Scaly fissured soles

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CLINICAL FINDINGS

A 7-year-old boy presented to our OPD with pruritus and scaling on the dorsum of both feet since 4 years. There was history of aggravation of symptoms during winters. The lesions subsided on using some topical medications, there was no history of similar lesions in his family. There was personal history of bronchial asthma since birth, and it was under remission for one year. Cutaneous examination showed hyperkeratotic scaly plaques and fissuring over the plantar aspect of feet (Fig. 1). Scraping from the scales for fungus was negative on KOH examination. A punch 4mm skin biopsy was taken from right foot and the patient was treated with topical mometasone, tacrolimus and a urea containing moisturizer for regular use on both feet along with antihistamines tablet Levocetirizine 5 mg for itching. There were no other cutaneous lesions and any signs of atopy. The lesions cleared completely and recured again one week after stoppage of the therapy.

What is the clinical diagnosis?

- Keratolysis exfoliativa
- Eczema
- Psoriasis
- Fugal infection

Microscopic examination of sections from a skin biopsy showed hyperkeratosis and focal parakeratosis. There was epidermal acanthosis with paranuclear vacuolization in few keratinocytes. The dermis showed perivascular and peri eccrine duct (at their point of entry to epidermis) inflammatory infiltrate formed lymphohistiocytic. PAS stain was negative for fungi (Fig. 2, 3).

Fig. 1 Scaly fissured plantar surface of the forefoot and heels.

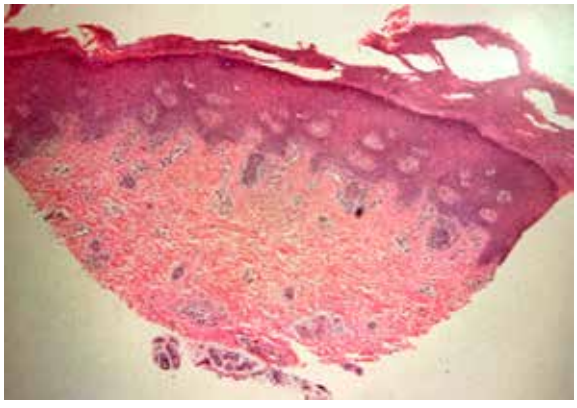

Fig. 2 Hyperkeratosis, parakeratosis, acanthosis with elongated and fused rete ridges. Paranuclear vacuolization in few keratinocytes. Perivascular and peri-eccrine lymphohistiocytic infiltrate.

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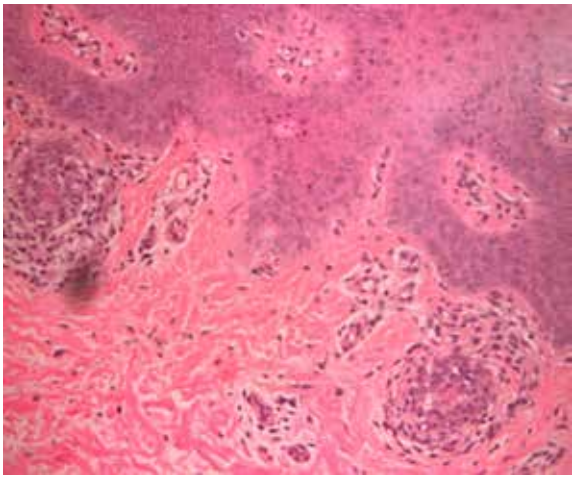

Fig. 3 The inflammatory infiltrate mainly around eccrine ducts at their entry to epidermis.

DIAGNOSIS

Juvenile plantar Dermatosis

DISCUSSION

Juvenile plantar dermatosis (JPD) is a dermatological condition that generally occurs in adults of all ages and boys between 3-14 years of age. Also, it is more common in females. When it occurs in children the prognosis is one of gradual improvement.[1] Children's eczema, also known as 'juvenile plantar eczema' has a tendency to be more severe during the summer months.

The typical clinical features of Juvenile plantar dermatosis (JPD) include erythematous rash of the weight-bearing plantar aspects of the feet, and the distal one-third of the plantar surface of the feet and toes tend to be involved more frequently. The proximal two-thirds of the plantar surface are not involved. Areas of involvement generally appear smooth and shiny with a high incidence of painful fissuring and cracking.[1-5]

The affected regions commonly presented as smooth and shiny with a high incidence of painful fissuring and cracking. In some pateints, the skin of the affected regions desquamates.[1-4] The plantar surface of the great toe is the most common site to be involved followed by forefoot, dorsa of the feet, intertriginous area, instep and heel. In few cases the entire sole can be affected. Some cases the hand can be involved, with fissuring and soreness of the fingertips and palm.[1] Forefoot eczema (FE) is also known as 'juvenile plantar dermatitis', 'forefoot dermatitis', 'atopic winter feet', 'dermatitis plantarissicca', 'peridigital dermatitis', 'sweating socks dermatitis'.[5]

The scaling of the skin can resemble keratolysis exfoliativa, but this typically presents initially as pin size white dots that coalesce. Furthermore, keratolysis exfoliativa tends to affect the palms of the hands more often than the feet and is often asymptomatic.[3]

The differential diagnosis of JPD also includes tinea pedis. However, tinea pedis typically involves the fourth and fifth toe web spaces, whereas JPD generally spares the toe webs. Although tinea pedis rarely affects small children, clinicians should not assume based on a patient's younger age that a questionable presentation is JPD rather than tinea pedis. A potassium hydroxide (KOH) preparation can confirm or rule out tinea.[6,7]

The exact etiology and pathogenesis of JPD are not well-understood. JPD is often seen in 'atopic' children, i.e., those who have atopic dermatitis (eczema), asthma or hay fever.[1,2] Our patient gave us a past history of bronchial asthma. The skin of patient with JPD seems generally more sensitive than others. The condition is related to friction. Friction is greater when the foot moves up and down in a shoe, especially when the foot is sweaty.[3]

It is a better to avoid synthetic shoes. As the foot became wetter in synthetic shoes (e.g., nylon or vinyl), during the summer months the condition is liable to be more severe, because heat and humidity cause the feet to perspire and sweat.

The synthetic and chemical substances used in the manufacturing process for shoes and socks are

the main provocating reasons in the occurrence of foot eczema. Sweat retention and covering of the feet by woolen or polyester socks aggravates this condition, whereas cotton permits the skin to breathe.

The use of a shoe or socks without aeration for a long time are an important triggering factor. Wearing leather footwear and cotton socks may help relieve the problem. It is also important that the footwear fits well and the sole of the foot is not sliding against the insole of the shoe. Walking barefooted on woolen or polyester carpets may contribute to juvenile plantar eczema as this may lead to static electric charges that may play a role in skin dryness and irritation of juvenile plantar eczema.

It is sometimes difficult to differentiate JPD from atopic dermatitis, contact dermatitis, psoriasis, keratolysis exfoliativa, or a fungal infection. Keratolysis exfoliativa has a similar appearance to juvenile plantar dermatosis, but usually affects the hands. Contact dermatitis (irritant, allergic) usually has a history of using new footwear, and dermatitis affects the dorsal aspect of the feet. Patch testing may be considered for identifying specific contact allergens. Dyshidrotic eczema presents with multiple tiny deep-seated vesicles on the palms, lateral fingers, and soles. Plantar psoriasis is usually associated other psoriatic lesions on the scalp, trunk, and extremities, and typical features of nail dystrophy (i.e. pitting, onycholysis, etc.). Family history of psoriasis, nail dystrophy, and psoriatic arthritis may be positive. Tinea pedis presents with scaling and/or maceration of the instep and interdigital spaces as well as onychomycosis. Potassium hydroxide test to visualize microscopic fungal elements or fungal cultures may be performed. Notably, tinea pedis is uncommon in children.[7-9]

In JPD, when the foot is exposed to moisture over extended periods of time (either through hyperhidrosis or occlusion of the foot via footwear made of none breathable synthetic materials), high levels of surface moisture develop.[10] However, it is well-established that exposure to water does not induce skin hydration. In fact, persistent water exposure is shown to disrupt epidermal barrier function.[11,12] Furthermore, there is recent evidence that transepidermal water loss increases as the temperature increases,[13] a finding that may be relevant because none breathable footwear may be associated with higher foot temperatures. As the disrupted epidermal barrier permits excessive evaporation of subcutaneous moisture beyond normal evaporation of moisture on the surface of the skin surface water loss, a cycle of further degradation and dysfunction is instigated. With the lack of hydration, desiccated corneocytes on the epidermal layer shrink. It is likely that in the presence of depleted lipids and epidermal proteins, corneocyte adhesion is diminished, and fissures develop.[11-12]

The management interventions for juvenile plantar dermatosis are: Decrease friction; Wear well-fitting shoes, preferably leather, with two pairs of cotton socks; Lubricate the dry skin. Greasy moisturizers can be very helpful, including white soft paraffin, particularly applied after a bath and before bed. Dimethicone barrier creams are easier to use during the day, applied every four hours. Have a rest day: Schedule quiet times with little or no walking to allow the fissures to heal. Cover the cracks: Fissures heal faster when occluded. Plasters are usually satisfactory. Spray or liquid bandage or nail glue can be applied to the fissure to relieve the pain. Take care not to stick the toes together. Topical steroids: Topical steroid ointments are often prescribed, but rarely prove more effective than simple emollients. The more potent products are worth a trial for a couple of

weeks. If helpful, they should then be reserved for a flare up, particularly if the affected skin is red or itchy.[1-5] This condition typically resolves by puberty and rarely occurs in adults. Follow-up can be performed on an as-needed basis.[5]

Our patient was treated with topical emollient ointment, topical steroid and topical tacrolimus with good and satisfactory result. Upon clearance of the lesions completely, he was advised to continue foot care with dimethicone barrier cream, moisturizers, and avoid ill-fitting footwear.

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