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In vivo laser scanning microscopy of cornea, conjunctiva and ocular adnexa with a handheld dermatological laser-scanning microscope: new perspectives

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ABSTRACT

Purpose: In vivo confocal microscopy (IVCM) is routinely used in well-equipped reference centers for the diagnosis of complicated corneal and conjunctival diseases, mainly infectious and tumoral ones. At present, only two CM are available for ophthalmology. Both are attached on a classical ophthalmology stand optimized for corneal examination. Aim: to expose new perspectives in examination of cornea, conjunctiva and ocular using a handheld dermatological CM **Methods:** Using the handheld dermatological reflectance laser-scanning microscope (Vivascope 3000, MAVIG GmbH) equipped with a 830nm laser, we observed cornea, bulbar and tarsal conjunctiva, eyelid margin, lacrimal puncta and palpebral skin of healthy volunteers as well as none pigmented or pigmented lesions of these sites. Correlations with histopathology were established whenever surgery was necessary **Results:** Thanks to its compact configuration and flexible, handheld positioning, the Vivascope3000 made it possible to easily access ocular and periocular tissue that remained challenging to observe with ophthalmological CM. With a definition of 1pixel/2µm and 1000x1000 µm images, the handheld CM allowed non-invasive optical biopsy of all normal and pathologic ocular surface as well as periocular tissues. Diagnosis of benign or malignant tumors (melanoma or epidermoid carcinoma) could be highly suspected. Confocal images were well correlated with conventional histopathology **Conclusion:** The compact handheld Vivascope 3000 offers new perspectives for diagnosis, optimization of treatments, and follow-up of ocular surface and ocular adnexa diseases