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CLINICAL LETTER

Semi-automated total body photography can identify subtle melanomas but false-negatives on automated comparison highlight the need for manual side-by-side image comparison

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Editor,

It is known that dermatoscopy improves diagnostic accuracy for skin lesions whether pigmented or not,[1,2] but it is also known that approximately 10% of melanomas are featureless, lacking diagnostic dermatoscopic criteria.[3(page 620)] Of relevance, a recent, appropriately powered and controlled study found that 59.2% of monitored lesions did not have dermatoscopic features of malignancy when excised, only being excised because of evident differences when sequential dermatoscopic images were compared side-by-side.[3(page 619)] Consistent with this, Australian melanoma guidelines highlight the role of both total body photography (TBP) and sequential digital dermatoscopic imaging (SDDI) but recommend as a "Practice Point" that TBP should be the *primary* imaging intervention for early melanoma detection in patients at elevated risk who have high naevus counts.[4]

We present two cases of high-risk young patients, whose clinically and dermatoscopically subtle melanomas were first detected by operator-recognition of size-enlargement in sequential TBP images, these changes in both cases *not* being detected by dedicated software. Both patients have provided informed consent to the publication of their information contained within this manuscript.

A 43-year-old female, with a past history of melanoma in situ at age 31, presented for follow-up TBP in July 2022 with detection software applied (FotoFinder Systems, GmbH, Germany), baseline TBP images having been obtained 5 years earlier in July 2017. The instrument's detection-software did not flag any change

in a lesion which was noted by the operator (general practitioner) to have very slightly increased in size (Figure 1a,b, black arrows) compared to a baseline, 5 years previously. Dermatoscopy (Figure 2a) showed a small, pigmented lesion, structureless centrally with a pattern of lines reticular peripherally and with a small focus of irregular clods, as a very subtle clue to malignancy. Excision biopsy was signed out as melanoma in situ (Figure S1).

A 41-year-old female, with six previous melanomas and with multiple (>200) naevi, presented for follow-up TBP in October 2022, baseline TBP images having been obtained 4 years earlier in February 2018. She also had a family history of melanoma in both parents and an identical twin, her father having died from metastatic melanoma at age 30. Detection software was applied, utilising the same equipment as for the previous case. Due to classification as high-risk, this patient had been examined 6-monthly since 2009, with ongoing SDDI, which had been critical for the diagnosis of two of her previous melanomas. On this occasion, the TBP detection-software did not flag any change for a lesion on the arm, which was noted to have changed in size by the operator (Registered Nurse) (Figure 1c,d). Dermatoscopy showed a subtle lesion with a pattern of fine serpentine linear vessels, and patchy, subtle, structureless brown pigment (Figure 2b), with no melanoma-specific criteria. Although it is reasonable to regard the vessel pattern as "atypical", of relevance the vessels on the perilesional skin had the same morphology, only more subtle and the vessel pattern exhibited was arguably as for the normal dermal plexus as commonly seen on atrophic sun-damaged skin (telangiectasia). Excision biopsy was signed out as an invasive melanoma (Breslow thickness 0.3 mm) (Figure S2).

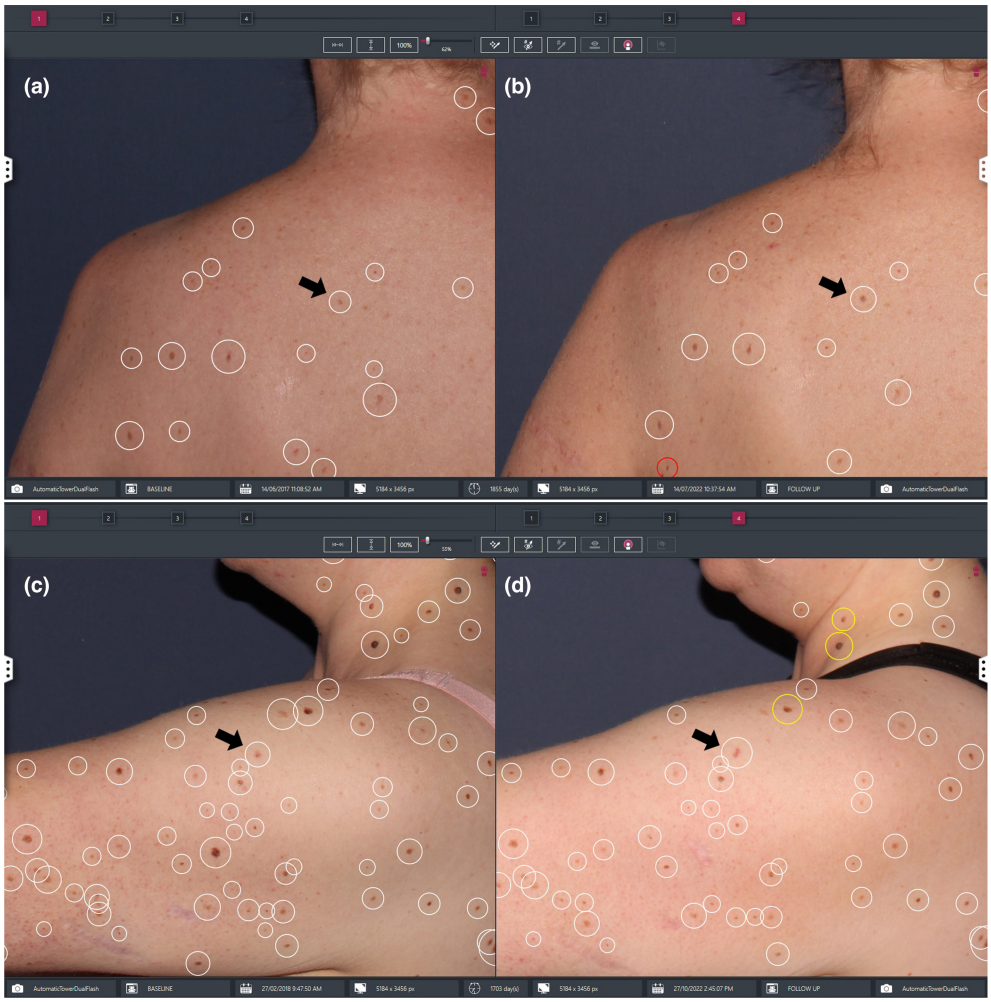

FIGURE 1 Sequential total body photography images of (a and b) the back of a 43-year-old female and (c and d) the left arm of a 41-year-old female. Lesions noted by the operators to have changed are indicated by black arrows. No change was flagged for these lesions by the TBP apparatus software, which marks detected lesions of concern with a coloured circle – yellow for changed and red for new. The additional lesions flagged with red and yellow circles in B and D, respectively, were assessed as suitable for follow-up at 6 months with sequential digital dermatoscopic imaging.

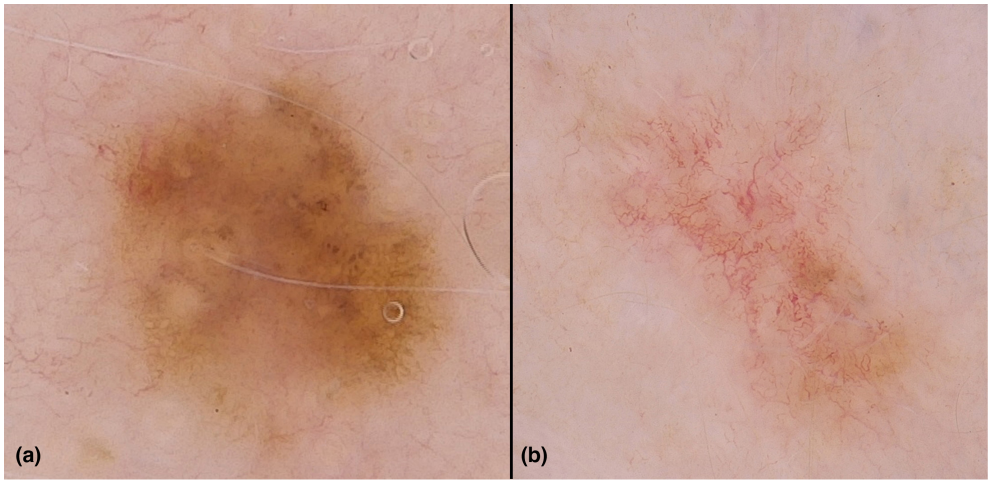

FIGURE 2 Dermatoscopy images (a) and (b) of the lesions indicated by black arrows in Figure 1b,d, respectively, obtained just prior to excision. The pigmented lesion (a) is arguably symmetrical with a pattern of reticular lines peripherally and structureless centrally and with a small focus of irregular of clods, as a very subtle clue to malignancy. The lightly pigmented lesion (b) shows a pattern of linear serpentine vessels and patchy, subtle, structureless brown pigment. Although the vessel pattern may be reasonably described by some as "atypical", this is at best, a very subtle clue to malignancy.

Photographic surveillance is an appropriate and efficacious response for the diagnosis of feature-poor and featureless melanomas, and clinicians should be aware that even a small change in size over several years may flag malignancy and that diligent operator examination of the images, side-by-side, is a prudent complement to detection-software.

AUTHOR CONTRIBUTIONS

Cliff Rosendahl conceived and wrote the case report. Mohsen Hassani, Aksana Marozava, Christine Lee and Cliff Rosendahl were directly involved in the management of these cases, Blake O'Brien and Sarah Wallace signed out the pathology reports and Nikita Rosendahl prepared the image collages and provided critical review of the manuscript. All authors provided critical input and approved the final manuscript.

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CONFLICT OF INTEREST STATEMENT

The authors have no conflict of interests to declare.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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