Untrastructure of Melanocyte in Penile Melanosis

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Penile melanosis is a new disease entity which is benign and different from pigmented nevus and acral lentiginous melanoma in situ.
A 20-year-old man had hyperpigmented macules on the glans penis and penile shaft for 5 years. Clinical and histologic findings were consistent with penile melanosis and giant melanosome complexes were observed ultrastructurally. (Ann Dermatol 2(1): 58-62, 1990)

Key Words: Penile Melanosis, Ultrastructure of melanocyte

Atypical pigmented penile macule is a new disease entity described by Coleman et al. which should be differentiated clinically from acral lentiginous melanoma in situ, because it shows benign histologic features. Since Kopf and Bart named an enlarging pigmented lesion of the glans penis penile lentigo, much interest has been focused on pigmented macules of penile shaft and/or glans which share similar clinical and histologic findings with their case. In 1989, Revuz and Clerici called macular hyperpigmentation of penile shaft and/or glans penis penile melanosis. We present, herein, a case of penile melanosis with an electron microscopic study of its melanosomes.

REPORT OF A CASE

A 20-year-old man visited our clinic for the evaluation of asymptomatic pigmented macules on the penile shaft and glans which he had for 5 years. These macules had remained unchanged, until 3 months ago when they began to increase in size and darken in color. There was no history of drug intake, trauma or prior eruptions in that area. There was no family history of a similar disorder.

Physical examination showed an ellipsoid, homogenous, darkly hyperpigmented macule on the penile shaft and a triangular tan to black macule on the shaft extending across the sulcus coronalis to the glans penis (Fig. 1). No other cutaneous or mucosal pigmented lesions were found.

A scalp biopsy specimen (Fig. 2) revealed marked hyperpigmentation of the basal cell layer. Focally, melanocytes exhibited prominent, melanin-filled dendrites and no nuclear atypia. The upper dermis contained many large melanophages. On Fontana-Mason stain (Fig. 3), there was marked epidermal melanin deposition, most prominent in the basal cell layer, with striking dendritic processes of melanocytes.

On transmission electron microscopy (Fig. 4), numerous melanosomes were scattered in the keratinocytes and melanocytes and many melanosomes were surrounded with a limiting membrane. In some areas, there were numerous membrane-

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Fig. 1. An elongated, oval, homogenous, darkly hyperpigmented macule on the penile shaft and an irregularly shaped, tan to black macule on the glans penis.
bound, giant melanosome complexes. Some of these complexes were composed of amorphous, coalescing melanosomes (Fig. 5).

Total surgical excision of the remaining lesions was done because the patient feared that the condition might become malignant.

**DISCUSSION**

Little can be found in the dermatologic literature about pigmented penile lesions, but in the 1980’s, there has been increased interest in these lesions because of the need to rule out malignant melanoma.

Kopt and Bart³ reported an enlarging pigmented lesion on the glans penis of a 37-year-old male which they called penile lentigo. The lesion was composed of macules with mottled hues of light tan to brown. The overall contour of the lesion was scalloped, but the individual borders appered smooth and well defined. A biopsy showed lentiginous acanthosis with an increase in the number of melanocytes. No atypia was found in the melanocytes.

Bhawan and Cahn⁵ reported a clinically similar macule on a 25-year-old man. Histologic examination showed diffuse melanocytic hyperplasia with focal atypia. They named it atypical penile lentigo because melanoma in situ occurring in genitalia as well as in acral areas could be deceptively benign in histologic appearance.

Similar lesions have been described on the vulva. Maize and Ackerman⁶ used the term of melanosis instead of melanosis of vulva.⁷ Melanosis refers to a pigmented patch on the vulva or, less commonly, on the penis that is clinically indistinguishable from malignant melanoma, but, in fact, is not malignant melanoma.⁶ The condition consisted of a brownish-black patch with irregular, scalloped or notched border with skip areas devoid of pigmentation. The melanocytes at the dermoepidermal junction were normal cytologically while their number was normal or slightly increased⁶.

On the other hand, Spann et al⁸ and Sexton and Maize⁹ suggested the term labial melanotic
macule for the brown or irregularly pigmented born macules which simulated clinically nevus, lentigo and malignant melanoma but were historically benign.

Leicht et al. described three patients with pigmented lesions of the penis that simulated clinically penile lentigo or evolving acral lentiginous melanoma in situ. The histologic features varied form epivocal or minimal melanocytic hyperplasia with short, melanin-filled, dendritic processes to dramatically prominent dendrites. All specimens showed increased basal cell pigmentation, pigment incontinence and lack of nuclear atypia. They postulated that further reports on similar cases would be necessary for the better delineation of the nature of these lesions.

Revuz and Clerici reported five patients with macular hyperpigmentation of the penile shaft and/or glans. On the glans, the lesions consisted of large, variegate, dark brown-black pigmented macules with an irregular outline. On the penile shaft, the lesions consisted of round or oval, sharply demarcated macules of uniform color. Histologic examination demonstrated hyperpigmentation of the lower layers of the epidermis without melanocytic hyperplasia or elongation of the ridges. The melanocytes did not show atypical features and melaophages were observed in the papillary dermis. They felt that the term penile melanosis seemed appropriate, and this condition shared many clinical and histologic features with other macular, mucosal hyperpigmentation such as Laugier-Hunziker syndrome and melanosis of vulva.

There has been no epidemiologic study of pigmentation of the male genitalia except for Cullen's report on the pigmented nevi of the genitalia, thus the incidence of penile melanosis remains unknown.

A variety of benign conditions must be consi-
dered in the differential diagnosis of hyperpigmented genital lesions. Melanocytic nevi are easily distinguished by histologic examination. Postinflammatory hyperpigmentation was ruled out in this case because there was no prior history of trauma, fixed drug eruption or any other inflammatory eruption in the area. Since early lesions of acral lentiginous malignant melanoma in situ might show similar clinical findings and as banal of a histologic picture as presented in this case, it is important to give this careful consideration.

Transmission electron microscopic examination showed numerous melanosomes in the keratinocytes and melanocytes with or without a limiting membrane. The membrane-bound compound melanosomes showed an early stage of degradation of autophagocytosed melanosomes. These findings might represent the precursors of giant pigment granules described by Hirone and Eryu. These giant pigment granules and/or giant melanosome complexes had a central mass of electron dense amorphous substances embedding microvesicles and a peripheral zone containing fine particles or amorphous substances. These can be found in lentigo simplex, Cafe au lait spots in neurofibromatosis, nevus spilus, multiple lentigines syndrome and normal skin.

The management of these patients is still controversial as the prognosis of these lesions is not known. Some felt that the lesions should be observed and others felt that the lesions should be completely removed. In this case, the patient wanted removal of the lesions, therefore, total surgical excision was performed.

REFERENCES

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