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Skin aging: in vivo microscopic assessment of epidermal and dermal changes by means of confocal microscopy.

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ABSTRACT

BACKGROUND: Skin aging is thought to be a complex biological process that is traditionally classified as intrinsic and extrinsic aging. Several clinical score and instrumental devices have been applied to obtain a precise assessment of skin aging. Among them, confocal microscopy has emerged as a new technique capable of assessing cytoarchitectural changes with a nearly histopathologic resolution.

OBJECTIVE: We sought to determine the microscopic skin changes occurring on the face in different age groups by means of confocal microscopy.

METHODS: The skin of the cheek in 63 volunteers belonging to distinct age groups was analyzed by confocal microscopy. In 4 cases, routine histopathology was performed on site-matched surplus areas from routine excisions for obtaining a better comparison with confocal findings.

RESULTS: Young skin was characterized by regular polygonal keratinocytes and thin reticulated collagen fibers. With aging, more irregularly shaped keratinocytes and areas with unevenly distributed pigmentation and increased compactness of collagen fibers were observed. In the elderly, thinning of the epidermis, marked keratinocyte alterations, and huddles of collagen and curled fibers, corresponding to elastosis, were present. A side-by-side correlation between confocal descriptors and histopathologic aspects has been provided in a few cases.

LIMITATIONS: Reticular dermal changes cannot be assessed because of the limited depth laser

penetration.

CONCLUSIONS: Confocal microscopy was successfully applied to identify in vivo skin changes occurring in aged skin at both the epidermal and dermal levels at histopathologic resolution. This offers the possibility to test cosmetic product efficacy and to identify early signs of sun damage.