Oral Soft-Tissue Management with a LightWalker Laser

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Introduction:

The pathology present at the level of oral soft tissues is encountered frequently in dental offices. Patients with soft-tissue lesions usually present themselves to the dentist. In these situations, the dentist must decide whether to treat such pathologies or send the patient to another specialist. Currently, the dentist has at his disposal a series of tools or procedures to treat diseases of the oral soft tissues.
The laser is a minimally invasive and extremely useful tool in the treatment of soft-tissue pathologies in the oral cavity. A series of clinical cases with oral soft-tissue pathologies are presented below. The LightWalker laser was used for the treatment of these oral soft-tissue lesions using the laser parameters described in the table. The clinical results show that Nd:YAG (1064 nm) and Er:YAG (2940 nm) lasers have proven to be effective in the management of oral soft tissues.

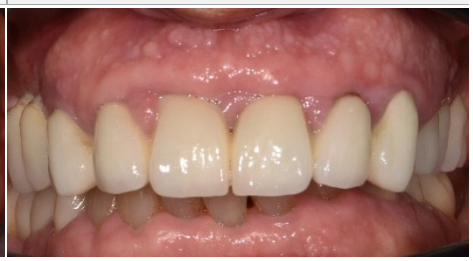
Laser	LightWalker AT		
	Case 1 **Removal of hypertrophic gingiva and coagulation**	**Case 2** **Removal of lower lip tumor and hemostasis**	**Case 3** **Vaporization of a leukoplakia lesion and hemostasis**
Wavelength	2940 nm	2940 nm	2940 nm
Handpiece	HC14-N	HC14-N	HC02-N
Fiber tip	Cylindrical 8/1.3	Chiseled 12/1.5	Non-contact
Energy	120–150 mJ	150 mJ	120 mJ
Power	1.2–2.25 W	2.25 W	1.2 W
Mode	VLP/LP	LP	SP
Frequency	10–15 Hz	15 Hz	10 Hz
Water	1	0	0
Air	2	2	2
Wavelength	1064 nm	1064 nm	1064 nm
Handpiece	R21-C3	R21-C3	R21-C3
Fiber tip	300 µm	300 µm	300 µm
Power	3.5-4 W	3.5 W	3.5 W
Mode	SP	VLP	VLP
Frequency	50 Hz	40 Hz	40 Hz

Dr. Bogdan Crișan graduated from the Faculty of Dentistry at "Iuliu Haţieganu" University of Medicine and Pharmacy in Cluj-Napoca, Romania in 2002. He obtained a master's degree in Oral Rehabilitation and Oral Health in 2007, and in 2011 received a certificate of complementary studies in "Therapeutic and surgical use of laser in dentistry". He obtained a PhD in Medical Sciences in 2013, with his PhD thesis on the use of laser in oral surgery. He has published as first author and co-author more than 52 scientific papers in national and international journals.

CLINICAL CASES:

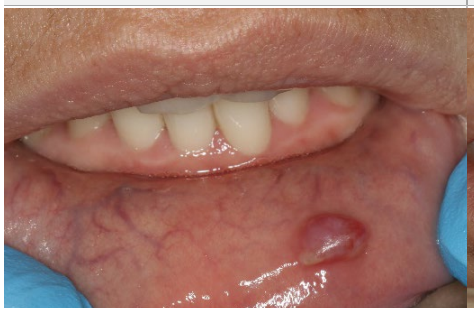
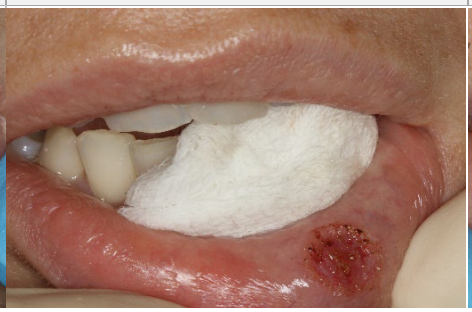
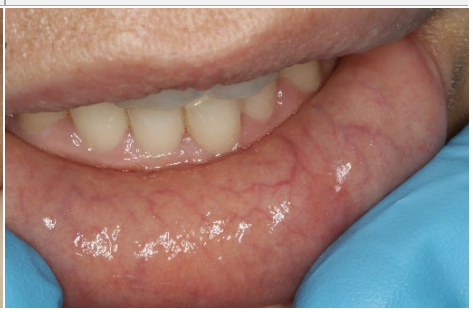
Case 1

A 67-year-old female patient with the presence of hypertrophic gingiva and papillae at the level of the anterior upper teeth requested the help of our clinic. The patient complained about bleeding during mastication and the aesthetic aspect when she smiled. The patient presented with comorbidities of hypertension and hypothyroidism. Initially, a classic excision with a scalpel of the hypertrophic gingiva and the interdental papillae was performed. The excised tissue was histopathologically examined, revealing the presence of hyperplastic gingival tissue with numerous inflammatory infiltrates. Three months after the classic intervention, a recurrence and increase in size of the interdental papillae and the marginal gingiva were observed. In this case, we suspected a gingival enlargement induced by drugs. Under local anesthesia (articaine 4% + adrenaline 1:200000), a laser-assisted removal of the hypertrophic gingival tissue and coagulation was performed. Er:YAG laser removal of the hypertrophic gingiva was carried out with the parameters described in the table, starting with 1.2 W for reducing the level of gingiva and continuing with 2.25 W for removal of fibrous interdental papillae. Following this laser intervention, hemostasis and coagulation using the Nd:YAG laser was performed. After the procedure, the patient was advised to avoid traumatizing the operated area, to eat soft and cold foods, and an anti-inflammatory treatment with ibuprofen (400 mg twice a day for 5 days) was prescribed. We also recommended maintaining good oral hygiene by using a soft toothbrush and rinsing with mouthwash based on chlorhexidine 3–4 times a day. We also requested the replacement of her antihypertensive medication based on calcium channel blockers to reduce the risk of relapse.

Before	After laser removal	After 1 month
		

Case 2

A 34-year-old female patient referred to the clinic with a left lower lip tumor formation produced by chewing the lip. The patient was bothered by the presence of the lip tumor, which affected her mastication and speech. The patient did not present any other associated pathologies. The patient requested a classic surgical excision of the tumor formation and histopathological examination. The result of the microscopic examination revealed the presence of a mucocele. Two months after the classic surgical intervention, the patient presented again with a relapse of the tumor formation. This time it was decided to remove the tumor formation with the laser to reduce the risk of the formation of a fibrous scar at the level of the excision area. Under local anesthesia (articaine 4% + adrenaline 1:100000), a laser-assisted removal of the relapsed lower lip tumor and hemostasis was performed. The Er:YAG laser was used to remove the tumor formation as a minimally invasive procedure with the parameters described in the table, and the Nd:YAG laser was used to obtain good hemostasis. After the intervention, the patient was prescribed an anti-inflammatory treatment with ibuprofen (400 mg twice a day for 5 days) and advised to avoid traumatizing the operated area by chewing the lip, to eat soft and cold foods and to maintain good oral hygiene. Two weeks after the laser removal of the tumor, a proper healing of the area was obtained through secondary epithelialization.

Before	After laser removal	After 2 weeks
		

Case 3

A 26-year-old male patient with a white lesion on the right lingual border presented to our clinic for laser treatment on the recommendation of a maxillofacial surgeon. The lesion on the right lingual margin was previously biopsied and the microscopic examination revealed hyperkeratosis but no dysplastic areas — a leukoplakia-like lesion. Under local anesthesia (articaine 4% + adrenaline 1:100000), a laser-assisted vaporization of the leukoplakia lesion and hemostasis was performed. Er:YAG laser was used to remove the hyperkeratotic layer until the subepithelial level, and the bleeding points were coagulated with the Nd:YAG laser. After the intervention, the patient was advised to avoid traumatizing the operated area, to eat soft and cold foods over the next few days and to maintain good oral hygiene. At the 1-month follow-up, the appropriate epithelialization of the vaporized area could be observed and there were no signs of local recurrence.

Before	After laser vaporization	After 1 month