Venous Lake of the Lips Treated Using Photocoagulation with High-Intensity Diode Laser

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Abstract

Objective: To evaluate the effectiveness of photocoagulation with high-intensity diode laser in the treatment of venous lake (VL) lesions. **Background Data:** VL is a common vascular lesion characterized by elevated, usually dome-shaped papules, ranging in color from dark blue to dark purple, seen more frequently in elderly patients. They often occur as single lesions on the ears, face, lips, or neck. Once formed, lesions persist throughout life. Although these lesions are usually asymptomatic, they can bleed if injured. **Methods:** Seventeen patients (7 men and 10 women) with VL on the lip were treated using a noncontact diode laser (wavelength 808 nm, power output 2–3 W in continuous wave). **Results:** After only one irradiation exposure, all lesions were successfully treated. Healing was completed in approximately 2 to 3 weeks, and none of the patients experienced complications. Postoperative discomfort and scarring were not present or were minimal. **Conclusion:** Photocoagulation with high-intensity diode laser is an effective, bloodless procedure for the treatment of VL.

Introduction

VENOUS LAKE (VL) IS A COMMON VASCULAR LESION caused by dilatation of venules, usually appearing as soft, compressible, dark blue to violaceous papules, occurring more often in elderly patients and on the lips. The helix of the ears, face, and hands are other commonly affected areas.^{1,2} Histologically, a single layer of flattened endothelial cells and a thick wall of fibrous tissue line the lesion.³ Once formed, VL persists throughout life. Except for occasional associated hemorrhaging and cosmetic problems, the lesion's course is uncomplicated.²

Treatments include cryosurgery with liquid nitrogen,⁴ surgical excision,⁵ laser photocoagulation,⁶ laser vaporization,⁷ infrared coagulation,^{8,9} and sclerosing agents.¹⁰ In the mouth, mainly on the lip, there is an aesthetic challenge when surgery or sclerosing agents are used, particularly in large lesions and in hemangiomas.¹¹ Treatment with high-energy lasers is an option.¹² The 810- to 830-nm diode laser beam is poorly absorbed by water but selectively absorbed by hemoglobin. Because of its poor absorption by water, the high-intensity diode laser penetrates into the tissue down to a depth of 4 to 5 mm. As it passes through the tissue, the laser beam generates heat when absorbed by hemoglobin and thus coagulates tissue (down to a depth of approximately 7–10 mm) in a process characterized as photocoagulation. The

noncontact diode laser technique is delivered using a flexible optic fiber that makes it easy to handle.¹³

For these reasons, the use of high-intensity diode laser has grown over the past decades in the treatment for vascular lesions.^{13,14} Accordingly, the purpose of this study was to evaluate the effectiveness of diode laser in the treatment of VL lesions.

Material and Methods

Patients

A total of 17 patients (7 men and 10 women) aged 25 to 71 (mean age 55) were included in this study. All lesions were located on the lips (13 on the lower lip and 4 on the upper lip); the diagnosis was made on a clinical basis, sometimes with the aid of the vitropression technique. All patients had small lesions, with surface diameters of approximately 1×1 cm. After treatment, analgesic medication was prescribed to be used if necessary. The patients were carefully monitored until complete healing. Any complications were treated and registered. The Committee on Ethics of the Hospital of the University of São Paulo approved the study.

Laser procedure

A high-intensity, 2- to 3-W diode laser (Lasering 808, Milan, Italy) was used in a noncontact technique under local

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FIG. 1. (A) A patient with a venous lake on the vermilion border of the lower lip before photocoagulation with high-intensity diode laser. (B) Immediately after the photocoagulation. Photographs after (C) 7 days and (D) 3 weeks of follow-up, respectively.

FIG. 2. (A) Venous lake on the right lower lip in a 25-year-old woman. (B) Photograph taken immediately after photocoagulation. (C) Four days after the treatment; note the crust formed. (D) After 3 weeks of follow-up with complete clearance without perceptible scarring.

anesthesia. Irradiation was delivered using a flexible quartz fiber 300 μm in diameter, kept 2 to 3 mm away from the lesion, in continuous wave mode, for 10 s, with a mean fluency of 20 J/cm², proceeding with quick circular movements. The endpoint of treatment was blanching and visible shrinkage of the lesion. When necessary, another cycle was performed after a 30-s interval to prevent heat damage. All lesions were photographically documented at all stages of treatment and healing (Fig. 1A–D).

Results

Patients received only one irradiation exposure. Immediately after laser treatment, all patients developed slight swelling of the treated area that lasted 1 to 2 days. Postoperative pain was minimal in most patients, and just one patient felt it was necessary to use analgesic medications. None of the patients experienced bleeding. The tissue sloughing occurred within 2 to 3 days, and healing with reepithelization was complete 2 to 3 weeks after treatment with minimal or no scarring. None of the typical adverse effects (significant scars, hyper- or hypopigmentation, atrophy, or wrinkled texture) were observed after complete healing (Fig. 2A–D).

Discussion

Various therapeutic modalities are available for benign vascular diseases, depending on their type and location and the depth and progression of the lesions. Clinical uses of various modalities of laser treatment such as argon laser,⁶ neodymium-doped yttrium aluminum garnet (Nd:YAG) laser,^{1,15} carbon dioxide (CO₂) laser,⁷ and diode laser¹³ have been found to be safe and effective for the treatment of vascular lesions. The high-intensity diode laser is preferable for VL because it penetrates deeper than the argon laser. Additionally, the high-intensity diode laser does not generate pigmentary or textural changes in treated areas, which are commonly seen when using defocused continuous CO₂ laser. The use of cryosurgery, as an alternative treatment for VL, may result in aesthetic scarring, mainly in lesions located on the vermilion border of the lips.^{1,7,13}

In the present study, the diode laser photocoagulation technique was effective in the treatment of VL, requiring only one irradiation. In addition, the postoperative problems resulting from this noninvasive and bloodless technique was limited to minimal discomfort and scarring. This technique is also practical because diode lasers devices are portable and have a significantly lower cost than other high-power lasers, namely Nd:YAG, argon, and CO₂ lasers. Electrocautery, which also acts by means of coagulation, and is a low-cost surgical device, may cause scarring, particularly on the lip border.

Surgeons should be attentive when using high-intensity diode laser because it can generate excessive tissue coagulation, leading to severe thermal damage of the normal tissues around the lesion.

Conclusion

The portability and low cost of the diode laser photocoagulation technique, following its appropriate use, proved to be safe and effective for the treatment of VL, with a consistent outcome in the patients in the present study.

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Author Disclosure Statement

No competing financial interests exist.

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