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A profound case of linear epidermal nevus in a patient with epidermal nevus syndrome

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Abstract

Background: Epidermal nevus syndrome is a multi-system disease with a wide spectrum of clinical presentation. Numerous specialists may be required to address its extra cutaneous manifestations.

Main observations: We report a severe case of epidermal nevus syndrome involving the oral cavity, pharynx, and central nervous system in addition to disfiguring skin lesions.

Conclusions: Dermatologists are in a unique position to first render the diagnosis of epidermal nevus syndrome for young patients and ensure appropriate follow-up. (*J Dermatol Case Rep.* 2011; 5(2): 30-33.)

Introduction

Epidermal nevus syndrome is a multi-system disease with a wide spectrum of clinical presentation. Numerous specialists may be required to address its extra cutaneous manifestations.[1,2]

Case Report

A 17-year-old African American female, recently placed with a new foster parent, was scheduled by her governmental protective agency for evaluation of her extensive "moles and warts". The patient was non-verbal and severely mentally handicapped. No treatment was requested, as the patient seemed unaware of their presence. Accompanying paperwork stated she suffered from grand mal seizures since childhood. Six years prior to presentation, an ear, nose, and throat physician surgically removed "obstructive linear papillomatous growths" from her hard palate and laryngopharyngeal structures. The patient reportedly was unable to completely swallow her food prior to the procedure. Her medications included dilantin and a benzoyl peroxide wash for her malodorous "moles". Her family history was unknown. No history regarding the evolution of the lesions was available. Attempts at obtaining further records of treatment were complicated by the foster agency.

The strikingly, large, hyperpigmented, verrucous plaques were apparent upon gross examination. Arranged in blaschkoid linearity, lesions were distributed along the left posteriolateral scalp and neck and demonstrated a sharp midline demarcation (Fig. 1A). Along the anterior midline neck and upper chest was a rubbery 21-cm linear papillomatous plaque (Fig. 1B). Faint linear and speckled hypopigmented macules were noted perilesionally on the neck. A 5-cm whorled verrucoid plaque was found on the mid forehead. Several smaller lesions were noted in the perioral area with sparing of the lips. No odor was detectable from the lesions and she appeared well cared for overall. The patient was uncooperative with several attempts at oral examination. No cranial or skeletal anomalies were appreciated on inspection. The eyes displayed a horizontal saccades-like movement

and she exhibited dyskinetic and spastic movements of her entire body at baseline. Epidermal nevus syndrome (ENS) of the linear epidermal nevus (LEN) type was diagnosed. It is highly likely that she carried this diagnosis prior to our evaluation.

An extensive discussion of the treatment options was conducted with the foster parent. Given the absence of a chief complaint in this visit and no formal request for treatment from the protective agency, no corrective modalities were undertaken. Her benzoyl peroxide 4% wash was refilled to address the reported odors emanating from the plaques. Detailed photographs were taken for comparison at future visits. Biopsy of the lesions was obtained to rule out the possibility of epidermolytic components (Fig. 2).

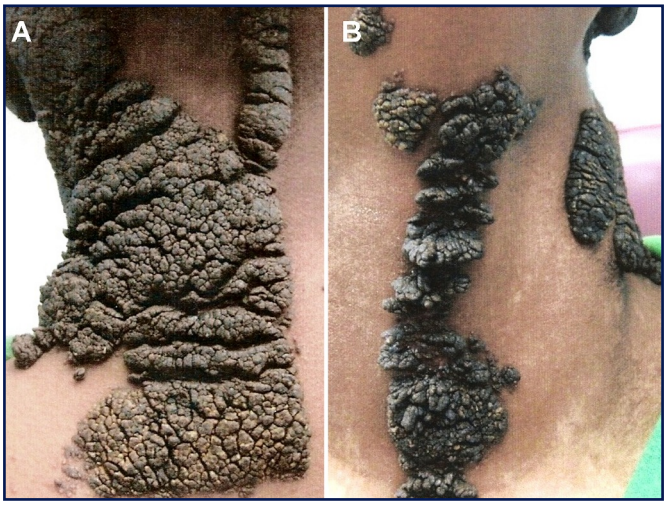

Figure 1

Back (A) and front (B) view of the linear epidermal nevus in the 17-year-old female with epidermal nevus syndrome.

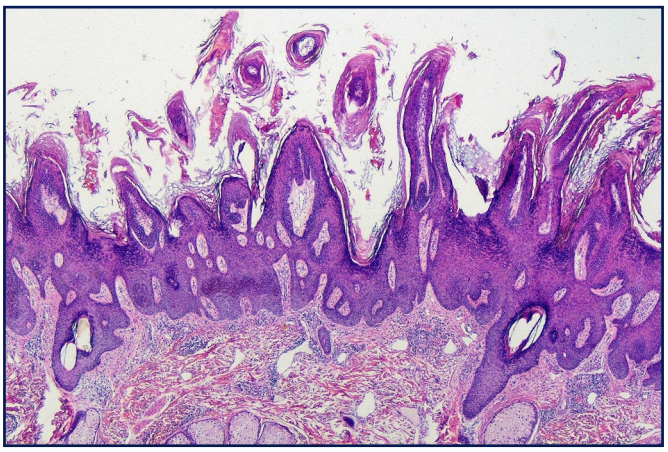

Figure 2

Histology of verrucous epidermal nevi showing hyperkeratosis, acanthosis and papillomatosis.

Discussion

Epidermal nevus syndrome is a term that refers to the association of epidermal nevus with systemic anomalies. The neurologic, ophthalmologic, and skeletal systems are most commonly involved. ENS occurs in a sporadic fashion and many different mosaic phenotypes are expressed. It likely represents a lethal disorder that is rescued by mosaicism. Several chromosomal aberrations have been identified, but no unifying mutation has been discovered. Epidermal nevi are hamartomas of ectodermal origin that are classified according to their major constituent: kerotinocytic, follicular, apocrine, eccrine, or sebaceous. The many names for ENS reflect the condition's heterogeneity. It has been known as: Solomon syndrome, Jadassohn syndrome, Schimmelpenning-Feuerstein-Mims syndrome, and nevus sebaceous syndrome. Dr. Gustav Schimmelpenning, a psychiatrist, was the first to recognize central nervous system defects with epidermal nevi. Solomon and Easterly proposed classifying the nevi based upon the nevi's constituents and first coined the term "epidermal nevus syndrome" in 1968.[1,2] Currently, four major different types of ENS are recognized: linear sebaceous nevus, linear nevus comedonicus, linear epidermal nevus, and inflammatory linear verrucous epidermal nevus (ILVEN).[3] ENS is likely a continuum, as many authors include a wide-array of various other syndromes under its mantle. The presence of epidermal nevi should alert the clinician to possible abnormalities in the underlying organ systems. Approximately 30% of patients will have one or more associated defects. Five or more abnormalities were reported in 5% of individuals in a review of one hundred thirty-one ENS patients.[4]

Our patient's condition is an excellent representation of the LEN type, and hence, will be the focus of this discussion. An estimated 60% of ENS is of the LEN variant.[4] LEN is considered a neurocutaneous condition, but skeletal and ocular complications may occur as well. Lesions appear as tan or brown macules along the lines of Blaschko at birth or infancy. As the child ages, they evolve into thick verrucous or papillomatous linear plaques. The patches and plaques of LEN are usually asymptomatatic but can be malodorous. The term "ichthyosis hystrix", or Systematized Epidermal Nevus, represents multiple lesions on both sides of the body. Unilateral lesions are referred to as nevus "unius lateris". These two terms however are not exclusive to LEN and are used throughout the ENS spectrum.

The most common manifestations of neurological involvement are seizures, mental retardation, deafness, and movement disorders. Ipsilateral facial hemihypertrophy and contralateral hemiparesis may also occur, but are less common.[4] There is no known specific mutation to explain the various central nervous system (CNS) findings. A myriad of findings are observed on magnetic resonance imaging with hemimegalencephaly heavily reported.[4,5] Evidence of infarcts, atrophy, and calcifications are not uncommon. CNS lipomas are also reported.[6] Clinicians should recognize that even small epidermal nevi, particularly on the head, can signal profound structural nervous system involvement. Lesions in the oral cavity often appear papillomatous and can obstruct phonation, swallowing, and breathing. However, cleft palate and extensive oral involvement is rare.[7] Many oral lesions possess papillomatous morphology and biopsy should be performed for any atypical foci to rule out infectious and malignant process, although rare.[8] Two cases of mandibular ameloblastoma from oral epidermal nevi are reported.[9]

The diagnosis of ENS and LEN can easily be made once lesions have fully manifested. Mature LEN may resemble linear psorasis, linear porokeratosis, linear lichen planus, acanthosis nigricans, eczema, linear Darier's disease, and planar warts. Assuring appropriate multi-disciplinary support before the onset of permanent systemic sequela is paramount. It is unlikely however that early intervention will attenuate most CNS related comorbidities. The dermatologist plays an ideal role in the potential for recognizing the early macules in the lines of Blaschko for epidermal nevi. Neurologic, ophthalmologic, and orthopedic evaluations should be considered if ENS is suspected. It is reasonable to allow the location of the nevi to guide the referral choices. Rare cases of hypophosphatemic vitamin D-resistant ricks have been reported in ENS, although this is classically associated with the linear sebaceous nevi type. Defects in the proximal renal tube allows phosphate wasting in the presence of already low serum phosphate levels. Thus, it is reasonable to periodically monitor calcium and phosphate levels in these patients.[10]

Histologic examination in ENS is as variable as the entities themselves. In LEN marked papillomatosis, hyperkeratosis, and acanthosis with elongation of rete ridges in psoriasiform pattern is noted.[3] The observation of epidermolytic hyperkeratosis on biopsy should prompt genetic counseling. The often devastating disfigurement of epidermolytic hyperkeratosis (EHK) results from mutations in keratins 1 and 10.[11] A mosaic pattern of Keratin 10 mutations in ENS of the epidermolytic type is transmissible to offspring.[12] Extensive skin involvement is also correlated with an increased risk of this germ-line transmission.[12] As epidermolytic nevi are clinically indistinguishable from other epidermal nevi, the importance of obtaining a biopsy is apparent in patients whom have a reasonable potential of reproducing.

Management of the cutaneous portion of LEN is usually initiated due to malodor or for cosmetic reasons. Physicians should offer the most practical and effective method for removal of the lesion. Malodorous plaques can be managed with benzoyl peroxide formulations. Surgical excision of obstructive or disfiguring lesions can be considered for smaller lesions. This may not be practical for larger plaques, as in our patient. The use of vitamin D analogues may slow or cause partial regression in some plaques.[13,14] Lactic acid, salicylic acids, anthralin, intralesional steroids, and topical and oral retinoids have all been utilized with varying degrees of success.[15] Electrocautery, cryotherapy, dermabrasion, and shave excision followed by phenol peel each have produced inconsistent results.[16] It has been reported that at least some partial dermal excision or destruction is necessary for permanent resolution.[17] Carbon dioxide ablative lasers have demonstrated promising results in this regard. The zonal creation of fibrosis in the area treated with ablation may minimize the risk of recurrence.[18] The primary thickness of the nevi is the most determining factor for cosmetic results.[19]

We report a patient with profound expression of the neurological and oropharyngeal complications of linear epidermal nevus, an entity within the spectrum of epidermal nevus syndrome. Awareness of underlying organ involvement is critical in the examination of suspected epidermal nevi.

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