

# Berloque Dermatitis Mimicking Child Abuse

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**B**erloque dermatitis is a type of photocontact dermatitis. It occurs after perfumed products containing bergamot (or a psoralen) are applied to the skin followed by exposure to sunlight. Striking linear patterns of hyperpigmentation are characteristic, corresponding to local application of the scented product. In the acute phase, erythema and even blistering can be seen. We report a case of berloque dermatitis in a 9-year-old girl that was initially reported as child abuse. To our knowledge, this is the first report of berloque dermatitis mimicking child abuse. Questioning to elicit a history of perfume application coupled with sunlight exposure should help to prevent this misdiagnosis in children.

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Berloque dermatitis is caused by a phototoxic reaction that occurs when fragrance products containing bergamot oil or a psoralen are applied to the skin, followed by exposure to sunlight.<sup>1</sup> Long-wave UV-A radiation acting on bergapten, a psoralen and the photoactive component of bergamot oil, results in erythema followed by hyperpigmentation corresponding to the local application of the scented product. In severe cases, a bullous reaction of the involved areas may occur.<sup>2</sup> Because bergamot oil is known to cause this phototoxic reaction, its use has been restricted in the United States.<sup>3</sup> However, it is still found in perfumed products and aromatherapy oils.<sup>4</sup> We report a case of berloque dermatitis in a 9-year-old girl that was initially reported as child abuse.

## PATIENT REPORT

A 9-year-old girl presented to her pediatrician 1 day after the eruption of a blistering rash on the right side of her face and the left side of her neck. Her primary care physician suspected the lesions were the result of child abuse and reported the family to child protective services. After several

child protective services investigations, the patient was subsequently referred to the pediatric dermatology clinic at Bellevue Hospital, New York, NY, for further examination. She was examined 5 days after the initial presentation.

The patient recalled that the eruption began in the evening after spending a day at the beach. On specific questioning, the patient revealed that she had applied perfume to the involved areas in the morning before going to the beach. The patient and her mother reported that erythema and blistering developed within the next 48 hours.

Physical examination demonstrated a 3.5 × 5.5-cm erythematous and desquamating patch on the right cheek (**Figure 1**). There were linear streaks of macular hyperpigmentation along the left lateral cheek and neck (**Figure 2**), and similar hyperpigmented macules were noted on the nose and chin. The remainder of the physical examination was unremarkable.

From the history of perfume application followed by sun exposure, together with the dermatologic findings, berloque dermatitis was diagnosed. The child was treated with topical corticosteroids and instructed on sun avoidance. The girl's cologne was brought to the clinic. It was marketed as "Baby Magic Colonia," and was from their home country of Ecuador. The

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**Figure 1.** Five days after the initial eruption occurred, the blister on the cheek had healed, leaving resolving erythema and a large postinflammatory hypopigmented patch.



**Figure 2.** Hyperpigmented linear streaks are seen on the cheek and neck, corresponding to the application of perfume before exposure to sunlight. This linear appearance is typically seen in patients with berloque dermatitis.

fragrance ingredients were not listed, as is typical for fragrance products. On follow-up 2 weeks later, the erythema of the right lower face had resolved and only postinflammatory hyperpigmentation remained.

#### COMMENT

*Photocontact dermatitis* is a term that describes a reaction of the skin caused by a topically applied substance followed by exposure to UV-A radiation. There are 2 categories of photocontact dermatitis: photoallergic and phototoxic reactions.<sup>5</sup> Photoallergic reactions are cell-mediated type IV reactions that require prior sensitization and occur only in susceptible individuals. In contrast, phototoxic reactions do not require prior sensitization and can occur in any individual if given sufficient exposure to a photosensitive chemical followed by sufficient UV-A radiation. Berloque dermatitis is classified as a phototoxic reaction. In phototoxic reactions, the cell membrane and the DNA of epidermal cells are damaged, causing erythema, edema, inhibition of DNA synthesis, inhibition of cell proliferation, and stimulation of melanin production.<sup>6</sup> In the acute phase, photocontact dermatitis can appear as erythematous patches, plaques, vesicles, and bullae, which may resemble severe sunburn.<sup>5</sup> Postinflammatory hyperpigmentation follows. Pigmentation usually fades after

many weeks to months; however, the hyperpigmentation may become chronic if application of the offending substance continues.

The term *berloque dermatitis* denotes that the photosensitive substance is a fragrance ingredient. Bergamot oil is the classic ingredient that caused berloque dermatitis in the past, but other psoralens or furocoumarins can also cause a berloque pattern, namely, linear patterns or handprint marks localized on the neck or areas where fragrance products had been applied.<sup>3</sup> The psoralen in bergamot oil is derived from the rind of the bergamot orange (*Citrus bergamia*).<sup>6</sup> Lemons, limes, and celery contain psoralens as well and commonly cause phototoxic reactions termed *phytophotodermatitis*.

The precise ingredients of fragrance products are usually well-kept trade secrets. In this case, although the fragrance ingredients were not known, phototoxicity was clearly demonstrated, and it is presumed that the cologne contained bergamot or a psoralen.

To our knowledge, there are no prior reports of berloque dermatitis mimicking child abuse in the literature. There are, however, several reports<sup>7-10</sup> of phytophotodermatitis (eg, from lemon or lime juice) mimicking child abuse.

To avoid misdiagnosis of berloque dermatitis or other phototoxic reactions, a history should elicit the use of perfume, aromatherapy oils, and/or contact with sub-

### What This Study Adds

Although berloque dermatitis is a well-described entity in dermatology, it is not familiar to pediatricians and primary care physicians. This report describes a girl who was reported to the authorities as being a victim of child abuse, when, in fact, her skin eruption was due to berloque dermatitis. While there are a few reports of phytophotodermatitis mimicking child abuse, to our knowledge, this is the first report of berloque dermatitis mimicking child abuse. We hope to increase awareness of berloque and photocontact dermatitis among pediatricians and to enable them to elicit the history and recognize the clinical signs needed to diagnose this dermatologic condition.

stances containing psoralens, followed by sun exposure. Caretakers should be questioned about their exposures to substances as well, because contact exposure in small children can occur when parents have the offending substance on their hands and then pick up the child. An example is a child who was picked up by a parent who had squeezed lemons for lemonade at a picnic on a sunny day.

In the case presented, misdiagnosis resulted in a considerable emotional toll. Before the diagnosis was made by a pediatric dermatologist, the family had undergone several investigations by child protective services and had been warned that the child may be removed from the home if further suspicious lesions were seen.

There are many additional dermatologic conditions that can mimic child abuse.<sup>11,12</sup> Mongolian spots may be mistaken for bruises. Suspicious-appearing purpura may result from underlying conditions such as hemophilia, von Willebrand disease, leukemia, or vasculitides. Neuroblastoma can cause ecchymosis of the upper eyelids, resembling a black eye. Bullous impetigo can be mistaken for cigarette burns.

The treatment of berloque dermatitis and phytophotodermatitis includes topical corticosteroids in the acute phase, future avoidance of plants or products containing phototoxic substances, and sun protection. The use of sunscreens helps prevent photodermatitis and photoaging, and aids in the fading of postinflammatory hyperpigmentation. Most available sunscreens provide only UV-B protection. The use of broad-spectrum sunscreens that block UV-A and UV-B radiation are recommended. Avobenzone (Parsol 1789) is an effective agent that provides UV-A protection.

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