Dermpath quiz: An irregularly colored papule on the back of an adolescent female

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ABSTRACT

This learning exercise challenges clinicians and dermatopathologists to consider the differential diagnosis of an unevenly colored solitary papule over the upper back of an adolescent female.

Key words: Halo nevus, leukoderma acquisitum centrifugum of Sutton, pigmented nevus

A 12-year-old female patient presented with an asymptomatic, 0.5 cm × 0.5 cm variably colored pink and brown papule on the right suprascapular back [Figure 1]. The lesion first appeared 10 years ago and remained stable until two years ago when it began to enlarge and change color. The patient's medical history was unremarkable except for a history of hypothyroidism.

A shave biopsy was performed. Histopathologic examination of the lesion demonstrated a well-defined proliferation of nested melanocytes with bland nuclei and superficial dermal nests with moderately atypical nuclei [Figures 2 and 3]. A bandlike lymphoid infiltrate extended through the lesion [Figure 2].

The lesion most likely represents

- Halo nevus
- Melanoma
- Pigmented spindle cell nevus of Reed
- Spitz nevus
- Wiesner's nevus.

ANSWER: A. Halo nevus

DISCUSSION

A halo nevus, also known as Sutton nevus or leukoderma acquistum centrifugum, is a benign acquired melanocytic nevus often clinically surrounded by a halo of depigmentation and with the loss of pigment in other portions of the lesion. Although this lesion is benign, the sudden change in the clinical appearance of the central melanocytic lesion often raises concerns among patients. The halo may be inconspicuous in some lesions and best appreciated under a Wood's lamp. A halo phenomenon may also occasionally occur around a variety of benign and malignant melanocytic and non melanocytic lesions including congenital nevi, blue nevi, Spitz nevi, basal cell carcinoma, and melanoma. Histopathological examination is required for a definitive diagnosis.

Although the halo nevus was first depicted in a 16th century painting of the "Temptation of St. Anthony" by Matthias Grunewald, the lesion was initially described in the medical literature by Hebra and Kaposi as a form of vitiligo occurring around preexisting nevi.[1] In 1916, Sutton coined the term "leukoderma acquisitum centrifugum" to describe the lesion.[2] An increased incidence of halo nevi has been observed in association with childhood vitiligo in several studies with the reported incidence ranging from approximately 4% to 20%.[3-7] Patients with halo nevi and vitiligo tend to present at an early age (<18 years of age) with lesions that preferentially involve the trunk and spare the hands and feet.[5] It has been suggested that in a subset of patients, the occurrence of halo nevi may be an initiating factor in the pathogenesis of vitiligo.[8,9] It has also been suggested that excessive ultraviolet exposure or sunburn in childhood and adolescence may provoke an aberrant immune response that triggers the development of halo nevi.[10] Cytotoxic CD8+ T-lymphocytes (T-cell) play a key role in the destruction of melanocytes in halo nevi and vitiligo.[11,12] However, differences in human leukocyte antigen associations and evidence linking oxidative stress to the

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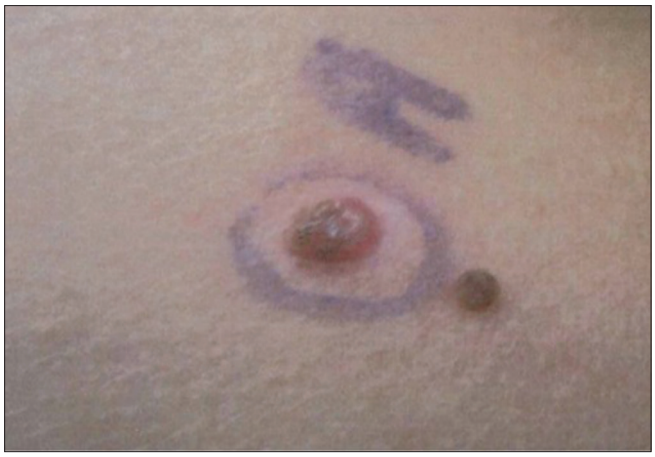

Figure 1: A variably colored pink and brown papule on the right suprascapular back

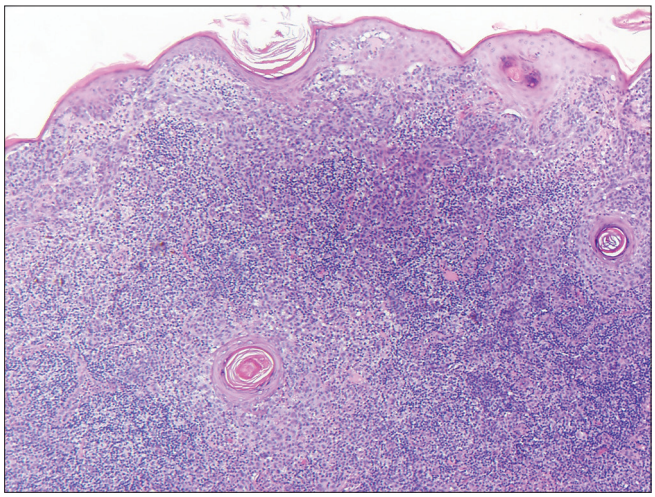

Figure 2: Well-defined proliferation of nested melanocytes with bland nuclei and bandlike lymphoid infiltrate (H and E, ×100)

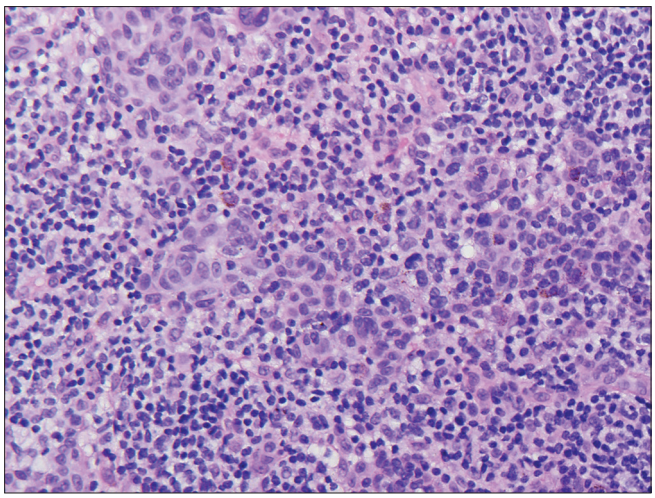

Figure 3: Moderately atypical nuclei are present within superficial dermal nests (H and E, ×400)

pathogenesis of vitiligo but not halo nevi suggest that these are distinct conditions with a different pathophysiology.[8,13]

A significant correlation between the central nevus diameter and halo diameter suggests the presence of a T-cell eliciting "melanocytic antigenic unit" composed of nevi melanocytes and adjacent epidermal melanocytes that extend from the central melanocytic core.[14] While T-lymphocytes are associated with the destruction of melanocytes in halo nevi, the precipitating factors and the precise role they play in nevus regression remain elusive.

The incidence of halo nevi in the population is estimated to be approximately 1%.[15] Halo nevi usually occur in childhood and early adulthood, with an average age of onset of approximately 15 years.[16] A familial predilection for halo nevi has been reported, but there is no race or gender predilection.[17] Halo nevi have also been reported to occur in 18% of patients with Turner syndrome.[18] Although thyroid disease tends to occur more often in patients with vitiligo,[19] antithyroid antibodies do not occur more frequently in patients with vitiligo and halo nevi than in patients with vitiligo without concomitant halo nevi.[5] There is no proven association between halo nevi and autoimmune thyroid disease without vitiligo.

Halo nevi tend to occur most commonly on the trunk, usually the upper back, although they also occur in other areas including the head and neck, extremities, groin and axillae.[9] Halo nevi are usually asymptomatic but can become inflamed and appear erythematous, raised, and crusted. They display the typical globular and/or homogeneous dermoscopic features of benign melanocytic nevi.[20] They often resolve spontaneously with the appearance of the halo correlating with the onset of nevus regression.[21] However, halo nevi can persist for years before completely resolving.[21] While the white halo can resolve completely in some patients, it can persist or repigment over time.[21]

Histopathologic examination reveals a sharply defined lesion with a band-like lymphocytic infiltrate consisting predominantly of T-lymphocytes in the papillary dermis. Lymphocytes and melanocytes mingle throughout the lymphoid infiltrate. Melanocytes in halo nevi are well nested at the dermal-epidermal junction and mature and disperse into single cells from the surface toward the base of the nevi. Melan-A and Mart-1 stains can reveal the nevus cells in the lymphocytic infiltrate. Halo nevi do not contain deep mitoses or deep pigment in nests although melanophages may be present in the deep dermis.

The differential diagnosis includes melanoma, Weisner nevus, Spitz nevus, and pigmented spindle cell nevus of Reed. Melanomas in children tend to be only slightly asymmetrical and vertically oriented involving much of the dermis.[22] Whereas in halo nevi lymphocytes and melanocytes intermingle in the lymphocytic infiltrate, in melanoma the band of lymphocytes is near the periphery of melanocytic nests.

Histologically, melanomas are usually broad, lack maturation and dispersion, and have non nested epidermal melanocytes, deep mitoses, cytologic atypia, and areas of confluence at the dermal-epidermal junction. In contrast to halo nevi, the melanocytes in Weisner nevi do not mature or disperse and show atypia ranging from a small nevus like cells with slight nuclear hyperchromasia to large atypical epitheliod cells with bizzare nuclei.[23] Although Spitz nevi often occur in children, they tend to present on the face or scalp and histologically have large spindle cells and epitheliod cells that contain vesicular nuclei with prominent nucleoli and two-tone cytoplasm. The presence of small spindled melanocytes would support the diagnosis of pigmented spindle cell nevus of Reed, which typically presents as a darkly pigmented flat-topped papule on the thighs or lower legs of young women.

Halo nevi without worrisome clinical features in the central lesion should be managed by reassurance and observation. However, if the central pigmented lesion demonstrates clinically atypical features, an excisional biopsy should be performed.

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