Treatment of Minocycline-Induced Cutaneous Pigmentation With the Picosecond Alexandrite (755-nm) Laser

Picosecond laser technology has been described for the treatment of blue and green pigments in tattoos,[1] but it has not been reported for medication-induced pigmentation to date. This article presents 3 patients with minocycline-induced facial pigmentation who were successfully treated within 1 or 2 sessions of the picosecond alexandrite (755-nm) laser (PicoSure).

Minocycline hydrochloride (minocycline)-induced pigmentation (MIP) is a rare but well-recognized adverse effect of the long-term use of doses above 100 mg daily, especially in those with advancing age.[2] Pigmentation may take months or years to resolve, but resolution may never be complete. Three types of MIP have been reported (Table 1).

TABLE 1. Types of Minocycline Pigmentation

Type	*Clinical Features*	*Histological Features*
1	Blue-gray pigmentation of normal skin. Seen in areas of before inflammation and scarring (often on the face) May resolve slowly over time	Stain for iron and melanin extracellularly and within dermal macrophages
2	Blue-black pigmentation of normal skin on the lower legs and forearms May resolve slowly over time	Nonspecific increase of melanin in basal keratinocytes and dermal melanophages
3	Diffuse muddy brown pigmentation of normal skin accentuated in photoexposed sites Persists indefinitely	Nonspecific increase of melanin in basal keratinocytes and dermal melanophages staining for melanin

The exact mechanism of laser-mediated pigment resolution is not completely understood. It is theorized that laser surgery may fragment the intracellular and extracellular pigment complexes trapped within the dermis, which are then cleared by macrophages.

Q-switched (QS) ruby, QS alexandrite, QS neodymium: yttrium aluminum garnet (QS Nd:YAG), and fractional photothermolysis have all been described in the treatment of MIP, with QS alexandrite being deemed superior to other laser devices.[3] However, several treatments scheduled many months apart are often required to achieve desired results.[3] Although picosecond laser technology has been used for tattoo removal, it has not been described for MIP.

This article presents a case series of 3 patients with MIP who were successfully treated with the picosecond laser (PicoSure). Pigmentation completely cleared or near completely cleared with a single

TABLE 2. First Session Laser Settings

	Patient A	*Patient B*	*Patient C*
QS Nd:YAG			
Fluence, J/cm^2	8	8	N/A
Spot size, mm	4	4	N/A
End point	PPP	PPP	N/A
Area treated	RS of the face	RS of the face	N/A
Picosecond Alexandrite			
Fluence, J/cm^2	3	2.8	2.8
Spot size, mm	3	3	3
End point	MW	MW	MW
Area treated	LS of the face	LS of the face	Whole face

LS, left side; MW, minimal whitening; N/A, not applicable; PPP, pinpoint purpura; RS, right side.

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TABLE 3. Second Session Laser Settings

	Patient A	*Patient B*	*Patient C*
Area treated	LS of the face	Whole face	N/A
Picosecond Alexandrite			
Fluence, J/cm^2	2.8	2.8	N/A
Spot size, mm	3	3	N/A
End point	MW	MW	MW

LS, left side; MW, minimal whitening; N/A, not applicable.

treatment of the picosecond laser in 2 patients and was significantly reduced in the third patient after just 2 treatment sessions.

Patient A was a 60-year-old white woman with a 5-year history of progressively worsening asymptomatic facial pigmentation. She had been on 100 mg minocycline daily for 25 years for rosacea. She demonstrated nonblanching, blue-gray macular pigmentation on her temples, periorbital area, right cheek, and upper lip. All fingernails revealed diffuse blue-green pigmentation.

Patient B was a 75-year-old white man with a 2-year history of asymptomatic facial pigmentation in the context of 11 years of minocycline (100 mg daily) administration for rosacea. Widespread homogenous blue-gray macular pigmentation on his forehead, temples, cheeks, and periorbital region was noted.

Patient C was a 59-year-old white man with pigmentation on the forehead. He had been on minocycline for 9 years. Fixed, slate gray macular pigmentation was noted on his forehead bilaterally.

All patients were referred by a primary care physician to the author's private dermatology rooms for management and were laser naive. Laser settings are displayed in Tables 2 and 3.

Patients A was treated with both picosecond and QS Nd:YAG laser technology on the same day. Areas of pigmentation on the left side of the face were treated with PicoSure, whereas affected areas on the right were treated with the QS Nd:YAG laser. At the follow-up 12 weeks later, complete clearance was demonstrated on the PicoSure-treated side while only partial clearance was noted on the QS Nd:YAG-treated side

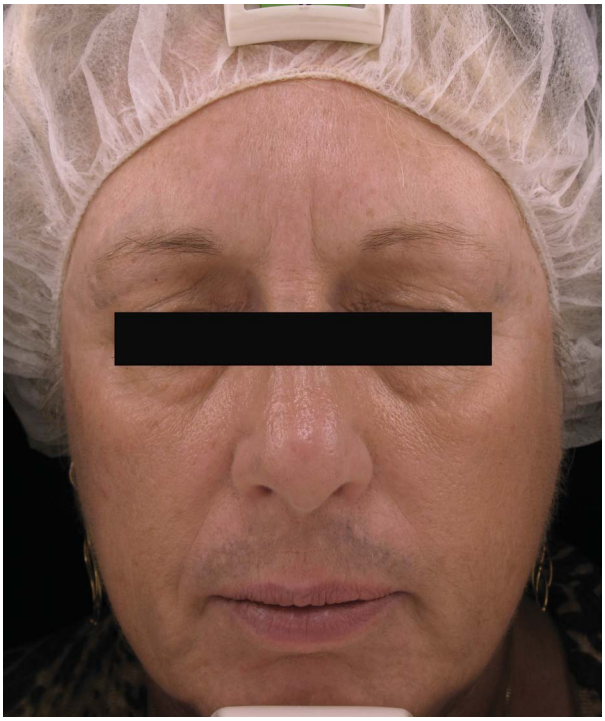

Figure 1. Patient A: at baseline.

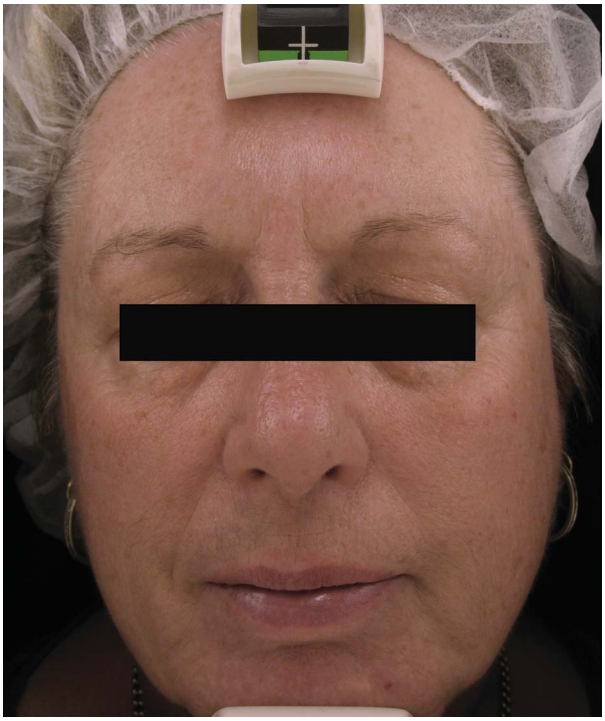

Figure 2. Patient A: 12 weeks after first treatment session.

(Figures 1 and 2). At this review, the picosecond laser was used to treat the residual pigmentation on the right side of her face. She was followed up 12 weeks later and complete clearance was noted.

Patient B was treated with picosecond and QS Nd:YAG laser technology at his initial visit. Areas of pigmentation on the left side of the face were treated with PicoSure, whereas affected areas on the right side were treated with the QS Nd:YAG laser. At the follow-up, 8 weeks later, partial clearance was noted on both sides of the face; however, the picosecond laser-treated side of the face demonstrated superior clearance. A second treatment with PicoSure on the whole face was undertaken at this visit. Eight weeks after the second treatment with picosecond laser, substantial lightening and clearing of pigmentation was noted on both sides of the face. Pigmentation continued to fade with the follow-up 6 months after the initial treatment, demonstrating significant lightening compared with baseline photographs. (Figures 3 and 4).

Patient C was treated only with the picosecond laser (PicoSure). The entire face was treated at the initial consultation. The patient was followed up after 12 weeks and near-complete resolution of pigmentation was noted.

Two patients (patient A and B) were photographed using the standardized photographic program (VISIA Complexion Analysis; Canfield Scientific Inc., NJ). Patient C was photographed using a Canon Powershot S3. No anesthesia was used before or during procedure. Cooling was used for both lasers. All patients tolerated the procedure well, describing little, if any, discomfort during the treatment. This treatment involved little downtime with mild erythema at the treatment site, noted for a maximum of 24 hours after the procedure. A 6-month follow-up has been documented for patients A and B.

The authors report a series of 3 patients who were successfully treated with the picosecond alexandrite (755-nm) laser for MIP. This cosmetically displeasing and often psychologically devastating condition was cleared in 2 patients with a single session of the picosecond alexandrite (755-nm) laser treatment with the third demonstrating significant lightening after just 2 treatments. This proved

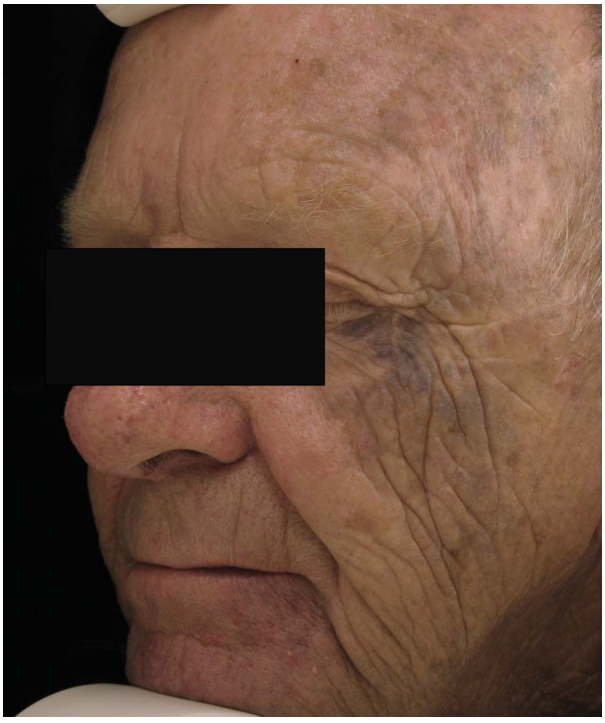

Figure 3. Patient B: at baseline.

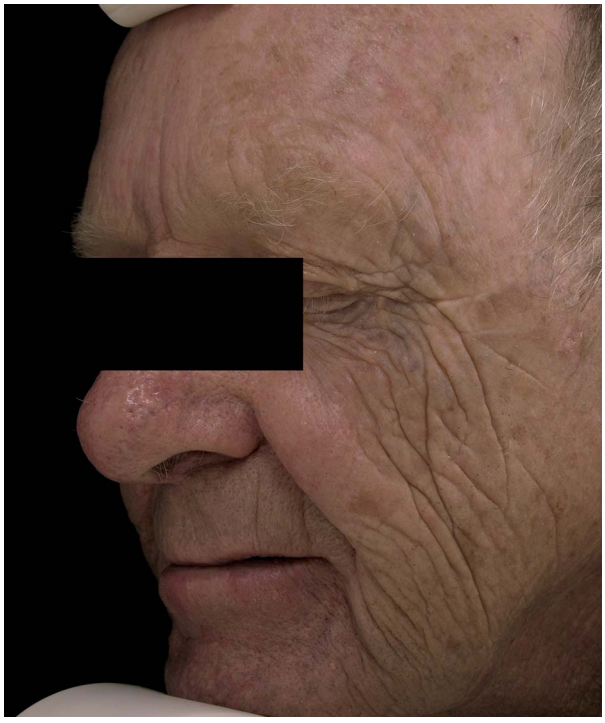

Figure 4. Patient B: 8 weeks after the second treatment session.

to be a well tolerated, safe, and efficacious treatment that delivered rapid clearance of MIP. Further studies are necessary to evaluate this promising treatment modality for this and other types of MIP.

References

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Retained Dermal Filler in the Upper Eyelid Masquerading as Periorbital Edema

Dermal fillers typically last in the skin from 6 months up to 1 to 2 years. Although edema in the tear trough region is a well-recognized adverse outcome related to dermal filler injections, prolonged periorbital edema has rarely been reported beyond 5 months from the time of injection.[1,2] The authors present the first case of an unusually extended course of hyaluronic acid (HA) filler–associated superior sulcus edema that lasted for 7 years in an otherwise highly active and mobile facial muscle area and was diagnostically dissolved with hyaluronidase. This article was created in compliance with the provisions of the Health Insurance Portability and Accountability Act (HIPAA).

A 42-year-old white woman presented to the oculoplastic surgery clinic as a cosmetic consultation for upper blepharoplasty. The patient reported a 1- to 2-year history of the left upper eyelid fullness and drooping that was not only obstructing her superior visual field but also causing her headache from the left brow hiking. On examination, the patient demonstrated left upper eyelid dermatochalasis with a trace amount of eyelid edema causing mechanical blepharoptosis (Figure 1). No palpable masses or pigmentation were appreciated. She endorsed no tenderness over the eyelid. Of note, the patient exhibited 1 to 2 mm of inferior left globe dystopia relative to the right globe. The remainder of her eye examination was within normal limits. She denied any recent facial trauma, illness, insect bites, or use of new skincare and/or cleansing products. Her medical history was unremarkable, and she had no known allergies.

To identify the cause of her unilateral eyelid dermatochalasis and edema, the authors generated a broad differential diagnosis, including entities such as Graves thyroid ophthalmopathy, orbital neoplasm, orofacial granulomatosis, Melkersson–Rosenthal syndrome, and blepharochalasis. When the authors discussed imaging and surgical biopsy as diagnostic adjuncts to the examination, the patient reluctantly admitted that she had had HA filler injected into her left superior sulcus approximately 7 years ago to correct asymmetric hollowing. Although deemed unusual for HA filler to remain in the upper eyelid for such a prolonged period, the authors planned to inject the edematous area with hyaluronidase and assess for any retained filler, before scheduling costly procedures, such as imaging or biopsy.

Within 30 minutes of the hyaluronidase injection, the patient demonstrated significant improvement in the