



Taro Kono, M.D.

Vbeam® Treatment of Solar Lentigines in Asian Patients

Taro Kono, M.D.

Department of Plastic and
Reconstructive Surgery
Tokyo Women's Medical University
Tokyo, Japan

Introduction

Skin rejuvenation represents the largest growth opportunity in light- and laser-based procedures. While the Vbeam long pulsed dye laser (LPDL) is known to be the most effective treatment for vascular lesions and diffuse redness—and pulsed dye technology has a reputation for being the gold standard in safety—there has not been much research into the treatment of epidermal pigmented lesions with Vbeam LPDL.

Since the introduction of selective photothermolysis, Q-switched lasers have been used for the treatment of pigmented lesions¹⁻⁵. Although Q-switched ruby and alexandrite lasers are highly effective in the treatment of lentigines for dark-skinned patients, such as Asians with a higher epidermal melanin content, historically there has been an increased risk of post-surgical complications, such as erythema, blistering, and post-inflammatory hyperpigmentation (PIH).

Knowing that energy levels of long-pulsed green Nd:YAG 532 nm and yellow 595 nm pulsed dye wavelengths are well absorbed by melanin, as well as oxyhemoglobin, we also understood that compression removes the competing chromophore (blood) from the skin. We hypothesized that the Vbeam LPDL delivered with compression would be a safe and effective treatment for lentigines in Asians.

To test such a hypothesis, we compared the clinical efficacy and complication rate of 18 Asian patients with lentigines, where one area was treated with Vbeam LPDL and another area was treated with a Q-switched ruby laser (QSRL).

Method

Eighteen Asian patients with facial lentigines and Fitzpatrick skin types III–IV were recruited and enrolled. A single operator treated all of the subjects. One of the lentigines present was treated with Vbeam LPDL by the compression method, and the other one was treated with QSRL. A Vbeam LPDL emitting a wavelength of 595 nm and a spot size of 7 mm was used, with fluences between 10 and 13 J/cm² and pulse duration of 1.5 ms. Cryogen cooling with the Dynamic Cooling Device™ (DCD™) was not used with the Vbeam LPDL. A 694 nm QSRL was used with spot size of 4 mm, fluences of 6–7 J/cm², and a pulse duration of 30 ns.

The clinical endpoint for the Vbeam LPDL was defined as an ash-gray color change without purpura. The clinical endpoint for the QSRL was defined as immediate whitening without bleeding. Postoperatively, antibiotic ointment was applied to the treated areas, and the subjects were advised to avoid scrubbing, abrasion, and exposure to the sun.

Lightening of the lesions was assessed by a reflectance spectrometer. Side effects, such as erythema, hypopigmentation, hyperpigmentation, and scarring were also assessed by clinical examiners.

Results

A research assistant took clinical photographs (Canon D30 with a ring flashlamp) in a standardized manner before each laser treatment and at each follow-up visit. Two independent, blinded observers reviewed the clinical photographs at one, four, and 12 weeks post-treatment and assessed them for the degree of improvement as



well as for complications, such as erythema, scarring, hypopigmentation, and hyperpigmentation.

Thirty-six sites of 18 patients were treated. The degree of clearing achieved by the two lasers was $70.3 \pm 23.9\%$ (mean \pm SD) for the QSRL and $83.3 \pm 12.9\%$ (mean \pm SD) for the Vbeam LPDL. Erythema was the most common postoperative complication among the patients. It was seen in all areas (100%) treated with QSRL, and in four of 18 areas (22.2%) treated with Vbeam LPDL ($P < 0.01$), as seen in Figure 1. Hyperpigmentation was observed in four of the 18 areas (22.2%) treated with QSRL, but not in the areas treated with Vbeam LPDL, as seen in Figure 2. There was no scarring or hypopigmentation.

Discussion

Patients often request the removal of lentigines for cosmetic reasons; and for this type of cosmetic procedure, minimizing complications is particularly important. Dark-skinned patients such as Asians have a higher epidermal melanin content and are more likely to develop erythema and PIH. These side effects lead to a high level of patient dissatisfaction.

In this study, by utilizing the principle of compression, we made it possible for the Vbeam LPDL to treat lentigines without the purpura indicative of vascular injury. This study also shows that long millisecond pulses can provide safe and effective treatment of lentigines.

Vbeam LPDL treatment delivered utilizing the compression method is more effective than QSRL for facial lentigines on skin types III-IV, offering a new approach to the treatment of epidermal pigmented

lesions in darker-skinned patients. Complications after the Vbeam LPDL treatments were substantially less frequent than after the QSRL, probably because the pulse durations of the Vbeam LPDL are optimal for targeting the basal cell layer, with minimal mechanical effects. The addition of the compression technique may allow "vascular" pulsed dye lasers to be used for treating a wide variety of pigmented lesions.

Bibliography

1. Anderson RR, Margolis RF, Watanabe S. Selective photothermolysis of cutaneous pigmentation by Q-switched Nd:YAG laser pulses at 1064, 532, and 355 nm. *J Invest Dermatol* 1989; 93:28-32.
2. Goldberg DJ. Benign pigmented lesions of the skin. Treatment with Q-switched ruby laser. *J Dermatol Surg Oncol* 1993; 19:376-379.
3. Kilmer SL, Wheeland RG, Goldberg DJ, Anderson RR. Treatment of epidermal lesions by Q-switched Nd:YAG laser. A controlled single impact, dose response, multicenter trial. *Arch Dermatol* 1994; 130:1515-1519.
4. Taylor CR, Anderson RR. Treatment of benign pigmented epidermal lesions by Q-switched ruby laser. *Int J Dermatol* 1993; 32:908-912.
5. Tse Y, Levine VJ, McClain SA. The removal of cutaneous pigmented lesions with the Q-switched neodymium:yttrium-aluminum-garnet laser. *J Dermatol Surg Oncol* 1994; 20:795-800.



Figure 5. PIH; Vbeam LPDL versus the QSRL.

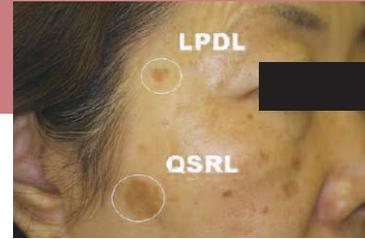


Figure 1. Pretreatment and one week post-treatment erythema was seen in the area treated with the QSRL, erythema was not seen in the area treated with the Vbeam LPDL.



Figure 2. Three months post-treatment, PIH was seen in the QSRL area only, not in the area treated with the Vbeam LPDL.



Figure 3. Clearance with the Vbeam Pigmented Lesion Handpiece after one treatment .

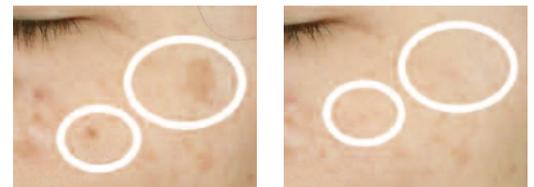


Figure 4. Clearance with the Vbeam Pigmented Lesion Handpiece after one treatment .

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

