Successful Treatment of Chronic Venous Stasis Hyperpigmentation of the Lower Limbs With the Picosecond Alexandrite Laser

Stasis dermatitis is a potentially debilitating condition that primarily affects the lower limbs and is characterized by a range of clinical findings including scaly pruritic erythematous plaques, well-demarcated and irregularly shaped hyperpigmented patches, induration, and ulceration. Topical corticosteroids can be effective at controlling the acute dermatitis with the mainstay of therapy being normalization of venous hypertension using graduated compression stockings. However, the significant hyperpigmentation that remains can be disfiguring.

Figure 1. Chronic venous insufficiency with significant lower limb hyperpigmentation.

Previous studies have found that this pigmentation is composed mainly of hemosiderin with some melanin.[1] In this report, the authors demonstrate the safety and efficacy of a 755-nm picosecond alexandrite laser (Picosure, Cynosure) for the treatment of lower-limb hyperpigmentation secondary to chronic venous insufficiency.

A 74-year-old man presented with a long-standing history of chronic venous insufficiency of the lower limbs. Despite prolonged use of compression stocking therapy, the hyperpigmentation remained refractory to treatment and was gradually worsening. On examination, there was a large hyperpigmented plaque to the right anterior shin with evidence of admixed varicosities, mild pitting edema, and solar purpura (Figure 1). Duplex evaluation did not demonstrate reflux in the great saphenous vein nor perforator veins. After a thorough discussion of the pros and cons of treatment, 3 test spots using the 694 nm q-switched ruby laser, the 755-nm q-switched alexandrite laser, and the 755-nm picosecond alexandrite laser were performed (Table 1). Healing postlaser was characterized by erythema, edema, and superficial erosion for a period of 1 to 2 weeks. Examination 3 weeks later revealed that while all 3 lasers were effective at clearing the hyperpigmentation, the

TABLE 1. Laser Settings Used for Test Spots on Hyperpigmentation Secondary to Chronic Venous Insufficiency

Laser	*Spot Size, mm*	*Fluence, J/cm²*	*Total Pulses*
Q-switched ruby	4	6.0	75
Q-switched alexandrite	4	5.0	66
Picosecond alexandrite	3.3	2.34	71

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Figure 2. Test spots with the q-switched ruby, q-switched alexandrite, and picosecond alexandrite lasers. Note the superior healing profile of the picosecond alexandrite laser at 3 weeks post-treatment. Settings are noted in Table 1.

TABLE 2. Laser Settings Using the Picosecond Alexandrite Laser for Treatment of Hyperpigmentation Secondary to Chronic Venous Insufficiency

Treatment Session	*Spot Size, mm*	*Fluence, J/cm²*	*Total Pulses*
1	3.3	2.34	4,003
2	3.3	2.34	2,576
3	3.3	2.34	2,173

picosecond alexandrite laser demonstrated superior healing (Figure 2). Three full treatment sessions were then performed with the picosecond alexandrite laser at 1 to 2 months intervals using the settings shown in Table 2. One month after the third treatment session, the patient experienced greater than 90% clearance of hyperpigmentation and was satisfied with his improvement (Figure 3).

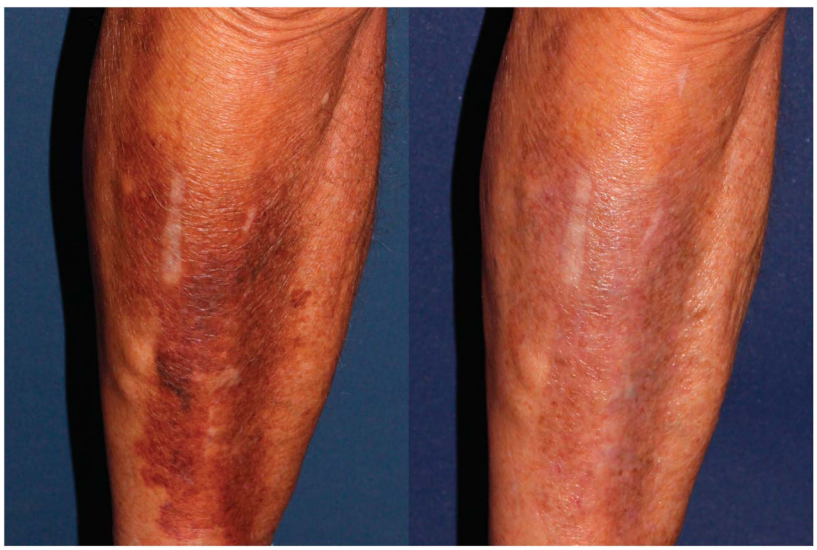

Figure 3. Before and after 3 treatment sessions using the picosecond alexandrite laser. Settings are noted in Table 2.

Although the 755-nm picosecond alexandrite laser was originally developed for tattoo removal, it has since demonstrated efficacy in treating a variety of benign pigmentary conditions.[2–4] The present case is the first report of successful treatment of hyperpigmentation secondary to chronic venous insufficiency with this laser modality.

There are 2 other unique features of the present case worth noting: 1. Treatment with this modality was successful on actively diseased skin and 2. Treatment with this modality was safe even on skin with a high propensity for ulceration. The authors hypothesize that the latter feature was due in part to the unique mechanism of action of picosecond lasers, namely that of photoacoustic laser induced optical breakdown which reduces the amount of nonspecific thermal damage and hence results in a safer treatment with less adverse events as compared with the previous generation of q-switched technologies.[5] This may also explain why complications such as postinflammatory hyperpigmentation were not observed.

In summary, picosecond laser technology is increasingly proving to be a versatile and safe treatment option for a wide range of pigmentary disorders.

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Douglas C. Wu, MD, PhD
Mitchel P. Goldman, MD
Cosmetic Laser Dermatology
San Diego, California

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