

White Paper

Evaluation of Safety, Efficacy and Tolerability of Elite MPX™ for the Treatment of Reticular Veins

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Introduction

The Nd:YAG and Alexandrite lasers have been substantiated in literature for their ability to target hemoglobin and aid in laser photocoagulation of vascular pathology. However, there have been limited studies to date on the use of both wavelengths fired in a sequential emission style. The unique ability of the Alexandrite laser, which confers a thermal-related metamorphosis of hemoglobin to met-hemoglobin allowing the second pulse of the Nd:YAG to be better absorbed, was evaluated in relation to its effect on reticular veins.

Reticular vessels have historically been targeted with sclerotherapy due to vessel diameter size¹, while the smaller spider vessels have been the optimal target for laser treatments. With the advent of longer pulsed lasers, such as the Nd:YAG laser and Alexandrite laser, a coagulative response has been shown in larger diameter reticular vessels.² The tradeoff for increasing coagulation is patient intolerance and necrotic skin lesions from the increased heat caused by high fluences.

To maximize vessel response and minimize adverse sequelae, MultiPlex™ was developed. The MultiPlex technology delivers two wavelengths in a sequential fashion which can synergistically improve clinical outcomes. The first laser to feature this technology was the Cynergy™ laser by Cynosure, Inc., in which the pulsed dye laser (595nm) converts hemoglobin to met-hemoglobin thereby improving the absorptive ability of the second wavelength delivered, the 1064nm Nd:YAG.^{3,4,5} The MultiPlex delivery allows lower fluences of the Nd:YAG to be utilized, resulting in a greater tolerance by the patient and enhanced clinical effect. Similar to the pulsed dye laser, the Alexandrite wavelength has been documented in literature for its vessel coagulative effects.⁶

Materials and Methods

Eighteen untanned patients (15 female, 3 male) between the ages of 35 and 62 years were involved in the study. Patient skin types ranged from I-IV, based on the Fitzpatrick Scale. Exclusion criteria included age younger than 18 years, pregnancy, scarring or infection in the treatment areas, suntan, use of iron supplements or an anticoagulant, history of a photosensitivity disorder, keloids/hypertrophic scarring or herpes simplex in the treatment area. No study participants had previously received sclerotherapy or laser treatments, and patients were not evaluated for underlying reflux via Doppler ultrasonography.

The laser used in this study was the Elite MPX which incorporates the Alexandrite and Nd:YAG lasers in one system. The laser wavelengths can be emitted individually or in sequential combination with single pulses using MultiPlex™ technology. To enhance patient comfort, air-cooling is integrated into the system. The Elite MPX design allows customized treatments to be developed for unwanted hair, pigmented and vascular lesions, veins, and aging/photodamaged skin in all skin types. The MultiPlex settings are versatile, allowing the clinician to titrate or fine tune the blend of wavelengths depending

on the sequence and energy settings of the two wavelengths.

After the risks, benefits and alternatives of laser treatments were discussed with the patients, informed consent was obtained. A total of 18 reticular veins measuring up to 3 mm in diameter received two treatments of 755nm and 1064nm dual-emitting, sequentially fired laser using the following parameters according to Fitzpatrick skin type. Treatment fluences varied from 30-35 J/cm² for the Alexandrite, followed by the Nd:YAG at fluences of 60-75 J/cm². (See Table 1)

No topical anesthesia was applied prior to treatment. The treatment area was cooled with the integrated air cooling in the laser. Reticular veins were treated initially with a single pulse. If the level of cyanosis was not obtained, certain areas were double pulsed; however, pulse stacking was avoided.

Standardized photographs were taken before treatment and at one and three months post treatment. Side effects included thrombus formation, erythema, matting, and crusting. Any pigmentary changes were evaluated at each visit and compared to baseline photos. Response to treatment was evaluated by photographic comparison to baseline. Patients also performed a self assessment of their results.

Results

Laser treatment of the reticular veins without the use of topical anesthetic cream was very well tolerated by all patients because the integrated cooling helped to diminish the heating sensation. In most cases, there was no observable clinical endpoint; however, some areas exhibited transient clearing from vasospasm and a cyanotic appearance from the vessel coagulation. An urticarial reaction was observed several minutes post treatment in the majority of patients.

Of the 18 patients treated, all achieved improvement of their reticular veins. Four weeks post the initial treatment, 50% clearance was noted in 15 out of 18 patients (See Figure 1). This further improved to 70% clearance in 17 out of 18 patients at one month following the second laser treatment (See Figure 2).

No hyperpigmentation, hypopigmentation, scarring or other adverse sequelae were observed visually by the treating physician or reported by the patient.

Patient tolerability of the treatment was high, with 56% of patients reporting discomfort levels of less than 4 out of 10 from the laser treatment. All patients would recommend this treatment to family and friends.

Table 1:

Skin Type	Vessel Size	Laser Parameters (J/cm ²)		Pulse Width (ms)	
		Alex	YAG	Alex	YAG
I-III	< 1mm blue in color	30-35	60-65	40	40
I-II	< 1mm red in color	35	65-75	10-20	10
IV	< 1mm red in color	35	65-75	30-40	10



Figure 1: One month after one treatment with Elite MPX; Alex/Nd-YAG: 30-60 J/cm²; 20-20 ms



Figure 2: One month after two treatments with Elite MPX; Alex/Nd-YAG: 30-50 J/cm²; 20-30 ms

Conclusion

The Elite MPX laser workstation not only provides efficacious treatment for laser hair removal and pigmentation but proves to be effective for vascular pathology such as reticular veins.

Utilizing the wavelengths singularly or in MultiPlex mode provides the clinician with a full arsenal for the treatment of aesthetic issues while minimizing adverse effects and improving patient tolerability.

“As a clinician, I highly recommend this laser system to any physician wanting to gain an edge on laser aesthetic treatments.”- Dr. A Ribe.

Adriana Ribe completed her Pathology residency in Spain and training as a research fellow in Dermatopathology at New York Presbyterian Hospital, Cornell University. With extensive experience in the field of cutaneous aesthetic laser science, Dr. Ribe is currently the medical director of Ribe Clinic in Barcelona, Spain.

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