

## CASE REPORTS AND SHORT REPORTS

# Striae after topical corticosteroid: Treatment with nonablative fractional laser 1540nm

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### Abstract

Striae distensae are atrophic dermal scars associated with psychosocial stress. Several treatments have been used but there is no gold standard until now. Fractional photothermolysis has been described as a successful and safe method to treat scars. In this description, we report 4 patients (Fitzpatrick phototype IV) who developed striae distensae after long-term use of topical corticosteroids and were successfully treated with fractional nonablative 1540 nm Erbium: glass laser.

**Key Words:** *corticosteroid, fractional nonablative, laser, striae*

### Introduction

Striae rubra or striae distensae are atrophic linear dermal scars with multiple causes including pregnancy, obesity, adolescent growth spurts, Cushing's and Marfan syndromes long-term systemic or topical steroid use (1). One of the most frequent skin conditions in dermatological consultations, striae is considered an aesthetic complaint, although it may be associated with psychosocial stress and interferes with patient's quality of life (2,3). Several options have been used to treat striae such as topical agents (e.g. moisturizers, retinoid, glycolic and trichloroacetic acid, peels) and also laser, intense pulsed light, microdermabrasion and radiofrequency. Nowadays, the increase of different kinds of lasers has brought new possibilities to manage those lesions. Fractional nonablative laser has the ability to create microscopic columns of coagulated tissue of the epidermis to the dermis, stimulating neocollagenesis. It is safer and allows faster healing since the treated areas are surrounded by untreated tissue and the preservations of the stratum corneum (4–6).

In this study, we report on 4 patients (skin type IV) who used topical corticosteroid for a long time

on their own and developed stretch marks in the arms and/or in the legs, becoming a challenge for treatment. The choice of fractional nonablative laser was a safe option with great cosmetic results.

### Case reports

#### Case 1

A 19-year-old male adolescent (Fitzpatrick skin type IV) with a 2-month history of striae on his arms after long-term use of topical corticosteroids. The patient had atopic eczema and used betamethasone on the lesions for more than 5 consecutive months.

Clinical examination showed striae rubra in both antecubital regions. (Figure 1)

#### Case 2

An 18-year-old female adolescent (Fitzpatrick skin type IV) with a 6 month history of striae rubra on the arms after 1 year of use of topic betamethasone. The patient had atopic dermatitis and used corticosteroid on her own. Clinical examination showed striae rubra in both antecubital regions. (Figure 2)

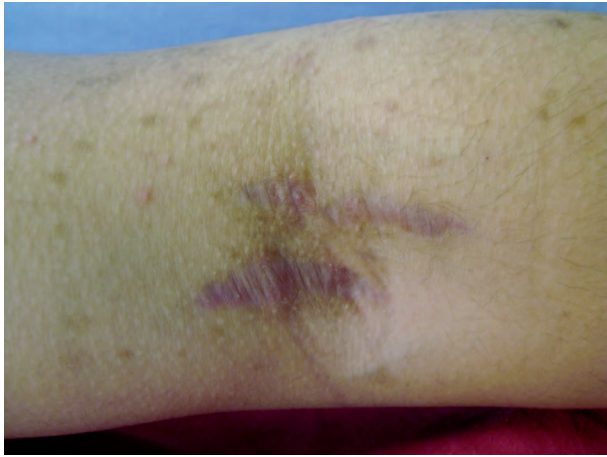


Figure 1. Patient 1 before treatment with striae rubra in antecubital region.

### Case 3

A 14-year-old female adolescent (Fitzpatrick skin type IV) with a 4 month history of striae on the thighs. She had atopic dermatitis for more than 13 years and abandoned the treatment within the previous 12 months. She started to use topical betamethasone on her own.

Clinical examination revealed multiple striae rubra on her inner thighs. (Figure 3).

### Case 4

A 14-year-old female adolescent (Fitzpatrick skin type IV) with a 6-month history of striae on the legs. She reported allergy on her legs 1 year ago, and was told to use topical betamethasone for 1 month, however she used it for 6 consecutive months. Clinical examination showed multiple striae rubra on the anterior part of her thighs and legs. (Figure 4).

All patients had striae rubra and were treated with a fractional nonablative laser (Erbium: glass 1540 nm). Before the procedure, patients used occlusive topical anesthesia (lidocaine 4%) for 1 h. Afterwards, the area



Figure 3. Patient 3 before treatment with striae rubra in the right inner thigh.



Figure 2. Patient 2 before treatment with striae rubra in antecubital region.



Figure 4. Patient 4 before treatment with striae rubra on the anterior part of right leg.

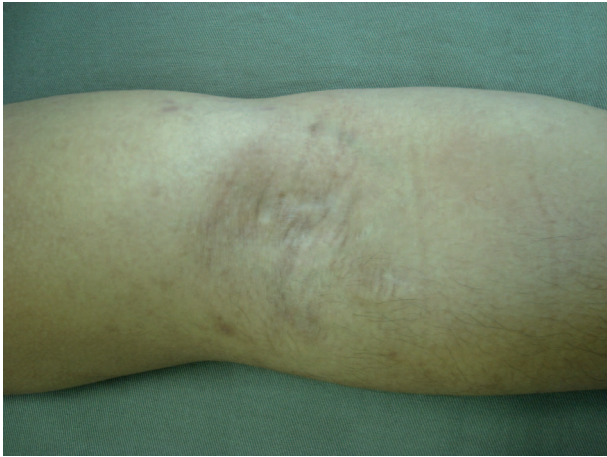


Figure 5. Patient 1 after 3 sessions with nonablative fractional laser treatment in antecubital region.

was cleansed with aqueous chlorhexidine solution. Patients then received the laser procedure. Three to six treatments were performed with 3 laser passes in each session with energy levels of 70 mJ, 15 ms pulse width and 10 mm spot size (Erbium glass 1540 nm, Starlux, Palomar®). After each procedure, they were advised to use sunscreen SPF 30 three times a day.

After 3 sessions (with 1 month interval between them), it was possible to see a great improvement in patients 1 and 3, both photographed after 1 month after the last session (4 months after the initial of the treatment) (Figures 5 and 6). However, patients 2



Figure 6. Patient 3 after 3 sessions with nonablative fractional laser treatment in the right inner thigh.

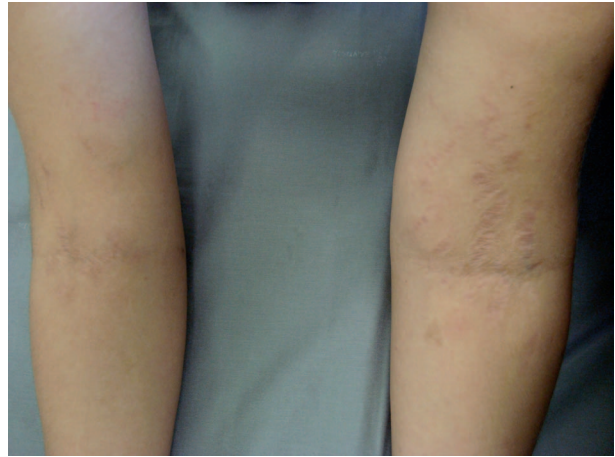


Figure 7. Patient 2 after 4 sessions with nonablative fractional laser treatment in antecubital region.

and 4 didn't have the same progress, therefore they were submitted to more sessions. Patient 2 performed 4 sessions and patient 4, 6 sessions monthly. Post-treatment pictures were registered one month after the last session in both cases (Figures 7 and 8).

### Discussion

Striae distensae is a very common disease that usually affects the quality of patient's lives and it can be observed in different clinical settings. One of the causes is the prolonged use of corticosteroids.

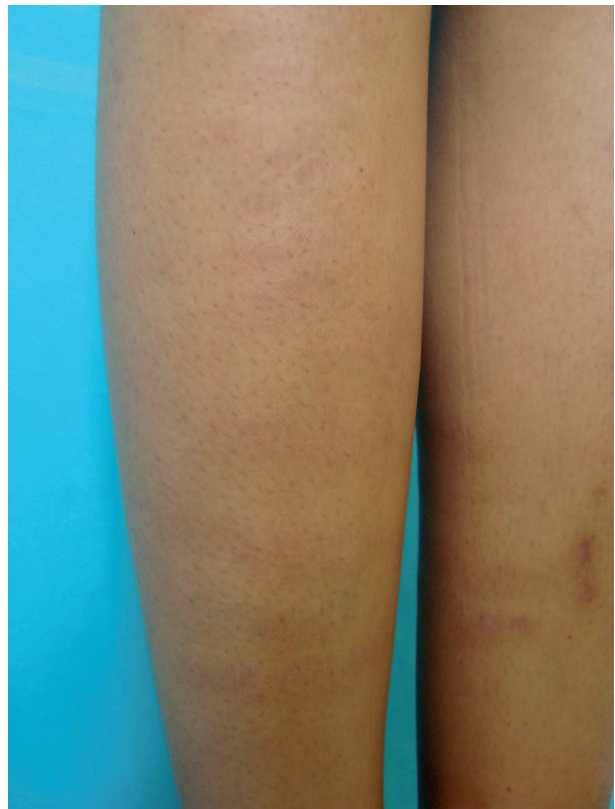


Figure 8. Patient 4 after 6 sessions with nonablative fractional laser treatment on the anterior part of right leg.

Striae is a linear atrophic scar, which can have different colors such as red, purple, blue, white and tends to follow the skin tension lines (5). Histopathology shows inflammatory reactions in the beginning (with edema and perivascular lymphocytic inflammatory infiltrate) which changes to atrophic epidermis with loss of collagen and reduced amount of fibrillin and elastin (5,6).

Pathophysiology of the striae is complex and inconclusive in the literature. Many theories and multiple factors have been described such as genetic predisposition (family and personal history, ethnicity) (3), mechanic agents (stretch) and hormonal and biochemical factors (increase of corticosteroids/androgen/estrogen receptors in the skin) (3).

Corticosteroids are commonly used in day to day dermatologist's prescriptions and they are associated with local and systemic side effects, which usually occur with prolonged treatments and high potency steroids and the location of its use (7). It has been previously shown that steroids are one of the main causes of stretch marks. Many studies in literature show topical corticosteroids side effects including many reports of striae caused by them. One of the first descriptions about this association [published in 1965] shows the increase of striae in adults after the use of potent topical steroids. Adam et al. presumed that the steroid changes the dermal connective tissue and dermal matrix causing the striae (8). Other authors have described similar cases with topical corticosteroids (9,10).

Pioneering studies of fractional photothermolysis for striae rubra treatment were published in 2009 and described two successful treatments with it. The two patients received three to five treatments (with 4-week intervals) and the improvement was more than 75% in both. The only side effect described was erythema and edema and they disappeared in 2–5 days post procedure (11).

In a Korean randomized blind study, published in 2011 with 24 patients, Yang et al. compared Erbium glass 1550 with ablative CO<sub>2</sub> fractional laser. All the patients received both treatments in half of the abdomen. They performed 3 sessions with 4-week intervals. Both methods were associated with clinical and histopathological improvement, but there was no difference between them (12). De Angelis et al. described the use of fractional nonablative lasers (1540 nm Erbium: glass) to treat striae in Fitzpatrick skin types II–IV with safe. They treated 51 patients with a total of 79 striae (some patients had more than one location). The most common locations were hips, breasts and abdomen. Treatment was well-tolerated, with minimal side effects. They reported improvements of 50% in the appearance for all patients (by nonblinded investigators) and 51–75% in blind reviews which examined 14 clinical images. Histology showed significant neocollagenesis and increased elastic fibers in the tissue (6).

This report shows 4 patients who developed striae after the extended use of potent topical steroids and have become a challenge for treatment without complications.

In Brazil, all kinds of steroids are sold without a prescription, which make them a risk in abusive use.

In all patients, striae appeared after an average of 8 months using the steroid and the mean duration was 4–5 months. Anatomical locations included upper and lower limbs. No patient had a previous treatment history of striae.

These patients are a considerable challenge because they had striae rubra and they were all phototype IV (Fitzpatrick classification).

Because of the risk of hyperpigmentation in those patients, we decided to use nonablative fractional laser (1540 nm). Advantages observed with this technique were the laser small tip size, which allows treatment of specific areas, stamping compression mode, that can reach deeper penetration in dermis, and nonablative fractional mode that allows faster and safer healing due to the treated areas surrounded by untreated tissue and the preservations of the stratum corneum.

Treatment was well-tolerated, and minimal side effects were observed (immediate erythema and edema, resolved in 1 week). After 3 sessions, we already could note improvement of skin color and texture, and patients were very pleased. One patient was submitted to 3 more sessions and another 1 more. At the end of the treatment, all patients were very satisfied.

Patients should be warned about the risks of the topical steroids. Physicians must alert patients about the local and systemic consequences of its abuse and instruct them to avoid risk areas (flexural, genital, face) and prolonged use. Our patients only had local side effects (striae rubra).

The nonablative fractional photothermolysis was shown to be an excellent and safe procedure to treat striae rubra caused by topical steroid in patients phototype IV.

**Declaration of interest:** The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the article.

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