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Feasibility of intraoperative imaging during Mohs surgery with reflectance confocal microscopy

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ABSTRACT

Mohs surgery for the removal of non-melanoma skin cancers (NMSCs) is performed in stages, while being guided by the examination for residual tumor with frozen pathology. However, preparation of frozen pathology at each stage is time-consuming and labor-intensive. Real-time intraoperative reflectance confocal microscopy (RCM) may enable rapid detection of residual tumor directly in surgical wounds on patients. We report initial feasibility on twenty-one patients, using 35% AICl₃ for nuclear contrast. Imaging was performed in quadrants in the wound, to simulate the Mohs surgeon's examination of pathology. Images and videos of the epidermal and dermal margins were found to be of clinically acceptable quality. Bright nuclear morphology was identified at the epidermal margin. The presence of residual BCC/SCC tumor and normal skin features could be detected in the peripheral and deep dermal margins. Nuclear morphology was detectable in residual BCC/SCC tumors. Intraoperative RCM imaging may enable detection of residual tumor, directly on Mohs patients, and may serve as an adjunct for frozen pathology. However, a stronger source of contrast will be necessary, and also a smaller device with an automated approach for imaging in the entire wound in a rapid and controlled manner for clinical utility.