Use of the Pigmented Lesion Assay to rapidly screen a patient with numerous clinically atypical pigmented lesions

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INTRODUCTION

The goal of early melanoma detection is to biopsy melanomas before they become invasive and avoid unnecessary biopsies of benign pigmented lesions.[1] Noninvasive gene expression profile testing has the potential to serve both purposes by improving clinical diagnostic accuracy and informing biopsy decision making. The Pigmented Lesion Assay (PLA) (DermTech, La Jolla, CA) involves tape-stripping lesions to obtain stratum corneum from which RNA is isolated and expression levels of the noncoding long RNA Linc00518 (*Linc*) and *PRAME* genes are assessed.[2] Lesions showing elevated expression levels of both *Linc* and *PRAME*, either *Linc* or *PRAME*, or neither gene are interpreted as high, moderate, or low risk, respectively.[2] In a validation study of 398 pigmented lesions, Gerami and colleagues[3] reported that the PLA test had a 91% sensitivity and 69% specificity for histologic diagnosis of melanoma. Reports of the diagnostic performance of the PLA test have been limited to individual lesions from separate patients. To our knowledge, its utility in screening patients with numerous clinically atypical pigmented lesions has not been described.

Abbreviation used:

PLA: Pigmented Lesion Assay

CASE REPORT

A 64 year-old man with history of 7 melanomas was referred to our pigmented lesion clinic. He presented with approximately 30 clinically atypical pigmented lesions distributed over the face, trunk, and extremities, with sparing of the scalp, palms, and soles. Full-body photography was performed. When he returned 3 months later, 1 lesion was noted with interval change, and biopsy indicated invasive (0.6-mm) melanoma. A second lesion, although not significantly changed, was also biopsied given its highly irregular clinical appearance. It proved to be melanoma in situ.

When the patient returned for surgical treatment of these 2 melanomas, 10 of his most clinically atypical remaining lesions were tested by PLA. Three lesions were $Linc^{+}PRAME^{+}$, 1 was $Linc^{+}PRAME^{-}$, and 6 were $Linc\text{-}PRAME^{-}$ (Fig 1); biopsies of the first 4 lesions indicated an invasive (0.3-mm) melanoma and 3 in situ melanomas, as indicated. When he returned for consultation regarding excision of these 4 melanomas, 10 remaining clinically atypical lesions were subjected to PLA testing. One lesion was $Linc^{+}PRAME^{+}$, 1 was $Linc^{+}PRAME^{-}$, and 8 were $Linc^{-}PRAME^{-}$ (Fig 2). Biopsy of the first 2 lesions indicated invasive (0.8-mm) melanoma and melanoma in situ, as indicated. The 14 lesions with low-risk PLA results were not biopsied. The patient was seen for follow-up 3 months later, and none of the PLA^{-} lesions exhibited any clinical changes compared with his baseline photographs.

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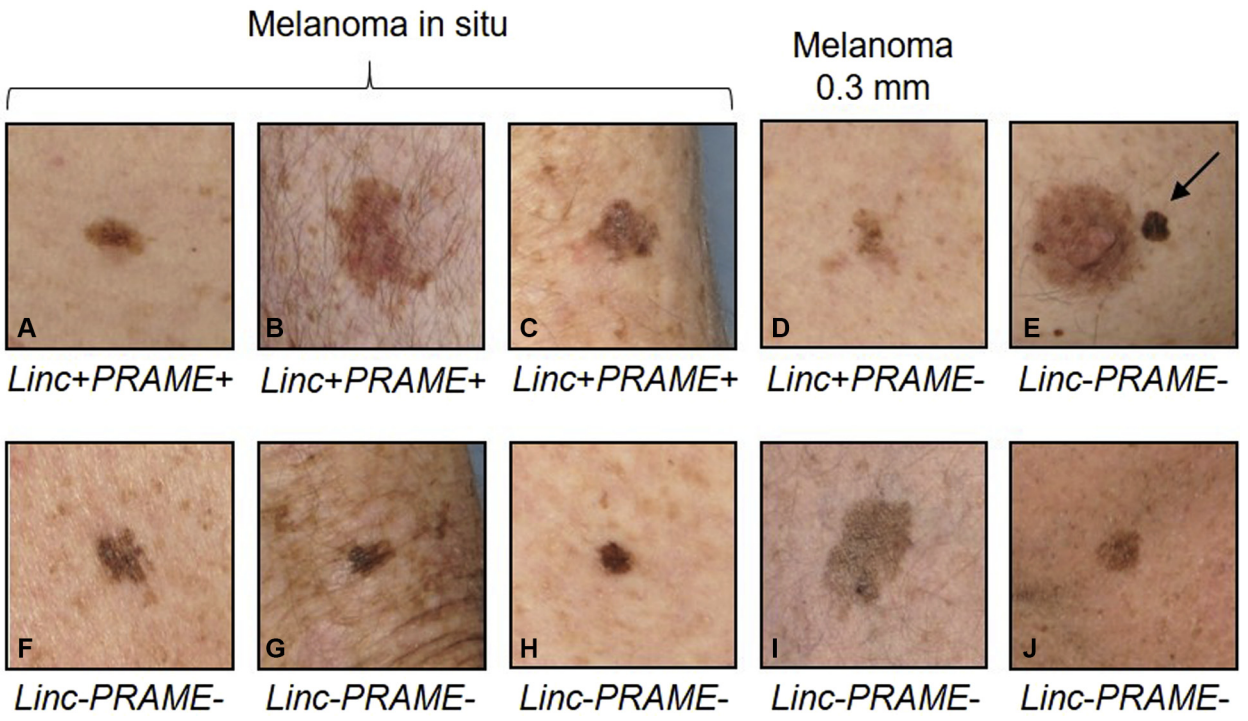

Fig 1. Lesions screened by Pigmented Lesion Assay testing in a patient with numerous clinically atypical pigmented lesions (group 1). >**A-C**, *Linc*$^{+}$*PRAME*$^{+}$ (melanoma in situ). **D**, *Linc*$^{+}$*PRAME*$^{-}$ (invasive melanoma; depth, 0.3 mm). **E-J**, *Linc*$^{-}$*PRAME*$^{-}$ (not biopsied).

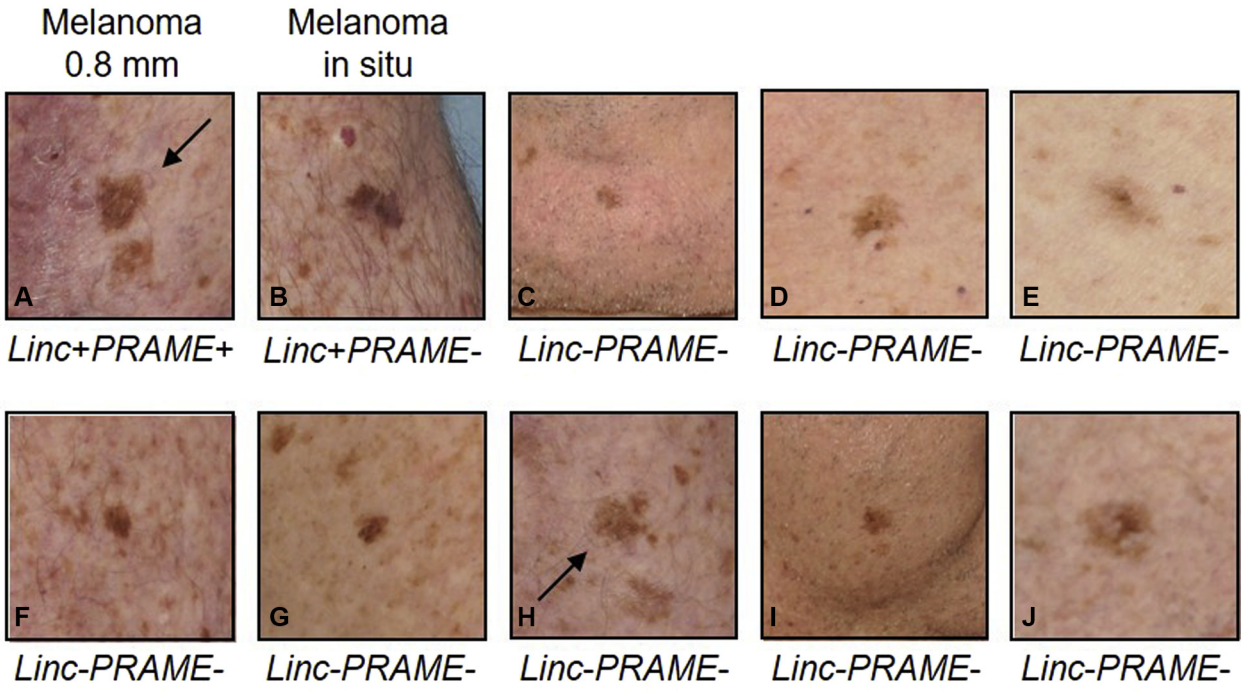

Fig 2. Lesions screened by Pigmented Lesion Assay testing in a patient with numerous clinically atypical pigmented lesions (group 2). **A**, *Linc*$^{+}$*PRAME*$^{+}$ (melanoma in situ). **B**, *Linc*$^{+}$*PRAME*$^{-}$ (invasive melanoma; depth, 0.8 mm). **C-J**, *Linc*$^{-}$*PRAME*$^{-}$ (not biopsied).

For both series of biopsies, consensus diagnoses based on review by 2 board-certified dermatopathologists were rendered, and the dermatopathologists were not aware of the PLA test results.

DISCUSSION

Here, we demonstrate the dual utility of the PLA test in a patient with history of multiple melanomas and presence of numerous clinically atypical pigmented skin lesions. First, multiple lesions that were clinically suspicious for melanoma were efficiently screened, and the test provided guidance as to which lesions should be biopsied. In our patient, there was 100% concordance for 6 lesions with moderate-/high-risk test results and melanoma diagnoses. Although prior studies reported a specificity of 70% for the PLA test,[2,3] a more recent real-world study by Ferris et al[4] yielded a positive predictive value of only 37%. Second, we avoided biopsy of 14 clinically suspicious lesions with low-risk results, which illustrates the utility of the test for increasing confidence that particular melanocytic lesions are benign. Although we did not biopsy the 14 lesions that tested negative to confirm they were benign, we are comfortable monitoring these lesions given a recent report by Ferris and colleagues[5] in which the PLA test had a greater than 99% negative predictive value for 2309 lesions (734 lesions with 1 year of follow-up). In addition to avoiding scarring associated with biopsy, particularly of nevi in cosmetically sensitive areas, use of the PLA test may be associated with significant cost savings compared with conventional biopsy and histologic review.[6] The PLA test is a low-cost alternative to biopsy that can be incorporated, along with dermoscopy and photographic monitoring, into our armamentarium for the treatment of patients with multiple clinically atypical pigmented lesions.

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