



Diode Laser Photocoagulation of Vascular Lesion in a 2-Year-Old Child: Case Report

Diana Marques^{1*}, Ana Maria Aparecida Souza², Marines Freire Sammammed², Marcelo Spiandon³ and Luciane Hiramatsu Azevedo^{2,4}

¹Clinical Intern of Special Laboratory of Lasers in Dentistry, School of Dentistry, University of São Paulo, Brazil

²Professor of the "Lasers in Dentistry" Qualification Course - FUNDECTO, University of São Paulo (USP), Brazil

³Dental Clinician in ABC Foundation, São Paulo, Brazil

⁴Clinician of Special Laboratory of Laser in Dentistry (LELO), University of São Paulo (USP), Brazil

***Corresponding Author:** Diana Marques, Clinical Intern of Special Laboratory of Lasers in Dentistry, School of Dentistry, University of São Paulo, Brazil.

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Abstract

Vascular lesions are common and when located on the face they can be a source of great aesthetic concern. This case-presentation describes the efficacy of a diode-laser technique for the treatment of a protuberant vascular malformation in a 2-year-old child on her upper lip. A high-intensity diode laser was used in a non-contact technique under local anesthesia during 1 session. This technique has provided a very satisfactory cosmetic result. The high-intensity diode laser treatment was effective, bloodless and safe. Postoperative problems and discomfort were minimal, and so is scarring.

Keywords: Vascular Lesion; Vascular Malformation; Diode Laser; High Intensity Laser; Laser Dentistry

Introduction

Vascular lesions (VLs), including both haemangiomas and vascular malformations, are common pathological entities. These lesions can be found in the skin and in the mouth, and rarely cause symptoms. The onset of the haemangiomas occur at birth, they usually appear in early infancy, and then may slowly involute completely by the age 4 or 5 years [1]. Concerning vascular malformations are usually note at birth, grow in concert with body growth and do not tend to regress [1,2].

In 2014, the ISSVA change the classification of Mulliken and Glowacki [1,2] for other differentiating vascular tumors from vascular malformations based on their clinical appearance, radiological features, pathological features and biological behavior [4].

Largest VL may are liable to be eventually injured and cause some important bleeding. Then, surgery particular in large lesions is not indicated due to the risk of hemorrhage. Another method for

treatment is chemical or physical sclerosis. In the chemical sclerosis, sclerosing agents are injected inside promoting a decidual necrosis with posterior reparation induce a reduction of the lumen of the vessels and a decreasing of the local blood flow. Among the substances utilized are monoethanolamine oleate 5%, tetradecyl sodium sulfate and glucose hypertonic solution. Physical sclerosis utilizes agents, which cause freezing of the area, being the liquid nitrogen being the most often used [4,5].

In the mouth, mainly on the lip, there is an aesthetic challenge when surgery and/or sclerosing agents are used particularly in large lesions [8,9].

With the advent of high-energy lasers, this type of vascular tumor may be treated efficiently, due to the properties of this kind of irradiation. The benefit of this treatment is demonstrated by the fact that almost all procedures were accomplished on an outpatient basis, that minimal blood loss and no blood replacement occurred,

and that postoperative pain and edema were virtually nonexistent [9,20].

Nowadays, we have many systems of laser therapy for treat vascular lesions and hemangiomas such as carbon dioxide laser (CO_2), argon, diode, pulsed dye laser (PDL) and neodymium-doped yttrium aluminium garnet (Nd: YAG) [19].

This article highlights the efficiency of diode-laser as a touchless and noninvasive procedure for the treatment of a vascular malformation on the lip, yielding a substantial shrinking of the lesion together with a remarkable aesthetic improvement.

Case Description

Diagnosis and etiology

A 2-year-old white female was referred for evaluation and treatment of a prominent vascular lesion on her upper lip. The lesion was violaceous color, nearly involving the upper lip of left side (Figure 1). The vermilion border was the affected area. On palpation, the lesion was soft and resilient. According to the parents of patient, her lesion was present since the birth.



Figure 1: Before the Photocoagulation.

The diagnosis of this lesion was a vascular malformation because the color, localization and the shape have been coherent with this lesion.

Treatment progress

Before the laser surgery we give a written informed consent for her parents. The team and baby who participated in this procedure had protective glasses to prevent eye damage. Local topic

anesthesia was performed with benzocaine gel local application for one minute.

A high intensity 2W diode laser (Thera Lase Surgery, São Carlos, Brazil) was used in a non-contact technique under local anesthesia. Irradiation was delivered using a flexible quartz fiber 300 μm in diameter, kept 2 - 3 mm away from the lesion, in continuous wave mode, for 10s, with a mean fluency of 20 J/cm^2 , proceeding with quick circular movements in an area of 1 cm^2 approximately. It was necessary another cycle of 10s with the same parameters after a 30-s interval to prevent heat damage. The endpoint of the laser delivering was a sign of blanching on the lesion's surface (Figure 2).



Figure 2: Photograph taken immediately after intervention.

Treatment results

There was no bleeding and no postoperative complications. Immediately after the first laser session, patient developed slight swelling of the treated area that lasted for 3 days. It was necessary to use analgesic during two days after surgery.

After 4 weeks' follow-up (Figure 3) the wound healed without complications and no signs of infection. The area shows good healing and complete wound recovery by the end of these irradiations. The re-epithelialization was complete by the end of 4 weeks.

It shows that surgical laser can be used effectively in a noninvasive fashion to treat vascular lesion in pediatric patient.

Discussion

Various therapeutic modalities are available for benign vascular diseases, depending on their type and location and the depth and



Figure 3: After 4 weeks of follow-up with complete clearance without perceptible scarring.

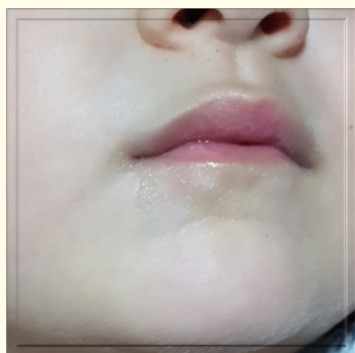


Figure 4: Follow-up (6 months after Photocoagulation).

progression of the lesions. Clinical uses of various modalities of laser treatment such as argon laser [19] Nd: YAG laser [13,14,18], CO₂ laser [15,19] and diode laser [10,16] 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 [20].

In this case report, the diode laser photocoagulation technique was effective in the treatment of VL. In addition, the postoperative problems resulting from this noninvasive and bloodless technique was limited to minimal discomfort. 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 high-intensity diode laser treatment is effective, bloodless and safe. Postoperative problems and discomfort are minimal, and so is scarring. Complications occur rarely. It must, however, be used with certain precautions, as the degree of tissue coagulation is not immediately obvious. When used appropriately, the diode laser is very useful tool for removal of vascular lesions.

Consent

The patient was treated after parental approval and in agreement with international guidelines.

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Declarations of Interest

None.

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