Long Pulse 532-nm Laser Treatment of Facial Telangiectasia

ROBERT M. ADRIAN, MD, FACP
EMIL A. TANGHETTI, MD

BACKGROUND. *Facial telangiectasias are a frequently observed cosmetic concern. Current therapeutic modalities have certain side effects and limitations. We treated a group of patients with facial telangiectasias with a new variable pulse width frequency-doubled neodymium:YAG laser at 532 nm.*

OBJECTIVE. *This study evaluated the clinical response and side effects during the treatment of facial telangiectasias in 40 patients.*

METHODS. *Forty patients with facial telangiectasias were treated with the VersaPulse laser. Fluences of between 9.5 and 12.0 J/cm² at 3 or 4-mm spot size were used. A sapphire water-cooled chill tip was used to cool the cutaneous surface during treatment.*

RESULTS. *Ninety percent of patients experienced between 75% and 100% clearance of their facial telangiectasias after single treatment. No significant side effects or complications were noted.*

CONCLUSION. *The VersaPulse variable pulse width neodymium:YAG laser appears to be an effective treatment modality for facial telangiectasia.* © *1998 by the American Society for Dermatologic Surgery, Inc. Dermatol Surg 1998;24:71–74.*

The term telangiectasia encompasses a group of superficial cutaneous vascular blood vessels visible to the human eye.[1] They may represent a dilated vein, capillary, or arteriole. Telangiectasias of the face are commonly seen in fair skin (Fitzpatrick type I and II patients) and are associated with various constitutional and environmental factors.[2] Familial or genetic factors, certain cutaneous syndromes such as scleroderma and hereditary hemorrhagic telangiectasias, rosacea, chronic topical steroid use, and chronic sun exposure all appear to play a role in this condition.

Past treatments of facial telangiectasias have included electrocautery, and continuous and quasi-continuous lasers such as argon, copper vapor, argon dye, carbon dioxide, and krypton.[3–5] All of these lasers have been variably successful in the treatment of facial vessels. The flashlamp-pumped pulsed dye laser has proven very effective in the treatment of these benign vascular lesions.[6,7] Unfortunately, purpura secondary to the use of this laser has been a major drawback in its clinical use. Ideally, a laser designed for the treatment of cosmetic facial vascular lesions would be effective, easy to use, with little associated discomfort. Postoperative appearance is quite important, since patient would be spared the "down time" associated with purpura as seen with pulsed dye lasers (Figure 1).

Over the past 6 months, we have had the opportunity to evaluate a new long pulse frequency-doubled neodymium (Nd):YAG laser in the treatment of vascular lesions. Our experience in the treatment of facial telangiectasias is reported below.

From the Department of Pediatrics (RMA), Georgetown University Medical School, Washington, DC; and the Department of Dermatology (EAT), University of California, Davis, California.

Address correspondence and reprint requests to: Robert M. Adrian, MD, FACP, 3301 New Mexico Avenue, NW, Washington, DC 20016.

Materials and Methods

Forty patients with primarily linear and arborizing facial telangiectasias were treated using a new variable pulse width frequency-doubled Nd:YAG laser (VersaPulse; Coherent Medical, Palo Alto, CA). The energy output of this laser is at 532 nm (green) with selectable pulse widths of 2, 5, 7, and 10 msec. Spot sizes range from 2 to 10 mm. Laser energy is delivered to the skin via a novel sapphire-cooled "chill tip." This water-cooled device is capable of lowering the temperature of the contact probe to a temperature of 4°C (Figure 2). After obtaining informed consent and clinical photographs, patients were treated using fluences between 9.5 and 12.0 J/cm² with a 3- or 4-mm spot size and a 10-msec pulse duration. Chill tip temperature was maintained between 5°C and 5.5°C with direct contact with the cutaneous surface. Vessels were treated from a peripheral to central direction with the clinical endpoints of vessel disappearance or a persistent purple vascular discoloration indicating intravascular thrombosis. Vessels were treated with one through three passes to achieve these clinical endpoints. Postoperative care consisted of the application of cold compresses for the first few hours, followed by the use of topical antibiotics in those few patients who developed superficial crusting. The patients were re-evaluated by the treating physician and nurse 3–4 weeks postoperatively. Postoperative clinical photographs were obtained at that time. Response to treatment was graded as: poor, less than 25% clearance; fair, 25–50% clearance; good, 50–75% clearance; and excellent, 75–100% clearance.

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Figure 1. Facial telangiectasia 2 days posttreatment with left) VersaPulse laser and right) pulsed dye laser.

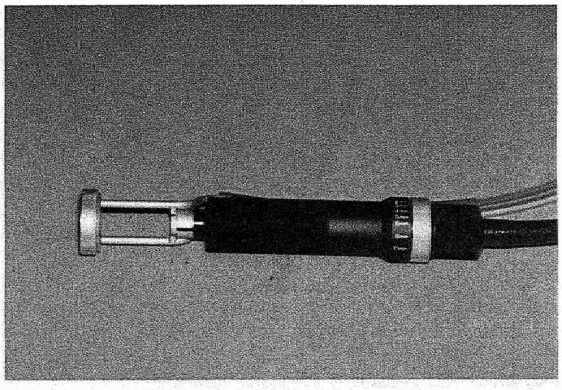
Results

All patients had excellent results with greater than 75% vessel clearance in one treatment of blood vessels that were 1.5 mm or less in diameter (Figures 2–4). There was no difference in efficacy between the larger and smaller vessels. Patients who were re-treated experienced further clearance of their vessels, with most patients achieving 90–100% clearance after a second treatment (Table 1). Postoperative changes consisted of swelling, erythema, and occasionally fine crusting. No instances of textural changes or scarring were noted in any of the treated sites (Table 2). Pain was mild and was most often described as a minor stinging sensation upon laser impact. No patients required any type of local or topical anesthesia.

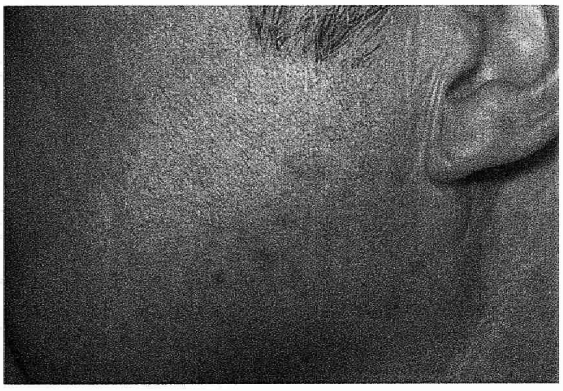
Discussion

Although multiple vascular lesion lasers are available for the treatment of facial telangiectasias, the pulsed dye laser remains the standard in safety and efficacy with which other lasers are compared. Unfortunately, purpura resulting from vessel rupture is a major draw-

Figure 2. VersaPulse laser handpiece connected to water-cooled "chill tip."



A



B

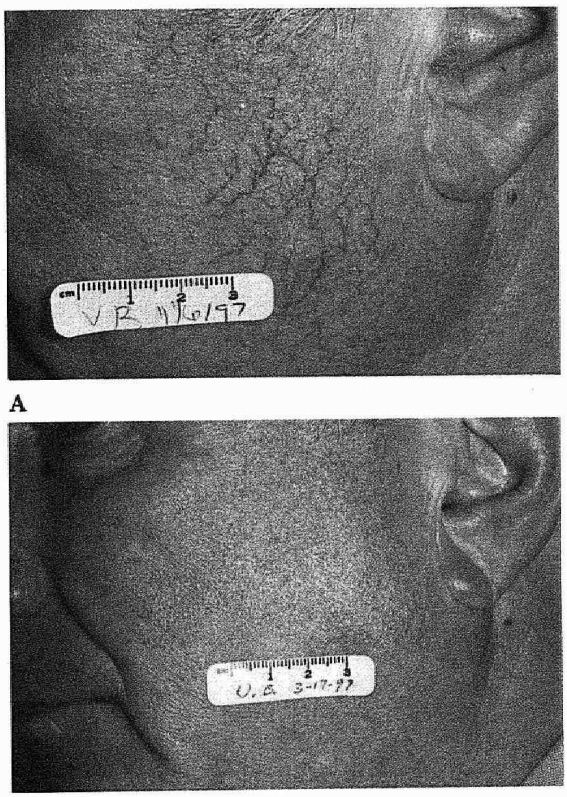
Figure 3. Facial telangiectasia A) before and B) 1 month after treatment at 9.5 J/cm² with a 4.0-mm spot size.

Table 1. Clearance Rates in Forty Patients

	Percentage	*First Treatment*	*Second Treatment*
Poor	0–25	0/40	0/40
Fair	25–50	0/40	0/40
Good	50–75	8/40	2/40
Excellent	75–100	36/40	39/40

Table 2. Adverse Effects Observed after Treatment with the VersaPulse Laser

Side Effect	*No.*	*Percent*
Erythema	40/40	100%
Swelling	40/40	100%
Hypopigmentation	0/40	0%
Hyperpigmentation	0/40	0%
Crusting	4/40	10%
Scarring	0/40	0%



A

B

Figure 4. Facial telangiectasia A) before and B) 6 weeks after treatment at 9.5 J/cm² with a 4.0-mm spot size.

back of this otherwise effective clinical modality. The use of larger spot sizes and lower fluences has reduced the intensity and length of postoperative purpura secondary to pulsed dye lasers. Unfortunately, this has reduced the degree of clinical efficacy (Adrian R, Tanghetti E, personal observations). The VersaPulse laser allowed rapid effective treatment of facial telangiectasias with minor discomfort and an acceptable postoperative appearance. The lack of purpura has resulted in less reluctance in our patient population to undergo this cosmetic procedure. Most patients chose to have the procedure done on the day of the initial consult and were able to immediately resume normal business and social activities. Histologic studies using of vessels treated using the VersaPulse laser show vessel wall damage and thrombosis with little or no epidermal changes and relatively minor thermal damage to the surrounding perivascular collagen tissue (Figure 5). The lack of vessel rupture seen histologically correlates with an absence of purpura as seen with the use of pulsed dye lasers.

The use of a long pulse with a cooling device in

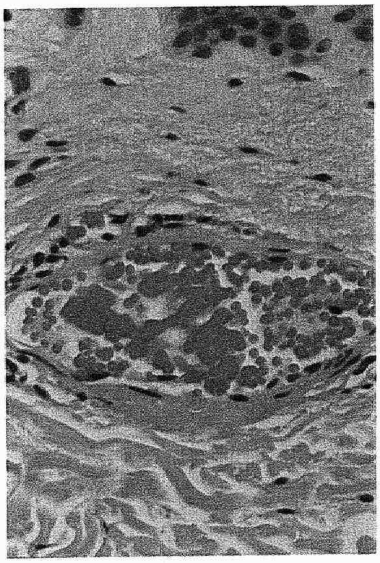


Figure 5. Facial blood vessel immediately after treatment using VersaPulse laser at 9.5 J/cm² showing vessel wall damage and early thrombus formation.

contact with the skin reflects an approach based on recent theoretical and clinical data concerning ideal laser parameters for the treatment of vascular lesions. In 1986 von Gemert et al[8] proposed that the ideal pulse duration for treating vascular lesions was between 2 and 10 msec. This work was further supported by studies done by Dierickx et al.[9] Cutaneous cooling has been shown by Gilchrest et al,[10] Adrian,[11] and Chess and Chess[12] to be of use in the delivery of energy to superficial vascular lesions since this appeared to offer some protection while enabling the delivery of higher fluences. The ability to deliver multiple pulses to treat vascular lesions may have theoretical support since Dierickx et al[13] were able to achieve multiple pulse photocoagulation of blood vessels using lower fluences. These studies suggest that the use of appropriate wave lengths and pulse durations may be capable of achieving superior clinical results without untoward side effects.

Summary

The VersaPulse variable pulse width laser has proved to be very effective in the treatment of facial telangiectasia. Rapid treatment with minor discomfort and acceptable postoperative cutaneous changes combined with a high degree of clinical efficacy would appear to make this a welcome addition for the treatment of facial cosmetic vascular lesions.

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