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IN VIVO MULTIPHOTON MICROSCOPY OF AMELANOTIC MELANOMA

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Background: Early detection of clinically amelanotic malignant melanoma (MM) presents a challenge to the dermatologist. Currently, MM are diagnosed by clinical evaluation and histopathologic examination, but because of the absence of visible pigment, diagnosis and treatment are often delayed. Multiphoton microscopy (MPM) is based on the non-linear excitation of endogenous fluorophores such as melanin, collagen, and keratin and may be used to highlight features of melanoma. Our objective in this case report was to utilize MPM as a noninvasive *in vivo* imaging modality to characterize the features of a biopsy-proven amelanotic melanoma prior to treatment and to correlate the histopathologic criteria with MPM images.

Study: A 68-year-old man had a two-year history of a poorly demarcated hypo-pigmented patch with newly arisen central pink papules. Biopsy of the lesion demonstrated an amelanotic MM. The lesion was imaged at three discrete sites using MPM. Scouting biopsies were taken at these three sites to correlate the microscopy imaging to the clinical and histopathologic findings. The lesion was subsequently excised by Mohs micrographic surgery. A sentinel lymph node biopsy was performed and no evidence of melanoma cells was found. MPM images of the lesional skin demonstrated qualitative features such as cytologic atypia, architectural disorder, and melanocytic dendrites. These imaging findings correlate with the histopathologic findings of melanoma.

Conclusion: This case report demonstrates that noninvasive in vivo MPM imaging can take advantage of endogenous fluorescence to characterize amelanotic MM lesions. This technique may aid in the early detection of clinically barely visible or non-pigmented melanomas, and hasten definitive therapy. Additional studies will need to investigate other imaging features of MM and compare MPM performance with histopathologic diagnosis.