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211 | Diagnostic Image Analysis of malignant melanoma in in vivo confocal laser-scanning microscopy: a preliminary study

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ABSTRACT

BACKGROUND/PURPOSE: In this study we assessed the applicability of image analysis and a machine learning algorithm on diagnostic discrimination of benign and malignant melanocytic skin tumours in in vivo confocal laser-scanning microscopy (CLSM).

METHODS: A total of 857 CLSM tumour images including 408 benign nevi and 449 melanoma images was evaluated. Image analysis was based on features of the wavelet transform. For classification purposes we used a classification tree software (CART). Moreover, automated image analysis results were compared with the prediction success of an independent human observer.

RESULTS: CART analysis of the whole set of CLSM tumour images correctly classified 97.55% and 96.32% of melanoma and nevi images. In contrast, sensitivity and specificity of 85.52% and 80.15% could be reached by the human observer. When the image set was randomly divided into a learning (67% of the images) and a test set (33% of the images), overall 97.31% and 81.03% of the tumour images in the learning and test set could be classified correctly by the CART procedure.

CONCLUSION: Provided automated decisions can be used as a second opinion. This can be valuable in assisting diagnostic decisions in this new and exciting imaging technique.