# The Morphologic Universe of Melanoma

Natalia Jaimes, MD[a,*], Ashfaq A. Marghoob, MD[b]

**KEYWORDS**

• Dermoscopy • Melanoma • Melanoma specific-structures • Non-glabrous skin • Lentigo maligna • Nail melanoma • Acral melanoma • Mucosal melanoma

**KEY POINTS**

- Melanomas usually display an asymmetric and chaotic dermoscopic morphology.
- Most melanomas will reveal at least one of the following melanoma-specific structures: atypical network, negative network, streaks, crystalline structures, atypical dots/globules, irregular blotch, blue-white veil, regression structures, atypical vessels, and peripheral tan structureless areas.
- Melanomas located on the face and on chronically sun-damaged skin are associated with polygonal lines. In addition, melanomas located on the face can also reveal annular-granular pattern with perifollicular granularity, asymmetric perifollicular openings, and rhomboidal structures.
- Melanomas on volar skin are associated with a parallel-ridge pattern or homogeneous pigment involving both the ridges and furrows, and melanomas of the nail unit may reveal a micro-Hutchinson sign and are linked with irregular bands with disruption of parallelism.
- Melanomas on mucosal surfaces are associated with blue, gray, or white colors.
- Featureless melanomas can be identified via digital surveillance (short-term digital dermoscopic monitoring).

Dermoscopy is recognized as a useful tool for the evaluation of skin lesions by increasing diagnostic accuracy by up to 30% above that of the unaided eye examination. However, this level of improvement is contingent on gaining expertise in its use.[1–4] Dermoscopy increases not only sensitivity but also specificity for the diagnosis of skin cancer in general and melanoma in particular.[2,5,6] In other words, dermoscopy allows one to detect more melanomas at an early stage, while reducing the number of unnecessary biopsies of benign lesions. This in turn results in an improved malignant-to-benign biopsy ratio.[4,7–11]

One of the main objectives of dermoscopy remains differentiating atypical or dysplastic nevi (DN) from melanoma.[12] To accomplish this task, it is important to recognize the benign patterns commonly seen in DN. Studies have demonstrated that nevi and DN tend to manifest 1 of the 10 benign patterns, all of which exhibit symmetry in their dermoscopic colors and structures (**Fig. 1**). In contrast, melanomas tend to manifest patterns that deviate from the benign nevus patterns. In fact, melanomas manifest a wide gamut of dermoscopic characteristics, and these can vary depending on factors such as the histopathological subtype, anatomic location, tumor thickness, and possibly even the specific genetic mutations present within the tumor. It should thus be intuitively obvious that the patterns

The authors have no conflict of interest to declare.
Funding Sources: None.
[a] Dermatology Service, Aurora Skin Cancer Center and Universidad Pontificia Bolivariana, Cra. 25 # 1 A Sur 155, Ed. Platinum Superior. CS 342, Medellín, Colombia; [b] Dermatology Service, Department of Dermatology, Memorial Sloan-Kettering Cancer Center, 160 East 53rd street, New York, NY 10022, USA
* Corresponding author.
*E-mail address:* njaimeslo@gmail.com

Dermatol Clin 31 (2013) 599–613
http://dx.doi.org/10.1016/j.det.2013.06.010
0733-8635/13/$ – see front matter 

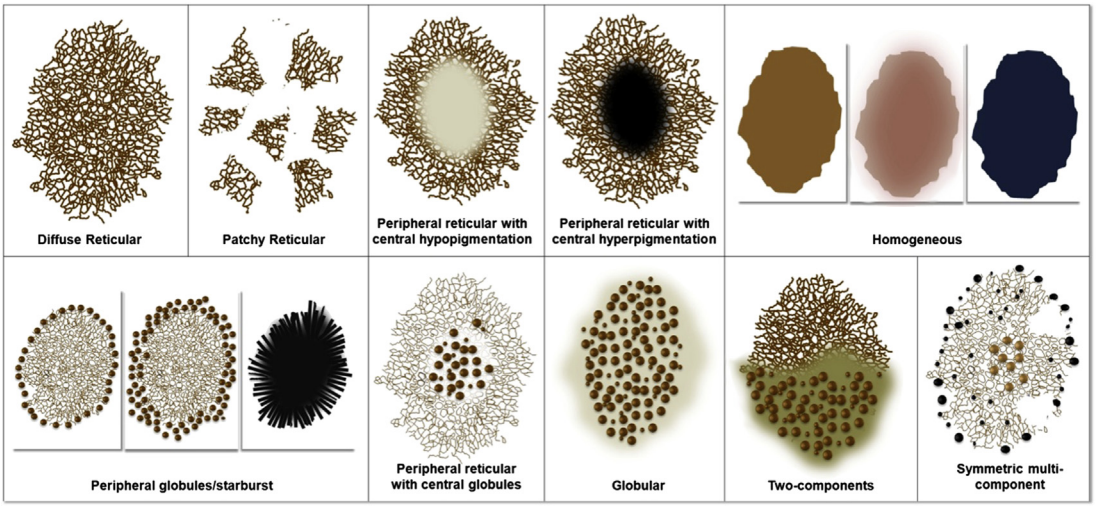


**Fig. 1.** The most common patterns encountered in acquired "Clark" nevi, blue nevi, some Spitz nevi, and congenital nevi. (© Ashfaq A. Marghoob and Natalia Jaimes.)

expressed by melanoma are, in essence, infinite. With that said, what many melanomas have in common is that they deviate from the benign patterns shown in **Fig. 1**, and they often reveal at least one of the melanoma-specific structures listed in **Table 1**.[13–15] Unfortunately, there still remain melanomas that are featureless and these lesions may be missed, especially at the time of the first evaluation. Fortunately, periodic surveillance with the use of digital imaging can help identify these featureless melanomas while they are still thin. Toward this end, digital surveillance of suspicious melanocytic lesions with total body photography and dermoscopy has proven to be quite effective in identifying these melanomas.[16–21]

This article provides an overview of the different dermoscopic morphologies of melanoma as a function of the anatomic location of the lesion.

## MELANOMA ON NONGLABROUS SKIN

Melanomas on nonglabrous skin may manifest a wide range of clinical and dermoscopic characteristics. These features will depend to some degree on the histologic subtype (ie, superficial spreading, nodular, lentigo maligna), anatomic location, thickness, and growth phase of the tumor. With that said, most melanomas developing on nonglabrous skin are of the superficial spreading subtype (SSM). In general, these melanomas tend to reveal 3 or more colors and at least 1 of the 10 melanoma-specific structures listed in **Table 1** (**Fig. 2**A, B). Colors may range from brown to black with red, white, and/or blue-gray also present to varying degrees. The melanoma-specific structures are those dermoscopic structures that have a documented heightened odds ratio for melanoma (see **Table 1**; **Table 2**). The 10 melanoma-specific structures often seen in melanomas located on nonglabrous skin are listed in **Table 1** (see **Fig. 2**A, B).

Although 1 or more of these 10 melanoma-specific structures are usually seen in melanomas on nonglabrous skin, there are yet some melanomas that are structureless/featureless.[16–19] Because of this, all featureless lesions, especially if they are outliers, should raise suspicion for melanoma. These featureless lesions can be biopsied or, if flat, can be subjected to digital surveillance. Flat lesions lend themselves to monitoring because even if they are early melanomas, they tend to grow slowly enough that a 3-month to 4-month delay will not have any detrimental prognostic implications.[17,19,22] Monitoring of such lesions can be effectively accomplished via short-term digital dermoscopic monitoring (STM).[17,19,23–26] STM is based on comparing dermoscopic images of the same lesion taken 3 to 4 months apart. STM should be performed only on flat lesions (nodular lesions should never be subjected to STM), and by those with experience in using the technique.[25] The rationale behind STM is that stable lesions are considered biologically indolent and benign, whereas changing lesions are biologically dynamic, and approximately 11% to 18%[19,26] of these will prove to be melanoma.[19,25,26] Thus, in general, lesions found to have any morphologic change on STM, with the exception of changes in the overall global color or in the number of millialike cysts, should be biopsied to rule out a melanoma.[19]