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Histometric Data Obtained by In Vivo Confocal Laser Scanning Microscopy In Patients With Systemic Sclerosis

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ABSTRACT

BACKGROUND: It would be a benefit if time-saving, non-invasive methods could give hints for diagnosing systemic sclerosis. To investigate the skin of patients with systemic sclerosis using confocal laser scanning microscopy in vivo and to develop histometric parameters to describe characteristic cutaneous changes of systemic sclerosis observed by this new technique, we conducted an exploratory study.

MATERIALS AND METHODS: Fifteen patients with systemic sclerosis treated with extracorporeal photopheresis were compared with 15 healthy volunteers and 10 patients with other disorders also treated with extracorporeal photopheresis. All subjects were investigated using confocal laser scanning microscopy in vivo.

RESULTS: Micromorphologic characteristics of skin of patients with systemic sclerosis and measuring parameters for melanisation, epidermal hypotrophy, and fibrosis for dislocation of capillaries by collagen deposits in the papillary dermis were evaluated. An interesting finding was an increased thickness of the tissue in the dermal papillae superior to the first dermal papilla vessel. It was also possible to reproduce characteristic histologic features by confocal laser scanning microscopy in vivo. Histometric parameters for fibrosis and vascular features developed in this study showed significant differences in patients with systemic sclerosis compared to controls.

CONCLUSIONS: Although the predominant histopathological features in systemic sclerosis are findings of the reticular dermis and the subcutis, and in histopathological investigation the epidermis seems to remain unaffected by the disease, we have demonstrate some characteristic differences in the epidermis and papillary dermis by confocal laser scanning microscopy in vivo. Some of them have not been described so far. However, to use this technique as a tool for diagnosis and/or staging of systemic sclerosis, further studies are needed investigating the sensitivity and specificity of the histometric parameters developed in this study.