

# Gingival Depigmentation by Laser and Electrosurgery - A Case Report

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## Abstract:

Gingival hyperpigmentation is one of the esthetic problems. It requires the removal of gingival melanin pigmentation by various methods such as gingivoplasty, gingivectomy with free gingival autograft, electrosurgery, cryosurgery, application of chemical agents like phenol and alcohol, abrasion with a diamond bur, Nd:YAG Laser, semiconductor diode laser. In this case hyperpigmentation is treated by a diode laser in the maxillary anterior sextant and by electrocautery in the mandibular anterior sextant.

**Keywords:** Electrocautery, Gingival depigmentation, Hyperpigmented Gingiva, Dummett Oral Pigmentation Index, Laser Surgery

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## INTRODUCTION

The gingiva is the most pigmented intraoral tissue. The facial aspect of gingiva with hyperpigmentation is unsightly during smile and speech, this is the first & foremost indication for depigmentation as per the patient's demand<sup>1</sup>. Depending on gingival display and score of melanin pigmentation during smile decides the need for depigmentation procedure and decides the extent of site. Melanin, a non-hemoglobin brown pigment, is the most common natural pigment contributing to endogenous pigmentation of gingiva and is produced by melanocytes in the basal and supra basal cell layer of the gingival epithelium<sup>2</sup>. The gingiva is the most frequently pigmented tissue of the oral cavity. The physiologically ideal color of the gingiva is coral pink, which can vary depending upon the intensity and depth of melanin pigmentation that is more prominent in Asians and Africans than Caucasians. The pigmentation may be physiologic or pathologic. The physiological color of gingiva is due to a combination of different types of pigments like melanin, carotene, reduced hemoglobin, soft keratin, and oxyhemoglobin<sup>3</sup>. The

positive correlation of skin color and gingival pigmentation among the South Indian population is seen and pigmentation was more in attached gingiva and interdental gingiva<sup>4</sup>. Dummett oral pigmentation index (DOPI)<sup>5</sup> is the most commonly used index to score pigmentation of gingiva due to its simplicity and ease of use. The scores are as follows:

1. No clinical pigmentation (pink-colored gingiva)
2. Mild clinical pigmentation (mild light brown color)
3. Moderate clinical pigmentation (medium brown or mixed pink and brown color).
4. Heavy clinical pigmentation (deep brown or bluish black colour)

The pathologic pigmentation is seen as manifestations of systemic illness (e.g., Addison's disease) and malignant neoplasms (e.g., melanoma and Kaposi's sarcoma)<sup>6</sup>.

CASE REPORT

A 21- year- old young female reported to the Department of Periodontics with a chief complaint of –black gums. The patient’s history revealed blackish discoloration of the gingiva present since birth, suggestive of physiologic melanin pigmentation. According to Dummet - Gupta Oral Pigmentation Index (DOPI)<sup>5</sup> score was - 4 indicating heavy clinical pigmentation (deep brown or bluish black). Considering the patient’s concern about gingiva color, a depigmentation procedure was planned using a diode laser in the maxillary arch and electrosurgery in the mandibular arch. Adequate anesthesia was given. The patient and staff were protected from laser beams by wearing protective spectacles. A diode laser with settings of 810 nm, in pulsed mode was delivered through a 400µm fiber optic tip. The hyperpigmented gingival epithelium was ablated using direct contact mode in painting strokes<sup>7</sup>. The care was taken to scrape only the gingival epithelium between the tip of the interdental papilla on one end and the mucogingival junction on the other end. Two weeks later mandibular arch depigmentation was done by electrosurgery. Local anesthesia was infiltrated in the mandibular arch from the first molar to molar. A electrode loop was used for depigmentation of the gingiva. It was used in light brushing strokes & the loop was kept continuously in motion all the time to avoid excessive heat buildup and destruction of tissues. The periodontal dressing was applied after both procedures. The analgesics were prescribed and advised to take if any pain was there. A visual analog scale (VAS) was used to quantify pain levels and patient discomfort during the procedure. Each participant was asked to complete the VAS index cards—for two hours, twenty four hours, and one week after the procedure. The patient is recalled after seven days for follow-up.



Figure 1:Pre-operative photograph



Figure 2: Depigmentation by Laser



Figure 4: Depigmentation by electrosurgery



Figure 5: Ten months postoperative view

Table 1 Visual analog scale (VAS) Score

	2hours Post treatment	24hours Post treatment	1week post treatment
Maxillary arch(LASER)	1	1	0
Mandibular arch(Electro surgery))	3	2	1

RESULT

There was minimal pain and bleeding during both laser and electrocautery procedures. A burning smell and fumes comes where the suction tip is placed to avoid fumes. After 24 hours patient was called for follow-up in both procedures, very mild pain patient had after laser. The patient can tolerate pain no analgesic is required after 3rd day in laser procedure. The patient experienced pain till one week after electrosurgery, analgesic is given for days once a day. The periodontal dressing was removed after seven days healing was good. Re-epithelization was completed within four weeks and gingiva looks normal. The healing is fast after laser as compared to electrocautery.

## DISCUSSION

Laser beams are found to destroy the epithelial cells, including those at the basal layer & hence reducing repigmentation as compared to other techniques. The laser beam targets pigmented area and strikes melanocytes. Diode lasers are well absorbed by melanin, and light energy is leading to heat energy by photothermolysis. Diode lasers are absorbed in chromophores with specific target tissue and cause tissue-specific ablation layer by layer and cell by cell<sup>8</sup>. Moritz et al. showed in a study the bactericidal effect of laser. It creates locally sterile operating area that results in the reduction of bacteremia concomitant with the procedure<sup>9</sup>. Oringer (1975) has explained the superior efficacy of electrosurgery based on —exploding cell therapy. It is predicted that the electrical energy leads to molecular disintegration of melanin cells in basal and suprabasal layers of the operated and the surrounding sites. Thus electrosurgery too retards the migration of melanocytes from locally situated cells. Electrosurgery, however, causes prolonged or repeated application of current to tissue may lead the accumulation of heat and undesired tissue destruction<sup>8</sup>. Thus, one should avoid contact of electrode loop with periosteum or alveolar bone and vital teeth to produce undesired tissue destruction. We found that wound healing after laser therapy is fast as compared to electrosurgery. The inflammation and postoperative pain was minimal for first three days after the laser procedure and then later on no pain, and discomfort to patient. After electrosurgery, pain was moderate for first 24 hours and then patient had mild pain which lasted for three days. In this case, maxillary arch was treated with lasers & mandibular with electrosurgery. Patient was recalled after six months and months postoperatively to evaluate repigmentation of melanin. No repigmentation is seen in both arches.

## CONCLUSION

Both the methods, lasers & electrocautery for the depigmentation procedure are effective. The rising concern for esthetic demand of an individual requires the removal of hyperpigmented gingival

areas to create a confident and pleasing smile, which could be easily attained by using the laser. This case report concludes that the laser is an effective and fast tool that causes less pain, discomfort and faster healing. Ten-month follow-up showed no recurrence of melanin pigmentation was seen in both arches.

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