of Texas Southwestern Medical Center at Dallas and its affiliated academic and healthcare centres, the National Center for Research Resources or the National Institutes of Health.

Conflicts of interest: B.F.C. is an investigator for Daavlin Corporation, Biogen Incorporated and Pfizer Incorporated, and a consultant for Viela Bio.

Digital ultraviolet B phototherapy in vitiligo: proof of concept

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Dear Editor, Phototherapy with ultraviolet (UV)B radiation is considered to be a cornerstone in the treatment of vitiligo.[1–3] However, performing phototherapy in a nontargeted way results in tanning of vitiligo-adjacent and vitiligo-free skin. A therapy-enhanced pigment difference between healthy and diseased skin in the case of phototherapy is most often only transient. However, it represents an important reason for insufficient satisfaction with therapy with regard to cosmetic outcome, in particular for facial lesions. We aimed to avoid exposure of healthy skin completely in vitiligo by using targeted phototherapy with the skintrek® PT3 device (Lüllau Engineering, Adendorf, Germany).

The novel and unique technology of skintrek uses a digital micromirror light-modulator device integrated into the exposure head, which allows exclusive irradiation of diseased skin, while the UV dosage can be gradually decreased by software control around the edge of detected skin lesions. This prevents the induction of rim-like hyperpigmentation, which can occur in conventional targeted phototherapy, for example with common light or excimer laser treatment.[4] An integrated camera and Wood's lamp enable precise and automatic detection and subsequent light exposure of depigmented lesions (Fig. 1, lower panel) using the digitized pixel rays (by 13·68 × 13·68 μm) of the skintrek technology. Targeted digital phototherapy with skintrek PT3 has recently been successfully administered to patients with psoriasis and mycosis fungoides.[5,6]

We report a case series of one 35-year-old woman and one 29-year-old man with localized vitiligo, and two men aged 22 years and 49 years, respectively, with generalized vitiligo. They were all treated with skintrek PT3 for depigmented facial lesions, in combination with three cycles of a cream containing methylprednisolone once daily for 3 weeks interrupted by pauses of 1 week. None of the patients had received any treatment for vitiligo lesions within 2 months before the start of digital phototherapy.

All patients received a total of 24 skintrek selective UVB dosages (peak at 317 nm) at a maximum irradiance of 1·7–8·3 mW cm^{-2}, depending on the size of the irradiation field (measuring 123 × 92 mm to 276 × 207 mm). These dosages were administered during 8–11 weeks twice weekly, and thereafter for 2–8 weeks once weekly. A fixed treatment number but variable frequency was chosen, as a previous phototherapy study (using a 308-nm excimer laser) indicated that the treatment response in vitiligo correlated with the total

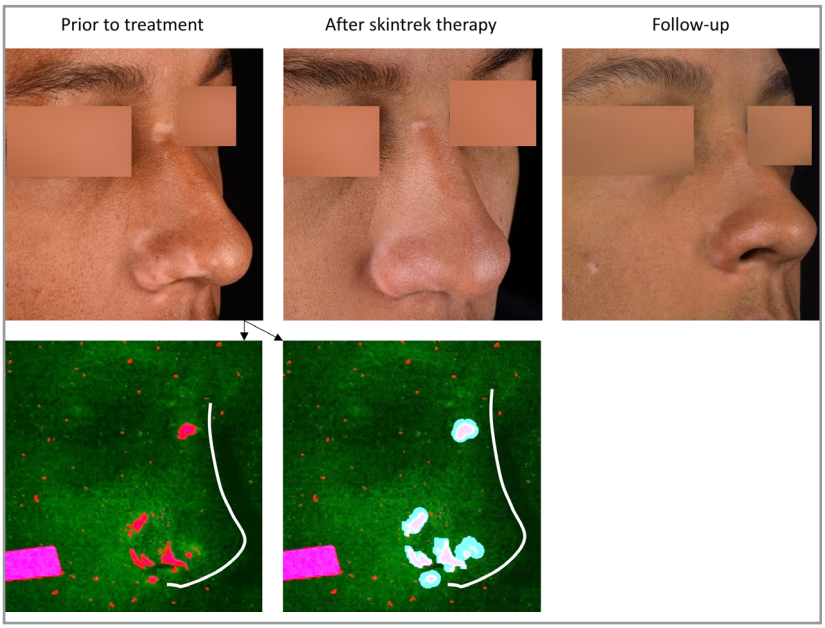

Fig 1. Depigmented lesions (upper panel) in a 29-year-old man prior to (left), after 15 weeks of digital phototherapy (middle; with nearly complete response) and 3 months thereafter (right). The lower panel shows automatically detected diseased skin (in red) prior to phototherapy (left); semiautomated selection of the irradiation area is shown in whitish-blue (right). Purple rectangular markers are used for automatic compensation of movement; white lines (nose) are drawn by hand for better recognition of the patient's face.

number of treatments but not with the frequency of administration.[7] The start doses in the four patients were 0·05, 0·2, 0·2 and 0·3 J cm^{-2}, which is largely in accordance with expert recommendations;[8] the dose was increased every two irradiations by 0·1 J cm^{-2} until erythema occurred. For the patients with skin type III, phototherapy was further administered with the last dose not resulting in erythema, and for patients with skin type IV and V, the dose after erythema was increased by 0·05 J cm^{-2} weekly. This resulted in end dosages of 0·65, 0·75, 0·8 and 0·9 J cm^{-2} and cumulative UV dosages of 11·4, 13·4, 12·2 and 15·2 J cm^{-2} for the patients in this study, who had skin types III, III, IV and V, respectively. Targeted phototherapy was immediately followed by the prescription of topical tacrolimus 0·1% ointment to be administered twice daily for 3 months after the last phototherapy session. This report is in accordance with the ethical approval of the Medical University of Graz (application number 25-294ex12/13).

We observed a reduction in the area of treated, depigmented facial lesions of the male patients by > 60%, > 50% and > 20%, respectively, directly at the end of phototherapy (Fig. 1, upper panel), with both marginal diffuse and perifollicular repigmentation. All patients reported mild erythema on one to two occasions during the phototherapy course. No other nondesired effects occurred during phototherapy. None of the patients showed tanning in lesion-adjacent, nondiseased skin. The two patients who responded with > 50% repigmentation were satisfied with the outcome.

The small sample size, short overall treatment duration and concomitant steroid administration are the major limitations of this study. Nonetheless, this report provides the proof of concept for digital phototherapy with automatic lesion detection (using the integrated Wood's lamp of the device) and treatment in patients with vitiligo. The exposure of only diseased skin makes this therapeutic approach very promising with regard to cosmetic outcome and safety. Although the exact mechanism of how phototherapy works in vitiligo is not known, one potential disadvantage of targeted treatment such as digital phototherapy may be the lack of treatment-induced, therapeutically effective systemic immunosuppression, particularly in patients with progressive and widespread lesions. This and the exact clinical efficacy of the approach need to be investigated further in the future, ultimately in a randomized study.

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Hailey–Hailey disease with acantholysis of the oral and oesophagogastric mucosa

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Dear Editor, A 65-year-old woman with a history of Hailey–Hailey disease (HHD) was followed for recurrent painful blistering eruptions in the axillary, inframammary and inguinal folds (Fig. 1a). Her mother and son also carried a diagnosis of HHD.

At 62 years of age, she underwent evaluation for an 18-pound weight loss. Computed tomography imaging with contrast of the abdomen revealed irregular wall thickening at the gastro-oesophageal junction (GEJ) and gastric cardia, concerning for malignancy or inflammation (Fig. 1b). Endoscopic biopsies of the thickened GEJ were significant for focal acantholysis of squamous mucosa without atypia or inflammation (Fig. 1d). The findings were deemed consistent with an unusual manifestation of her HHD and she was managed with observation only.

Two years later she presented for an enlarging pedunculated friable papule on the inferolateral tongue (Fig. 1c). Differential diagnosis included pyogenic granuloma, squamous cell carcinoma, or verruca. The lesion was removed and histopathology again demonstrated intraepidermal acantholysis without atypia or inflammation (Fig. 1e).

HHD was confirmed with (i) lesional biopsy of the axilla showing intraepidermal acantholysis and (ii) genetic testing

