

Differentiating malignant melanoma from other lesions using dermoscopy

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Dermoscopy (also called *dermatoscopy*, *epiluminescent microscopy*, or *episcopy*) is a noninvasive method of examining skin lesions using a handheld magnifying device (a dermoscope) equipped with a light source.¹ Dermoscopy allows adequate visualization of the structures in the skin not only by magnifying them but also by eliminating the surface light reflection and scatter that obscures the deeper features.^{2,3} This article provides information on the dermoscopic features specific to malignant melanoma and other pigmented lesions that often resemble malignant melanoma via naked-eye examination (ie, benign melanocytic nevus [BMN], seborrheic keratosis, and dermatofibroma).

Technique

Before evaluating the lesion of interest using dermoscopy, the clinician should take an adequate history and evaluate the morphology and distribution of the lesion with the naked eye.¹ Dermoscopy is then performed by applying the dermoscope on the lesion of interest and looking through the lens to visualize the morphologic features of the skin lesion (**Figure 1**). Dermoscopy should never be used alone, and the dermoscopic result should be correlated with that of the naked-eye examination.

The cost of a dermoscope ranges from a few hundred to a few thousand dollars. Dermoscopes with polarized and nonpolarized light are available, but the nonpolarized light instruments require water or oil to be applied to the lesion and need direct placement of the dermoscope on the skin lesion for proper visualization.¹ The newer generation of dermoscopes employ a polarized light source that obviates the need for fluid coupling and allows for no-contact visualization (**Figure 1**).¹

Approach

Seborrheic keratosis and dermatofibroma can be diagnosed based on their specific dermoscopic features (**Figure 2** and further discussed below). In most instances these lesions are easy to diagnose and are rarely confused with nevi or melanoma. Once seborrheic keratosis and dermatofibroma are excluded, the diagnosis of a melanocytic lesion (malignant melanoma or BMN) should be considered. The so-called 3-point checklist should be applied to differentiate between a melanocytic nevus and melanoma and to decide if the lesion should be biopsied or not.⁴ This checklist includes the following dermoscopic features: structural symmetry, presence of atypical pigment network, and blue-white structures (**Figure 3** and further explained below).

Figure 1. Image depicting proper dermoscopic technique: This is a polarized light dermoscope and does not require direct contact with the skin or application of oil.




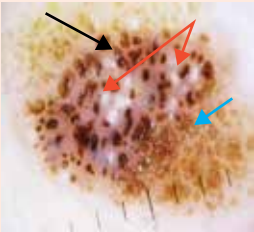


The presence of 2 or more of the above features suggests a suspicious lesion that should be biopsied or that the patient should be referred for further assessment.⁴

Conditions

Seborrheic keratosis. To the naked eye, seborrheic keratosis (**Figure 2A**) appears as a verrucous, well defined, dull-brown plaque or papule. Seborrheic keratosis has the following dermoscopic features: diffuse pigmentation, ridges and fissures, crypts, milialike white cysts, and moth-eaten borders.^{2,3} Milialike white cysts are numerous, white to yellowish round structures that are found scattered within the lesion. Crypts are dark-brown oval pores mimicking enlarged hair follicle openings. Often, seborrheic keratoses have ridges and fissures (sulci and gyri) resembling the surface of the brain, and hence called *brainlike structures*. A “moth-eaten border” is a sharply demarcated indentation in the border of the lesion resembling a bite.² Not all features are present simultaneously in the lesion, but the presence of at least 3 features allows seborrheic keratosis to be recognized with confidence.

Dermatofibroma. Dermatofibromas are common benign fibrous nodules caused by fibroblast proliferation (**Figure 2B**). They appear pink to light brown in colour and can occur on many areas of the body but most commonly appear on the legs and arms. The characteristic clinical feature is the “dimple sign,” where the lesion seems to

Figure 2. Clinical and dermoscopic images with features for A) seborrheic keratosis and B) dermatofibroma

CONDITION	CLINICAL IMAGE	DERMOSCOPIC IMAGE	DERMOSCOPIC FEATURES
A) Seborrheic keratosis			<ul style="list-style-type: none"> • Follicularlike openings (black arrow) • Milialike white cysts (red arrow) • Ridges and fissures and sulci and gyri (blue arrow) • Moth-eaten borders
B) Dermatofibroma			<ul style="list-style-type: none"> • Central scarlike white patch (green arrow) • Peripheral pigment network

sink below skin surface when gently squeezed between the examiner's fingers.² The characteristic dermoscopic features for dermatofibroma include a central white area resembling scar tissue (**Figure 2B**). Pigment might be diffused but sometimes might be arranged in a faint pigment pseudonetwork, which should not be confused with the true pigment network of a melanocytic lesion.²

Benign melanocytic nevus. Benign melanocytic nevus is a benign melanocytic proliferation and might closely resemble malignant melanoma on clinical examination (**Figure 3A**).³ Benign melanocytic nevi show overall structural symmetry in all axes. Pigment in BMN can be arranged as a network or as globular structures, resembling a cobblestonelike pattern.² The globular pattern is mostly seen in children or very young individuals and will not further be discussed here. The typical pigment network of BMN is also symmetric and shows gradual fading and thinning toward the outer edges of the lesion.^{2,3} The colour of BMN varies from light brown to very dark brown, and there are no blue or scarlike white areas in the lesion.


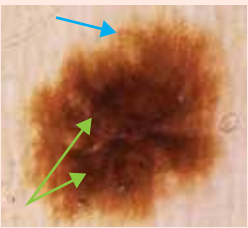

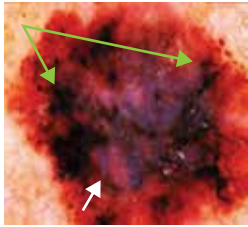
Malignant melanoma. Malignant melanoma is a deadly skin cancer of the melanocyte. The ABCDE criteria of melanoma (ie, asymmetric shape, border irregularity, colour variation [white, red, brown, blue-gray, and black], diameter greater than 6 mm, and evolution in appearance) are commonly used to examine a lesion of interest in a naked-eye examination.^{3,5} The easiest way to screen for

malignant melanoma using dermoscopy is to employ the 3-point checklist and evaluate for the following features: asymmetry (overall asymmetry due to variation in thickness and structure of the pigment network, the presence of white [scarlike] areas of tumour regression, or asymmetrically distributed pigment globuli), atypical pigment network (thickened branches and lack of thinning and fading toward the periphery), and blue-coloured areas (**Figure 3B**).^{2,4} More than 1 of these 3 features present in any lesion suggests the possibility of malignant melanoma, and the lesion should be biopsied and followed up or the patient should be referred to a dermatologist.⁴

Discussion

Dermoscopy improves sensitivity for detecting skin cancer, compared with using the naked eye alone, and is a helpful supplemental diagnostic tool in primary practice.^{2,3} This article provides an overview of the dermoscopic features for malignant melanoma and other similar pigmented lesions including BMN, seborrheic keratosis, and dermatofibroma. The 3-point checklist discussed in this article is primarily based on a simplified pattern recognition process and is intended to be used by novice dermoscopists as a screening technique with the purpose of differentiating malignant melanoma from BMN. A limitation of dermoscopy is that adequate training and maintenance of the skill is a prerequisite for success. Dermoscopy should not replace the clinical examination, but should be used as an adjunct to history and naked-eye examination. Any pigmented lesion

Figure 3. Clinical and dermoscopic images with features for A) benign melanocytic nevus and B) malignant melanoma

CONDITION	CLINICAL IMAGE	DERMOSCOPIC IMAGE	DERMOSCOPIC FEATURES
A) Benign melanocytic nevus			<ul style="list-style-type: none"> • Symmetric colour and structure • Regular pigment network (green arrow) • Absence of blue color • Fading of pigment toward periphery (blue arrow)
B) Malignant melanoma			<ul style="list-style-type: none"> • Asymmetric colour or structure • Irregular thickened pigment network (green arrows) • Blue colour (white arrow)

with a recent history of change or growth should be evaluated very carefully, as changes in shape or colour often accompany malignant melanoma.^{1,5} We encourage anyone who is interested in using dermoscopy to seek training before using it in clinical practice, as insufficient training decreases diagnostic precision. 🌿

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Competing interests
None declared

References

1. Campos-do-Carmo G, Ramos-e-Silva M. Dermoscopy: basic concepts. *Int J Dermatol* 2008;47(7):712-9.
2. Malvey J, Puig S, Braun RP, Marghoob AA, Kopf AW. *Handbook of dermoscopy*. Oxon, UK: CRC Press; 2006.

3. Rosendahl C, Cameron A, McColl I, Wilkinson D. Dermoscopy in routine practice. 'Chaos and clues.' *Aust Fam Physician* 2012;41(7):482-7.
4. Soyer HP, Argenziano G, Zalaudek I, Corona R, Sera F, Talamini R, et al. Three-point checklist of dermoscopy. A new screening method for early detection of melanoma. *Dermatology* 2004;208(1):27-31.
5. Emiroglu N, Pelin Cengiz F, Hofmann-Wellenhof R. Dermoscopic and clinical features of trunk melanomas. *Postepy Dermatol Alergol* 2014;31(6):362-7.

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