Treatment of Compound Melanocytic Nevus Using a Long-pulsed 755-nm Alexandrite Laser

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We herein report a 16-year-old Korean male patient with darkly pigmented mammillated compound melanocytic nevus effectively treated by a 755-nm alexandrite laser with a pulse duration of 3 msec. Pigment-specific lasers are known to be effective in the treatment of acquired and congenital melanocytic nevi as they mainly target the chromophores of melanin pigments in nevus cells. In the present report, we proposed the use of an integrated dynamic cooling device that effectively protected the epidermis and facilitated safer delivery of high pulse energy of sufficient intensity to destroy large nests of compound nevus cells. Furthermore, a 755-nm alexandrite laser with a pulse duration of 3 msec shortened procedure times compared to conventional resurfacing lasers by eliminating the risk of post-therapy oozing or bleeding with selective photothermolysis, in addition to targeting a larger spot size.

Key words

Long-pulsed alexandrite laser; Compound melanocytic nevus; Asian skin

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INTRODUCTION

Common acquired melanocytic nevi (AMNs) and small to medium-sized congenital melanocytic nevi (CMNs) are commonly treated with resurfacing laser devices, such as 10,600-nm carbon dioxide and 2,940-nm erbium:yttrium-aluminum-garnet (YAG) lasers.¹⁻³ Lasers with selective photothermolysis are known to be effective against AMNs and CMNs by targeting the chromophores of melanin pigments in such lesions. Studies on pigment-specific lasers in treatment of AMNs and CMNs have suggested that junctional nevus can be effectively treated with Q-switched pigment lasers and that longer-pulsed pigment lasers are effective in treating CMN.¹⁻⁵

Wang et al.¹ demonstrated that satisfactory treatment outcomes were achieved via a single session of 755-nm alexandrite laser treatment with a pulse duration of 100 μ sec for small junctional nevus in Asian patients. Here, we report a case of darkly-pigmented and mammillated compound melanocytic nevus effectively treated by a 755-nm alexandrite laser with a pulse duration of 3 msec.

CASE REPORT

A 16-year-old Korean male patient presented with a black papule with thick hairs on the perioral area. The lesion had appeared as a child and had slowly enlarged and darkened over the past several years. He had no pertinent family history or medical history. Upon examination, a black mammillated papule with centrally located thick hairs was seen on the perioral area (Fig. 1A). Dermoscopic examination revealed no remarkable findings suggestive of malignant transformation. The pigmented lesion was clinically diagnosed as compound melanocytic nevus; the patient had never been treated for this skin condition before.

After obtaining informed consent, he was treated with four sessions of long-pulsed 755-nm alexandrite laser (GentleMax; Candela, Wayland, MA, USA) therapy at one-month intervals. Topical EMLA cream (eutectic mixture of 2.5% lidocaine HCl and 2.5% prilocaine; AstraZeneca AB, Södertälje, Sweden) was applied as a local anaesthetic one hour prior to laser therapy. The lesion was treated with the settings of a 3 msec-pulse width, 35 J/cm², a

Fig. 1. A black mammillated compound nevus with centrally located thick hairs (A) before and (B) one month after the first session, (C) one month after the second session, (D) one month after the third session, and (E) one month after the final session of long-pulsed 755-nm alexandrite laser treatment.

6 mm-spot size, and two passes, creating fine bubbles on the irradiated lesion. A dynamic cooling device with a setting of 0/0/30 (pre-irradiation cooling/delay/post-irradiation cooling) msec was applied to cool the epidermis. The compound nevus became crusted soon after the long-pulsed alexandrite laser treatment, and the crust spontaneously subsided within 5 to 7 days. The patient was advised to avoid rubbing, excessive washing, and sunlight overexposure to the treated area. He was also instructed to apply a broad-spectrum sunscreen thereto after the crusting peeled off.

Marked clinical improvement was observed from the second therapy session (Fig. 1B-D), and at one month after the final treatment, the compound nevus had remarkably been disappeared (Fig. 1E). No side effects of post-therapy blister formation, secondary bacterial or viral infection, post-therapy prolonged erythema, dyschromia, or scarring, were recorded.

DISCUSSION

Here, we report a case of darkly-pigmented mammillated compound melanocytic nevus effectively treated by four sessions of 755-nm alexandrite laser therapy with a pulse duration of 3 msec. We discerned that an integrated dynamic cooling device effectively protected the epidermis and facilitated safer delivery of high pulse energy great enough to destroy large nests of compound nevus cells. Additionally, selective photothermolysis, eliminating the risk of post-therapy oozing or bleeding, as well as the use of a larger spot size, seemed to conveniently shorten procedure times compared to conventional resurfacing lasers.

Pigment-specific long-pulsed lasers have been shown to be effective and safe in treating pigment lesions by irradiating with μ sec to msec-pulse-width laser energies.⁶⁻⁹ August et al.² reported that Q-switched pigment-specific lasers were unable to lighten mammillated CMN and offered no significant benefit over treatment with a carbon dioxide laser. However, large nests of nevi cells in CMN can be effectively destructed by high-energy fluencies of ruby laser with pulse durations of 1 to 300 msec.⁶ We suggested that the 755-nm alexandrite laser therapy with a pulse duration of 3 msec might have targeted not only melanin pigments, but also large nests of nevi cells in our case.

In Asians, long-pulsed 532-nm neodymium (Nd):YAG laser treatment with a pulse duration of 2 msec demonstrated equivalent clinical efficacies in treatment

of facial lentigines, as well as a significantly lower risk of side effects, to a Q-switched 532-nm Nd:YAG laser.⁷ A prospective split-face study also reported that a long-pulsed alexandrite laser with a 100 msec-pulse width lead to effective clinical outcomes for freckles and lentigines, similar to a Q-switched alexandrite laser with a 50 nsec-pulse width, but the long-pulsed alexandrite laser presented with remarkably fewer adverse events.¹⁰

In conclusion, we suggest that a long-pulsed 755-nm alexandrite laser may be of use in treating compound nevus as a new treatment modality in some patients. In this therapy, side effects associated with resurfacing lasers and pigment-specific lasers, especially post-therapy dyschromia and scarring in Asian skin, can be minimized. However, optimized, prospective studies should be conducted in the future to confirm our findings.

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