

## What Is Your Diagnosis?



A 22-year-old woman presented to her primary care physician 6 days after traveling to different beaches in Mexico, Belize, and Guatemala. She reported a painful, streaky, hyperpigmented rash on the lateral surface of her right thigh, with an associated area of blistering and erythema. A similar rash also had developed on the dorsal aspect of both hands. The rash started with painful burning erythema and then progressed to blister formation in a linear pattern. She noticed the appearance of the rash shortly after she had begun washing her clothes with the juice of freshly squeezed limes as per a local native custom. During this time she reported spending a notable amount of time outdoors in the sun hiking and scuba diving. She had no known allergies, took no medications, and was not using any topical products. Of note, she was staying in youth hostels during her travels. She was treated at a clinic in Belize several days prior to her current visit at which time the blisters were unroofed and drained. No further advice was given. At the time of presentation she was concerned because the hyperpigmented lesions were extending down her leg in a linear fashion.

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The authors report no conflict of interest.

## The Diagnosis: Phytophotodermatitis



After a careful history and direct questioning regarding possible psoralen exposure, the diagnosis of phytophotodermatitis was made. The patient reported using “many sliced limes” to wash her clothes and also scrubbed the limes directly on her right leg.

*Phytophotodermatitis* is a generalized term used to describe a nonimmunologic skin eruption caused by a reaction between psoralen and subsequent exposure to long-wave UV light.<sup>1</sup> Psoralen is found in many plants, including lemons, limes, parsley, celery, carrots, and figs.<sup>2</sup> When exposed to light, psoralen electrons absorb energy and are excited to 3 times their ground state. When the electron returns to the ground state, energy is released in the form of heat, fluorescence, and/or phosphorescence.<sup>3</sup> This reaction damages cell DNA by causing cross-linking between the furocoumarin ring and the pyrimidine bases, resulting in signals for apoptosis and inhibition of cell growth or survival in the epidermis. The hyperpigmentation that follows the blistering and eventual desquamation of the epidermis is due to the melanocytes that fall from the epidermis to the dermis. A photoprotection mechanism also occurs in which more melanocytes are distributed in the epidermis.<sup>2</sup>

The psoralen from the lime juice on this patient’s skin caused a chemical reaction when exposed to the sun. In fact, psoralen plus UV light is used to treat conditions such as psoriasis and T-cell lymphomas. This treatment inhibits keratinocyte growth and hyperproliferating lymphocytes.<sup>4</sup>

Given the patient’s history of multiple possible environmental exposures, other differential diagnoses must be considered including scabies, Lyme disease, and insect bites. Scabies, suggested by possible exposure in youth hostels, would consist of a more diffuse and pruritic eruption with papules and telltale burrows. Lyme disease typically presents with a characteristic, slowly expanding, homogeneous or, less likely, bull’s-eye lesion of erythema migrans.<sup>2</sup> Insect bites generally appear as clustered papules or vesicles in groups of 3 (termed *breakfast, lunch, and dinner*) and rarely occur in a linear pattern. They are customarily pruritic and not burning. Cutaneous larva migrans causes a linear, pruritic, painless reaction that migrates in a characteristic circuitous, not linear, fashion. Another possibility is seabather’s eruption, which is caused by *Linuche unguiculata*, *Edwardsiella lineata*, and other larvae in the phylum Cnidaria. Inflammatory papules that become vesicular or pustular develop

at points of pressure (ie, areas covered by a wet suit or bathing suit). This rash is a result of the tiny jellyfish injecting toxin when exposed to freshwater, which typically occurs when showering after a seawater swim. Our patient did not have a rash in a bathing suit distribution and she did not provide the classic rash patterns.<sup>5</sup> In younger patients, phytophotodermatitis has even been mistaken for child abuse, which is mostly due to the fact that some lesions can appear as bruises in the shape of a handprint.<sup>6</sup>

Treatment consisted of strict avoidance of the offending lime peels and juice and application of soothing aluminum acetate wet-to-dry dressings to the open blisters, which resulted in gradual improvement of the blistered denuded areas. Antihistamines, calamine lotion, and corticosteroid creams (eg, triamcinolone acetonide cream 0.1% twice daily) also may be prescribed as needed.<sup>7</sup> The use of topical corticosteroids should be discontinued once the inflammation has resolved.<sup>2</sup> The patient still has hypopigmented scarring where the phytophotodermatitis was the most severe.

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