
Millisecond 1064-nm Neodymium:YAG Laser Treatment of Facial Telangiectases

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BACKGROUND. Millisecond pulse duration 1064-nm Neodymium:YAG (Nd:YAG) lasers have been shown to be effective in the treatment of some lower leg telangiectases.

OBJECTIVE. To evaluate the efficacy and complication rate of a millisecond pulse duration 1064-nm Nd:YAG laser in the treatment of facial telangiectases.

METHODS. Fifteen subjects were evaluated.

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LASERS HAVE been used for many years in the treatment of all types of vascular lesions, including hemangiomas, port-wine stains, and a variety of telangiectases.¹ A variety of wavelengths have been used, including 1064-nm Neodymium:YAG (Nd:YAG), 800- to 810-nm diode, 585- to 595-nm pulse dye, 532-nm potassium titanyl phosphate, and 515- to 1,200-nm intense pulsed light.¹⁻³ The efficacy of the treatment is dependent on various factors, including target chromophore, vessel size, vessel depth, and vascular flow rate.² It is this great variety of factors that makes a single most effective treatment modality difficult to define.

Hemoglobin has strong absorption peaks at both 532 and 585 to 595 nm. There is also a significant, albeit lesser, absorption between 800 and 1100 nm. Therefore, it has been postulated that 1064-nm Nd:YAG lasers could be used in the treatment of telangiectases.⁴ In addition, because there is decreased melanin absorption at this wavelength, such a wavelength may also lead to a decrease in the risk of pigmentary side effects.⁵ Previous studies have shown that 1064-nm Nd:YAG lasers used at longer pulse widths can be used to treat telangiectases on the lower extremities.^{4,6} In this study, we investigated the efficacy of the 1064-nm long pulse Nd:YAG laser in the treatment of facial telangiectases.

RESULTS. Moderate to significant improvement was seen in 73% patients at day 30 and in 80% of patients at 3 months. These results were seen in the treatment of both blue/red and red facial telangiectases.

CONCLUSION. The millisecond pulse duration 1064-nm Nd:YAG laser is effective for treatment of facial telangiectases.

Methods

Fifteen subjects, Fitzpatrick skin types I-III, with facial telangiectases on the cheek and/or nose were evaluated in a prospective study. Exclusion criteria included pregnant or lactating women, any history of keloid formation or photosensitivity, any previous treatment with injectable gold, and the use of oral isotretinoin within the previous 12 months. All subjects' eyes were completely covered with opaque goggles before any treatment. All subjects were treated on one side of their face using a 1064-nm laser (CoolGlide Excell; Altus Medical, Burlingame, CA) with a 3-mm spot size, 120 to 170 J/cm², 5- to 40-ms pulse durations with contact cooling. Fluence and pulse width were varied to achieve a clinical endpoint of vessel blanching in each patient. Generally higher fluences and shorter pulse durations were required to blanch smaller and redder vessels. Treatments were undertaken after subjects signed a written informed consent form approved by the Institutional Review Committee of Pascack Valley Hospital (Westwood, NJ). All subjects were photographed on both the treatment side and the control side of their face before each laser treatment. All subjects received two treatments to the same side of the face, at day 0 and at day 30, and were evaluated for 3 months after the first treatment. Clinical improvement was assessed by a comparison of photographic images taken on day 0, on day 30, and at 3 months. Four categories of clinical improvement were used based on a decrease in vessel size or number as follows: none, mild improvement, moderate improvement, and significant improvement. Patients

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were also evaluated for side effects, including edema, erythema, purpura, and blister formation at day 0, day 30, and 3 months.

Results

Moderate to significant improvement was seen in 73% of the patients at day 30 and in 80% of the patients at

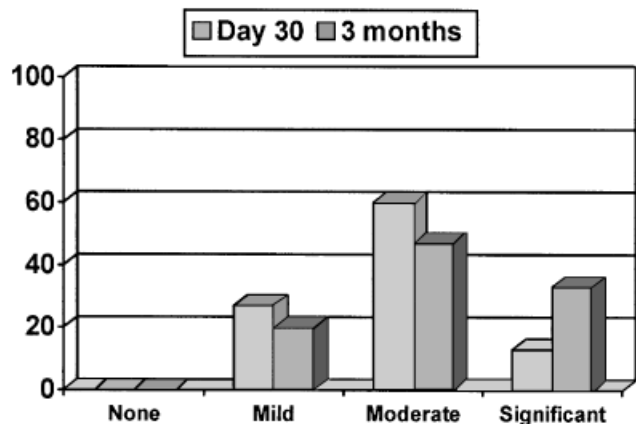


Figure 1. Clinical improvement at Day 30 and at 3 months.

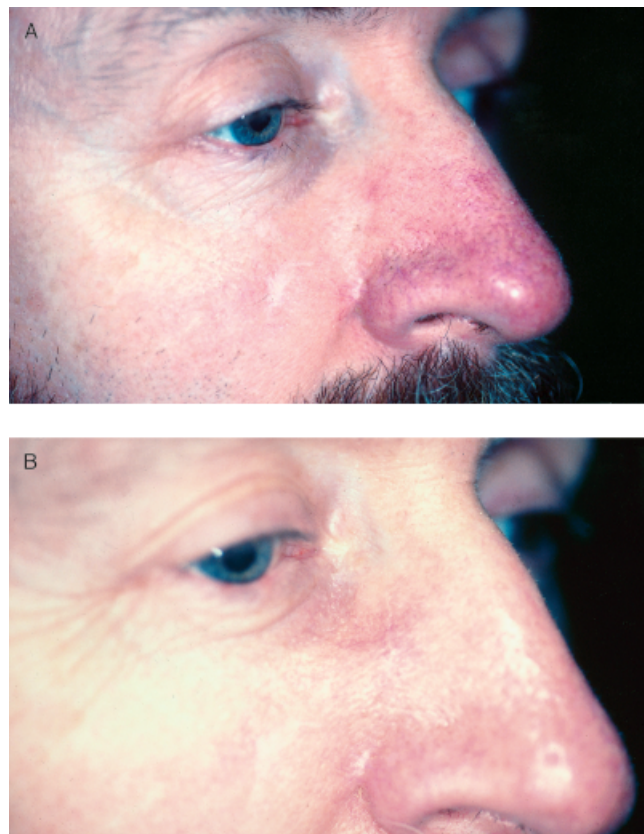


Figure 3. (A) Pretreatment. (B) Posttreatment at 3 months.

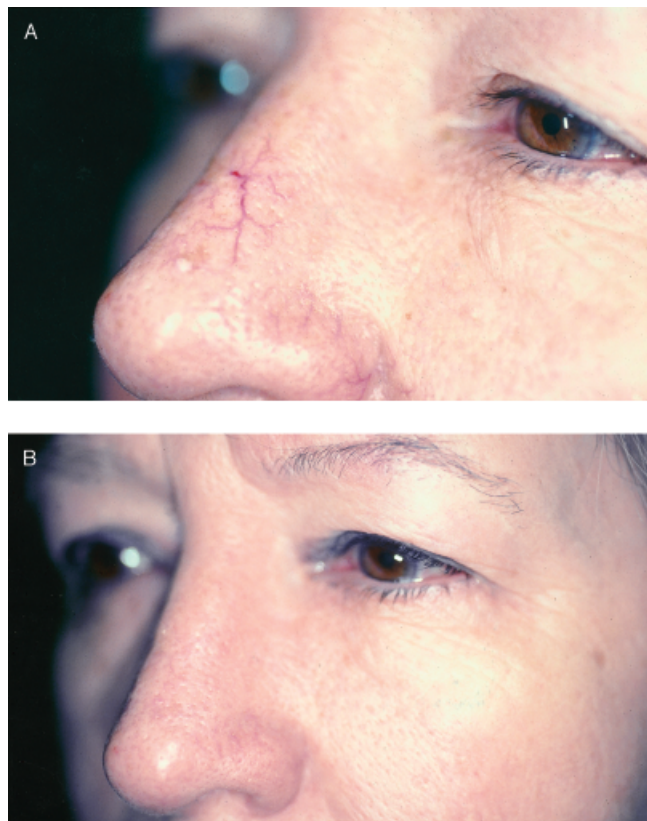


Figure 2. (A) Pretreatment. (B) Posttreatment at 3 months.

3 months (Figure 1). This improvement was seen in both larger red/blue facial telangiectases (Figure 2), as well as in smaller red facial telangiectases (Figure 3). Adverse events were minimal in this study. Two subjects had mild blistering at their treatment sites. These were treated with topical bacitracin ointment and were resolved in 2 to 3 days. There was no incidence of infection, scarring, residual erythema, or postinflammatory pigmentary change in any of the subjects.

Discussion

Recent studies by our group and others have demonstrated that millisecond pulse duration Nd:YAG lasers are effective in the treatment of lower extremity vessels.^{4,6} This study demonstrated that such lasers are also effective in the treatment of facial telangiectases. Moderate to significant clinical improvement was seen in both larger blue/red and smaller red facial vessels. Use of a millisecond Nd:YAG laser, such as the one used in this study, allowed for great variations in the chosen fluence and pulse duration. Such choices allow adjustment for individual variations in vessel size, depth, and color.

This ability for adjustment is a double-edged sword. Treatment of smaller, redder vessels generally requires the use of higher energy and shorter pulse widths. At these treatment parameters, the risk for blistering and scarring is theoretically increased. We were able to compensate for this risk with ample pretreatment and posttreatment cooling of each individual treatment site. Using the clinical endpoint of vascular blanching with adequate precooling and postcooling of each treatment site, we were able to obtain consistent clinical outcomes with minimal adverse effects. Clearly, however, the lower the delivered fluence and the longer the pulse duration used, the less likely one is to see scarring. Further studies are required to compare the vascular clearing efficacy of millisecond Nd:YAG lasers with that of other vascular-specific lasers.

References

1. Alster TS. Laser treatment of vascular lesions: recent trends. *Cosmetic Derm* 2000;47:51-3.
2. Dover JS, Sadick NS, Goldman MP. The role of lasers and light sources in the treatment of leg veins. *Dermatol Surg* 1999;25:328-36.
3. West TB, Alster TS. Comparison of the long-pulsed dye and KTP lasers in the treatment of facial telangiectasia. *Dermatol Surg* 1998;24:221-6.
4. Wiess RA, Weiss MA. Early clinical results with a multiple synchronized pulse 1064 nm laser for leg telangiectasias and reticular veins. *Dermatol Surg* 1999;25:399-402.
5. Sherwood KA, Murray S, Kurban AK, Tan OT. Effect of wavelength on cutaneous pigment using pulsed irradiation. *J Invest Dermatol* 1989;92:717-20.
6. Rogachefsky AS, Silapunt S, Goldberg DJ. 1064 nm Nd: YAG laser irradiation for lower extremity telangiectases and small reticular veins: efficacy as measured by vessel color and size. *Dermatol Surg* 2002;28:220-3.