

12

HISTOPATHOLOGY AND IMMUNE HISTOCHEMISTRY OF RED TATTOO REACTIONS

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Aim: Most chronic tattoo reactions occur in red tattoos or in nuances of red. An allergic mechanism elicited by red pigment composed of various azo-chemicals is suspected. The aim of the study was to assess and grade epidermal and dermal changes of such tattoo reactions including immunochemistry relevant for the study of a possible allergic pathomechanism.

Methods: Skin biopsies taken from red tattoo reactions were assessed and graded by conventional microscopy and stained for T and B-lymphocytes, Langerhans cells, macrophages and TNF- α .

Results: The study included 19 biopsies from 19 patients. The culprit colours were red/pink (n=15) and purple/bordeaux (n=4). Every biopsy showed dermal inflammation with lymphocytic infiltration (in 100%), especially in the papillary dermis immediately under the basement membrane zone, where it was obligatory. Fully developed Interface dermatitis concentrated around the basement membrane zone was the lead pathology pattern found in 78% of samples. Overlap with granulomatous (in 32%) and pseudolymphomatous reaction patterns (in 32%) was noted, and these patterns were inconsistent and might coincide in the same biopsy. Epidermal hyperkeratosis (in 89%) was common. Leakage of red pigment across the normally tight dermo-epidermal junction with pigment escaped from the outer dermis into the epidermis was noteworthy (in 28%). Pigment escape was interpreted as a consequence of interface damage with barrier defect created by the interface dermatitis and caused by the pigment in the outer dermis. Epidermal hyperplasia was interpreted as reactive. The dermal cellular infiltration was dominated by T-lymphocytes (in 100%) and dense infiltration with Langerhans cells (in 95%) and macrophages (in 100%). TNF- α was common.

Conclusions: Inflammation of red tattoo reactions is concentrated in the papillary dermis, where cellular infiltration with lymphocytes is obligatory. The predominant histological pattern of reactions is interface dermatitis, which may be associated with interface damage and escape of red tattoo pigment into the epidermis. Granulomatous and pseudolymphomatous patterns are inconsistent and overlap and coincide. T-lymphocytes and Langerhans cells are dominating supporting the view that allergy is the typical pathomechanism behind reactions of red tattoos. TNF- α may contribute to reactions as a mediator of inflammation.