LightWalker Laser Treatment of Vascular Malformations in the Oral Area

Bogdan Crișan, DMD, MSc, PhD

Introduction:

Vascular malformations represent a frequent pathology found in adult patients with vascular anomalies during medical examinations in dental offices. A large proportion of these vascular malformations are localized in the oral area and aesthetically or functionally affect patients. For the treatment of these vascular malformations, the Nd:YAG laser (1064 nm) represents a minimally invasive alternative. A series of three clinical cases with oral vascular malformations are presented below. For diagnostic accuracy, color Doppler ultrasonography was used as a non-invasive investigation. Each patient received contact laser therapy for vascular malformation by means of a photothermal coagulation procedure using the laser parameters described in the table. The clinical results confirm that infrared laser light (1064 nm) is effective for the treatment of vascular malformations in the oral area.

Laser	LightWalker AT		
	Case 1	**Case 2**	**Case 3**
Wavelength	Nd:YAG (1064 nm)	Nd:YAG (1064 nm)	Nd:YAG (1064 nm)
Handpiece	R21-C3-002	R21-C3-002	R21-C3-002
Fiber tip	300 µm	300 µm	300 µm
Power	5–6 W	5–6 W	4–5 W
Mode/Pulse	SP	SP	SP
Frequency	100 Hz	100 Hz	100 Hz
Sessions	4 sessions (at 6-week interval)	3 sessions (at 6-week interval)	1 session

Dr. Bogdan Crișan graduated in 2002 from the Faculty of Dentistry at "Iuliu Haţieganu" University of Medicine and Pharmacy in Cluj-Napoca, Romania. A specialist in oral surgery since 2011, he obtained his master's degree in Oral Rehabilitation and Oral Health in 2007, and in 2011 received his certificate of complementary studies in "Therapeutic and surgical use of laser in dentistry". He received his PhD in Medical Sciences in 2013, with his thesis on the use of laser in oral surgery. His scientific activity includes participation in numerous national and international scientific congresses and more than 15 research projects. He has published more than 50 scientific papers as a first author and co-author in national and international journals.

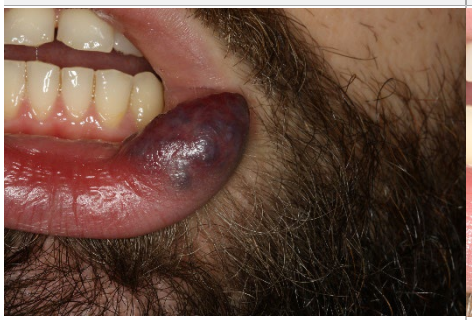
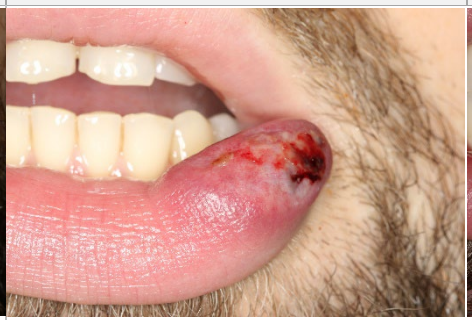
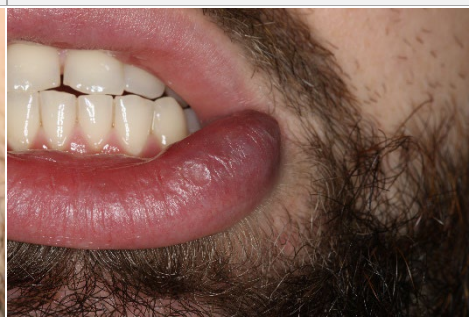
CLINICAL CASES:

Case 1

A 26-year-old male patient with a venous malformation on the left lower lip presented to our clinic for laser treatment on the recommendation of a maxillofacial surgeon. The presence of the vascular malformation affected the patient both aesthetically and functionally. The patient presented with Hashimoto's autoimmune thyroiditis and previously operated cutaneous lipomas.

Color Doppler ultrasonography highlighted vascular lakes located submucosally and above the muscle layer with dimensions of 17 × 15 × 7 mm. The laser procedure was performed under local anesthesia (articaine 4% + adrenaline 1:100,000) using a glass plate to compress the vascular malformation. Laser passes were made through the glass plate until the lesion blanched and white dots appeared. Cooling with ice cubes and application of emollient cream were performed.

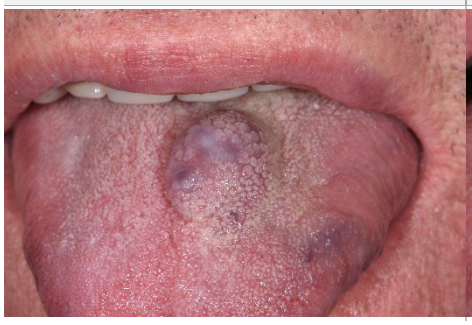
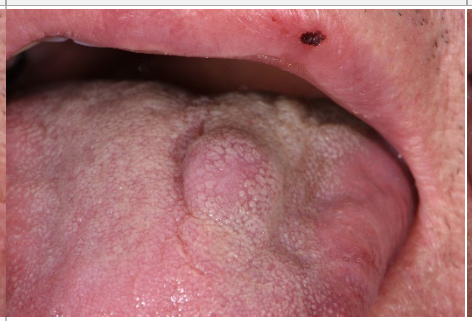
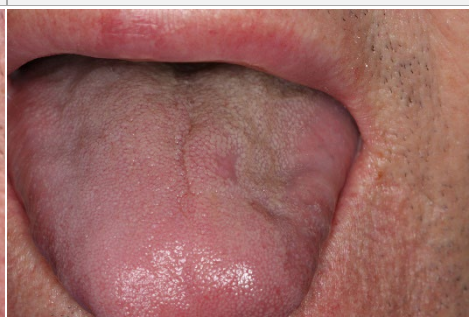
Post-procedure recommendations included ibuprofen (450 mg twice a day for 5 days), local ice application for 3–4 days, and Cicaderm repair cream. Four sessions at 6-week intervals were required to achieve good aesthetic and functional results.

Before	After one session	After last session
		

Case 2

A 63-year-old male patient presented with a tumor formation on the dorsal side of the tongue and the left lingual border. The patient had hypertension under treatment (160/100 mmHg). The lesion affected mastication and speech. Color Doppler ultrasonography revealed an arterio-venous malformation located submucosally with extension into the muscle, measuring 13 × 8 × 16 mm. Under local anesthesia (articaine 4% + adrenaline 1:200,000), a laser photothermocoagulation procedure was performed through a glass plate to improve penetration of laser radiation. Cooling with ice cubes was applied, and the patient was advised to eat cold, soft foods.

Postoperative treatment included ibuprofen (450 mg twice daily for 5 days). Three treatment sessions were needed to achieve satisfactory results.

Before	After one session	After last session
		

Case 3

A 62-year-old female patient presented for treatment of a vascular formation on the lower lip that affected her aesthetically. The patient also suffered from arthritis and osteoporosis. Ultrasound examination revealed a superficial venous lake measuring 10 × 5 × 8 mm. A single laser session was performed using the parameters described in the table. A glass plate, emollient cream, and cooling with ice cubes were used to minimize bleeding risk.

After the procedure, the patient was advised to use ibuprofen (450 mg twice daily for 5 days), Cicaderm repair cream, and photoprotection. A very good result was achieved after only one session due to the superficial location of the lesion.

Before	Immediately After LASER session	After one session