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Dermatoscopic features of cutaneous non-facial non-acral lentiginous growth pattern melanomas

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ABSTRACT

Background: The dermatoscopic features of facial lentigo maligna (LM), facial lentigo maligna melanoma (LMM) and acral lentiginous melanoma (ALM) have been well described. This is the first description of the dermatoscopic appearance of a clinical series of cutaneous non-facial non-acral lentiginous growth pattern melanomas.

Objective: To describe the dermatoscopic features of a series of cutaneous non-facial non-acral lentiginous growth pattern melanomas in an Australian skin cancer practice.

Method: Single observer retrospective analysis of dermatoscopic images of a one-year series of cutaneous non-facial, non-acral melanomas reported as having a lentiginous growth pattern detected in an open access primary care skin cancer clinic in Australia. Lesions were scored for presence of classical criteria for facial LM; modified pattern analysis ("Chaos and Clues") criteria; and the presence of two novel criteria: a lentigo-like pigment pattern lacking a lentigo-like border, and large polygons.

Results: 20 melanomas occurring in 14 female and 6 male patients were included. Average patient age was 64 years (range: 44-83). Lesion distribution was: trunk 35%; upper limb 40%; and lower limb 25%. The incidences of criteria identified were: asymmetry of color or pattern (100%); lentigo-like pigment pattern lacking a lentigo-like border (90%); asymmetrically pigmented follicular openings (APFO's) (70%); grey blue structures (70%); large polygons (45%); eccentric structureless area (15%); bright white lines (5%). 20% of the lesions had only the novel criteria and/or APFO's.

Limitations: Single observer, single center retrospective study.

Conclusions: Cutaneous non-facial non-acral melanomas with a lentiginous growth pattern may have none or very few traditional criteria for the diagnosis of melanoma. Criteria that are logically expected in lesions with a lentiginous growth pattern (lentigo-like pigment pattern lacking a lentigo-like border, APFO's) and the novel criterion of large polygons may be useful in increasing sensitivity and specificity of diagnosis of these lesions. Further study is required to establish the significance of these observations.

Introduction

Cutaneous lentiginous growth pattern melanomas have been traditionally recognized in the literature as being either lentigo maligna/lentigo maligna melanoma (LM/LMM) of the head and neck, or acral lentiginous melanoma (ALM) of the palmar and plantar skin. They are commonly quoted to comprise about 5% each of all melanomas. Cutaneous lentiginous growth pattern melanomas may, however, occur more frequently than previously thought [1,2]; and in areas of warm climate, high ultraviolet light intensity (UVLI) and predominantly outdoor lifestyles it is logical to expect that lentiginous growth pattern melanomas, particularly of the LM/LMM type, may occur with increased frequency on non-facial and non-acral sites than in cooler and lower UVLI climates.

The dermatoscopic criteria for the detection of facial LM/LMM and of ALM are well established, and these features correlate with the unique histological structure of facial skin (absence of rete ridges and presence of numerous pilosebaceous units) [3] and plantar and palmar skin (ridge and furrow structures) [4,5]. Some dermatoscopic features of non-acral, non-facial lentiginous growth pattern melanomas have recently been described in a report [6], and these and other features may be important in detecting these lesions in geographic regions where they may be expected to occur. As the traditional dermatoscopic criteria for detection of melanoma have been developed in temperate climates and weighted toward the detection of invasive lesions (mainly superficial spreading melanoma [SSM] growth pattern), they may miss detection of non-acral non-facial lentiginous growth pattern melanomas.

Additionally, a study of pigmented lesions in an Australian primary care series demonstrated that the first-step criteria of the traditional two-step algorithms lacked specificity in identifying lesions as melanocytic, thus additional diagnostic criteria may be helpful to differentiate cutaneous non-facial non-acral lentiginous growth pattern melanomas from other lentigo-like lesions [7].

Objective

This study aims to describe the features of a series of cutaneous non-facial, non-acral lentiginous growth pattern melanomas seen in an open access primary care skin cancer clinic over a one-year period.

Method

Clinical data, histopathology records, clinical and dermatoscopic images and Skin Cancer Audit and Research Database [8] records for all cutaneous melanomas detected over a one-year period in an open access primary care skin cancer practice in coastal regional Australia were reviewed. All lesions had been submitted for histology and were reported by any of six different pathologists, three each from two dermatopathology practices. All lesions had been photographed dermatoscopically with a Nikon CoolPix 4500 digital camera (Nikon Corporation, Tokyo, Japan) coupled to a Dermlite II Pro HR dermatoscope (3Gen LLC, San Juan Capistrano, California).

All facial and acral lesions were first excluded. Histopathology reports of the remaining lesions were then reviewed. Only those reported as having a lentiginous growth pattern were included and the following types of lesions were excluded: lesions with an SSM growth pattern (predominantly nested and pagetoid spread growth pattern; lesions with a mixed lentiginous and SSM growth pattern; lesions with rare growth patterns; and lesions with unspecified growth patterns.

The following data was then extracted from the patient records of the included cases: patient age, patient sex, site of lesion, Breslow thickness.

Dermatoscopic images of the lesions that met the inclusion criteria were reviewed by the author and scored for the presence or absence of: criteria used for facial LM [3]; criteria of Chaos and Clues [9]; presence or absence of a global appearance of lentigo-like pigment pattern lacking lentigo-like border; and presence or absence of large polygons.

A lentigo-like pigment pattern was defined as any combination of light brown structureless pattern, curved lines ("fingerprinting") or fine lines reticular. A lack of lentigo-like border was defined as the lesion border not being sharply defined.

Large polygons have been previously defined informally by the author [10]. They are polygonal geometric shapes larger than the perifollicular rhomboidal structures previously described for facial LM and are formed by straight lines. The lines are grey or light brown (which on high magnification themselves may be formed by multiple fine dots) or are formed by the straight edge of a junction between lighter and darker areas of the lesion. These shapes may be complete (Figure 1) or incomplete (Figure 2) or may be formed by a coalescence of smaller geometric structures. They may be subtle and are best appreciated at lower magnification.

Results

Over the study period, a total of 66 cutaneous melanomas were detected in the practice. The inclusion criteria were met by 20 lesions on 20 patients. Excluded from the study were acral or facial lesions (n=18) and non-facial non-acral lesions which lacked a lentiginous growth pattern (n=28). The histological growth patterns of the excluded non-facial non-acral lesions were: SSM pattern (n=13); mixed pattern (n=11); growth pattern not specified (n=3); and desmoplastic (n=1).

There were 14 female and 6 male patients; average patient age was 64 years (range: 44-83). Lesion distribution was:

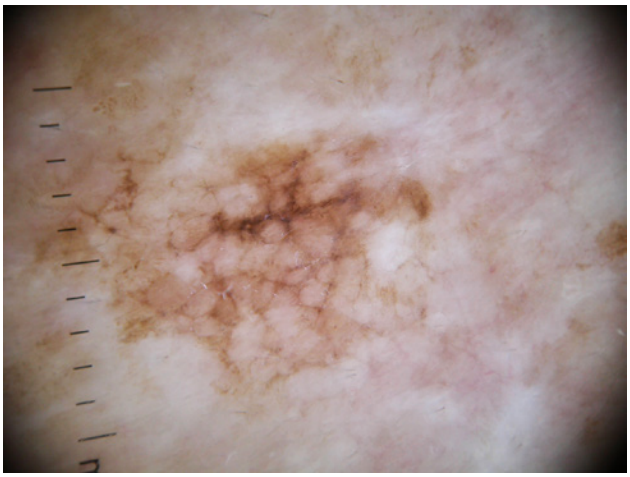

Figure 1. An 8 x 11 mm diameter lentiginous growth pattern melanoma showing multiple complete large polygons. [Copyright: ©2014 Keir.]

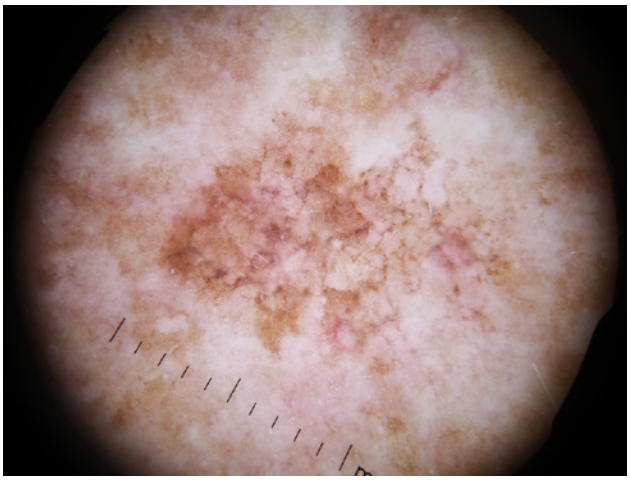

Figure 2. A 13 mm diameter lentiginous growth pattern melanoma showing complete and incomplete large polygons. [Copyright: ©2014 Keir.]

trunk 35%; upper limb 40%; and lower limb 25%. There were two thin invasive melanomas with the remainder being in-situ. The incidence of dermatoscopic criteria identified in the series was: chaos 100% (n=20); lentigo-like pigment pattern lacking a lentigo-like border 90%; asymmetrically pigmented follicular openings (APFO's) 70% (n=14); grey blue structures 70% (n=14); large polygons 45% (n=9); eccentric structureless area 15% (n=3); bright white lines 5% (n=1) (see Table 1). Twenty percent of all lesions had only the novel criteria and/or APFO's. Examples of lesions and key dermatoscopic features are illustrated in Figures 1 to 5.

Discussion

The coastal regions of northern Australia have a high UV index, year round warm climate, a largely Caucasian population and an outdoor sporting lifestyle. The local government region in which the clinic is located has the highest reported incidence of invasive melanoma in the world, with an age adjusted annual incidence of 100:100,000 per year for the 2004-2008 period [11]. Chronic ultraviolet (UV) exposure occurs here not just on the head and neck but on the trunk and limbs. It is thus not surprising that there was a high incidence of cutaneous non-facial non-acral lentiginous growth pattern melanomas in this series, comprising 30% of all melanomas detected in the one-year period. If the facial lesions with a lentiginous growth pattern are included, cutaneous lentiginous growth pattern melanomas comprise 58% of melanomas seen in the practice over the study period, far higher than the traditionally quoted figures of 5%.

Histologically, cutaneous lentiginous growth pattern melanomas are comprised of a poorly circumscribed proliferation of atypical melanocytes at the dermoepidermal junction, usually with confluence and often showing follicular involvement by the atypical melanocytes. Nesting, bridging of rete ridges and pagetoid spread may be occasionally present but are not prominent features, although the latter has been described in some lentiginous melanomas [12,13,14]. They frequently occur on sun- damaged skin where there may be varying degrees of epidermal and dermal atrophy as well as elastosis; lentigo maligna is the label used in this context.

By their very nature they do not demonstrate many of the classical dermatoscopic features of melanoma: brown and black dots require pagetoid spread; thick lines reticular require preservation of rete ridges as well as bridging of rete ridges; pseudopods and radial lines require cords of cells to form [15, 16]. When in situ, they will not exhibit a large range of colors.

The dermatoscopic features of cutaneous non-facial non-acral melanomas with a lentiginous growth pattern should

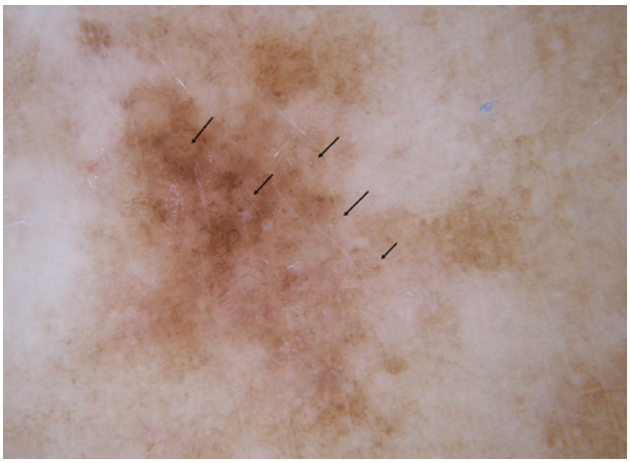

Figure 3. Dermatoscopy of case 13. This 6 mm diameter thin invasive melanoma shows a lentigo-like pigment pattern (light brown structureless and lines curved) and lacks a defined lentigo like border. Arrows indicate multiple APFOs as eccentrically pigmented light brown and/or grey circles. [Copyright: ©2014 Keir.]

TABLE 1. Results showing demographics, site, Breslow thickness and positive dermatoscopic criteria by case. [Copyright: ©2014 Keir]

ID	Sex	Age	Site	Breslow Thickness	Dermatoscopic features*						
					Chaos	Lentigo-like, lacking lentigo-like border	APFOs†	Polygons	Grey structures	Eccentric structureless area	White lines
1	F	73	Arm	in situ	x	x		x	x		
2	F	69	Back	in situ	x	x	x	x			
3	F	54	Back	in situ	x	x	x				
4	F	54	Chest	in situ	x	x			x		
5	M	68	Forearm	in situ	x	x	x		x		
6	F	55	Back	in situ	x	x	x		x		
7	F	69	Arm	in situ	x	x		x	x		
8	F	80	Leg	in situ	x	x			x	x	
9	F	65	Thigh	in situ	x	x	x		x		
10	F	46	Back	in situ	x		x			x	x
11	M	59	Back	0.45 mm	x				x	x	
12	M	78	Back	in situ	x	x	x		x		
13	F	44	Forearm	0.29 mm	x	x	x	x	x		
14	M	70	Thigh	in situ	x	x		x			
15	F	59	Back	in situ	x	x	x	x			
16	M	67	Leg	in situ	x	x	x	x	x		
17	M	65	Arm	in situ	x	x	x		x		
18	F	57	Arm	in situ	x	x	x				
19	F	63	Arm	in situ	x	x	x	x	x		
20	F	83	Forearm	in situ	x	x	x	x	x		

*Note: The following dermatoscopic features were not seen in any lesion:
Classic LM features: rhomboidal structures.
Chaos and Clues features: Lines thick reticular, lines thick branched, pseudopods or lines radial segmental, black dots or clods peripheral, polymorphous vessels.

†Asymmetrically pigmented follicular openings

be able to be logically predicted from their histological description: the modest proliferation of melanocytes at the DEJ predicts a light brown color whose pattern will reflect preservation or otherwise of the rete ridges; the poor circumscription predicts that the lesion will not have a sharply defined edge; and follicular involvement predicts APFOs. It is known that melanomas are immunogenic tumors, often provoking a host response: if there has been regression, there will be grey structures—usually grey dots and clods.

In many respects these lesions may thus clinically resemble solar lentigines or lichen planus-like keratoses and often will occur on patients whose chronic UV exposure has resulted in a background assortment of many solar lentigines from which any lentiginous growth pattern melanoma must be distinguished.

The presence of geometric structures in melanoma has been previously described: rhomboidal structures in facial lentigo maligna [3,6], the geometric cutaneous sign [17], and a "zig-zag" pattern in facial lentigo maligna [18]. The presence of the large polygons defined by straight lines and often centred around follicles remains to be explained and verified, but may be due to regression phenomena.

Although cutaneous in-situ lentiginous growth pattern melanomas are said to have a low rate of progression to invasion of much less than 1% per year [19], 10% of the lesions seen in a one-year period in this practice were invasive. Application of the criteria of lentigo-like lesion without lentigo-like border, APFO's and large polygons to non-facial non-acral lesions may result in an increased detection of these melanomas before they become invasive.

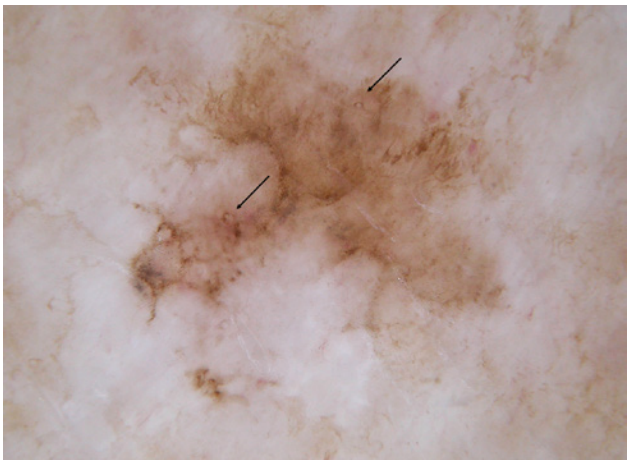

Figure 4. Dermatoscopy of case 16. This 4.5 mm diameter melanoma in situ shows a lentigo-like pigment pattern (light brown structureless and lines curved) and lacks a defined lentigo like border. There are multiple complete and incomplete large polygonal shapes of varying sizes formed by lines composed of fine brown dots. Arrows indicate multiple APFO's as eccentrically pigmented light brown and/or grey circles. [Copyright: ©2014 Keir.]

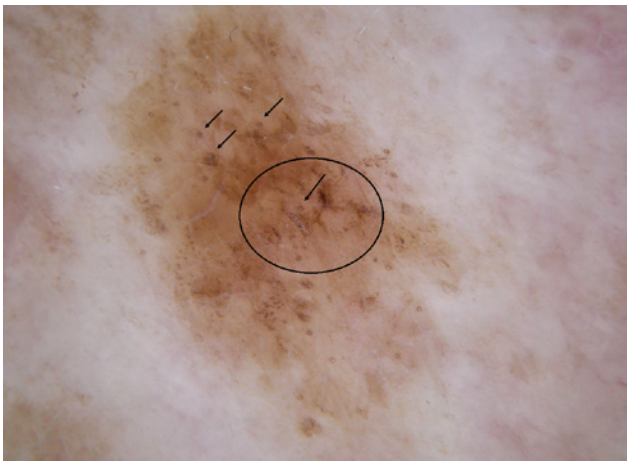

Figure 5. Dermatoscopy of case 19. This 4 x 7 mm diameter melanoma in situ shows a lentigo-like pigment pattern (light brown structureless and lines curved) and lacks a defined lentigo like border. In the center of the lesion, indicated by the circled area, there are multiple complete and incomplete large polygonal shapes of varying sizes formed by lines composed of fine brown dots. Arrows indicate multiple APFO's as eccentrically pigmented light brown and/or grey circles. [Copyright: ©2014 Keir.]

Limitations

Retrospective, single observer, single center study.

Conclusion

Cutaneous non-facial non-acral lentiginous growth pattern melanomas may lack traditional melanocytic criteria, or in the case of presence of network, the melanocytic criteria present may lack specificity. The global criterion of lentigo-like pigment pattern lacking a lentigo-like border, combined with the criteria of APFO's and large polygons detected the great majority of these lesions. One in five of the lentiginous melanomas in the study lacked any previously described dermatoscopic criteria for diagnosis of non-facial melanoma.

In a warm high UV climate, cutaneous non-facial non-acral lentiginous growth pattern melanomas may be more common than previously reported and may possibly progress to invasion at a greater rate than previously reported. These additional dermatoscopic criteria may be helpful to increase early detection of these lesions.

Further multi-observer study with a larger series is required to verify these conclusions.

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