Pitted Keratolysis: A Discussion of Two Cases in Non-weight-bearing Areas

Sir,

Pitted keratolysis (PK) is a superficial infection of the horny layer by gram-positive organisms, most frequently occurring in tropical countries (1). The skin lesion is characterized by defects of the horny layer, consisting of small crateriform pits which sometimes coalesce to form a larger depression (1–3). The most common sites for PK are the pressure-bearing areas of the sole, such as the ventral aspect of the toe, the ball of the foot and the heel, as described previously (1, 2). To the best of our knowledge, there has been no report concerning lesions on the non-weight-bearing areas of the foot among people who are not in the habit of bare-foot walking. Lesions on these sites are considered to be very uncommon. We report 2 cases with PK lesions on the arch and the instep.

CASE REPORTS

Case 1

A 12-year-old Japanese girl came to us with a 2-month history of plantar lesions on both feet, which had developed largely on the arches (Fig. 1) and partly on the toes. Small crateriform pits, the characteristic and diagnostic features of PK, had coalesced to form a larger defect of the horny layer on both sites. Soreness, unpleasant smell and hyperhidrosis were associated with this condition. She had no systemic symptoms and was otherwise healthy. She had been playing volleyball for a month before the onset.

Fig. 1. Plantar lesions of Case 1. The non-weight-bearing areas were involved. Small pits were distributed around a large depression on the arch.

Case 2

An otherwise healthy 20-year-old Japanese woman had a 3-month history of malodorous slimy lesions on both feet in association with hyperhidrosis. The typical keratolytic lesions developed on part of the weight-bearing areas of the soles, including the ball, the heel and the toes. The non-weight-bearing areas, such as the instep and the dorsal aspect of the toes of her right foot, were also affected in this case (Fig. 2). The lesions had spread from the inner side of the right foot and presented themselves as ringed keratolysis associated with a scaling collarette. She was an office worker and field-athlete.

Laboratory examination

Biopsy specimens were taken from both cases using the shaving technique, as described previously (2), and stained with haematoxylin and eosin (HE), gram, Schiff's periodic acid (PAS) and methenamine silver. Gram-positive coccoid and filamentous organisms were detected in the pit of the horny layer. They were also stained positively with haematoxylin, PAS and methenamine silver. Potassium hydrochloride preparations were negative for fungi in both cases.

DISCUSSION

Pitted keratolysis was first described by Castellani as a disease affecting bare-footed people during the rainy season in Sri Lanka (4), and there have been many reports from other tropical and subtropical countries (1, 5, 6). Crateriform defects, coalescing to form a larger plaque, are characteristic features of this disease. Hyperhidrosis is the most frequently observed symptom. Unpleasant smell and sliminess are also distinctive manifestations (2). Gram-positive organisms with coccoid and filamentous forms are usually well-demonstrated during histological examination (1).

Fig. 2. Lesions of Case 2. Non-weight-bearing areas of the foot lesion: the instep and the dorsal aspect of the toes, presenting as "ringed keratolysis."

The weight-bearing areas are most commonly infected by the organisms (1). In 1931 Acton & McGuire (5) showed five clinical forms of PK among bare-footed people in Bengal, including pitted, keratolytic, fissured, paronychial and cracked types. Besides these major types, they referred to another type of lesion, in which the non-weight-bearing areas, the arch and the instep, were involved. There has been no other report concerning these forms of the disease. The instep lesion of Case 2 had a characteristic clinical appearance, consisting of "ringed keratolysis" with a delicate collarette of scale at the periphery (6, 7).

It is still unknown why PK lesions develop on weight-bearing areas of the foot much more frequently than on non-weight-bearing areas. It may be suggested that the non-weight-bearing areas are likely to be infected with the organisms following infection of the weight-bearing areas.

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Somatostatin and Psoriasis

Sir,

It was with great interest that I read the recent article on somatostatin-immunoreactivity in dendritic cells of psoriatic skin by Talme et al. (1), who observed an increased number of such cells in psoriatic lesions and a colocalization with HLA-DR. In addition, they found some epidermal cells positive for both HLA-DR and somatostatin. These cells seemed to be localized in the basal and parabasal cell layers. This is particularly interesting since we observed an increased number of epidermal Merkel cells in psoriatic lesions vs. normal skin per cm^2 of skin surface (2, 3). We also observed that immunostaining with antibodies against a broader range of neuropeptides disclosed that the Merkel cells in psoriatic skin expressed or co-expressed immunoreactivity for neuropeptides in a higher percentage than in normal human skin (2) (Table I). The findings support an "activation" of epidermal Merkel cells in psoriasis.

Table I. *Expression of neuropeptides by epidermal Merkel cells*

	Percentage of Merkel cells positive in	
Neuropeptide	Psoriatic skin	Normal skin
Somatostatin	7.0	0.0
Synaptophysin	21.7	0.0
Pancreatic polypeptide	14.8	0.0
Chromogranin A	<3.0	<3.0

Since keratinocytes do not show receptors for somatostatin (3), they are unlikely to be the target for somatostatin released by epidermal Merkel cells and HLA-DR-positive dendritic cells. Somatostatin receptors can be found on T-lymphocytes and monocytes. An increase of somatostatin-like immunoreactivity in the lesional epidermis of human skin, however, may suggest a hitherto unexpected role of Merkel cells in T-cell regulation.

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