

# *Chronic contact allergic and irritant dermatitis of palms and soles: routine histopathology not suitable for differentiation*

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## ABSTRACT

**Objective:** Chronic contact allergic dermatitis (CAD) and contact irritant dermatitis (CID) of palms and soles have similar clinical features. The pathohistological characteristics of chronic palmoplantar CAD and CID are also similar, as presented by hyperkeratosis, acanthosis, and a chronic inflammatory infiltrate in dermis. The aim of our study was to reconsider whether it makes sense to order pathohistological investigations in the differential diagnosis of chronic palmoplantar CAD and CID.

**Materials and methods:** Biopsies of palmoplantar skin lesions in 24 patients with CAD and 24 with CID were examined according to routine pathohistology. Hematoxylin-eosin and periodic-acid-Schiff (PAS) staining were used.

**Results:** The inflammatory infiltrate in papillary dermis was more marked in CAD, and often composed of eosinophils and lymphocytes. In CID the infiltrate was less pronounced and composed of lymphocytes. Hyperkeratosis is characteristic of both diseases. Even though all examined lesions were chronic, spongiosis, microvesicles and their sequels were seen in the epidermis more often in CAD.

**Conclusion:** Pathohistological findings in chronic palmoplantar CAD and CID must be considered together with results of clinical examination and other tests. Though some slight differences were noticed, the value of light microscopic examination in order to differentiate between chronic CAD and CID is limited.

## KEY WORDS

contact dermatitis, allergic, irritant, chronic, histopathology, diagnostic value

## *Introduction*

Chronic contact allergic dermatitis (CAD) and contact irritant dermatitis (CID) of palms and soles reveal similar clinical features: hyperkeratosis, desquamation and rhagadae. Any attempt to make a diagnosis must include a detailed history, clinical and allergological examinations (patch testing) as well as a mycological in-

vestigation. Palmoplantar tinea and palmoplantar psoriasis present a further diagnostic problem. The pathohistological characteristics of chronic palmoplantar CAD and CID are similar: hyperkeratosis, acanthosis, and a chronic inflammatory infiltrate in dermis (1-6). Light microscopy of paraffin sections often reveals non-

specific chronic dermatitis with hyperkeratosis, and it is usually not possible to distinguish histologically between CAD and CID (4, 7).

In view of the general trend to reduce the cost of laboratory investigation, we decided to reconsider whether a routine pathohistological investigation may be justified in differential diagnosis of chronic palmoplantar CAD and CID.

## Material and methods

Biopsies of palmoplantar skin lesions in 24 patients with CAD and 24 with CID were examined. The routine tissue processing and staining with hematoxylin-eosin (HE) and with periodic-acid Schiff (PAS), were used for the pathohistologic investigation. Attention was paid to the structure of the corneal layer, the expression and type of hyperkeratosis, the appearance of acanthosis, the presence of edema and spongiosis, the outlook of dermal papillae, as well as to the presence and composition of the dermal inflammatory infiltrate.

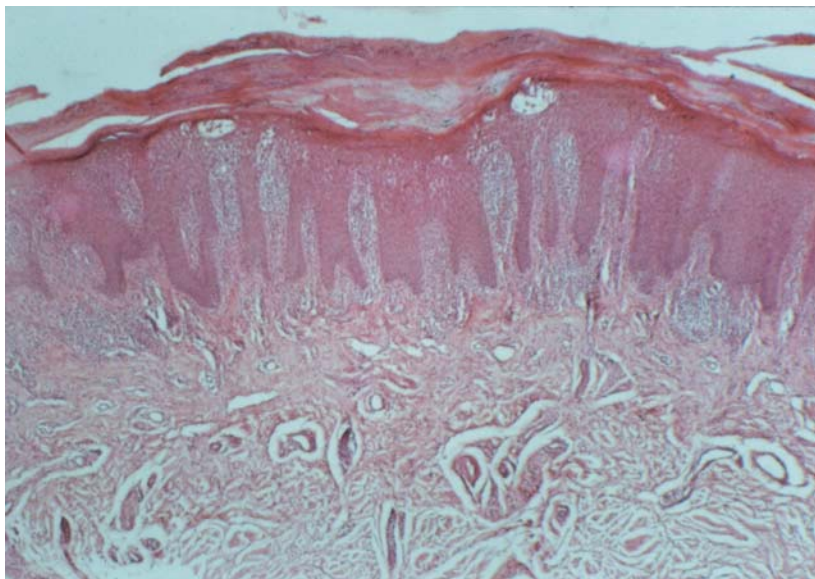
Tinea palmaris and/or plantaris was excluded by negative microscopic examination for fungal elements and by negative culture on Sabouraud's medium. No mycotic elements were observed in preparations stained by the PAS method. Palmoplantar psoriasis was excluded by clinical examination (no psoriatic lesions on other parts of the body, no nail changes), negative anamnesis, and by the absence of typical pathohistological features: no marked elongation of dermal papillae, no microabscesses, no spongiform pustules, and no thick and marked parakeratosis in the horny layer.

## Results

The inflammatory infiltrate in papillary dermis was more marked in CAD, and it often contained eosinophils and lymphocytes. Figures 1 and 2. In CID the infiltrate was less pronounced and composed of lymphocytes. Edema of papillary dermis was often observed in CAD (20 cases), and was rare in CID (5 cases). A moderate elongation of dermal papillae was noticed sometimes in CAD (9 cases).

Hyperkeratosis was seen in both diseases, mostly orthokeratosis, but parakeratosis was also noticed in 9 cases of CAD and 8 cases of CID. In both diseases acanthosis was moderate. The corneal layer did not stain equally, but as irregular areas with different intensity of colour.

Even though all examined lesions were chronic, spongiosis, microvesicles and their sequelae were relatively often seen in CAD (15 cases), and were rare in CID (4 cases). Figure 1. The stratum lucidum was observed only in some instances (5 cases of CAD and 3 cases of CID).



**Figure 1. Contact allergic dermatitis (CAD).** Hyperkeratosis, parakeratosis subcorneal vesicle, moderate spongiosis and acanthosis elongation of dermal papillae pronounced inflammatory infiltrate composed of lymphocytes and some eosinophils, moderate elongation of epidermal papillae. Hematoxylin-eosin 120 x.

**Figure 2. Contact irritant dermatitis (CID).** Hyperkeratosis, acanthosis moderate inflammatory infiltrate, composed of lymphocytes. Hematoxylin-eosin 100 x.

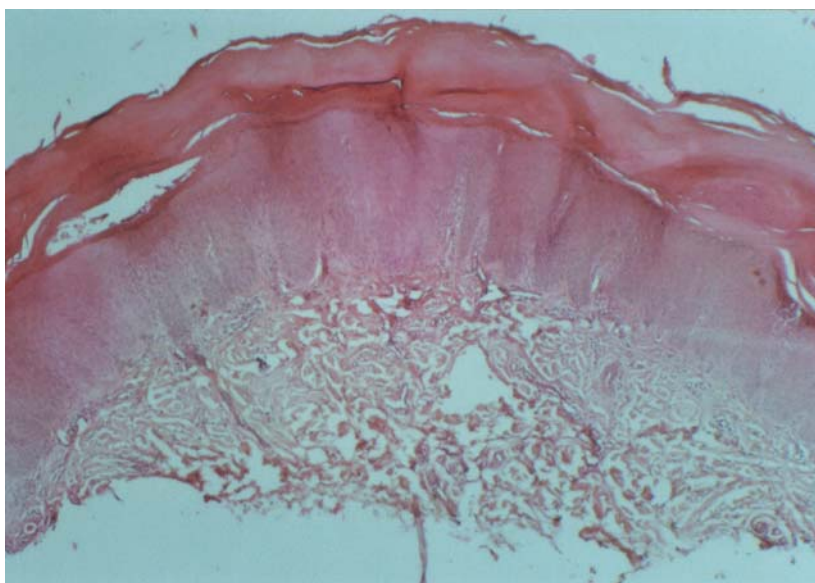


Table 1. Pathohistologic characteristics of CAD and CID

Pathohistologic characteristics	CAD <sup>24</sup> patients	CID <sup>24</sup> patients
Inflammatory infiltrate in papillary dermis	Always, relatively pronounced, often composed of eosinophils and lymphocytes	Always, less pronounced, mainly lymphocytes
Elongation of dermal papillae	Sometimes	Absent
Edema of papillary dermis	Frequent	Rare
Hyperkeratosis	Always	Always
Parakeratosis	In one third of cases	In one third of cases
Acanthosis	Moderate	Moderate
Spongiosis, microvesicles and their sequelae	Usually present	Rare
Presence of stratum lucidum	Sporadic	Sporadic

A summary of the observed histopathological characteristics is presented in table 1.

## Discussion

Pathohistological features may be similar in cases of chronic CAD and CID of palms and soles. Some histological characteristics may however be useful for establishing the diagnosis, as shown in table 1.

The most prominent histological changes in all of the examined cases were in epidermis. The nonequal susceptibility of the corneal layer to staining indicates that the epidermal cells are not all in the same phase of proliferative activity.

It was unexpected that vesicles and their sequelae in epidermis (especially in cases of CAD), were found relatively frequently, since chronic appearance of palmoplantar CAD and CID were examined. It can be partially explained by the history of continual exposition to allergens or irritants.

The inflammatory infiltrate in papillary dermis in CAD was composed mostly of lymphocytes and some eosinophils, while in CID exclusively of lymphocytes. Certain authors who have considered this problem (8–10) and mention no differences in dermal infiltrate between CAD and CID. A disagreement exists however between most competent histopathologists. W. Lever

believed that the histologic picture of various types of dermatitis is rarely characteristic enough to offer sufficient criteria for diagnosis (4). On the other hand B. Ackerman sticks to the opinion that necrotic and ballooned keratinocytes indicate chronic CID, while spongiosis and eosinophils favour the diagnosis of CAD (11). According to our findings the presence of eosinophils in dermal infiltrate in CAD, and their absence in CID, may sometimes be useful differentiating characteristics.

## Conclusion

Pathohistological findings in chronic palmoplantar CAD and CID must be considered together with results of clinical examinations and with other tests. Some characteristics may be potentially useful for differential diagnosis in doubtful cases: the presence of eosinophils in the dermal inflammatory infiltrate, edema of the papillary dermis and the presence of microvesicles and their sequelae in epidermis in CAD. Since these findings are far from being pathognomonic, and there are no unequivocal differences in pathohistology between CAD and CID, it can be said, that the value of light microscopic examination in chronic palmoplantar CAD and CID is limited. Thus in view of the cost/benefit relation we conclude that biopsy and histopathological investigation should not be ordered routinely.

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