

Treatment of photoaging with a very superficial Er:YAG laser in combination with a broadband light source.

Abstract

Background and Objective: Studies documenting improvement following combined laser and light-based devices are needed. The objective of this study was to evaluate clinical, histological, and ultrastructural changes in photodamaged facial skin following sequential treatment with ablative superficial erbium:YAG (Er:YAG) laser peels and nonablative intense pulsed light, or broadband light (BBL), treatments.

Study Design/Materials and Methods: Fifteen subjects with photodamaged facial skin and Fitzpatrick skin types I to III underwent 3 monthly treatments with the ProfileTM system (Sciton, Inc, Palo Alto, CA) utilizing very superficial MicroLaserPeelTM settings of 2.5 to 5.0 J/[cm.sup.2] and BBLTM settings of 515-, 560-, or 590-nm filters, 10-msec pulse duration, and fluences of 12 J/[cm.sup.2]. Five subjects underwent pre- and post-treatment postauricular skin biopsies for evaluation of treatment-induced light and electron microscopic changes.

Results: Twelve subjects completed the study. Both blinded evaluator and subject assessment of clinical changes documented significant improvement in photodamaged skin, with the greatest improvement achieved in overall appearance and epidermal dyspigmentation. These results were largely maintained at 3 months following the last treatment. Light microscopy showed changes in the epidermis, collagen, and elastic fibers consistent with a wound repair mechanism to the depth of 250 to 350 microns. Electron microscopy revealed a slight decrease in the average collagen fiber thickness, pointing to an increase in type III collagen.

Conclusion: A protocol utilizing multiple combined superficial Er:YAG ablative treatments and nonablative BBL treatments lead to a significant improvement in the clinical signs of photodamaged skin, with histological and ultrastructural evidence of new collagen formation.

Introduction

As various laser and light-based devices are being combined in clinical practice for their additive effect, studies documenting improvement following such treatments need to be undertaken. Both superficial ablative treatments using erbium:YAG laser and nonablative treatments using intense pulsed light (IPL)--also known as broad-band light (BBLTM)--have been successfully used for facial photorejuvenation. (1,2) In addition to the clinical improvement noted with each of these devices, histological and ultrastructural evidence of new collagen formation and other changes associated with the wound repair mechanism have also been demonstrated. (3) Since both of these treatment options result in minimal, if any, downtime and adverse effects, they represent attractive options for facial rejuvenation.