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### Unravelling of difficult-to-diagnose skin tumors by analysis with in-vivo confocal laser scanning microscopy

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#### ABSTRACT

**Question:** The routine clinical examination of skin tumors includes naked eye inspection and dermoscopy. Dermoscopy was shown to significantly improve the diagnostic accuracy for identifying melanomas and to reduce the number of unnecessary excisions of benign skin lesions. Nevertheless, in daily routine the clinician is confronted with a certain amount of skin tumors that allow no specific diagnosis due to the absence of typical clinical or dermoscopic features. The in-vivo confocal laser scanning microscopy (CLSM) offers a novel diagnostic tool for the visualization of the upper layers in skin tumors in a high cellular resolution. Recent studies, which investigated the role of the CLSM, have provided diagnostic algorithms for the identification of frequent neoplasms as cutaneous melanoma, basal cell carcinoma or benign nevi with a high diagnostic accuracy. **Methods:** Consecutive patients with difficult-to-diagnose skin tumors at a university-based skin cancer unit were examined with naked eye, a digital dermoscopy system (FotoFinder Systems), CLSM (VivaScope 1500), and routine histopathology. **Results:** In this report we present a number of difficult-to-diagnose pigmented and non-pigmented skin tumors, including melanoma, benign nevi, basal cell carcinoma and Bowen's disease with results of corresponding clinical, dermoscopic, CLSM, and histopathologic examinations. The CLSM technique in these cases allowed to make a preliminary diagnosis with important impact on the managing decision making process. Typical features of the different tumor entities are visualized and explained. **Conclusion:** In vivo CLSM represents a complementary diagnostic tool for a more precise noninvasive preliminary diagnosis that may have an important impact on further managing decisions.