1-1-2018

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Recommended Citation

Drugge, E. D., Volpicelli, E., Sarac, R., Strang, S., Elston, D., & Drugge, R. (2018). Micromelanomas Identified with Time-Lapse Total Body Photography and Dermoscopy. *Journal of the American Academy of Dermatology, 78* (1), 182-183. https://doi.org/10.1016/j.jaad.2017.07.049

Ref. MS.NO.JAAD-D-16-01647

Micromelanomas Identified with Time-Lapse Total Body Photography and Dermatoscopy

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Acknowledgements:

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IRB: IRB Assurance 00002052 (see attached)

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Author Contributions: Drs. Elizabeth Drugge and Elgida Volpicelli had full access to all of the data in the study and take responsibility for the integrity of the data and accuracy of the reporting.

Funding/Support: This article has no funding source.

Conflict of Interest Disclosure of the Authors: Dr. Rhett Drugge is the inventor and holder of the intellectual property rights (US 7,359,748) of the Melanoscan system. Dr. Elizabeth Drugge is a first-degree relative of Dr. Rhett Drugge.

Prior Presentation: None

Word count: (text) 499; (references) 158; (figure legends) 122

Number of references: 5

Number of figures: 2

Reprints: Requested

Abbreviations: Melanoma (MM), Micromelanoma (MicroMM), Melanoma-in-Situ (MIS), Invasive (INV), American Academy of Dermatology (AAD), Asymmetry, Border Irregularity, Colors (two or more), Diameter (>6 mm), Evolution (ABCDE), Brigham and Women's Hospital (BWH)

To the Editor:

Secondary prevention efforts to detect malignant melanoma (MM) focus on lesions at an initial growth phase with diameters less than 6 mm; earlier detection correlates with improved survival rates.[1]Two photographic approaches provide critical and complementary information in the differential diagnosis of MM. Total body photography (TBP) traditionally provides baseline images from which macroscopic lesion changes can be detected, whereas digital epiluminescence (dermatoscopic) microscopy reveals subtle changes in pre-existing nevi[2]. Time and cost barriers restrict the use of both modalities to a select group of high risk patients in pigmented skin lesion clinics.

Automation of TBP using a 25 camera array enables the routine capture of clinical images as an adjunct to the total body skin examination. Computer-assisted comparison of serial images exposes new and changed lesions, which are then photographed dermatoscopically [3]. We describe the clinical, dermatoscopic and histopathological features of melanomas ≤ 3 mm in size (micromelanomas) identified using this process.

We performed a retrospective study of 268 consecutive melanocytic lesions biopsied from 218 patients, from January, 2015 through June, 2016 in a single practice dermatology clinic. Lesion diameter was obtained from dermatoscopic images taken prior to biopsy and depth was obtained from pathology reports.

Eighty-one of 268 melanocytic lesions (30.22%) were in situ (MIS) or invasive melanoma (range: 0.12, 3.5; median: 0.34), and 28 (34.57% of the melanomas) were ≤ 3 mm in diameter; 27 (33.33%) were > 3 & ≤ 6 mm; and 26 (32.10%) were

> 6 mm. Of the lesions ≤ 3 mm, 21 (75.00%) were MIS and 7 (25.00%) were invasive (range: 0.22 - 0.42; median 0.3 mm). Of lesions > 3 and ≤ 6 mm, 13 (48.15%) were MIS and 14 (51.85%) were invasive (range: 0.2 - 2.3; median 0.395 mm). Of lesions > 6 mm, 16 (61.54%) were MIS and 10 (38.46%) were invasive (range: 0.12 - 3.5; median 0.38 mm).

Nineteen of the 28 micromelanomas (68%) had diameters ≤ 2 mm and were sent for two additional blinded histopathologic assessments. Eleven of these (58%) were diagnosed as melanoma by all 3 dermatopathologists. The remaining eight lesions were called melanoma by one pathologist and severely atypical by another with a comment that they could represent evolving melanoma and should be excised.

Time-lapse clinical images and the corresponding dermatoscopic image of a melanoma can be seen in Figure 1. Dermatoscopic features of chaos, clods and amorphous areas were identified in all malignant lesions, but our sample size is not large enough to determine the relative value of each feature.

There are other reports of micromelanomas identified using various TBP and dermoscopy platforms with yields in the range of 23 (11%) of 206 lesions biopsied[4], and 4 (4%) of 95 pigmented lesions biopsied[5]. Compared to the Abassi study, we found a significantly lower number needed to biopsy (3.1 vs 12.01), with a similar MIS:INV ratio (1.56:1). These studies suggest that routine comparison of complete sets of TBP images combined with dermatoscopy can identify very small lesions of melanoma, some of which are already invasive.

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Figure Legend:

Fig. 1. Malignant melanoma. Time-lapse total body clinical images exhibited a new lesion that appeared within 1 year and 3.5 months. The corresponding dermatoscopic image revealed a lesion that measured 1.7 mm in diameter (using the dermatoscope scale), with features of chaos, clods and amorphous areas.