

ORIGINAL ARTICLE

Evaluation of a combined laser-radio frequency device (Polaris WR) for the nonablative treatment of facial wrinkles

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Abstract

Nonablative wrinkle reduction or skin tightening is desired by individuals who, ideally, hope to have the skin improvement associated with chemical or laser ablative techniques but without the undesirable recovery process. Electro-optical synergy (ELOS) technology that combines radio frequency (RF) and diode laser energy (900 nm) was used to treat 15 patients in this IRB sanctioned study. Energy settings were based on the depth of wrinkles (the greater the depth and concentration of wrinkles, the higher the RF setting) and ranged from 50–100 J/cm² RF and 15 J/cm² for the optical, laser component. Patients received three full-face treatments, and results were evaluated by comparison of standardized photographs and patient questionnaire given prior to each treatment and one month after the third treatment. The primary investigator and three other “blinded” physicians evaluated these photographs using Fitzpatrick’s wrinkle classification to assess the improvement, if any, between the initial and final visit. Eight patients completed the study. Explanation for the exclusion of the remaining six patients were: one decided to have surgery, two felt the treatment was too painful, and three moved out of the area. Following treatment, all patients had mild swelling (resolved <48 hours) and skin hyperemia (resolved <24 hours). Results observed one month after the last treatment in eight patients demonstrated an average of 25% reduction in skin wrinkles (range 14%–32%). There were no adverse side effects. The major concern of the patients was the discomfort associated with the treatment. As part of an FDA investigation to assess efficacy, long-term follow-up was not a part of this study protocol.

Key words: ELOS, laser treatment, non-ablative, radio frequency, wrinkle reduction

Background

The ability to reduce wrinkles without a prolonged recovery time is desired by many patients. Individuals continue to seek a more permanent reduction in skin wrinkling not attainable with various skin “fillers”. Many technologies have shown improvement in skin wrinkles/texture, including Coblation (1), laser (2–10) and chemical ablative technologies, longer wavelength devices (11–16) and intense pulsed light (IPL) (17,18). Treatment results vary depending on the clinical situation, operator experience and patient compliance. The selection of a particular technique centers on the balance between cost, efficacy and post-treatment recovery/morbidity. The common pathway of most treatment modalities that lead to wrinkle reduction and skin tightening is the inflammation that occurs in the sub-epidermal layers. Collagenesis is the by-product of this process as well as a modification in the elastin and epidermal layers (19,20).

An emerging technology for the nonablative treatment of skin laxity/wrinkles is RF. Unlike low frequency electrical current that causes muscle spasm and heat, current at 300 kHz and higher primarily produces a thermal effect in tissue. RF energy is blind to skin color classification and controlled by the electrical properties of the treated tissue. An additional benefit can be obtained if the RF energy can be optimally modulated/directed into a “selective” energy delivery system. Thermage Inc. has developed a promising utilization of RF energy called ThermaCool TC. Studies have shown a skin tightening effect in certain patients treated with this device (21). Syneron has developed a device that utilizes RF energy and, in addition, creates a synergistic effect with diode laser, “optical” energy in an attempt to optimize sub-epidermal heating and collagenesis without epidermal damage. This technology has been named ELOS (electro-optical synergy).