

Case Report

Gingival Depigmentation by Using Diode Laser - A Case Report

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Abstract

The concepts, methods, and management of the issues related to gingival melanin pigmentation still need to be well defined. Melanin pigmentation is frequently caused by an aberrant deposition of melanin in the gingiva, making the gums seem black. This case report describes a simple and effective depigmentation technique using a diode laser which has produced good results with patient satisfaction. The Dummet oral pigmentation index (DOPI) was used to assess gingival hyperpigmentation intensity.

This case report describes a simple and effective depigmentation technique using semiconductor diode laser surgery – for gingival depigmentation, which has produced good results and patient satisfaction.

The diode laser is a reasonably safe, minimally invasive, and secure method for removing gingival hyperpigmentation.

INTRODUCTION

The gingival/oral mucosa can become discoloured due to oral pigmentation, which has both exogenous and endogenous causes. The pigmentation affects females more than males and is primarily centred in the anterior labial gingiva. Drugs, heavy metals, genetics, endocrine disorders, syndromes including Albright's syndrome and Peutz-Jegher's syndrome, and inflammation are a few of the diverse etiological variables. Negative behaviours like smoking can also accelerate the production of melanin, and the quantity and duration of smoking affect the degree and amount of pigmentation.¹The degree of pigmentation is influenced by various variables, including epithelial thickness, keratinization quantity, number and size of blood vessels, oxygenation of the blood, and the amount of pigmented tissue (melanin, melanoids, Oxyhemoglobin, reduced haemoglobin and carotene).²

A periodontal plastic procedure called gingival depigmentation removes gingival hyperpigmentation using a variety of approaches and techniques. The technique chosen should be based primarily on clinical expertise and the patient's desire for enhanced aesthetics. Several depigmentation methods have been described in the literature. They may be divided into chemicals like alcohols, phenols, and ascorbic acid, Conventional surgical

procedures, gingival abrasion, laser, and cryosurgery.³

Lasers have the advantage of better haemostasis and patient compliance and are used for depigmentation procedures. In this case report, a patient with gingival hyperpigmentation was treated with a soft tissue diode laser.

CLINICAL CASE

A 23-year-old male patient came to the outpatient Department of Periodontology and Oral Implantology, J.N. Kapoor D.A.V (C) Dental College, Yamunanagar, with a chief complaint of "black gums". Despite being healthy, the patient had a pigmented gingiva in the maxillary anterior region with a DOPI score of 2, i.e., Moderate clinical pigmentation (medium brown or mixed pink and brown) (Fig.1). Detailed medical history revealed no relevant history of systemic illness, drug usage and smoking. The patient was briefed about the operation, and consent was obtained. A diode laser was used to de-epithelize the unpleasant gingival pigmentation from the right maxillary first premolar to the left maxillary first premolar.

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Local infiltration was done with an anaesthetic solution containing 2% lignocaine with 1:80,000 adrenaline. The patient was treated with a Zolar diode laser photon-810nm (zolar technology and mfg. Canada). Properly initiated tip of the diode LASER unit was used with short back-and-forth brush-like strokes from the mucogingival junction toward the free gingival margin, including papillae, and gradually progressed deeper along the same initial LASER incision. For the de-epithelialization method, a 400 µm strippable fibre was utilised at a power setting of 1.5 watts initially in pulsed wave mode (PW) set at 0.20 ms of pulse length and 0.10 ms of pulse interval. To achieve quick ablation for pigments present deep under the basement membrane and to reduce the bleeding from the connective tissue, the power setting was increased to 2 W after removing the covering epithelial tissue. Every three to five minutes, tissue tags were cleaned after the

laser ablation with sterile gauze soaked in saline to ensure total depigmentation. (Figure 2) A periodontal dressing was applied to the surgical site. (Figure 3)

The patient was given proper postoperative instructions and a prescribed analgesics and antibiotics for pain and infection control. He was also advised to abstain from smoking and consuming hot or spicy food for the first 24 hours. After one month, healing was complete. The pink colour was equivalent to the nearby untreated region, improving the overall aesthetic appearance. The DOPI score demonstrated no instances of repigmentation after one month postoperatively. (Figure 4) The patient was delighted with the treatment outcomes and improved aesthetics with no infections or postoperative complications, such as discomfort or bleeding.



Figure 1- Pre-Operative



Figure 2- Immediately after the procedure



Figure 3 - Periodontal dressing



Figure 4 - 1-month postoperative

DISCUSSION

Gingival hyperpigmentation is benign and poses no health risks. However, complaints of "black gums" are prevalent, especially in individuals with a prominent smile line, excessive gingival display, and a "gummy smile" when speaking and smiling.³

Melanin pigmentation is typically brought on by active melanocytes, primarily found in the basal layer of the oral epithelium and deposit melanin. However, as Dummet⁴ stated, physician expertise, patient cost, and personal preferences may all play a role in physiologic pigmentation. For gingival melanin pigmentation, there is a rising desire for aesthetic rehabilitation. Even though many methods are currently employed, a single laser treatment is typically sufficient to remove the pigmented areas.⁵

The diode laser is a superb soft tissue surgical laser suited for soft tissue curettage or sulcular debridement and for cutting and coagulating gingiva and oral mucosa. The application resembles electrocauterization quite a bit. The heat generation rate in a diode laser is more extensive, but tissue penetration is less than with an Nd: YAG laser. The semiconductor diode laser is often operated in a contact way with a flexible fibre optic delivery system. It emits continuous-wave or gated-pulsed modes. Laser light at 800-980 nm is poorly absorbed in water but highly absorbed in haemoglobin and other pigments.

Its main benefits are the smaller units and reduced financial costs of diode lasers. The root surface did not show any adverse effects from the diode laser. The diode laser creates a relatively thick coagulation layer on the treated surface by exhibiting thermal effects using the "hot-tip" phenomenon brought on by heat accumulation at the end of the fibre. Diode laser surgery is broadly accepted as safe near dental hard tissue.

Diode lasers have the benefit of being smaller, more affordable, and better performance.^{3,5}

Moritz et al.⁶ demonstrated a bactericidal effect of diode laser in an in vitro and in vivo investigation. They discovered a very high decrease in bacteria. The main benefit is haemostasis and a generally dry working field since blood vessels in the surrounding tissue up to a diameter of 0.5 mm are sealed.

Although the early results of the depigmentation technique are pretty encouraging, repigmentation problems are a common issue. Though the exact process of repigmentation is not entirely known, hypotheses include the activation of melanocytes left over from surgery or the migration of active melanocytes from nearby pigmented tissues into the area treated.⁷

CONCLUSION

The diode laser depigmentation treatment method is reasonably safe, minimally invasive, practical, and efficient. The treatment is nearly painless, sterile, and without much blood, improving patient compliance and happiness.

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