Epidermal Nevus with Epidermolytic Hyperkeratosis: A Case Report

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Abstract
Epidermal nevus has various histological patterns. Epidermal nevus having features of epidermolytic hyperkeratosis is a rare condition. This lesion is clinically indistinguishable from other epidermal nevi but shows characteristic histological features. Diagnosis of this entity is important management. Epidermolytic hyperkeratosis is an autosomal dominant disease. Offspring of these patients may have generalized epidermolytic hyperkeratosis. Here we present a case of 12 years old boy with Epidermal nevus with epidermolytic hyperkeratosis, which is a rare entity.

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Keywords: Epidermal nevus, Epidermolytic hyperkeratosis, Generalized epidermolytic hyperkeratosis, Line of Blaschko.

Introduction

Epidermal nevus comprises a heterogenous group of diseases. It is a congenital non-inflammatory cutaneous hamartoma. It may occur sporadically or as a part of several syndromes. The condition affects 1 in 1000 people in the world.[1] Histologically, epidermal nevi are composed of keratinocytes, apocrine glands, eccrine glands, sebaceous glands or other components of pilosebaceous unit. Epidermal nevi are traditionally asymptomatic. Small number of cases of epidermal nevi show histologic features of epidermolysis hyperkeratosis. Epidermolytic hyperkeratosis has been observed in variety of benign and malignant skin condition or hereditary disorders. Epidermal nevus with epidermolysis hyperkeratosis has a significant clinical importance. This patient carries the risk of parenting a child of gerneralizedepidermolytichyperkeratosis.[2] We report a case of epidermal nevus showing epidermolytic hyperkeratosis in a 12 year old boy for the rarity of the entity.

Case report

A 12 year old boy of a non-consanguineous parentage, presented with non-pruritic, dark coloured elevated skin eruptions since birth. The lesion was first observed over the dorsum of right foot. After that lesions gradually appeared in front of leg and thigh, lower abdomen and flexor aspect of both forearm. Lesions were not related with any seasonal variation. Patient had a normal birth history and developmental milestones. Right sided extremities were more involved than left side.Examination revealed numerous hyperpigmented warty papules distributed in both extremities and lower abdomen (Figure. 1 and 2). Hair, nails and oral mucosa were normal. Other system examination revealed no abnormality. No laboratory investigation was done.

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Clinically it was diagnosised as Linear verrucous epidermal nevus. For histopathological examination 3 mm punch biopsy was taken from right foot**.** Histological examination revealed hyperkeratosis, acanthosis, papillomatosis, elongated rete ridges. The dermis revealed mild perivascular infiltration of chronic inflammatory cells.Some foci also revealed perinuclear vacuolization of the keratinocytes in spinous and granular layers, and increased number of keratohyalin granules in the stratum granulosum (Figure 3, 4 and 5). So, histologically it was diagnosed as epidermal nevus with epidermolytic hyperkeratosis.

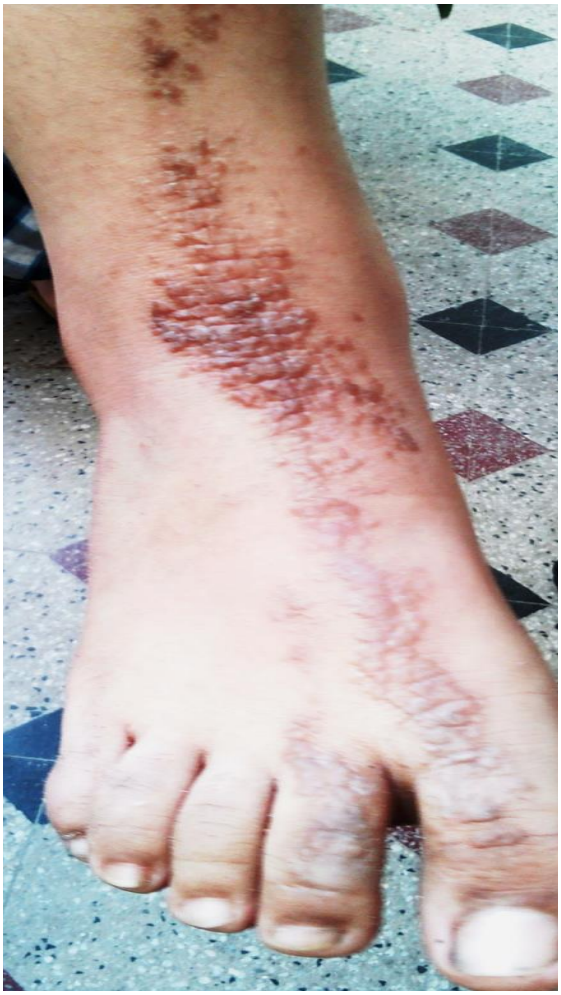

Figure 1. Hyperpigmented warty plaque in lower leg and foot.

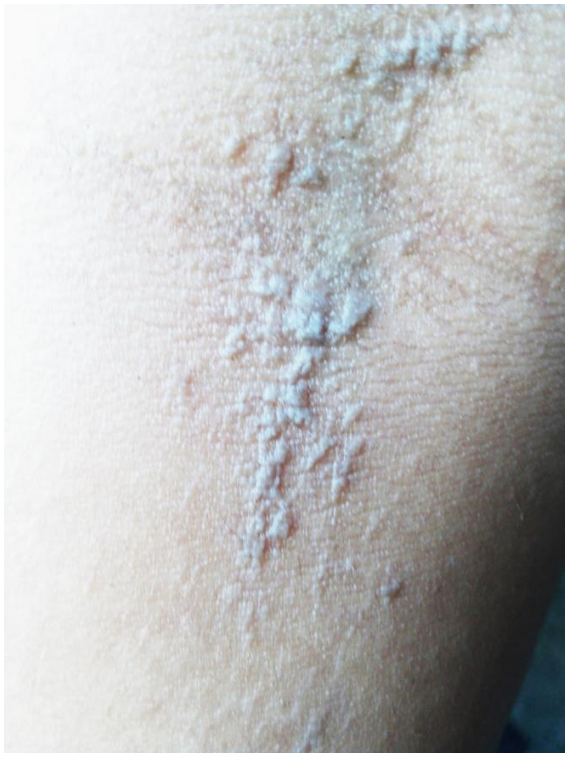

Figure 2. Close- up view of warty skin lesions.

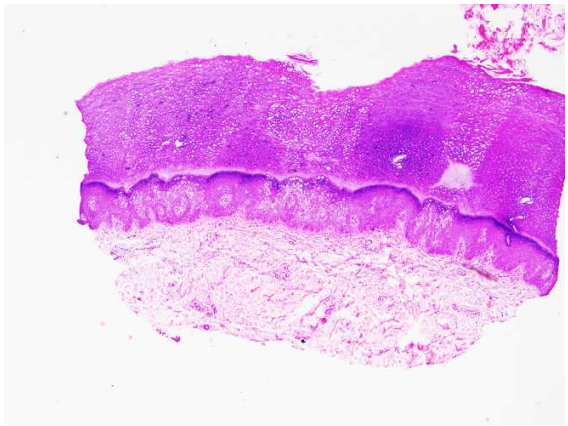

Figure 3. Low magnification features of lesional skin showing massive hyperkeratosis with foci of epidermolytic hyperkeratosis in epidermis. Hematoxylin- Eosin, original magnification X40.

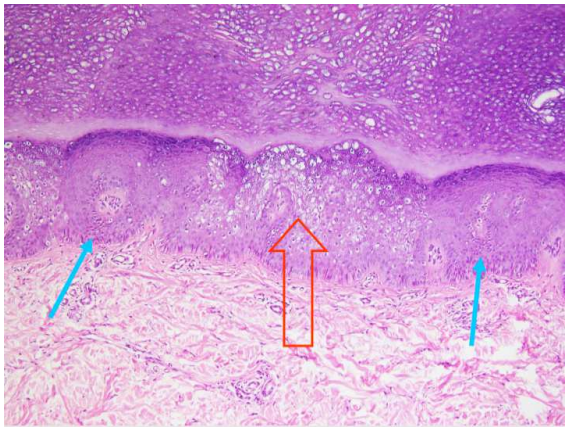

Figure 4. Epidermolytic hyperkeratosis in spinous and granular layer (Red arrow). Blue arrow indicates acanthosis without epidermolytic hyperkeratosis. Hematoxylin-eosin, original magnification X100.

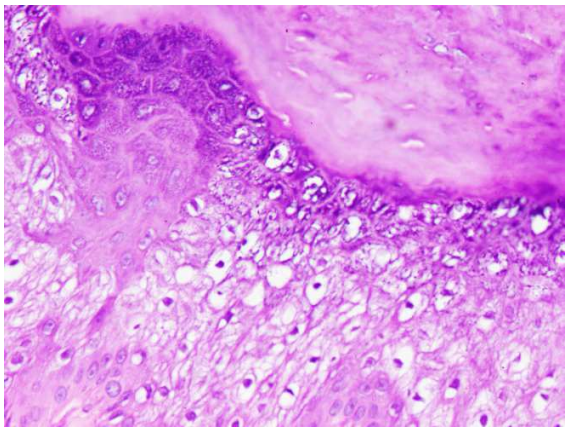

Figure 5. Perinuclear vacuolization of keratinocytes with large keratohyaline granule in epidermolytic hyperkeratosis. Hematoxylin& Eosin, original magnification X400.

Discussion

Epidermal nevus is hamartoma of skin, occurs due to over growth of epidermis. It arises from embryonic ectoderm as a result of mosaic postzygotic mutations. Lesions are present at birth in about half of the patients or may develop early in childhood. Depending on the affected component of the epidermis epidermal nevus can be divided into two types: keratinocytic or non organoidand organoid type.[3] Keratinocytic epidermal nevus is the most common type of epidermal nevus. It occurs due to overgrowth of keratinocytes. Different varients of keratinocytic epidermal nevus are seen, such as linear epidermal nevus, hard nevus of Unna, soft epidermal nevus and nevus verrucosus etc.[1] On the other hand organoid type shows predominantly another component of skin.[4] Epidermal nevus occurs as a result of activated genetic mutation in FGFR-3, HRAS or PIK3CA genes. FOXN1 is highly expressed in these lesions.[1] Most common pattern of keratinocytic nevus is linear epidermal nevus. The lesions are verrucous, skin-coloured dirty gray or brown coloured papule, which coalesce to form serpiginious plaques. They follow the line of Blaschko. These lines are thought to be representative pathways of epidermal cell migration and proliferation during development of fetus.[5]

Linear epidermal nevus may be either localized or systematized. In localized type, only one linear lesion is present and lesion is confined to one side of the body. Common sites are head, trunk and extremities. In systematized type there are many parallel linear lesions are seen. They may be unilateral or bilateral.

Localized and more commonly systematized linear epidermal nevus may be associated with skeletal deformity and CNS deficiency.[6] Rarely squamous cell carcinoma or basal cell carcinoma may arise in epidermal nevus.[7]

Epidermal nevus may occur as a part of epidermal nevus syndrome and may be associated with internal manifestation. These syndromes have characteristic cutaneous findings and at times relevantly specific internal findings.[1] The six different types of epidermal nevus syndromes are nevus sebaceous, CHILD (congenital hemidysplasia with ichthyosiform erythroderma and limb defects) syndrome, nevus comedonicus, Becker's nevus, Proteus syndrome, phacomatosispigmentokeratotica.

Histologically epidermis of epidermal nevus is hyperplastic. There is variable hyperkeratosis, papillomatosis and acanthosis with elongation of rete ridges. Upto 62% of biopsy specimens have these pattern and these are called non-

epidermolytic epidermal nevus. About 16% of epidermal nevi show features of epidermolytic hyperkeratosis. Other histologic patterns are psoriatic type, acrokeratosisverruciformis like type and a Darier's disease like type.[1] Epidermolytic hyperkeratosis is more common in systematized type than localized type. This reaction pattern of skin was first described by Ackerman in 1970.[7]It occurs due to defective keratin genes (KRT-1 and KRT-2), which causes excessive and abnormal keratinization. The salient histologic features are- compact hyperkeratosis, perinuclear vacuolization of the cells in stratum malpighii, irregular cellular boundaries and increased numbers of large irregular keratohyaline granules. Epidermolytic hyperkeratosis is seen in other conditions, such as- bullous congenital icthyosiformerythroderma, icthyosisbullosa of Siemens, Vorner'spalmoplanterkeratoderma, melanocytic nevus, epidermolyticacanthoma, basal cell carcinoma and squamous cell carcinoma etc.

Main clinical differential diagnosis of epidermal nevus areepidermodysplasiaverruciformis, inflammatory linear verrucous epidermal nevus, linear psoriasis and lichenstriatus.Epidermodysplasiaverruciformis is a genetic disease characterized by HPV infection. This is usually associated with HPV 5 or 8, less commonly 3, 4, 5.[1] Histologically this lesion is characterized by acanthosis, hyperkeratosis, large cells with blue-gray cytoplasm, often with dysplastic change and irregular granular layer with rare perinuclear halo. Inflammatory linear verrucous epidermal nevus (ILVEN) is a type of epidermal nevus. These lesions are also distributed in linear pattern, but they are erythematous and itchy. Histologically ILVEN is characterized by some specific features, which are absent in epidermal nevus. These are- areas of depressed orthokeratosis with underlyinghypergranulosis, alternating areas of slightly raised parakeratosis with underlying hypogranulosis.[8] In linear psoriasis, the lesions may be pink to red papules or silvery scales. Typical histologic findings are regular elongation of rete ridges, thin suprapaillary plates, hypo or agranulosis, Munro microabcess and spongiform pustules of Kogoj, which are absent in epidermal nevus. In lichen striatus, the lesions are erythematous papules arranged in linear pattern following lines of Blaschko. But histologically it differs from epidermal nevus by presence of vacuolar alteration of basal layer and band like lymphocytic infiltrate.[7] Treatment modalities of epidermal nevus are topical cream, cryotherapy, laser and dermabrasion. But management is difficult, because the lesions recur unless treatment extend into dermis.

Conclusion

Epidermal nevus with epidermolytic hyperkeratosis is a rare condition. As this is a mosaic genetic disorder of suprabasal keratin, it can be transmitted to offspring and produce generalized epidermolytic hyperkeratosis. So genetic counseling is essential for these patients.

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