

furosemide and porokeratosis in the patient described here, but no history of pre-existing porokeratosis.

During furosemide therapy, photosensitivity and phototoxic reactions are rarely observed and, until now, disorders of cornification have not been known as typical side-effects of furosemide treatment. Furosemide is chemically characterized as a hydrochlorothiazide analogue.

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## Successful Treatment of Hailey-Hailey Disease with a Scanned Carbon Dioxide Laser

*Sir,*

Familial benign chronic pemphigus (Hailey-Hailey disease) is characterized by recurrent blistering lesions. Topical therapy of Hailey-Hailey disease includes application of antibiotic or antimycotic solutions and glucocorticosteroids, but these therapies do not usually induce prolonged remissions. Surgical intervention with dermabrasion or excision of the lesional sites and subsequent transplantation of grafted skin can lead to complete remission (1–3). Skin ablation can also be performed using modern CO<sub>2</sub> laser systems, such as the SilkTouch Flashscanner<sup>®</sup>. This flashscanning mechanism delivers a focused laser beam with constant velocity in a spiral pattern over a designated area. The laser energy is delivered so quickly that it never lingers at any given point in the scan longer than the thermal relaxation time of the tissue, resulting in char-free ablation and predictable, repeatable vaporization. We report here on 2 patients with Hailey-Hailey disease who were treated successfully with the SilkTouch Flashscanner<sup>®</sup> CO<sub>2</sub> laser system.

### CASE REPORT

#### *Case 1*

A 38-year-old female patient with recurrent Hailey-Hailey disease of both axillas for years (Fig. 1a) was treated with the SilkTouch Flashscanner<sup>®</sup> CO<sub>2</sub> laser. After disinfection of the lesional sites and infiltration anaesthesia with Prilocain 1% (Xylonest<sup>®</sup> 1%) the SilkTouch Flashscanner<sup>®</sup> CO<sub>2</sub> laser vaporization was performed with 3 passes over affected axillary tissue using a 125 mm handpiece, producing a spot size of 3 mm. The power setting was 6.0 W and the scan time was 0.2 s. After every pass the char that appeared following the vaporization was removed with 0.9% NaCl solution. Finally, the treated areas were covered with Polyvidon-iodine wound gauze. Postoperatively the patient did not show any complications and reported little pain. After a follow-up of more than 1 year, the treated, scar-free healed areas revealed no clinical signs indicating the recurrence of Hailey-Hailey disease (Fig. 1b). However, recurrence of the disease was noted in the skin surrounding the treated area.

#### *Case 2*

A 31-year-old male patient with recurrent Hailey-Hailey disease of both axillas was treated similarly to case 1. Again, there were no postoperative complications and after a follow-up of 6 months the treated areas were scar-free and without clinical signs of the disease.

### DISCUSSION

The conservative topical treatment of Hailey-Hailey disease is difficult and is characterized by the frequent recurrence of symptoms and lesions. Interestingly, dermabrasion or excision of lesional sites results in durable healing. An alternative to surgical intervention is the ablation with a CO<sub>2</sub> laser. CO<sub>2</sub> laser ablation is a careful, low bleeding method with less postoperative pain than dermabrasion, which is followed by rapid healing of the erosions (4, 5). Two previously published studies used CO<sub>2</sub> laser in defocus reported significant clinical and symptomatic improvement (5, 6). However, by using the CO<sub>2</sub> laser in defocus, the depth of CO<sub>2</sub> laser ablation cannot be controlled very effectively, resulting in a considerable risk of scarification or insufficient ablation leading to recurrence of the disease. This problem is also observed in cryosurgery or dermabrasion. The modern pulsed or scanned CO<sub>2</sub> laser systems deliver the laser energy so quickly that controlled vaporization of tissue in layers of 40–60 µm becomes possible (4, 7) allowing deeper ablation into the dermis compared with Er:YAG laser systems. The patients described above show that the SilkTouch Flashscanner<sup>®</sup> CO<sub>2</sub> laser system allows ablation of lesional skin with sufficient depth to induce remission of the disease without scar formation. As illustrated by case 1, treatment should extend beyond the visible skin margin (1–2 cm) to prevent recurrence.

The mechanism of durable healing of Hailey-Hailey disease lesions after vaporization of the affected areas with the scanned or pulsed (8) CO<sub>2</sub> laser is not clear. Theories maintain that the superficial erosions are re-epithelialized by fast proliferating adnex keratinocytes that do not express the molecular defect of Hailey-Hailey disease (2, 3). An



Fig. 1. Right axilla of patient 1 (a) before treatment and (b) 1 year after treatment with the scanned carbon dioxide laser. Note the recurrence of disease in the untreated skin surrounding the treated area in (b).

alternative hypothesis could be proposed that a gene involved in the process of senescence of keratinocytes causes Hailey-Hailey disease, which might explain the late onset of the disease. Thus, repopulation of treated areas with “young” keratinocytes temporally cures the phenotype of Hailey-Hailey disease.

In summary, this report corroborates and extends previous studies suggesting that for severe cases of Hailey-Hailey disease ablation of affected areas with modern CO<sub>2</sub> laser systems may become the surgical treatment modality of choice. However, larger controlled studies are needed to confirm these results and to determine the long-term effects of this treatment and the duration of remission.

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