Pustular rosacea secondary to *Demodex* infestation shown with reflectance confocal microscopy

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Key words: confocal; *Demodex*; rosacea.

CLINICAL PRESENTATION

The patient, a 75-year-old male with a history of large granular lymphocytosis and common variable immunodeficiency, presented to dermatology with a 2-year history of erythematous, constantly pruritic pustules on his scalp and face that he reports intermittently became warm and inflamed with a pus-filled "whitehead." (Fig 1) The patient described achieving no symptomatic improvement with topical clobetasol but endorsed some improvement in pruritus with cold compresses. The patient was prescribed topical 1% ivermectin cream, which resulted in some symptomatic improvement at 4-week follow-up.

CONFOCAL MICROSCOPY APPEARANCE

The lesions were examined using the VivaScope 3000 (Caliber Imaging and Diagnostics) reflectance confocal microscope (RCM). Imaging performed in clinic proved follicular infestation with human *Demodex* mites. The handheld confocal exam allowed us to examine several areas on the scalp and forehead, with each area showing many mites in nearly every follicle. In one follicle, 20 individual mites were counted (Figs 2 and 3, Video 1, available on www.jaad.org). Upon follow-up after 4 weeks using ivermectin, the patient returned and was again examined with handheld RCM at several locations, showing no visible *Demodex* mites, and near complete resolution of his skin symptoms (Fig 4).

Abbreviation used:

RCM: reflectance confocal microscope

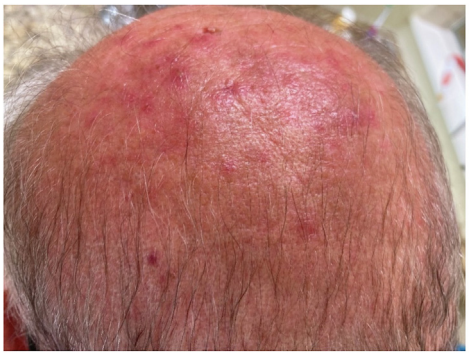

Fig 1. Clinical photograph of the patient's scalp lesions, pretreatment.

KEY MESSAGE

Human *Demodex* mites (*Demodex folliculorum* and *Demodex brevis*) have become increasingly implicated in cases of folliculitis refractory to standard dermatologic treatment.[1] These species of obligate human ectoparasites are nearly ubiquitous, with infection rates increasing starkly after puberty, as sebaceous units develop, and approaching 100% prevalence by age 70 in the United States.[2] Demodicosis has been shown to mimic a variety of eruptive pathologies including various subtypes of

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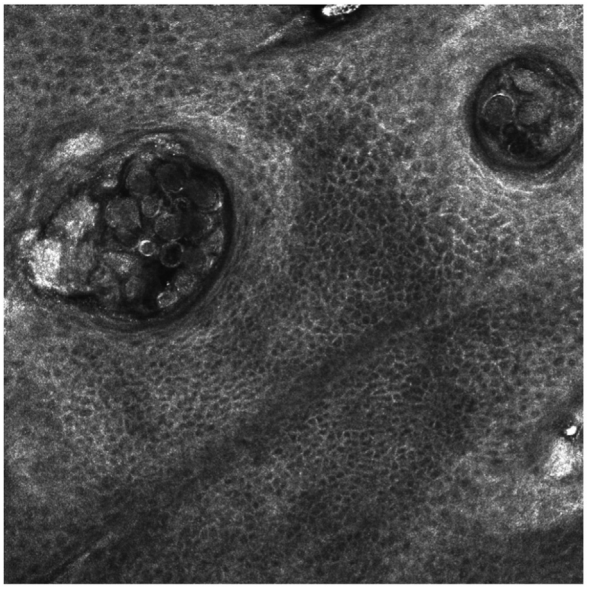

Fig 2. Reflectance confocal microscopy still image of *Demodex* mites within our patient's scalp lesion.

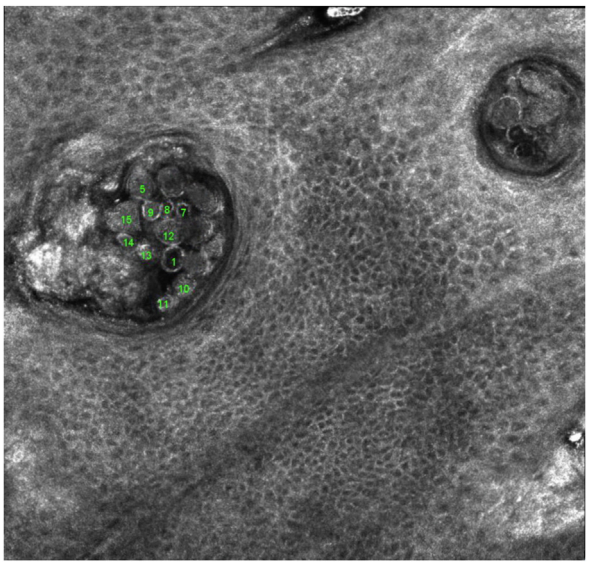

Fig 3. Reflectance confocal microscopy video counting 20 intralesional *Demodex* mites in vivo.

seborrheic, perioral, and contact dermatoses, leading to ineffective treatments often chosen based on a misinterpretation of etiology. Studies have supported the notion that the likelihood of developing a symptomatic infestation increases with increasing *Demodex* density as well as in the context of immunosuppression.[3] The mainstay of treatment and symptomatic relief for patients with demodicosis includes the topical application of 1% ivermectin, a medication with a purported dual mechanism of action that includes antiinflammatory and antiparasitic properties.[4]

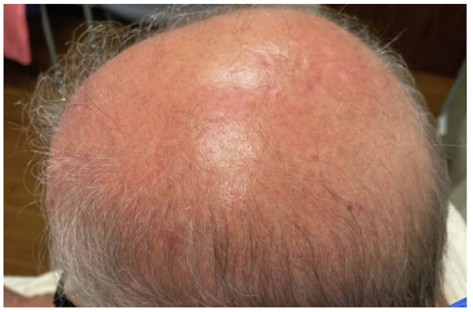

Fig 4. Clinical photograph of the patient's scalp after 4 weeks of treatment.

RCM is a powerful noninvasive clinical tool that has been shown to allow in vivo cutaneous imaging and diagnosis and to reduce unnecessary biopsies.[5] RCM offers dermatologists the ability to identify patterns of cell morphology and potential parasite infestation efficiently and accurately at varying depths of the epidermis to upper dermis. In cases of demodicosis, the benefit of RCM is not limited to diagnosis but can also be used to quickly monitor real-time treatment response at clinical follow-up appointments, using intralesional *Demodex* density and subjective symptomatology as markers of disease severity.

Conflicts of interest

Dr Grichnik notes that he serves as a consultant to Galileo Group and Canfield Scientific; serves on Skin Advisory Board for Regeneron and Dermatology Advisory Council for Melanoma Research Foundation; and receives clinical trial support from Novartis, Eli Lilly, Dermira, Elorac, Boehringer, and Amgen. Dr Correa is a consultant for Accutex Blades and a researcher and consultant for Novartis Pharmaceutical. Dr Cohen and Author Hanlon have no conflicts of interest to declare.

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