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Fractional Photothermolysis for Treatment of a Residual Discoid Lupus Erythematosus Lesion: A Case Report

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Cutaneous discoid lupus erythematosus (CDLE) is a chronic inflammatory skin disease often resulting in permanent scarring of the affected area. Fractional photothermolysis (FP) is a well-known inducer of tissue regeneration by wounding the skin in a fractional pattern, hence inducing a well defined, wound healing response. It has been used clinically to treat atrophic as well as hypertrophic scars and also fibrotic diseases like morphea since more than a decade. We report a case of a young female patient treated with three sessions of ablative FP for stable atrophic scars due to CDLE affection of the upper left and right cheeks. After the last treatment, no side effects were observed. At the 13-month follow-up visit, the treated atrophic scars showed satisfying improvement for the patient. Skin texture, relief, color, and overall cosmetic appearance were all rated as improved by three independent dermatologists. No signs of unwanted side effects were observed at any time point. This case report should be followed up with a larger case series or ideally a prospective randomized clinical trial to better establish FP as a safe and effective tool to treat reminiscent scars after CDLE.

Keywords: Discoid, Lasers, Lupus erythematosus, Scar, Skin

INTRODUCTION

Cutaneous discoid lupus erythematosus (CDLE) is a chronic inflammatory disease often resulting in permanent scarring of the affected skin[1]. Its prevalence has been increasing over the last decade: from 0.017%~0.048% worldwide[2] to more than 0.07%[3]. Unfortunately, treatments are rather symptomatic by suppressing the inflammatory component of the disease and a permanent scar can not always be avoided[1,4].

Fractional photothermolysis (FP) was introduced by Manstein et al.[5] in 2004 as an inducer of wound healing and dermal collagen remodeling by wounding the skin in a fractional pattern[6]. It has been reported to successfully treat atrophic scars as well as fibrotic skin diseases like morphea[7,8]. However, laser treatments in general are still considered dangerous in treating patients with underlying immunologic deficiency or autoimmune connective tissue disease as wound healing in these patients may be impaired[9,10]. Nevertheless, there is not enough scientific evidence neither to confirm nor reverse this common belief in the case of discoid lupus[11-13]. It remains to be shown that treatments with infrared laser systems (in this case 10,600 nm) are safe and do not trigger flare-ups of the disease.

CASE REPORT

We report the case of a 28-year-old female patient who presented with two stable atrophic scars due to biopsy-confirmed CDLE affection of the upper left and right cheeks. The CDLE first appeared in October 2013 after a strong sun exposure. One year after the initial therapy with topical tacrolimus and oral hydroxychloroquine, the lesions were still very active (Fig. 1). A second line therapy with ultrapotent topical steroids and oral thalidomide (50 mg daily) were then started, with a complete control of the inflammatory process after 4 months of therapy,

however leaving atrophic scars (Fig. 2A). Thalidomide was tapered off after 18 months with no recurrence of the inflammatory process. However no improvement was noted of the atrophic scar nature of the lesion. To this day there is no evidence that oral thalidomide improves non-inflammatory, atrophic scars.

After this complete remission of the lesions (after 4 months of thalidomide) the patient received, three sessions of ablative FP within a 5-month period for the residual atrophic scars.

Initially, a small area (2 cm×2 cm) of the scar on the right cheek was treated as a test area in order to assure the tolerance of the treatment and most importantly to confirm the absence of a Koebner phenomenon.

The treatment was performed after one hour of local topical anesthesia (EMLA Patch, lidocaine 25 mg/prilocaïne 25 mg; AstraZeneca, Cambridge, United Kingdom) with a commercially available 10,600 nm CO_2 laser (Dotscan® 10,600 nm; German Medical Engineering, Erlangen, Germany). Parameters were selected conservatively with 60 mJ/microscopic treatment zone (MTZ), a pulse duration of 2 ms, and a maximum density of 10% to the affected area with concomitant skin cooling by forced cold air (Cryo 6®; Zimmer MedizinSystems GmbH, Neu-Ulm, Germany). All before and after pictures were taken by the same professional photographer using a standardized approach (Nikon D810, Nikkor 60 mm, lens aperture of f/14; Nikon, Tokyo, Japan).

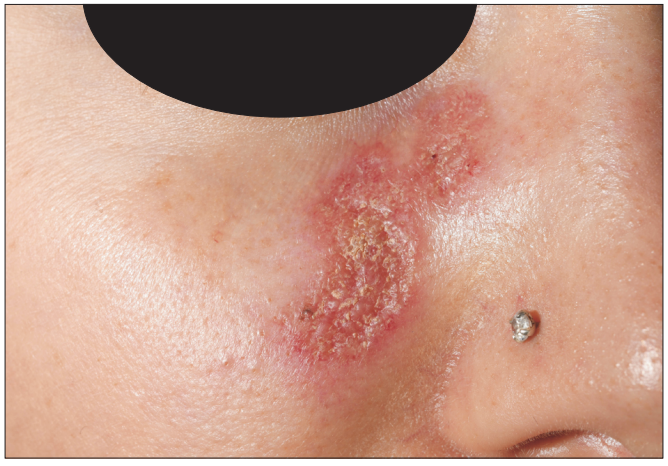

Fig. 1. Active cutaneous discoid lupus erythematosus lesion.

One month after the test treatment, no unexpected side effects or adverse events were observed.

We then proceeded with three additional treatments of the entire surface of the two lesions of the left and right cheeks maintaining the same treatment parameters as for the test treatment. Our post-laser skin care protocol consisted of at least once daily topical antibiotic ointment (FUCIDIN ointment 2%; LEO Pharma, Ballerup, Denmark), twice daily cleansing with a mild soap until and frequent white petrolatum (Vaseline; Unilever, London, United Kingdom) application to assure rapid epidermal regeneration until complete re-epidermisation occurred ("last crust falls off"). This protocol was then followed by the regular application of sunscreen with a sun protection factor of 50+ during the treatment intervals.

Fig. 1 shows the active CDLE lesion before systemic treatment. Fig. 2A shows the atrophic CDLE scar 4 months after systemic treatment and before any laser intervention. Fig. 2B was taken at 5-month follow-up after two laser treatments (at 0 and 3 months from baseline) showing clinical improvement. Fig. 2C was taken at 13-month follow-up after the third laser treatment. Additional improvement can be seen in comparison to the 5-month follow-up picture. The improvement is due to the induction of the long-term dermal remodeling process typically seen with fractional FP.

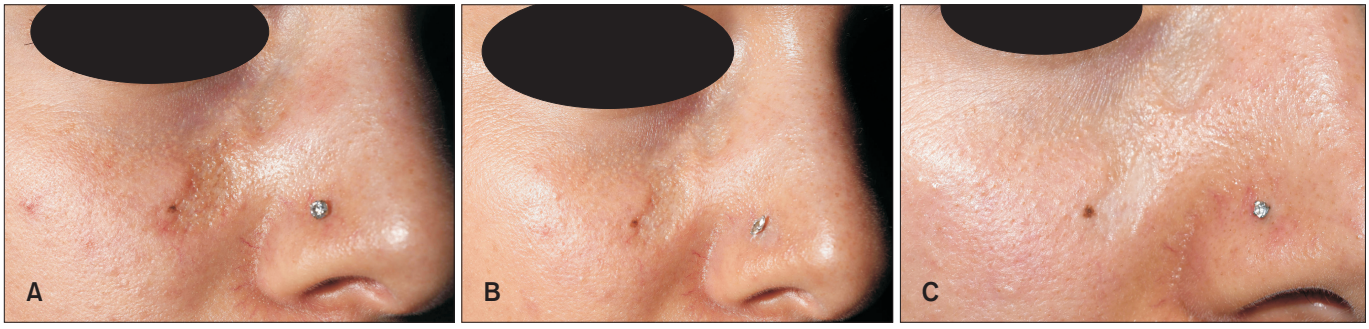

Fig. 2. Atrophic cutaneous discoid lupus erythematosus scar at baseline (A), 5-month follow-up (B), and 13-month follow-up (C).

Table 1. Average improvement on a 10-point scale

Average rating	Overview lesion right face	Overview lesion left face
Texture	6.0	4.0
Relief	5.3	3.7
Color	5.7	4.7
Overall aesthetic	7.0	5.7

No unwanted side effects or adverse events were observed at 5- and 13-month follow-up visits. The treated atrophic scars improved in depth and borders became less visible. Moreover, both scars appeared more homogenous and the skin surface had improved in roughness (Fig. 2B, C).

The patient rated her satisfaction with an 8 on a 10-point grading scale for the improvement of the overall cosmetic appearance.

Picture grading was performed using clinical pictures in a print out format by three independent senior dermatologists not involved in laser medicine. They were asked to correctly identify the baseline and follow-up pictures. Additionally, they were asked to rate the improvement on a 10-point grading scale (0, no improvement; 10, maximum improvement) independently for texture, skin surface, color, and overall aesthetic appearance of the lesions. An average rating of 7.0 and 5.7 points on a 10-point scale was given for the overall aesthetic improvement of the right and left lesions, respectively (Table 1).

We received the patient's consent form about publishing all photographic materials.

DISCUSSION

As we mentioned earlier, there is no curative treatment for CDLE[1]. Hence CDLE is often leading to permanent damage of the affected area resulting in a typically atrophic, depressed scar without adnexal structures. This is especially important since a lot of the affected patients are rather young and the disease is often affecting the face. The psychological impact of visible facial scars with their possible impact on the quality of life is debatable[14,15]. In our opinion, the demand of aesthetic improvement should be decided case by case. However, treatment options for the residual scar after CDLE so far have been scarce[1]. FP has been used since more than 10 years to improve atrophic acne scars[15,16]. However, the FP treatment of atrophic scars after CDLE affection of the face has not yet been described in the literature. Physicians appear to be on the defensive to treat residual atrophic scars caused by inflammatory disease and especially CDLE. Nevertheless photosensitivity of inflammatory skin disease is caused mainly by UVA, UVB and rarely by visible light[17]. However even visible lights have been used previously to successfully treat inflammatory skin lesions themselves[18]. Therefore laser treatments using infrared wavelengths appear to be a reasonable and safe approach to improve the reminiscent atrophic scar caused by CDLE.

After a test treatment both atrophic scar lesions were treated with three FP treatments within a 5-month period. At the time of the last laser treatment (5-month follow-up visit), both lesions showed already signs of clinical improvement (Fig. 2B). Additionally, further improvement was evident at the last 13-month follow-up (Fig. 2C). We would therefore like to raise awareness that the final outcome of FP procedures should be judged several months or even a year after the last treatment session. Treatment series of more than three fractional treatments appear in our opinion not necessary and additional sessions should be performed only after insufficient improvement is found at least 6 months after the last laser treatment. In our opinion, FP could be considered as a valid therapeutic approach to induce a stable and long-term cosmetic improvement with only minimal risks[8].

To conclude, a series of three ablative FP treatments improve the cosmetic appearance of stable CDLE atrophic scars. However, before recommended to a larger patient base, the presented case report needs to be followed up with larger case series or ideally with a prospective clinical trial establishing the treatment's safety and efficacy for this indication.

CONFLICTS OF INTEREST

The authors have nothing to disclose.

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