Original paper

Dermoscopic and clinical features of trunk melanomas

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Abstract

Introduction: Malignant melanomas account for 5% of all skin cancers and usually have a fatal clinical course. Additionally, the incidence of melanoma increases more rapidly than in any other cancer, and this has been attributed to the development of highly sensitive diagnostic techniques, mainly dermoscopy, which allows for early diagnosis. The phenotypic manifestations of gene/environment interactions, environmental factor and genetic factors may determine subtypes and anatomic localization of melanoma. Histopathologic subtypes, risk factors, and thickness of the skin are different in trunk melanomas.

Aim: To determine the frequency of dermatoscopic features in trunk melanomas. This study also investigates dermoscopic features according to the diameter of lesions.

Material and methods: Seventy-one trunk melanomas were included. Their dermoscopic and clinical images, histopathological and clinical data were assessed. The relations between the diameter, Breslow thickness and dermoscopic characteristics were evaluated.

Results: The most common dermoscopic findings of trunk melanomas were the multicomponent pattern (55 patients, 77.5%), asymmetry (62 patients; 87.3%), blue-gray veil (59 patients, 83.1%), and color variety (56 patients, 78.8%). When dermoscopic findings were compared, a multicomponent pattern (p = 0.03), milky-red areas (p = 0.001), blue-gray veils (p = 0.023), and regression structures (p = 0.037) were more common in large melanomas than in small melanomas.

Conclusions: The most common dermoscopic findings of trunk melanomas were the multicomponent pattern, asymmetry and blue-gray veil, color variety. The multicomponent pattern, milky-red areas, blue-gray veils, regression structures were statistically significant dermoscopic features in a group of large-diameter melanomas, compared to small melanomas.

Key words: dermoscopy, trunk, melanoma.

Introduction

Malignant melanoma (MM) accounts for 5% of all skin cancers but 65% of all skin cancer deaths. The MMs are rapidly progressing potentially lethal skin tumors. The incidence of MM is increasing globally day by day [1, 2]. Dermoscopy makes it possible to distinguish earlier stages of melanoma from benign lesions [3]. A few decades ago, 40 expert dermatologists discussed dermoscopic images for diagnosis and identified dermoscopic criteria of melanoma. A few algorithms were created with these criteria [4, 5].

The National Institutes of Health consensus conference on the diagnosis of melanoma has suggested the use of the ABCD checklist (asymmetry, border irregularity, color variegation, diameter > 6 mm) for the detection of melanocytic lesions. One of the major clinical criteria to describe atypical naevi and melanomas is the size of the lesion [6]. However, it has been demonstrated that melanomas smaller than 6 mm have the potential to metastasize [6]. Small-diameter melanocytic lesions do not follow the ABCD rule for diagnosis. Therefore, identification of different dermoscopic features in small melanomas is very important for early diagnosis. One of the goals of this study was to identify clues for early diagnosis of small MM, by comparing the dermoscopic features of MMs smaller than 6 mm to those of larger MMs.

Risk factors for the development of melanoma may be divided into three categories: phenotypic manifestations of gene/environment interactions, environmental factor and genetic factors [7, 8]. These factors may

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also determine subtypes and anatomic localization of melanoma [9]. For example, while superficial spreading melanoma and nodular melanoma are usually seen in patients with intermittent sun exposure on the trunk, lentigo MM is usually found in patients who are exposed to cumulative ultraviolet on the face [7–9]. According to the above information, dermoscopic findings of melanomas may also be different in terms of histopathologic subtypes, risk factors, anatomic localization.

Aim

We also aim to investigate dermoscopic features of trunk melanomas.

Material and methods

This observational, descriptive, retrospective study was conducted by three dermatologists. The dermoscopic photos of trunk melanoma taken at three participating clinics (Department of Dermatology, Kars State Hospital, Kars; Department of Dermatology, Kutahya Tavsanli State Hospital, Kutahya; Department of Dermatology, Medical University of Graz, Graz) during the period of June 2012 – November 2013 were included. The local ethic committee approved the study. Informed consent forms had been received from the patients at the first examination. For all participants, sex, age, skin type (ST) according to Fitzpatrick (FP) Scale, the data of Breslow index, location, diameter, histological subtype of lesions were collected. Only trunk melanomas were included in the study. Dermoscopic images were captured with a Canon Powershot A630 digital camera equipped with Dermlite Foto polarized dermoscope. The patterns were classified according to the patterns in the literature (Table 1) [10, 11]. Trunk melanomas were also classified as lentigo malignant melanoma (LMM), superficial spreading melanoma, nodular melanoma, and desmoplastic melanoma.

Statistical analysis

SPSS 15.0 (SPSS Inc., Chicago, IL, U.S.A.) was used in the statistical analysis with a statistical significance of $p < 0.05$. The χ^2 test was used to evaluate any differences between groups in the qualitative variables. For correlations between variables, Spearman correlation coefficients were estimated.

Results

Clinicopathological features

Seventy-one patients with trunk melanomas (26 females; 36.6%, 45 males; 61.4%) participated in the study. The median age of patients was 53 (min: 32; max: 84). The Fitzpatrick skin type of 10 patients was type 1 (14.1%), 44 (62.0%) patients with type 2, 15 (21.1%) patients with type 3, and 2 (2.8%) patients with type 4. The most common histological type was the superficial spreading type. The most commonly affected trunk locations were scapulae and shoulders.

Seventy-one lesions were evaluated with dermoscopy. The median diameter of melanomas was 8 mm (min: 3 mm, max: 32 mm). The diameter of 29 lesions was less than 6 mm. The diameter of 42 lesions was larger than 6 mm. The melanomas with a diameter of less than 6 mm were recognized as small melanomas according to the literature [6]. If the diameter of melanomas was

Table 1. Definition of dermoscopic features [24, 25]

Dermoscopic criteria	Definition
Asymmetry in two axes	Asymmetry is described as the asymmetric distribution of dermoscopic structures, colours and shape with regard to two orthogonal mirror axes crossing at the gravity centre of the lesion
Atypical pigment network	Atypical black, brown, or gray pigmented reticule, irregular distribution and thick mesh (prominent)
Atypical dots and globules	Irregular black or brown, round or oval structures of different sizes that are irregularly distributed
Blotches	Areas of unstructured brown, black, or gray asymmetrically distributed pigment
Streaks	Irregular linear structures not connected with the network lines and distributed irregularly at the periphery of the lesion. The term “streaks” includes radial streaming, radial streaks, and pseudopods. The presence of focal irregular streaks indicates malignancy
Blue-gray veil	Unstructured irregular blue-gray area with ground glass appearance. The pigmentation cannot occupy the whole lesion and usually coincides with the highest part of the lesion
Regression structures	Scar-type white depigmentation and/or blue peppered dots, which usually coincides with the flattest part of the lesion
Milky red areas	Globules and/or larger areas of fuzzy or unfocused milky-red color usually corresponding to an elevated part of the lesion
Vascular structures	Dotted vessels. Irregular linear vessels. Vessels and/or erythema in regression areas

Table 2. Characteristics of melanomas according to the diameter, invasiveness and histological subtypes

Characteristics of melanomas according to the diameter, invasiveness and histological subtypes	Small-diameter melanomas (< 6 mm)		Non-small diameter melanomas (< 6 mm)	
	n	%	*n*	%
In situ	8	27.6	5	11.9
Invasive melanomas:	21	72.4	37	88.1
≤ 1 mm	19	65.5	26	61.9
> 1 mm	2	6.9	11	26.2
Histological subtype:				
LMM	2	6.9	3	7.1
SSM	24	82.8	34	81.0
NM	2	6.9	4	9.5
DM	1	3.4	1	2.4
Total	29		42	

LMM – lentigo malignant melanoma, NM – nodular melanoma, SSM – superficial spreading melanoma, DM – desmoplastic melanoma

larger than 6 mm, they were recognized as large melanomas. All lesions had been excised. Thirteen cases were melanoma in situ. Fifty-eight patients had invasive melanomas. The median Breslow index of invasive melanomas was 0.8 mm (min: 0.3 mm, max: 2.4 mm). The characteristics of melanomas according to the diameter, invasiveness and histological subtypes are reported in Table 2.

Dermoscopic features

In all of trunk melanomas, the most common pattern type was the multicomponent pattern (55 patients, 77.5%). Asymmetry (62 patients, 87.3%), blue-gray veil (59 patients: 83.1%), and variety of colors (56 patients, 78.8%) were the most prevalent dermatoscopic findings. The following dermoscopic findings were regression structures (53 patients, 74.6%), irregular blotches (50 patients, 70.4%), irregular dots and globules (47 patients, 66.2%), atypical pigment network (43 patients, 60.6%), irregular streaks (43 patients: 60.6%), milky-red areas (39 patients, 54.9%), and atypical vascular structures (21 patients, 29.6%) (Table 3).

Table 3. Frequencies of dermoscopic findings in patients

Dermoscopic criteria	Number	Percent
Asymmetry in two axes	62	87.3
Atypical pigment network	43	60.6
Atypical dots and globules	47	66.2
Blotches	50	70.4
Streaks	43	60.6
Blue-gray veil	59	83.1
Regression structures	53	74.6
Milky red areas	39	54.9
Atypical vascular structures	21	29.6
Multicomponent structure	55	77.5
Variety of colors	56	78.8

When lesions were analyzed according to the diameter, and compared dermoscopically, the dermoscopic findings of melanomas were asymmetry in two axes (23 patients; 79.3%), atypical pigment network (20 patients; 69.0%), streaks (17 patients; 58.6%), atypical dots and globules (21 patients; 72.4%), blotches (23 patients; 79.3%), blue-gray veil (19 patients; 65.5%), regression structures (14 patients; 48.3%), milky red areas (7 patients; 24.1%), atypical vascular structures (4 patients; 13.8%), multicomponent structure (17 patients; 58.6%), and variety of colors (21 patients; 72.4%) (Table 4).

The dermoscopic findings of large melanomas are asymmetry in two axes (39 patients; 92.9%), atypical pigment network (23 patients; 54.8%), streaks (26 patients; 61.9%), atypical dots and globules (26 patients; 61.9%), blotches (27 patients; 64.3%), blue-gray veil (40 patients; 95.2%), regression structures (39 patients; 92.9%), milky red areas (32 patients; 76.2%), atypical vascular structures (17 patients; 40.5%), multicomponent structure (38 patients; 90.5%), and variety of colors (35 patients; 83.3%) (Table 4).

We found a positive correlation between the presence of the multicomponent pattern and diameter of lesions ($p = 0.03$, rs = +0.385). Additionally, there were positive correlations between milky-red areas, blue-gray veils, regression structures and diameter of melanomas ($p = 0.001$, rs = +0.455; $p = 0.023$, rs = +0.530 and $p = 0.037$, rs = +0.410). Other findings were not statistically significant for large-diameter or small-diameter melanomas (Table 4).

Table 4. Evaluation of dermoscopic findings according to the diameter of melanomas

Dermoscopic criteria	Melanomas with a diameter of less than 6 mm (*N* = 29)		Melanomas with a diameter larger than 6 mm (*N* = 29)		Value of *p*
	n	%	*n*	%	
Asymmetry in two axes	23	79.3	39	92.9	0.165
Atypical pigment network	20	69.0	23	54.8	0.169
Streaks	17	58.6	26	61.9	0.704
Atypical dots and globules	21	72.4	26	61.9	0.454
Blotches	23	79.3	27	64.3	0.097
Blue-gray veil	19	65.5	40	95.2	0.023
Regression structures	14	48.3	39	92.9	0.037
Milky red areas	7	24.1	32	76.2	0.001
Atypical vascular structures	4	13.8	17	40.5	0.097
Multicomponent structure	17	58.6	38	90.5	0.03
Variety of colors	21	72.4	35	83.3	0.151

On the other hand, we did not find any correlations between dermoscopic features and Breslow thickness in trunk melanoma.

Discussion

The MM is an aggressive skin cancer of melanocytes that proliferate uncontrollably. Dermoscopy is a method to strengthen the clinical diagnosis of melanoma [1, 2, 12]. It is an *in-vivo*, non-invasive diagnostic method that highlights color and structure in the epidermis, and makes the dermoepidermal junction and papillary dermis appear. These structures cannot be observed with the naked eye and with a magnifying glass. Dermoscopy increases the clinical diagnosis of melanoma by 10–27% based on clinical examination alone [3, 13]. The algorithms used for this purpose are pattern analysis, ABCD rules, Menzies algorithm, the algorithm of Argenziano (7-point checklist) and 3-point checklist [4, 5, 14].

In this study we investigated asymmetry, atypical pigment network, atypical dots and globules, blotches, streaks, blue-gray veil, regression structures, milky-red areas, vascular structures, variety of colors, and multicomponent structure with dermoscopy in trunk melanomas. The most common pattern was the multicomponent pattern. The multicomponent pattern is a combination of 3 or more dermoscopic structures (Figure 1). In this study, the multicomponent pattern was seen in 77.5% of patients while 3% of patients had a reticular pattern. Five percent of patients had a globular pattern. Two percent of patients had a homogeneous pattern. Twelve percent of patients had a nonspecific pattern. Although reticular, globular, homogeneous patterns are usually seen in benign lesions, irregular forms of these patterns can be found in melanomas. In another study, the multicomponent pattern was found in 71% of patients, and the nonspecific pattern was seen in 7% of patients [11]. In still another study, the nonspecific pattern was observed in 8% of patients, which was similar to our study [14]. Therefore, if the clinical history supports melanoma like itching, bleeding, discoloration, the lesion should be removed.

Sometimes it is difficult to distinguish atypical naevi from melanomas. Therefore, we need new dermoscopic descriptors. For example, the term "mistletoe sign" is suggested as a new descriptor of the melanoma *in situ* and the inflammatory melanocytic junctional nevus [15]. Although we did not observe this finding in our study, it seems to be important to follow up melanocytic lesions.

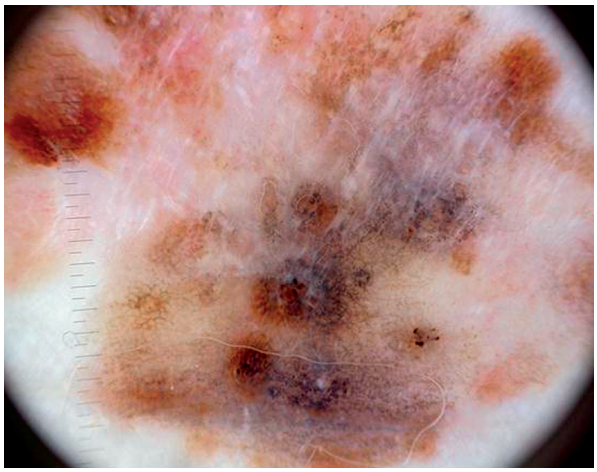

Figure 1. Anatomic location: abdominal area. Histopathologic subtype: superficial spreading melanoma. Breslow thickness 0.5 mm, AJCC 2009: T1a, mitoses < 1/mm². Diameter: 32 mm. Dermoscopic features: asymmetry, multicomponent structure, atypical pigment network, atypical dots and globules, blue-gray veil, blotch, regression structures

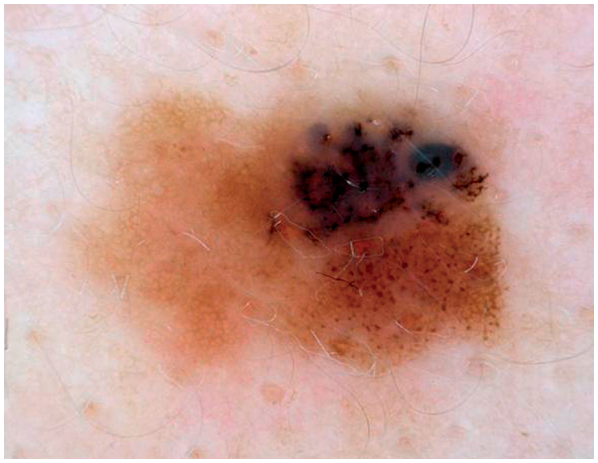

Figure 2. Anatomic location: shoulder. Histopathologic subtype: melanoma *in situ*. Breslow thickness < 0.5 mm, mitoses < 1/mm², AJCC 2009: T1a. Diameter: 8 mm. Dermoscopic features: asymmetry, atypical dots and globules, streaks, blue-gray veil

In this study, the most common local dermoscopic findings were asymmetry (62 patients; 87.3%), blue-gray veil (59 patients; 83.1%) and variety of colors (56 patients; 78.8%). Asymmetry is a dermoscopic finding that is defined 96% in melanomas, our study was similar to the literature [16] (Figures 1, 2).

In this study, blue-gray veil was observed 83.1% of patients. This finding is an important dermoscopic finding in the diagnosis of invasive melanomas (Figures 1, 2). Blue-gray veil is a diffuse pigmentation that colors change between gray-blue-white. It does not cover the entire surface of the lesion. In melanomas, it covers regression areas. It histopathologically corresponds to orthokeratosis and hypergranulosis. In our study we observed it in 83.1% of patients. Regression structures appear as scar-type white depigmentation and/or blue peppered dots that usually coincide with the flattest part of the lesion. In melanomas they are usually irregular. In this study, scar-type depigmentation was found in 32.3% of patients. Blue peppered dots, one of the regression structures, were observed in 42.3% of patients in our study. These results were consistent with the literature [14, 17].

The presence of at least three colors was observed in 85% of melanomas and at least five colors are found in 40% of melanomas [16]. In this study, we observed at least 3 colors in 78.8% of melanomas, and at least five colors in 36.2% of patients (black, gray blue, red, dark brown, light brown). Invasion may be related to the increasing variety of colors [18].

Irregular dots and globules (47 patients, 66.2%), irregular blotches (50 patients, 70.4%), irregular streaks (43 patients, 60.6%), atypical pigment network (43 patients, 60.6%) were the other dermoscopic findings (Figures 1, 2). Irregular dots and globules are black, brown, round or oval structures that are of various sizes, and show irregular distribution. In a study performed by de Troya-Martín *et al.*, the ratio of atypical dots (62%) and globules (68%) were similar with our study [11]. Irregular streaks are brown, black, bulbous or finger-like, distributed irregularly at the periphery of the lesion. Irregular streaks were seen in 20% of participants in a study by de Troya-Martin *et al.* [11]. Gkalpakiotis *et al.* investigated 71 thin melanomas (< 1 mm), and observed these structures in 68 patients [19]. Irregular blotches are areas of unstructured brown, black, or gray asymmetrically distributed pigment. These structures were found in 84% of patients by de Troya-Martin *et al.* [11].

Milky-red areas show increased tumor vascularity. Although it is not a common finding, the specificity is very high (77.8%) [20]. In this study, milky-red areas were observed in 39 patients (54.9%). In many studies, especially in thin melanomas atypical vascular structures are a rare finding [21, 22]. In this study, it was seen in 29.6% of patients.

In this study, including 71 patients with melanomas, melanomas were divided according to the diameter (less than 6 mm, larger than 6 mm). The ratio of blue-gray veil, regression structures, milky-red areas and multicomponent structures were statistically different between two groups. A multicomponent structure, blue-gray veil, regression structures and milky-red areas were observed less in small melanomas. In a study, Seidenari *et al.* observed that asymmetry, variety of colors, irregular dots and globules, regression areas, atypical vascular structures, blue-white veil were less common in small melanomas. An atypical pigment network and irregular blotches are more common findings in melanomas with a small diameter [23]. In our study, although there is no statistical difference between two groups, these two findings were seen more common in small-diameter melanomas as a percentage. In another study performed by Pupelli *et al.*, small melanomas and naevi were analyzed. They observed atypical vessels, irregular pigmentation, irregular dots/globules, presence of peripheral streaks, presence of regression in small melanomas more often than naevi [6]. In our study we observed these findings in small-diameter lesions, too. Small melanomas may cause diagnostic mistakes under clinical, dermoscopic and histopathological examination. Therefore, new technology devices may be help diagnose small melanomas like confocal microscopy. Confocal microscopy is a new imaging tool that provides *in vivo* histopathological analysis of the skin [6]. If dermoscopy and confocal microscopy are used together, the diagnosis of small melanomas may be easier. We also observed that 58 of 71 trunk melanomas (81.7%) were invasive melanomas. The reason for this might be difficult self-examination of the trunk lesions, and visiting the dermatologist too late. Trunk melanomas are usually seen in patients who are exposed to intermittent UV. Intermittent UV exposure might also increase

the risk of invasive melanoma more than cumulative UV exposure.

Further studies are needed to clarify these differences.

Conclusions

The most common dermoscopic findings are the multicomponent pattern, asymmetry and blue-gray veil, and color variety. We found correlations between the diameter of melanomas and the multicomponent pattern, blue-gray veil and milky red areas. These results suggest that we should be careful with the lesions which do not have these dermoscopic characteristics when the diameter of the lesion is small. Additionally, we observed the multicomponent pattern, blue-gray veil and milky-red areas in small melanomas more than in large-diameter melanomas. Therefore, if we do not see these three findings in a lesion on the trunk, we should investigate more carefully other melanoma-specific dermoscopic findings.

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