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Confocal microscopy to guide erbium:yttrium aluminum garnet laser ablation of basal cell carcinoma: an ex vivo feasibility study.

Sierra H, Larson BA, Chen CS, Rajadhyaksha M., J Biomed Opt. 2013 Sep;18(9):095001. doi: 10.1117/1.JBO.18.9.095001.

ABSTRACT

For the removal of superficial and nodular basal cell carcinomas (BCCs), laser ablation provides certain advantages relative to other treatment modalities. However, efficacy and reliability tend to be variable because tissue is vaporized such that none is available for subsequent histopathological examination for residual BCC (and to confirm complete removal of tumor). Intra-operative reflectance confocal microscopy (RCM) may provide a means to detect residual tumor directly on the patient and guide ablation. However, optimization of ablation parameters will be necessary to control collateral thermal damage and preserve sufficient viability in the underlying layer of tissue, so as to subsequently allow labeling of nuclear morphology with a contrast agent and imaging of residual BCC. We report the results of a preliminary study of two key parameters (fluence, number of passes) vis-à-vis the feasibility of labeling and RCM imaging in human skin ex vivo, following ablation with an erbium:yttrium aluminum garnet laser.