

Overview

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Improving diagnostic sensitivity of combined dermoscopy and reflectance confocal microscopy imaging through double reader concordance evaluation in telemedicine settings: A retrospective study of 1000 equivocal cases.

Witkowski AM, ?udzik J, Arginelli F, Bassoli S, Benati E, Casari A, De Carvalho N, De Pace B, Farnetani F, Losi A, Manfredini M, Reggiani C, Malveyh J, Pellacani G. *PLoS One*. 2017 Nov 9;12(11):e0187748. doi: 10.1371/journal.pone.0187748.

ABSTRACT

BACKGROUND: Reflectance confocal microscopy (RCM) is an imaging device that permits non-invasive visualization of cellular morphology and has been shown to improve diagnostic accuracy of dermoscopically equivocal cutaneous lesions. The application of double reader concordance evaluation of dermoscopy-RCM image sets in retrospective settings and its potential application to telemedicine evaluation has not been tested in a large study population. **OBJECTIVE:** To improve diagnostic sensitivity of RCM image diagnosis using a double reader concordance evaluation approach; to reduce mismanagement of equivocal cutaneous lesions in retrospective consultation and telemedicine settings. **METHODS:** 1000 combined dermoscopy-RCM image sets were evaluated in blind by 10 readers with advanced training and internship in dermoscopy and RCM evaluation. We compared sensitivity and specificity of single reader evaluation versus double reader concordance evaluation as well as the effect of diagnostic confidence on lesion management in a retrospective setting. **RESULTS:** Single reader evaluation resulted in an overall sensitivity of 95.2% and specificity of 76.3%, with misdiagnosis of 8 melanomas, 4 basal cell carcinomas and 2 squamous cell carcinomas. Combined double reader evaluation resulted in an overall sensitivity of 98.3% and specificity of 65.5%, with misdiagnosis of 1 in-situ melanoma and 2 basal cell carcinomas. **CONCLUSION:** Evaluation of dermoscopy-RCM image sets of cutaneous lesions by single reader evaluation in retrospective settings is limited by sensitivity levels that may result in potential mismanagement of malignant lesions. Double reader blind concordance evaluation may improve the sensitivity of diagnosis and management safety. The use of a second check can be implemented in telemedicine settings where expert consultation and second opinions may be required. PMID: 29121636 DOI: 10.1371/journal.pone.0187748