

From Nevi to Melanoma: Understanding the Basics of Lesions



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KEYWORDS

• Melanoma • Nevus • Biopsy • Melanocyte origin

KEY POINTS

- PAs must understand the basic anatomic structure and cells that give rise to nevi and melanoma.
- It is important to know the main types of nevi and be able to identify them clinically.
- It is also important for PAs to know when and how to biopsy pigmented lesions and be able to identify the stage of melanoma and appropriate referral pattern based on the stage.

INTRODUCTION

Pigmented or melanocytic lesions are among the most commonly encountered skin lesions. These lesions span from simple lentiginos, through nevi, into the realms of melanoma. Melanocyte origins and function are important to understand when evaluating or treating melanocytic lesions. One of the constant dilemmas facing clinicians is whether these lesions need to be biopsied or can be observed safely. Many different methods are in use as an aid to making this decision.

In this review of lesions of melanocytic origin, we discuss the embryologic roots of the melanocyte and the different lesions that originate from the melanocyte. In the course of this review on the melanocyte, clinical methods of determining atypia and deciding to biopsy or not will be explored. Finally, we outline the currently practiced literature supported methods of treating these entities. To accomplish this, we divide the discussion into the following 3 sections:

1. Melanocyte origin
2. Nevi
3. Melanoma

Disclosures: None.

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MELANOCYTE ORIGIN

The origin of the melanocyte is in the neural crest tissue of the human embryo. Melanocyte precursors develop in the neural crest and, as the embryo transitions into a human fetus, these melanocyte precursors migrate from the neural crest tissue to their permanent residence primarily in the skin. In the skin (and elsewhere in the body), the melanocytes retain some traces of their neural crest “disguise.” The human immune system is tasked with the constant surveillance of cells within tissue and should identify cells that are out of place. The origin of the melanocyte in neural tissue allows it, when in its neoplastic form, to move through the body undetected by these sentinels of the immune system. This ability to migrate is the primary reason melanoma is such an aggressive and mortal cancer.

Melanocytes naturally reside primarily in the basement membrane of the epidermis. It is their role to generate small pigment packets, called melanosomes, which are placed in the surrounding epidermal cells. Much like the black paint used by athletes to draw the light from their eyes, the melanosome absorbs the energy of ultraviolet (UV) radiation before it hits the nucleus of the host cell. The ratio of melanocytes to basal cells varies significantly. Through a lifetime of exposure to UV radiation, a body generates more melanocytes to compensate for the increased exposure.

As the amount of UV exposure and the compensatory ratio of melanocytes to basal cells increases, so does the number of melanocytic lesions, melanoma precursors, and the risk of melanoma. Hence race/inherited skin types and the amount of UV exposure over a lifetime are the primary risk factors of melanoma. Those with more than 50 nevi or with atypical nevi are also at risk of melanoma. It is important to note the potential role of diet, UV blocking agents, and inherited gene mutations in that risk. There remains much to be learned about these risks and the role of nevi in the development of melanoma.

INTRODUCTION TO NEVI

Generally, nevi are clusters or growths of melanocytes. They are categorized by the location of the cluster of melanocytes in the dermis or epidermis, their presence at birth or developing after birth, and some clinical features. The majority of moles are acquired and sun exposure increases their frequency.

A quick and simplified review of the anatomy of the skin is helpful when considering the related terminology. The skin consists of the dermis (deeper layer, pink in [Fig. 1](#)) and epidermis (outer layer, purple in [Fig. 1](#)). The epidermis is nonvascular and is relatively thin, although its thickness varies by body site. The dermis makes up the majority of the skin's volume and is a complex network of vessels, nerves, follicles, and glands within a collagen matrix. These 2 layers are connected by an interlocking wavy layer

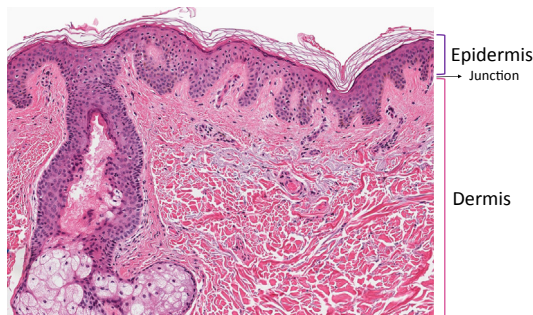


Fig. 1. Histologic view of the skin showing the layers of interest.

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