Treatment of Nevus of Ota With a Picosecond 755-nm Alexandrite Laser

Nevus of Ota, also known as nevus fusco-caeruleus ophthalmo-maxillaris, is a benign dermal melanocytic condition mostly seen as blue–gray patches on the faces of more darkly pigmented individuals, especially Asians, but it has been observed in all races.[1]

Lesions of nevus of Ota have historically been a difficult problem to treat, but lasers have shown positive results. Through selective photothermolysis, the advent of Q-switched (QS) lasers with pulse durations as short as 10 nanoseconds (ns) allowed precise targeting of the melanosomes with reduced collateral damage.[2,3] The 10-ns pulse duration of the QS lasers is much shorter than the 50- to 250-ns thermal relaxation times of the 500- to 1,000-nm diameter dermal melanosomes.[4] However, many patients plateau before their desired end point, and that end point requires a large number of treatments.[4]

Picosecond lasers were first shown to be effective in tattoo removal by Ross and colleagues[5] in the 1990s. A commercially available and FDA-approved 755-nm alexandrite (Cynosure, Westford, MA) version became available in 2012 for treatment of tattoos but has not been reported for use with Nevus of Ota.

Objective

Because both tattoos and nevus of Ota share a pigmented chromophore in the dermis, the authors hypothesized that a picosecond 755-nm alexandrite laser might show improvement in nevus of Ota lesions that had plateaued or were otherwise minimally responsive to QS laser treatment, just as it had with recalcitrant tattoos.

The authors now report results of the novel use of a picosecond 755-nm alexandrite laser in 3 patients with nevus of Ota lesions recalcitrant to QS laser or no longer responding to treatment.

Figure 1. Patient 1, nevus of Ota, right cheek and temple, after more than 10 treatments with QS lasers.

Materials and Methods

Over 12 months, 3 patients (2 female and 1 male; age, 24, 32, 34 years) were selected from a university's academic practice. All patients were of skin Type IV and had nevus of Ota lesions that had 4 to 10 or more previous QS laser treatments but did not respond or were no longer responding to such treatments. Previous QS lasers consisted of 694-nm ruby, 755-nm alexandrite, and 1,064-nm Nd:YAG. A 750-picosecond pulse duration 755-nm alexandrite laser (Cynosure) was used to treat all patients.

All patients had their previous histories obtained, and informed consent was obtained. Compounded 7%

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lidocaine, 7% tetracaine ointment was applied topically 1 hour before all treatments.

One 32-year-old female patient with a lesion on her right forehead, temple, malar cheek, buccal cheek, lower eyelid, and nasal sidewall (Figure 1) had a history of minimal response to more than 10 previous treatments with QS 755-nm alexandrite and QS 1,064-nm Nd:YAG, was spot tested at 1.59 to 2.08 J/cm^2 (4 and 3.5 mm spot sizes, respectively), and then treated initially with 2.08 J/cm^2 to the superior temple. Eight weeks later, the treatment was repeated with the same settings (Figure 2).

A second female patient, 34 years old, with a lesion near her medial canthus had previously responded to QS treatments with the 694-nm ruby, 755-nm alexandrite, and 1,064-nm Nd:YAG lasers but was experiencing a response plateau. She was treated with a 3-mm spot size (2.83 J/cm^2) on 3 occasions over a 6-month period, with modest improvement.

A 24-year-old male patient with a lesion on his right forehead and temple had responded to 4 previous treatments with QS 755-nm alexandrite and QS 1,064-nm Nd:YAG lasers but had plateaued in his response (Figure 3). His lesion was treated 2 times, 6 weeks apart, with the picosecond 755-nm alexandrite laser with a spot size of 3.5 mm (2.08 J/cm^2), with good clinical response (Figure 4).

Results

All patients experienced mild and transient localized edema and erythema in the treatment areas immediately after the procedure, which resolved over 2 days. No adverse events were reported after any treatments.

All lesions showed significant lightening and cosmetic improvement. All patients reported being pleased with their response. None of the patients have experienced redarkening in 2 to 7 months of follow-up.

Discussion

With the first clinical use described by Alster and Williams,[3] QS lasers revolutionized the treatment of

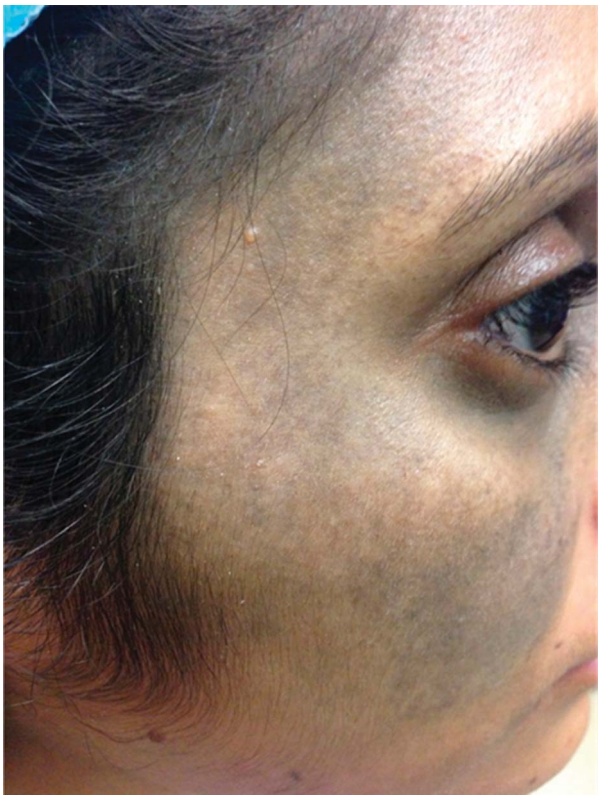

Figure 2. Patient 1, after 2 treatments of 2.08 J/cm^2, 3.5-mm spot size, with a picosecond 755-nm alexandrite laser.

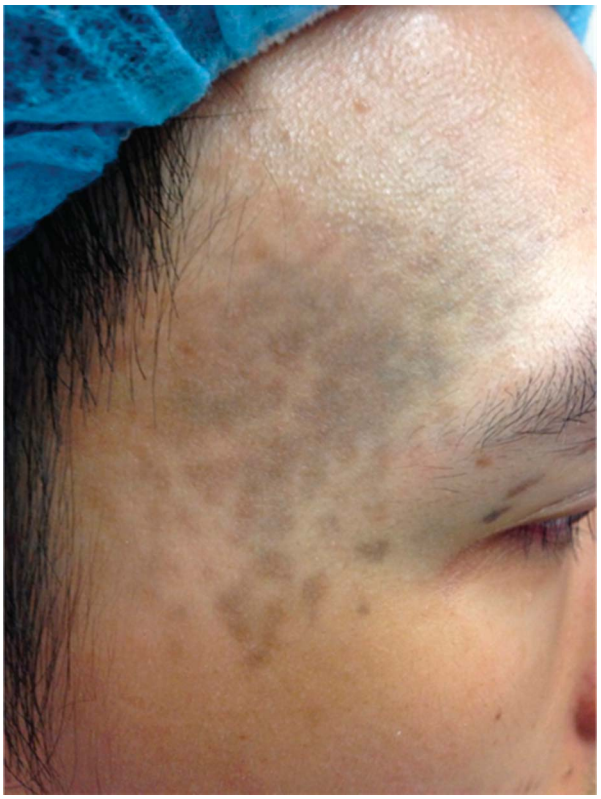

Figure 3. Patient 3, nevus of Ota, right forehead and temple, after 4 treatments with QS lasers.

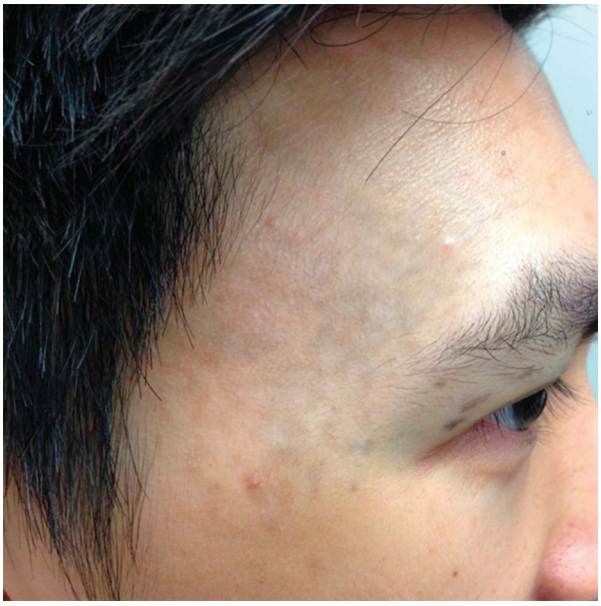

Figure 4. Patient 3, after 2 treatments of 2.08 J/cm^2, 3.5-mm spot size, with a picosecond 755-nm alexandrite laser.

nevus of Ota by offering a safe and relatively effective option for treatment. However, issues with nonresponders, responders who experience a premature response plateau, and redarkening of lesions left room and desire for improved treatment options.

In these patients, the authors found that lesions otherwise recalcitrant to QS laser treatment of various wavelengths or experiencing a treatment plateau responded well to a picosecond 755-nm alexandrite laser with no adverse events, universal improvement, and satisfaction with the treatment.

These results suggest that although the QS lasers have pulse durations that are less than the 50- to 250-ns thermal relaxation time of a dermal melanosome,[4] shortening the pulse duration even more can improve the treatment response.

Conclusion

Patients with nevus of Ota experience significant psychosocial impact with a few treatment options of limited efficacy and high treatment numbers. A picosecond 755-nm alexandrite laser showed significant improvement in recalcitrant lesions over 2 or fewer treatments and should be further explored as a primary treatment option for such patients.

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Chronic Inflammatory Reaction After Thread Lifting: Delayed Unusual Complication of Nonabsorbable Thread

The evolution of dermatologic and plastic surgery has involved a shift toward less invasive procedures. Consequently, numerous noninvasive face-lift techniques have been investigated over the past decade to improve the results of the procedure and to avoid incisional surgery. Thread lifting promises to correct facial aging with limited scarring, rapid recovery, and minimal complications compared with the