CLINICAL BULLETIN

No. 20

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Skin Tightening* Using the GentleYAG® Laser with Infrared Surface Temperature Measurement

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Introduction

Multiple treatment options now exist to address skin laxity, including a variety of devices incorporating laser or radio-frequency energies that heat the skin and reformulate new collagen. Regardless of the technology, the goals are to offer patients fast treatment times, avoid side effects, minimize discomfort and maximize outcomes.

Interestingly, clinical endpoints are consistently vague when utilizing any of these devices to address skin laxity. Despite the simple premise of delivering enough heat to reformulate collagen, defined, measurable endpoints have yet to be established with most of these devices.

This paper evaluates the performance of the GentleYAG 1064 nm laser from Candela to tighten the skin using a low fluence, short pulse duration, high repetition rate and multiple pass technique, and measuring the resulting surface temperature of the skin using an infrared (IR) thermometer.

Method

The subject of this study was a 64-year-old male. He was treated using a variable pulsed, Nd:YAG laser at the following treatment parameters: **Face**: 8 mm spot size, 12 J/cm^2 fluence, 0.5 ms pulse duration, and 7 Hz repetition rate; **Neck**: 10 mm spot size, 12 J/cm^2 fluence, 0.5 ms pulse duration, and 10 Hz repetition rate on the neck. Disposable eye shields were used to protect the eyes. Three passes were delivered in sections over each area of the face and neck. The handpiece is kept in constant motion at a minimal distance over the skin. The Dynamic Cooling Device™ (DCD™) is turned off, as epidermal protection is not required for this procedure. Topical anesthesia also is not required.

The targeted temperature after each laser pass was 41° to 43° C as measured by a simple IR thermometer. Care was taken not to cool the treated areas following any of the laser passes, as the overall goal of the treatment is to deliver sufficient bulk heating deep into the skin and maintain heat in the treated area as long as possible. (A quick wipe with a room-temperature “baby wipe” is acceptable after each laser pass.)

A total of five treatments were administered at three- to four-week intervals.

Results

The before-and-after pictures attached show a remarkable improvement in both skin tightening and overall wrinkle reduction. Patient tolerance is also very good. During the procedure, I usually have the patient raise his or her hand or verbally indicate when the heat buildup is becoming uncomfortable. Treatments are completed quickly and can generally be described as “easy” on both the patient and practitioner.

On a regular basis, I find it important to educate my patients on the nature of collagen remodeling so that their expectations are realistic regarding the time it will take to see results. I let them know at the outset that they should not expect to begin seeing results until approximately the fourth treatment, and that improvement will continue for up to six months following their last treatment. With that said, I have had patients notice results after one treatment, most likely from temporary contraction of the collagen bundles.

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Discussion

Skin-tightening treatment outcomes vary from from patient to patient, and are dependent upon a number of factors. Patient-dependent variables include the patient's age, sex, the extent of wrinkling and/or sun damage, tobacco use, the anatomical site being treated and the relative thickness of the skin.

Device-dependent variables basically rest upon the ability of the product–of-choice to safely deliver sufficient bulk heating deep enough into the skin to generate new collagen development.

As seen in the treatment of this patient (and in my experience treating several other patients using these same protocols), the "amount" of dermal heating required to tighten the skin using the GentleYAG 1064 nm laser can be correlated to a surface skin temperature of 41° to 43°C when using an IR thermometer as described in this paper.

While additional research should be undertaken to more firmly establish this correlation between dermal heat deposition and surface skin temperature, as well as a greater predictability in treatment results in general, I have found this approach to deliver consistent and good tissue-tightening results.

Figure 1—Face pretreatment

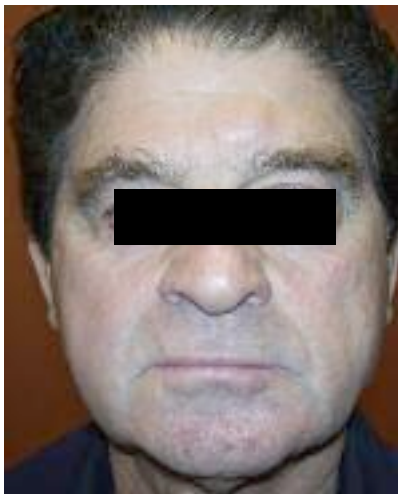

Figure 1b—Face post-treatment

Figure 2—Neck pretreatment

Figure 2b—Neck post-treatment

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*Tightening by reduction of wrinkles.

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