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Micromelanomas Identified with Time-Lapse Total Body Photography and Dermoscopy

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2 **Micromelanomas Identified with Time-Lapse Total Body Photography and**
3 **Dermatoscopy**

4

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37

38 **Abbreviations:** Melanoma (MM), Micromelanoma (MicroMM), Melanoma-in-Situ (MIS),
39 Invasive (INV), American Academy of Dermatology (AAD), Asymmetry, Border
40 Irregularity, Colors (two or more), Diameter (>6 mm), Evolution (ABCDE), Brigham and
41 Women's Hospital (BWH)
42

1 ***To the Editor:***

2 Secondary prevention efforts to detect malignant melanoma (MM) focus on
3 lesions at an initial growth phase with diameters less than 6 mm; earlier detection
4 correlates with improved survival rates.¹Two photographic approaches provide
5 critical and complementary information in the differential diagnosis of MM. Total
6 body photography (TBP) traditionally provides baseline images from which
7 macroscopic lesion changes can be detected, whereas digital epiluminescence
8 (dermatoscopic) microscopy reveals subtle changes in pre-existing nevi². Time
9 and cost barriers restrict the use of both modalities to a select group of high risk
10 patients in pigmented skin lesion clinics.

11 Automation of TBP using a 25 camera array enables the routine capture of
12 clinical images as an adjunct to the total body skin examination. Computer-
13 assisted comparison of serial images exposes new and changed lesions, which
14 are then photographed dermatoscopically³. We describe the clinical,
15 dermatoscopic and histopathological features of melanomas ≤ 3 mm in size
16 (micromelanomas) identified using this process.

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

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

24 > 6 mm. Of the lesions \leq 3 mm, 21 (75.00%) were MIS and 7 (25.00%) were
25 invasive (range: 0.22 - 0.42; median 0.3 mm). Of lesions > 3 and \leq 6 mm, 13
26 (48.15%) were MIS and 14 (51.85%) were invasive (range: 0.2 - 2.3; median
27 0.395 mm). Of lesions > 6 mm, 16 (61.54%) were MIS and 10 (38.46%) were
28 invasive (range: 0.12 - 3.5; median 0.38 mm).

29 Nineteen of the 28 micromelanomas (68%) had diameters \leq 2 mm and were
30 sent for two additional blinded histopathologic assessments. Eleven of these
31 (58%) were diagnosed as melanoma by all 3 dermatopathologists. The remaining
32 eight lesions were called melanoma by one pathologist and severely atypical by
33 another with a comment that they could represent evolving melanoma and should
34 be excised.

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

39 There are other reports of micromelanomas identified using various TBP and
40 dermoscopy platforms with yields in the range of 23 (11%) of 206 lesions
41 biopsied⁴, and 4 (4%) of 95 pigmented lesions biopsied⁵. Compared to the
42 Abassi study, we found a significantly lower number needed to biopsy (3.1 vs
43 12.01), with a similar MIS:INV ratio (1.56:1). These studies suggest that routine
44 comparison of complete sets of TBP images combined with dermatoscopy can
45 identify very small lesions of melanoma, some of which are already invasive.

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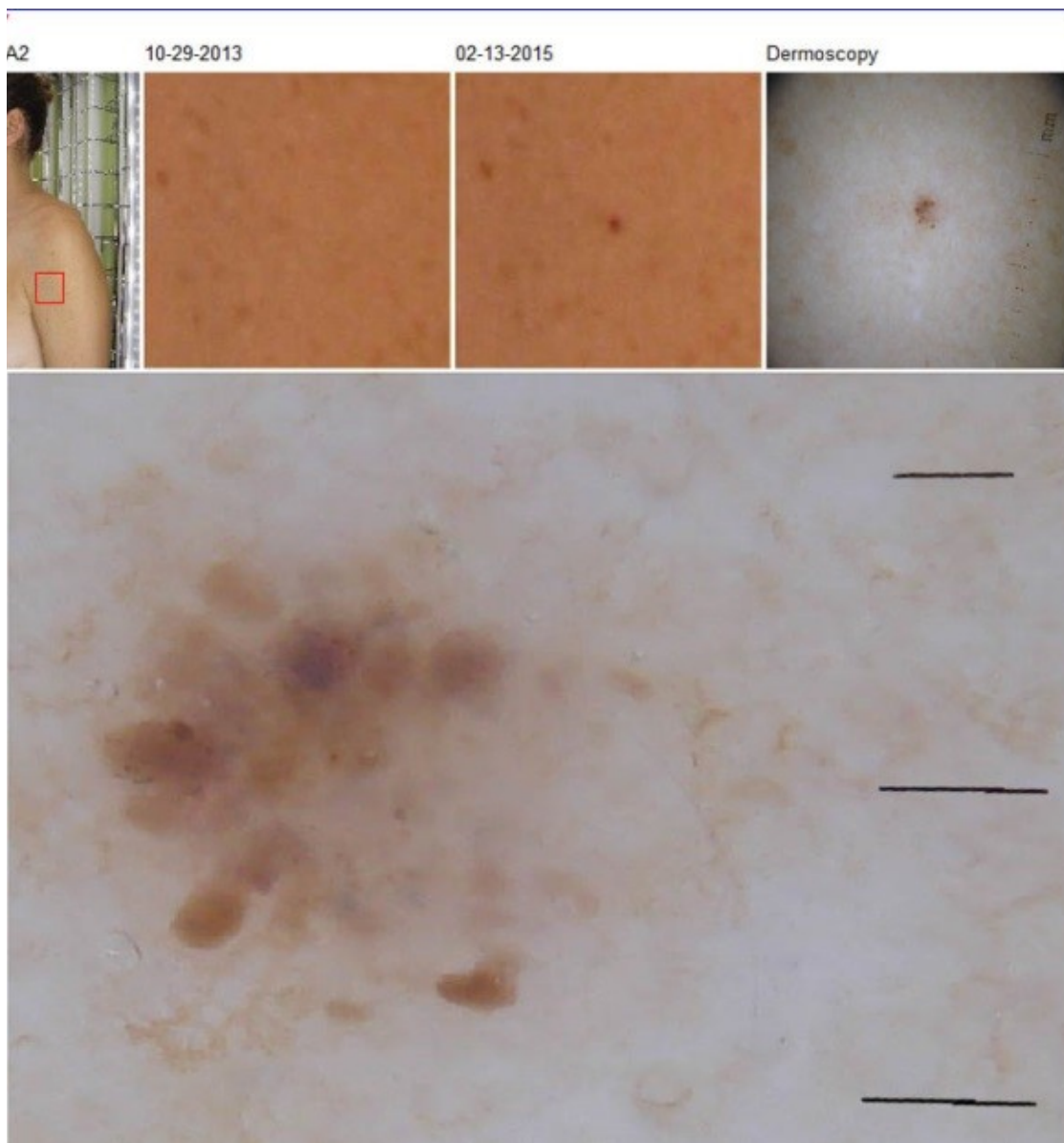
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1 **Figure Legend:**

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

6



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