

**GINGIVAL DEPIGMENTATION BY LASER -A CASE REPORT****Dr. Maya Teresa Jacob and Dr. Afroz Anjum\***

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**ABSTRACT**

The pigmented lesions of the oral cavity may be endogenous or exogenous. Endogenous lesions are benign and usually caused by melanin, and they are called gingival melanin pigmentations. Among the options for depigmenting these areas, laser therapy stands out for being a minimally invasive procedure. This study aims to report a clinical case of the gingival depigmentation technique using a high-power diode laser in the anterior maxillary region, for the ablation of the pigmented tissue to improve gingival aesthetics. The patient had an aesthetic complaint of the darkened aspect of the gingiva in the anterior maxillary and mandibular portions. After local anesthesia, we started depigmentation with high-power diode laser and performed ablation from the attached gingiva toward the free marginal gingiva. The patient returned after 1 week and 60 days presenting healthy gingiva and absence of melanin repigmentation. Thus, we concluded that the diode laser was a good alternative for melanin depigmentation because it is a procedure with lower morbidity and satisfactory postoperative results.

**KEYWORDS:** Depigmentation, Hyperpigmentation, Laser.**INTRODUCTION**

The smile is a key for self-confidence that involves aesthetic and psychological factors, and it includes teeth, lips, and gingival tissue. The colour of the gingival tissue is usually pink, but it may be darker in some cases, also known as gingival hyperpigmentation (Suragimath et al., 2016)

Gingival color relates to the dimension of blood vessels, thickness and degree of epithelial keratinization, and pigments. Melanin stands out among the pigments, considering it is a natural dye from melanocytes and present in the basal and suprabasal layers of the gingival epithelium. Several factors affect the darkened color of gingiva, including: (1) drugs; (2) ingestion of heavy metals; (3) genetics; (4) endocrine disorders; (5) ultraviolet rays; (6) inflammation; (7) smoking; and (8) others (Pavlic et al., 2018).

Gingival hyperpigmentation causes aesthetic complaints, especially from patients with a gummy smile or excessive gingival exposure when smiling. The depigmentation treatment aims to remove melanin, and the techniques proposed include the scalpel technique (gold standard), gingivectomy, grafting, electrosurgery, cryosurgery, and laser (Suragimath et al.; Bakutra et al., 2017). Currently, laser therapy has stood out, which works on melanocytes that absorb light and transform it into energy. Its

effectiveness relates to the wavelength of apatite and water. For gingival depigmentation, the lasers mostly used are the diode, carbon dioxide (CO<sub>2</sub>), and Neodymium-YAG (yttrium aluminum garnet) (Suragimath et al.; Bakutra et al.). Considering the aesthetic complaint of patients with gingival hyperpigmentation and the advantages of laser therapy, this study aimed to describe the clinical case of gingival depigmentation using diode laser.

**CASE REPORT**

A women 26 years old, came to dr.maya dental center complaining of darkened gums and reporting that pigments were impairing her smile.

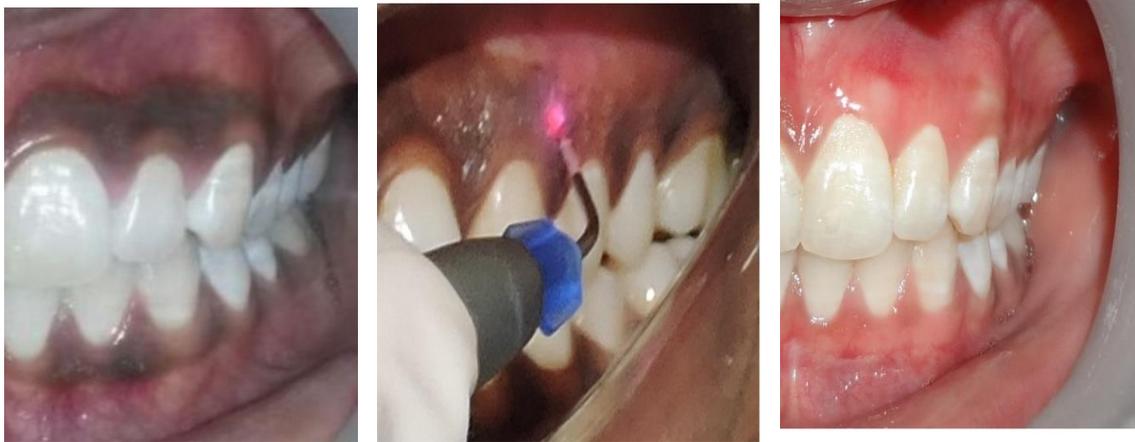
The clinical examination diagnosed a gingival melanin pigmentation in the anterior maxillary and mandibular regions (Fig. 1). For the treatment, we offered the patient a diode laser pigmentation. Therapeutic Intervention. After antisepsis with 0.12% and 2% chlorhexidine digluconate, intra- and extraorally, respectively, we anesthetized the patient from the upper left first premolar to the upper right first premolar using the infraorbital anesthetic technique with 4% articaine and 1:100,000 epinephrine as an anesthetic. The mandible received the terminal infiltration technique in the bottom groove from the left canine to the right canine, using the same anesthetic. For the laser therapy, the patient and the

surgical team used protection goggles. Depigmentation occurred with a diode laser surgical appliance (wavelength of 980 nm and power of 1.2 W).

A flexible optical fiber tip emitted the laser light continuously. The laser setting consisted of energy of 215 J, power of 1.2 W, and time of 3 minutes. Ablation started from the attached gingiva toward the free marginal gingiva, according to Fig. 2. First, we performed ablation in the upper left quadrant to the first

molar continuing it till anterior teeth. Follow-up and Outcomes. We performed circular and intermittent movements being careful not to reach adjacent and subjacent structures. We used a gauze moistened with 0.9 % saline solution to remove the epithelial tissue for improved visualization. After total ablation of the pigmented mucosa, the patient received postoperative instructions and the prescription of an analgesic returned after 1 week and 60 days presenting healthy gingiva and the absence of melanin repigmentation.

### Diagrams



**Pre operative inter operative post operative 1 WEEK**

Characteristic lesion pigment present

- I. Cheek –yes
  - II. Gum -yes
  - III. Tongue -yes
  - IV. Lips -yes
  - V. Palate –yes
- Influential factor  
 Smoking Yes  
 Genetics Yes  
 Disorders Yes  
 Inflammation Yes

### DISCUSSION

According to Suragimath *et al.*, the prevalence of melanin pigmentation ranges between 0 % and 89 % in different populations regarding ethical factors. Gingival hyperpigmentation is called physiological or racial pigmentation because it occurs as a genetic trait in some populations (Dummett & Barends, 1971). The patient of the present report is a woman. Other studies reported melanin pigmentation (MP) in different sexes. The literature is certain to affirm that MP affects both men and women equally or in the same proportion (Sims,ek Kaya *et al.*, 2012; Soliman *et al.*, 2014; Ponnaiyan *et al.*, 2014). Regardless of sex, MP is more prevalent in black individuals. Depigmentation occurred with a surgical diode laser appliance with a wavelength of 980 nm, power of 1.2W, and 215 J of energy. In contrast, other authors (Murthy *et al.*, 2012; Simsek Kaya *et al.*; El Shenawy *et al.*, 2015) used diode laser with powers of 1.5 W, 1 W, and 3 W, and wavelengths of 810 nm, 808

nm, and 980 nm, respectively. There are other depigmentation techniques such as electrosurgery, Nd:YAG laser, cryosurgery, scalpel removal, and rotary abrasion, addressed by Murthy *et al.*, Gupta *et al.* (2015), Chandna & Kedige (2015), and Patil *et al.* (2015), who used high-power diode laser because of hemostasis and lower postoperative morbidity. According to Ali *et al.* (2018), gingival melanin depigmentation with laser presents several advantages in relation to other therapies, such as hemostasis, visibility in the surgical field, and minimum discomfort to patients. Moreover, the diode laser has an affinity with hemoglobin and melanin, and it does not interact over hardened dental tissues. Therefore, it is highly indicated for cutting/coagulating the gingiva and oral mucosa, as well as for curettage and sulcular debridement. We performed infiltration anesthesia with 2 % mepivacaine before starting the surgery due to the presence of adrenaline as a vasoconstrictor, enhancing the anesthetic effect and reducing transoperative bleeding. Similarly, authors (Kaur & Das, 2012; Soliman *et al.*; Ponnaiyan *et al.*; Murthy *et al.*; Gupta *et al.*; Basha *et al.*, 2015) also performed infiltration anesthesia before the procedures. However, Sims,ek Kaya *et al.* did not perform anesthesia before the procedure, because one of the objectives of the study was to assess trans- and postoperative pain, comparing diode laser and Er:YAG laser. Melanin depigmentation occurred in the upper and lower quadrants, similar to other authors (Gupta, 2011, Soliman *et al.*). The literature review shows that some authors (Sims,ek Kaya *et al.*; Soliman *et al.*; Ponnaiyan *et al.*; Grover *et al.*, 2014; Elevarasu *et al.*, 2015) performed

depigmentation only in the upper quadrant because patients presented a high smile line and melanin pigmentation only in the maxillary anterosuperior region. During ablation with the diode laser, we used a gauze moistened with 0.9 % saline solution to remove the epithelial tissue and reduce bleeding, which was similar to authors Ponnaiyan *et al.*, El Shenawy *et al.*, Elevarasu *et al.*, Grover *et al.* and Derikvand *et al.* (2016)

In this clinical case, we completed depigmentation in one session, agreeing with authors Simsek Kaya *et al.*, Ponnaiyan *et al.*, El Shenawy *et al.*, Elevarasu *et al.* and Basha *et al.* However, Soliman *et al.* performed the procedure in two sessions to remove the pigmentations satisfactorily, because patients presented melanin pigmentation in the gingiva and cheek mucosa. Melanin absorbs the laser light with a wavelength of 980 nm and converts the light energy into heat by photothermolysis. When reaching a temperature of 100 up to 150°C, this heat causes protein denaturation, tissue vaporization, and coagulation, thus reducing trans- and postoperative bleeding, according to most authors cited. The patient returned after 30 and 180 days for assessment, presenting healthy gingiva, without maxillary and mandibular edema and pigmentation. The results of this study were similar to those obtained by Thangavelu *et al.* (2012), Murthy *et al.*, Simsek Kaya *et al.*, Soliman *et al.*, El Shenawy *et al.*, Elevarasu *et al.*, and Grover *et al.*, who did not present repigmentation up to the third month after depigmentation with diode laser within the observation period determined. Such period was halfway of the assessment of the present study. Gupta did not observe repigmentation in the patient up to 15 months after depigmentation with the diode laser, confirming the longevity of the result and the efficiency of the high power laser technique.

## CONCLUSION

Using a high-power diode laser was a safe and effective treatment modality that offered adequate final aesthetics with minimum discomfort to patients with gingival hyperpigmentation.

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