CLINICAL BULLETIN

No. 11

Tara Bryant, M.D.

GentleLASE® Treatment of Dark Skin

Tara Bryant, M.D.
Carraway Laser Center
Birmingham, Alabama

Introduction

Despite a plethora of hair removal lasers on the market today and the numerous claims of improved performance or breakthrough results, delivering successful laser hair removal results is really a function of understanding laser physics and determining the optimal treatment parameters for a given skin type.

Regardless of the laser being used, all hair removal is based on the theory of Selective Photothermolysis, which basically states that targeted structures in the skin, called chromophores, can be selectively heated using specific wavelengths of energy to an intended clinical outcome without causing injury to surrounding normal tissue. In the case of laser hair removal, the targeted chromophore is melanin, the intended out-come is the destruction of the hair follicle, and the collateral injury to be avoided is that to the epidermis. Because the amount of epidermal melanin is significantly greater in dark- skinned types than in light-skinned patients, the risk of epidermal injury as a result of laser hair removal is greater for patients of color. Because of this fact, the applicability, and not unrelatedly the popularity of laser hair removal has been slow to catch on for type V and VI patients.

But understanding the interaction of a laser's treatment parameters—wavelength, spot size, fluence, and pulse duration—and how the epidermis can be adequately protected during the laser hair removal procedure regardless of skin pigmentation, is the second key to delivering successful laser hair removal treatments.

This study reports on the efficacy of using a 755 nm alexandrite laser with cryogen cooling [Candela's GentleLASE laser with Dynamic Cooling Device™ (DCD™)] to treat a Fitzpatrick skin type V (+) patient.

Method

The patient is a 46-year-old African American postmenopausal female with hirsutism. The skin type is Fitzpatrick V (+). Treatment settings were as follows: 12 mm spot size, DCD 70 ms, and fluence of 20 J/cm^2. The patient's upper lip, chin, and neck were treated. Six weeks before the initial treatment the patient used hydroquinone 4% cream as well as post-therapy between her six-week treatment intervals. The patient was instructed to avoid sun exposure and use a sun block of spf 30 every day.

Results

The patient demonstrated immediate tissue reaction to the laser with superficial blistering and subsequent hypopigmentation. During the treatment interval, she utilized hydroquinone 4% cream to assist with blending her skin tone. Hair removal results were excellent (>90% reduction), and her skin pigment returned to normal except for small areas of hyperpigmentation on her chin and neck. Some of the areas had previous scarring from shaving and chronic folliculitus.

with DCD

GentleLASE®

CLINICAL BULLETIN No. 11

Discussion

Because the laws of physics have not changed since the introduction of the GentleLASE in 1988, it is not that hard to believe that the GentleLASE is still one of the most versatile and popular hair removal lasers on the market today. With its large 18 mm spot size and patented DCD cooling system, the GentleLASE remains a superior hair removal system in terms of speed, efficacy, and ease of use.

As was demonstrated with this African American patient, the GentleLASE clearly has the laser parameters with which to treat darker skin types. By understanding the physics behind laser hair removal and the interdependence of the laser parameters affecting hair removal efficacy—wavelength, spot size, fluence, and pulse duration—the GentleLASE can be shown to be effective treating darker-skinned as well as lighter-skinned patients.

In this particular case, we went down in spot size to minimize the amount of fluence, or energy, that the patient's dark melanin rich skin was subjected to with each laser pulse; and we increased the amount of DCD spray, or epidermal protection, that was delivered, also with each laser pulse.

The wavelength and pulse duration on the GentleLASE laser are fixed. While longer wavelengths and extended pulse durations have been shown to increase skin tolerance, successful treatment of dark skin types can be demonstrated using a fixed pulse duration, alexandrite (755 nm) laser.

In fact, understanding laser physics once again, a shorter pulse duration is actually advantageous when treating finer, thinner hairs. The Thermal Relaxation Time of smaller structures actually allows heat to dissipate faster than it can be absorbed when pulse durations are extended. For that reason, having a shorter pulse duration to maximally effect the smaller hair follicles is required.

The successful use of the GentleLASE alexandrite laser to treat darker skin types can also be attributed to its epidermal cooling methodology. GentleLASE's DCD cooling system, which sprays cooling bursts of cryogen onto the skin before every laser pulse, assures not only adequate protection of the epidermis, but also maximizes patient comfort during the procedure. Care must be taken not to use too much cryogen spray because the cryogen itself can cause temporary hyperpigmentation, a side effect easily avoided by establishing the correct DCD settings before starting the procedure.

In summary, understanding how laser energy is delivered and modifying treatment parameters depending on skin type can result in permanent hair reduction using a 755 nm, fixed pulse duration laser with adequate epidermal protection.

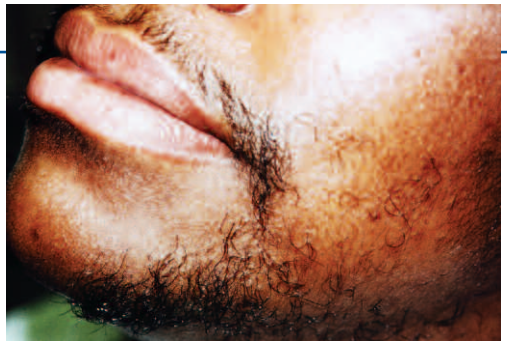

Figure 1—African American female, skin type V, pretreatment.

Figure 2—Same patient immediately following the last of three treatments at six-week intervals.

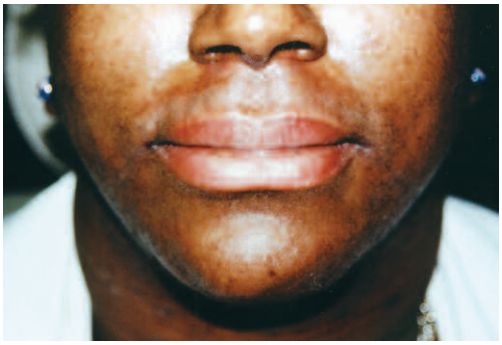

Figure 3—Same patient three months post-treatment.

Candela Corporation
530 Boston Post Road
Wayland, MA 01778, USA
Phone: (508) 358-7637
Fax: (508) 358-5569
Toll Free: (800) 821-2013
www.candelalaser.com

CANDELA
BE CONFIDENT

Printed in the USA. 07/03 0920-23-0820 Rev. 01