evident [**14**]. In our case series, we identified regression area comprising at least 50% of the lesion in 33.3% of our melanomas. Melanocytic lesions with more than 50% regression area should be considered as high risk for melanoma. These lesions should be completely excised and dermoscopic structures should be reported to the pathologist [**14**].

In conclusion, dermoscopy is a simple, in vivo, and non-invasive technique that makes possible more accurate diagnosis of melanoma. Although we have short number of patients to make any conclusion about dermoscopic features, our data was supported by previous studies. In our case series, we evaluate dermoscopic pattern analysis which was melanoma specific in all cases. But the true percentage of unremarkable melanomas is greater because some melanomas were resected with no clinical suspicion and without dermoscopic analysis. According to these findings, dermoscopy should be performed in all lesions with positive history or clinical suspicion or before excision even if there is no clinical suspicion.

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