Treatment of Gingival Melanin Pigmentation by CO2 and Nd:YAG laser ablation

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Abstract
Melanin is an endogenous granular pigment that can present colors ranging from yellow to black and is produced by melanocytes present in the basal layer of the oral epithelium. Changes or disorders related to melanin and other pigments can be initiated by trauma, infection, habits (smoking, food), use of medications (antimalarials, minocyclines) and by some systemic factors such as Addison's disease, Peutz-Jeghers syndrome and tumors. Physiological gingival melanin pigmentation (GMP), also called racial melanosis, is a non-pathological condition with variable prevalence in different ethnic groups.
There are only a few reports in the literature [1] comparing the effects of lasers on GMP. This study was performed to compare and evaluate the effects of the Nd:YAG laser, CO2 laser at superpulse mode, and conventional surgery with Kirland scalpel applied for gingival depigmentation.
Recently, several surgical techniques for gingival depigmentation have been proposed with the aim of removing physiological pigmented lesions from the gingival tissue. However, the decision and indication for its removal must be based mainly on a correct diagnosis of physiological pigmentation, determining differential diagnoses with other changes that can also manifest pigmented lesions in the oral cavity. After confirming the diagnosis of racial melanosis, the objective of this work was to present a clinical case in which we used different ablative forms of treatment using CO2 and Nd YAG lasers in the same patient. The removal of pigmented lesions in the oral mucosa was divided as follows: Upper right quadrant: CO 2 laser, upper left quadrant: Kirkland scalpel (conventional technique), lower region of the oral epithelium: Nd YAG. This division aimed to compare the results of the conventional surgical technique with ablative techniques.
Ablation of the hyperpigmented gingiva with CO2 and ND:YAG laser was accomplished with minimal carbonization and almost no bleeding. Postoperative healing was uneventful, with no significant postoperative pain. Partial repigmentation was observed only in non-ablated areas, so additional treatment was performed in these regions regardless of the laser used.
In conclusion, we have that the application of the superpulse mode of the CO2 laser or the Nd:YAG laser appears to be an effective and safe method for eliminating (GMP,) as it causes less bleeding, consequently less edema and less postoperative pain when compared to the conventional surgical method

Keyword: Laser ablation, gingival melanin pigmentation, Nd:YAG laser, CO2 laser , Laser Applications in Life Sciences

References: [1]. Assessment of clinical outcomes and patient response to gingival depigmentation using a scalpel, ceramic bur, and diode laser 980 nm Faten Fawzy Mikhail, Hala El Menoufy, Naglaa Shawki El Kilani. Clin Oral Investig. 2023; 27(11): 6939–6950. 2023 Oct 25.