

Fractional Nonablative 1540-nm Laser Treatment of Striae Distensae in Fitzpatrick Skin Types II to IV

Clinical and Histological Results

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Abstract

Background: Current striae treatments are limited in their ability to deliver long-lasting improvements for all skin types. The success of fractional nonablative lasers for surgical scars has been attributed to the controlled wound-healing response stimulated by microscopic columns of epidermal and dermal thermal damage.

Objectives: The authors describe the safety and efficacy results of treatment with a fractional nonablative 1540-nm erbium:glass laser in patients with Fitzpatrick skin types II to IV for both striae rubra and striae alba.

Methods: A 51-person clinical study was conducted on striae ranging in duration from one to 40 years. Nine different anatomical locations were treated, including the breasts, hips, and abdomen. Treatment parameters included two to three passes with the 1540-nm laser, with energy settings from 35 to 55 mJ/mb with the 10-mm optical tip or 12 to 14 mJ/mb with the 15-mm optical tip. Two to four total treatments were performed at four- to six-week intervals. Nonblinded efficacy evaluations were performed on all 51 patients; blinded evaluations were conducted by three independent clinicians on 14 randomized sets of pre- and posttreatment images on a 0% to 100% quartile improvement scale. Skin reactions were assessed by the treating physician and recorded at multiple time points, and histology was conducted with hemotoxylin and eosin as well as Orcein-Giemsa staining.

Results: Nonblinded clinical assessments rated overall improvement as 50% or greater for all patients at six months or longer after the last treatment. Blinded evaluators reported an overall mean improvement score of 51% to 75% on properly selected images taken at least three months after treatment (n = 11). In all patients examined at either 18 or 24 months after treatment, there was no recurrence of striae. Typical side effects included transient erythema and edema. A small minority of patients experienced transient cases of trace postinflammatory hyperpigmentation (PIH), which all

resolved. Histologic observations showed thickening of the epidermis and dermis, neocollagenesis, and increased elastin deposition one month after the last treatment.

Conclusions: Positive safety and efficacy results with the fractional nonablative 1540-nm erbium:glass laser for the treatment of striae rubra and striae alba ranging in maturation age from one to 40 years was demonstrated in Fitzpatrick skin types II to IV.

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