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In vivo confocal laser scanning microscopy: diagnostic criteria for the differentiation of vesiculobullous skin disorders

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ABSTRACT

Background: In vivo confocal laser scanning microscopy (CLSM) is a modern non-invasive method for the investigation of dermal and epidermal lesions in high cellular resolution. Our aim was to define diagnostic CLSM-criteria for selected vesiculobullous skin disorders that may be helpful in daily clinical routine. **Methods:** We examined patients with vesiculobullous skin disorders (n=32) by using digital dermatoscopy (FotoFinder HD800 medicam) and in vivo CLSM (VivaScope 1500/3000). In a retrospective analysis of individual vesiculobullous skin disorders we were able to define several diagnostic CLSM-criteria specifically associated with the different disease entities. We report one representative case for each of the following diagnoses: i) bullous pemphigoid, ii) varicella zoster virus infection and iii) allergic contact dermatitis (positive patch-test reaction). **Results:** Allergic contact dermatitis presented with intraepidermal microvesicles just below the stratum corneum, inflammatory infiltrate and spongiosis. The intact stratum corneum contained multinucleated keratinocytes as a sign of parakeratosis. Varicella zoster infection was characterized by multichambered larger vesicles within the epidermis. Acantholytic cells and some lobulated-enlarged cells, with several nuclei and bright cytoplasm, corresponding to multinucleated giant cells, were surrounded by loose aggregates of keratinocytes, inflammatory cells and debris. The bullous pemphigoid showed large bullae at the level of the dermoepidermal junction containing numerous inflammatory cells within the fluid. In the lower part of the stratum spinosum, an intercellular edema was interspersed with inflammatory cells. There were no abnormalities in the cellular structure or architecture of the upper stratum spinosum, stratum granulosum or stratum corneum. **Conclusions:** Besides a good correlation between conventional histology and the results of confocal laser scanning microscopy, we could show distinguishing criteria for the above stated diseases, which may facilitate a non-invasive and immediate diagnosing, especially in vague or unusual clinical cases.