

of the hair follicles) and differentiates it from the other conditions.⁵ Histology of tissue obtained by curettage of a papule is sufficient to establish the definitive diagnosis.

Although there are reports of GP that resolved spontaneously once the irritant was eliminated, the lesions usually persist. A number of therapeutic modalities, including topical and oral preparations of retinoids, vitamin D derivatives (calcipotriol, tacalcitol), topical corticosteroids, ammonium lactate, cryotherapy, and antibiotics have been used with variable responses.²⁻⁵ In our patient, the lesions resolved almost completely with methylprednisolone aceponate 0.1% cream twice daily for 15 days.

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***Agave americana* Causing Irritant Contact Dermatitis with a Purpuric Component**

Dermatitis irritativa de contacto por *Agave americana* con componente purpúrico

To the Editor:

Agave americana, commonly known as the century plant, is a subtropical perennial plant of the family Agavaceae that is used in medicine, foodstuffs, and textiles. Since its importation during the discovery of America, *Agave americana* has spread over the European part of the Mediterranean basin. A large population of this plant can be found in Spain, on the coasts of Andalusia, Murcia, and Valencia, where it has adapted exceptionally well. The sap of this plant has irritant properties due its calcium oxalate crystals, oxalic acid, and saponins.

We report the case of a 37-year-old man with no relevant past history who attended the emergency dermatology clinic because of the appearance, 48 hours earlier, of intensely pruritic lesions on the upper and lower limbs. The patient stated that, when working in the garden, he had used a chainsaw to cut down an *Agave americana* plant (Figure 1). He had been splashed with a great deal of sap and lesions had subsequently appeared on the areas of his body not covered by clothing.

Physical examination revealed numerous shiny, confluent papules and vesicles on these areas. In some areas, purpuric lesions that did not disappear on pressure were also observed. The affected areas were clearly delimited, with well-defined borders, and there were artifacts in the areas protected by clothing (Figure 2). The patient also reported a sensation of fever and discomfort in the 8 hours following the event.

Complete blood count, biochemistry, and coagulation studies were normal. Skin biopsy revealed parakeratosis, epidermal atrophy with necrotic keratinocytes, marked edema of the dermal papillae with erythrocyte extravasation, and a perivascular and periadnexal lymphocytic infiltrate (Figure 3).

Treatment with topical betamethasone and fusidic acid and oral antihistamines led to complete resolution in 7 days.

Few cases of contact dermatitis caused by the components of *Agave americana* sap have been reported.¹⁻³ This condition usually presents with very rapid onset of intense itching and burning associated with the appearance of marked erythema and edema in the affected area. Papular and vesicular lesions with a linear distribution following the trajectory of the splashing then develop. Purpuric lesions such as those appearing in our case have only been



Figure 1 *Agave americana*.



Figure 2 Papular-vesicular lesions with accompanying purpuric component and linear distribution.

observed in 4 of the cases reported in the literature.⁴⁻⁷ The pathogenesis of this dermatitis is linked to the high-velocity spray of the sap when the plant is cut with a power saw or chainsaw. Oxalate crystals and saponins are modified by the mechanical action of the saw and are absorbed by the skin. Unlike other types of plant dermatitis, that caused by *Agave americana* does not involve phototoxic or photoallergic reactions. A mechanism of dose-dependent vascular toxicity induced by these substances has been suggested. Similarly, in patients with kidney stones it has been shown that oxalate crystals in the urinary tract cause urothelial toxicity similar to that produced in the

skin.⁸ Purpuric lesions develop in those cases in which the dose of oxalate absorbed by the skin is very high.⁴ General symptoms such as fever (which also occurred in our patient), myalgia, headache, and diarrhea have also been described^{9,10} and could also be dose-related.

In conclusion, we present a rare case of irritant contact dermatitis caused by *Agave americana* that is of interest because of its nonphotoinduced pathogenic mechanism. It also has the peculiarity of being associated with a rare purpuric component that reflects the presence of dose-dependent vascular toxicity of oxalate crystals and saponins.

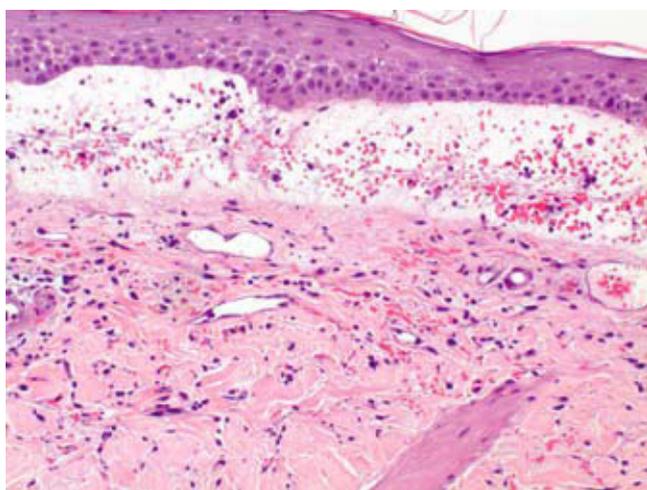


Figure 3 Histopathology revealed parakeratosis, epidermal atrophy with necrotic keratinocytes, marked dermal papillary edema with erythrocyte extravasation, and a perivascular, periadnexal lymphocytic infiltrate (hematoxylin-eosin, original magnification $\times 10$).

Conflict of Interest

The authors declare that they have no conflict of interest.

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Carbon Dioxide-Laser Treatment of Trichoepitheliomas in Brooke-Spiegler Syndrome

Síndrome de Brooke-Spiegler: tratamiento de los tricoepiteliomas con láser de CO₂

To the Editor:

Brooke-Spiegler syndrome is a rare genodermatosis that causes a predisposition to adnexal tumors due to alterations in the folliculosebaceous apocrine unit.¹⁻⁴ It is an autosomal dominant condition with variable penetrance and is characterized by the simultaneous and progressive appearance of multiple cylindromas on the scalp, facial trichoepitheliomas, and, occasionally, eccrine spiradenomas.¹⁻⁴

The locus implicated in this condition is found on chromosome 16q12-q13, a region that holds the *CYLD1* tumor suppressor gene, which is involved in the regulation of proliferation of the skin appendages.⁵ There is marked phenotypic variability within families, such that members of a single family with identical mutations can present isolated or multiple trichoepitheliomas, cylindromas or, less frequently, eccrine spiradenoma.

Trichoepitheliomas present clinically as small, translucent papular lesions that are painless and are most commonly found in groups in the nasolabial sulci, on the nose, and on the forehead. Histologically there are multiple islets of basaloid cells in a fibrous stroma associated with numerous corneal cysts. There have been very rare reports of malignant transformation in multiple familial trichoepitheliomas and of the associated presence of basal cell carcinomas.⁶ The differential diagnosis includes hereditary disorders that present with multiple firm facial papules such as Birt-Hogg-Dubé syndrome (fibrofolliculomas), Cowden syndrome (tricholemmomas), tuberous sclerosis (angiofibromas), multiple basaloid follicular hamartoma syndrome (basaloid follicular hamartomas), Rombo syndrome (trichoepitheliomas), and Gardner syndrome (epidermal cysts).⁷

Cylindromas appear as multiple, well-defined, firm pink nodules with a smooth surface and superficial telangiectasias, and a diameter that varies from a few millimeters to several centimeters; they are found on the

head, particularly on the scalp, and may occasionally be painful. Histologically, the lesions present as well-defined dermal nodules not in contact with the epidermis; they are formed of dense islets of basaloid cells arranged in a jigsaw-puzzle pattern and surrounded by a highly eosinophilic material.

Both trichoepitheliomas and cylindromas tend to increase in size and number over time and can lead to pronounced cosmetic alterations with psychological, social, and occupational repercussions. Early treatment is therefore indicated in order to reduce postsurgical sequelae and increase patient satisfaction.

Various palliative treatment approaches have been described in the literature, including electrocoagulation, cryotherapy, dermabrasion, trichloroacetic acid, retinoic acid, carbon dioxide (CO₂) laser, radiation therapy, and surgery.^{8,9}

We present 2 cases of multiple trichoepitheliomas treated using CO₂ laser. The first patient was a 43-year-old woman with Brooke-Spiegler syndrome. Over 9 years she had received 4 sessions of continuous-wave CO₂ laser vaporization (sessions every 2 years) with a power setting of 3 to 5 W and 1 to 3 passes (Figures 1 and 2). The second patient was a 43-year-old man with Brooke-Spiegler syndrome. Since 2003 he had undergone sessions every 2 years of continuous-wave CO₂ laser vaporization using a power of 5 W (Figure 3).

In both cases the cosmetic result had been satisfactory, achieving a significant reduction (flattening) of the lesions, though they had never disappeared completely. Over time there had been a gradual recurrence, associated with the appearance of new lesions, but there was an adequate response to further CO₂-laser treatments.

The CO₂ laser is a surgical instrument that emits energy in the form of infrared light at a wavelength of 10 600 nm; this wavelength is absorbed by water, leading to vaporization of the skin with coagulative necrosis in the remaining dermis. Used in continuous mode it produces a surgical cut (focused beam) or vaporization (defocused beam). The most important characteristics of this laser are its rapid action, permitting large areas to be treated, the selectivity and precision of its effects, and its high specificity of tissue damage, producing highly localized destruction and enabling multiple lesions to be treated with minimal bleeding. The complications of treatment include erythema, edema, a burning sensation, Herpes simplex