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RESEARCH LETTER

WILEY

Muir–Torre syndrome in Fitzpatrick skin phototype V assessed by dermoscopy and reflectance confocal microscopy

Dear Editor,

Muir–Torre Syndrome (MTS), a variant of hereditary non-polyposis colorectal cancer (HNPCC) syndrome (also known as Lynch syndrome), is characterized by cutaneous sebaceous tumors (adenomas, carcinomas, and epitheliomas) and keratoacanthomas.[1] Inherited in an autosomal dominant pattern, MTS is caused by mutations in genes involved in the mismatch repair (MMR) system which lead to microsatellite instability.[2] While 90% of all HNPCC cases are attributed to either *MLH1* or *MLH2* gene defects, patients diagnosed with MTS are more likely to be *MLH2* defect positive,[3] though not all studies agree.[4] MTS patients may present with both visceral malignancies and skin findings simultaneously, though in some cases skin tumors have been reported to precede other findings by up to 25 years.[5]

A 46-year-old man, Fitzpatrick skin phototype V, presented for a total body skin cancer screening. The patient's family history was notable for HNPCC in two siblings as well as sebaceous carcinomas in multiple maternal relatives. He also described a long-standing maternal family history of "stomach problems". He had previously undergone genetic testing and was found to be *MLH1* gene variant positive. His most recent colonoscopy revealed non-cancerous polyps. One year prior to his presentation, a biopsy-proven sebaceous neoplasm on his left chest was removed via Mohs surgery.

Multiple ulcerated hyperpigmented papules were found on the patient's back and neck (Figure 1). Two lesions were selected for non-invasive imaging with reflectance confocal microscopy and subsequent biopsy. On dermoscopy, the first papule was found to have a central crater with keratin crust (Figure 2A), and the second papule presented as a homogenous dark blue lesion with an area of heme crust (Figure 2B). Although these dermoscopy findings are non-specific, given the clinical context, the initial differential included sebaceous neoplasm as well as basal cell carcinoma (BCC) and keratoacanthoma.

Reflectance confocal microscopy (RCM) was performed using the VivaScope 1500 (Caliber Imaging and Diagnostics, Rochester, NY, USA). RCM findings for both lesions included dark interlobular septae and sebaceous ducts with amorphous material inside (Figure 3A, C). Limited inflammation surrounded the ducts in the second lesion (Figure 3B). The visualization of other sebaceous structures on RCM was limited by depth and obscured by overlying keratotic material.

On histopathology, both lesions were noted to have a nodular growth of lobules that consisted of basaloid cells and mature adipocytes (Figure 4). Furthermore, basaloid cells in the upper dermis and sebaceous cells in deeper layers could be seen. Both were diagnosed as sebaceoma (sebaceous epithelioma). The patient underwent excision with a 0.5 cm margin.

In this case, the patient presented having already undergone genetic testing. As such, there was high suspicion for sebaceous neoplasia. Based on the Mayo Muir–Torre risk score algorithm, even if this patient presented without previous genetic testing, following biopsy confirmation there would have been sufficient clinical and historical evidence to reasonably suspect MTS and recommend extracutaneous cancer screening (patient younger than 60, two or more sebaceous neoplasms, and a family history of Lynch-related cancer).[6] The *MLH1* genetic variant, given its known association with an increased risk of multiple internal malignancies, should further inform such a recommendation in similar patients.

There is limited literature on dermoscopy for MTS lesions in skin of color. Based on our review, expected dermoscopy findings for sebaceoma include elongated crown vessels (branching vessels originating at the periphery that radiate towards the center), structureless opaque white or yellow areas, and ulceration.[7] None of these features were observed in this patient, and may be more difficult to detect in darker skin tones. The only dermoscopy finding consistent with published descriptions was a crater in one lesion.

RCM findings in sebaceoma may include large cell aggregates with dark cytoplasm and large bright nuclei, as well as an absence of space between tumor and stroma.[8] RCM findings suggestive of a sebaceous tumor in this case included dark interlobular septae and sebaceous ducts.

Distinctive features may not always be present on RCM and sebaceoma can be mistaken for other tumor types including BCC. Ning *et al*. reported a case of sebaceoma with RCM findings suggestive for BCC including well-defined tumor islands with dendritic cells and scattered bright fine granules.[9] In addition, sebaceoma must be differentiated from other adnexal tumors including trichoepithelioma, fibrofolliculoma, and eccrine carcinoma. As tumor islands were not appreciable in this patient's lesions, one utility of RCM here was in effectively ruling out BCC.

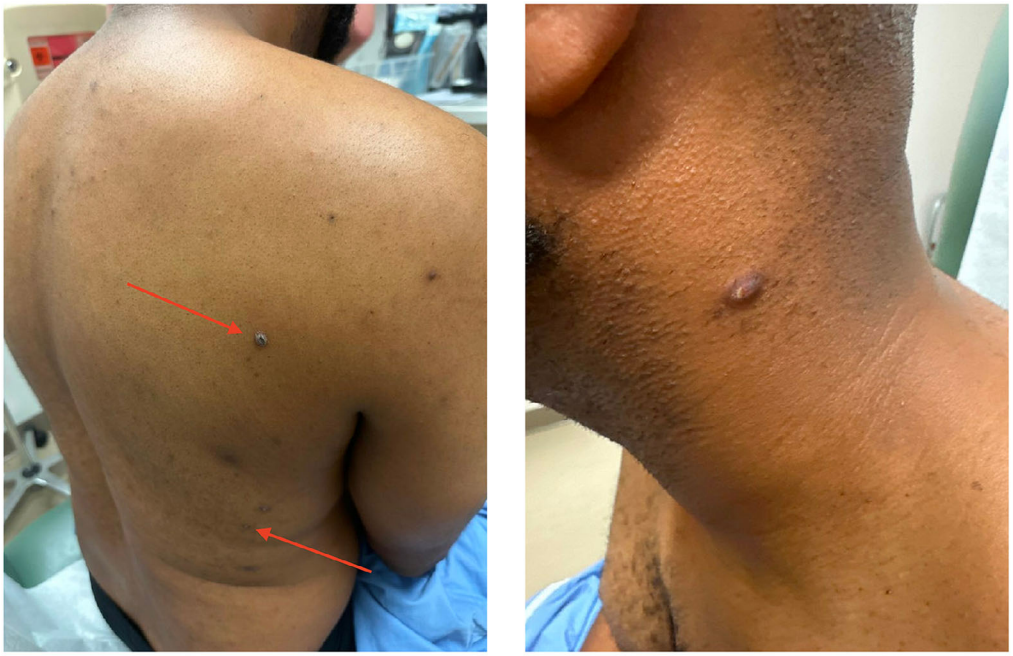

FIGURE 1 Clinical photos showing multiple ulcerated hyperpigmented papules on the back (A) and neck (B). The two lesions imaged for this study are indicated with arrows in image A (first lesion superior, second lesion inferior).

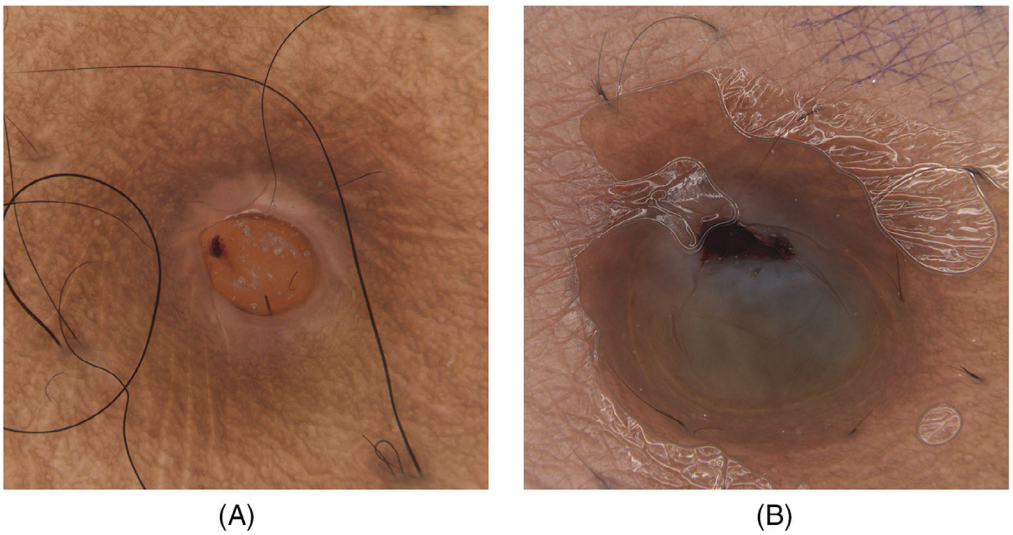

FIGURE 2 (A) Dermoscopy with a central crater and keratin crust in the first lesion. (B) Dermoscopy of the second lesion was homogenous and dark blue with an area of heme crust.

The histology of both lesions presented here is instructive for what may contribute to the challenges of RCM in this tumor type. Basaloid cells are difficult to distinguish on RCM, and the sebaceous cells seen at deeper layers on histology are beyond the depth of penetration of this imaging modality.

As seen in this case, RCM can help rule out BCC and may assist in the identification of features suspicious for a sebaceous tumor, which may raise suspicion for sebaceoma prior to biopsy. To the authors' knowledge, this is the first report of RCM for MTS in skin of color. As dermoscopy of sebaceous lesions can present challenges in darker skin phototypes, RCM is an appropriate adjunctive diagnostic tool. Further collection and dissemination of dermoscopy images and RCM findings for rare tumor types in skin of color is necessary to improve screening for at-risk patients.

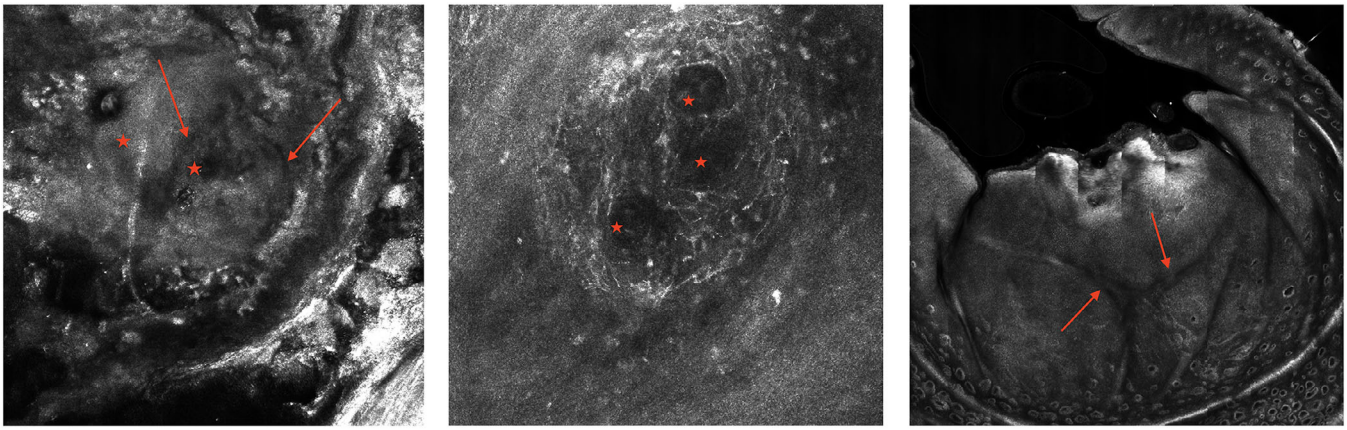

FIGURE 3 (A) Reflectance Confocal Microscopy image showing the first lesion with dark interlobular septae (red arrows) and sebaceous ducts (red star) with amorphous material seen on the left. (B) The second lesion with sebaceous ducts and amorphous material visible inside (red stars) and some inflammation surrounding these ducts. (C) The second lesion was also imaged using the Vivablock tool and displayed dark interlobular septae (red arrow).

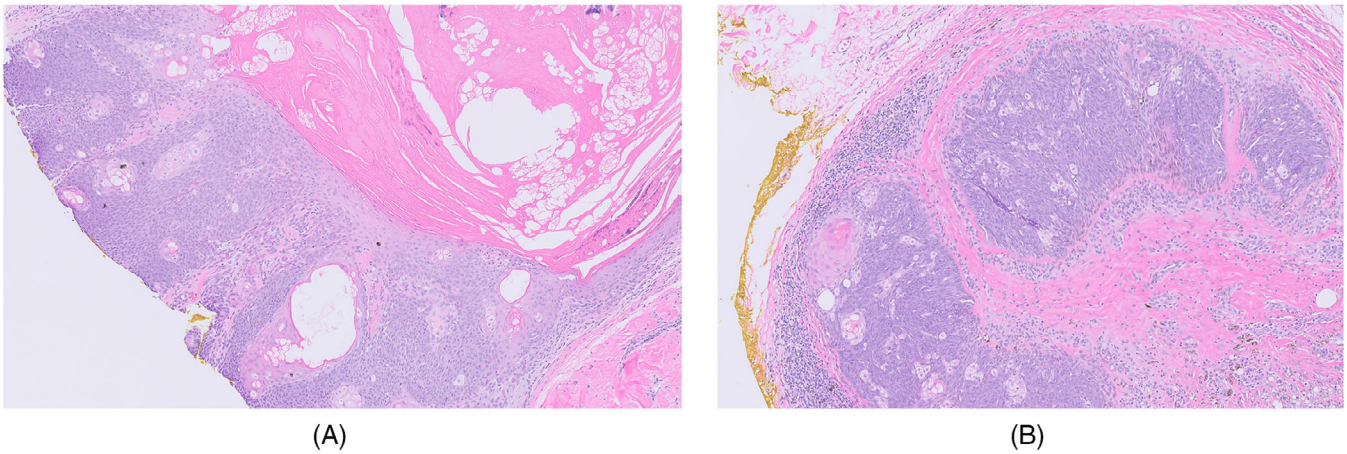

FIGURE 4 (A) Histology of the first lesion. (B) Histology of the second lesion. Hematoxylin and Eosin (5× magnification).

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CONFLICT OF INTEREST STATEMENT

None.

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to article as no new data were created or analyzed outside of what is shared in the article.

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