

Cynergy with MultiPlex™ Treatment of Telangiectasia

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Background and Objectives

The recent advent of a combined laser system platform (Cynergy with MultiPlex™, Cynosure, Inc.), the pulse dye laser (PDL) and 1064 nm Nd:YAG wavelengths, has for the first time allowed both wavelengths to be sequentially emitted from the same handpiece, improving the treatment efficacy of vascular lesions.

Several studies have demonstrated that subtherapeutic PDL light doses can alter the absorption characteristics of blood, making it a better target for 1064 nm Nd:YAG.^{1,6-8} PDL conversion of blood to a combination of Methemoglobin (Met-Hb) and thrombus temporarily increases absorbance at 1064 nm by approximately 3-5x over that of normal blood.^{2,11}

This increased absorption allows for significantly reduced Nd:YAG fluence (2-3x less) required, while achieving greater clearance of facial vessels and leg veins. The combined therapy provides enhanced efficacy with reduced side effects when compared to individual wavelength treatments of PDL or Nd:YAG alone.



Figure 1: Example of single clearance with MultiPlex.

The MultiPlex feature within the Cynergy laser system allows the pulses to be delivered with adjustable time delay. The delay is adjustable to account for both blood flow rates and bulk skin heating due to the dual-pulse treatment. Facial telangiectasia have relatively high flow-rates, which require the use of short delays to “trap” PDL treated blood before it can flow out of the treatment area. Leg veins typically have lower flow rates, allowing the use of either short or medium delays.

This study focused on the treatment of facial and leg telangiectasia. The objective was to determine the single treatment efficacy of MultiPlex treatment of telangiectasia with sizes between 0.2 and 1.2 mm in diameter when using subpurpuric treatment parameters.

Methods and Materials

A total of 10 treatment locations on nine subjects with skin types I-III were given a single MultiPlex treatment for the application of facial and leg telangiectasia. Sequentially emitted PDL and Nd:YAG wavelengths were delivered by a Cynergy with MultiPlex laser device (Cynosure, Inc, Wesford, MA). Only patients with at least 60 days follow-up were evaluated for this study.

Vessels greater than 600µm were treated with a 7 mm spot size at an average fluence of 11 J/cm² at 40 msec with the PDL, followed by the Nd:YAG at an average of 50 J/cm² at 40 msec with a short delay.

Vessels less than 600 µm were treated with a 7 mm spot size at a average fluence of 7.6 J/cm² at 10 msec with the PDL, followed by the Nd:YAG at an average fluence of 47 J/cm² at 10 msec with a short delay.

All treatments used Cynosure’s SmartCool™ air cooling device to avoid collateral injury and for maximum patient comfort.

Treatment endpoint was either intravascular coagulation or vessel disappearance. If there was no vessel response, settings were adjusted, and vessels were retreated. When purpura was noted, settings were reduced prior to continuation of treatment.

Results

The average follow-up was 79 days post treatment. All treatments were performed without inducing significant purpura. Treatments were well tolerated, and no side effects were noted.

Overall, subjects exhibited an average of 85% single-treatment improvement following MultiPlex treatment. Patients with vessels larger than 600 μm achieved an average of 82.5% single treatment improvement. Patients with vessels less than 600 μm achieved an average of 86.7% single treatment improvement.

Discussion

MultiPlex treatment of these telangiectasia resulted in impressive single-treatment clearance, with no significant side-effects.

By comparison, clinical evaluation of single wavelength, Nd:YAG or PDL, treatments demonstrate that these methods require an increased number of treatments, or increased side effects to achieve similar outcomes.³ Respectively, scarring and purpura are problematic.

Typical outcomes for the Nd:YAG laser include "significant improvement" in between 71 and 80% of treated sites after two treatments of Nd:YAG alone, and greater improvement in blue vessels.^{10,4} Using a 595 nm pulse dye laser on small diameter (< or =400 μm), 78% clearance was achieved after three treatments with "sub-purpuric" parameters. Even with these settings, purpura was not uncommon.⁵

Combined PDL and Nd:YAG laser treatment with the MultiPlex feature provides substantially better outcomes when compared to single wavelength treatments. In comparison, PDL, Nd:YAG, and KTP single wavelength treatments typically require 2-3 treatments to achieve a combination of similar treatment efficacy, and low side-effect rate.^{4,5,9,10}

Conclusions

This study of the combined and sequentially emitted Nd:YAG and PDL wavelengths suggests that the synergistic approach to laser therapies for telangiectasia is the superior method of treatment for greatest efficacy and reduced side effects.

Before and After Images



Figure 2: Facial vein.



Figure 3: Facial vein.



Figure 4: Leg vein.



Figure 5: Nose vein.

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