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Effects of a topically applied wound ointment on epidermal wound healing studied by in vivo fluorescence laser scanning microscopy analysis.

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ABSTRACT

Epidermal wound healing is a complex and dynamic regenerative process necessary to reestablish skin integrity. Fluorescence confocal laser scanning microscopy (FLSM) is a noninvasive imaging technique that has previously been used for evaluation of inflammatory and neoplastic skin disorders in vivo and at high resolution. We employed FLSM to investigate the evolution of epidermal wound healing noninvasively over time and in vivo. Two suction blisters were induced on the volar forearms of the study participants, followed by removal of the epidermis. To study the impact of wound ointment on the process of reepithelization, test sites were divided into two groups, of which one test site was left untreated as a negative control. FLSM was used for serial/consecutive evaluations up to 8 days. FLSM was able to visualize the development of thin keratinocyte layers developing near the wound edge and around hair follicles until the entire epidermis has been reestablished. Wounds treated with the wound ointment were found to heal significantly faster than untreated wounds. This technique allows monitoring of the kinetics of wound healing noninvasively and over time, while offering new insights into the potential effects of topically applied drugs on the process of tissue repair.