**Abstract**

Gingival hyperpigmentation is seen as a genetic trait in some populations and is more appropriately termed physiologic or racial gingival pigmentation; a benign condition, which affects all races. Gingival depigmentation is most often performed as a ‘patient demanded’ periodontal plastic surgical procedure; wherein scalpel, laser, electrosurgery, cryosurgery, diamond bur or chemical agents are used to remove hyper pigmented gingival epithelium. We compared the effectiveness of scalpel and laser depigmentation in same patient in terms of early healing responses and patient satisfaction. Maxillary anterior region was the area of concern for the patient, where at the right side scalpel technique and at the left side Diode Laser was used. Both the treatment modalities showed comparative results in terms of patient acceptance. Scalpel depigmentation resulted in uneventful healing of the treated site. Laser depigmentation resulted in absolute bloodless field at treated site which healed unevenly. Patient discomfort was more in laser treated areas during the initial healing period.

**Keywords:**

Hyperpigmentation; gingival melanin; depigmentation

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**Case Report**

**Split Mouth Gingival Depigmentation Using Blade and Diode Laser- A Case Report**

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Introduction

Melanin pigmentation of the gingiva occurs in all races. Melanin, a brown pigment, is the most common cause of endogenous pigmentation of gingiva and is the most predominant pigmentaton of mucosa. Gingival hyperpigmentation is seen as a genetic trait in some populations and is more appropriately termed physiologic or racial gingival pigmentation. Melanin hyperpigmentation usually does not present as a medical problem, but patients may complain their black gums are unaesthetic. This problem is aggravated in patients with a “gummy smile” or excessive gingival display while smiling. Gingival depigmentation is a periodontal plastic surgical procedure whereby the gingival hyperpigmentation is removed or reduced by various techniques. The first and foremost indication for depigmentation is patient demand for improved esthetics.

Various depigmentation techniques have been employed with similar results. Selection of a technique should be based on clinical experience and individual preferences. Little literature has been published regarding practical methods of treatment of pigmented gingiva with acceptable results.

Methods aimed at removing the pigment layer

A. Surgical method of de-pigmentation
   1. Scalpel surgical technique.
   2. Cryosurgery
   3. Electrosurgery
   4. Lasers
      Erbium-YAG lasers.

B. Chemical methods of de-pigmentation

Methods aimed at masking the pigmented gingiva with grafts from less pigmented area
Free gingival graft.
Acellular dermal matrix allograft.

Case Report

A 23 year old male patient visited the department of Periodontology, complaining of dark gums. History revealed that it was present since childhood suggestive of physiological melanin pigmentation (Fig 1). Patient was systemically healthy without any habits. Patient’s oral hygiene was good. Patient was explained about the treatment options available and the possibility of repigmentation after certain period of time. Phase I therapy was carried out during the initial visit.

A split mouth approach comparing scalpel technique with that of diode laser was planned. Local infiltration of lignocaine was administered. At the maxillary left anterior region from central incisor to canine (Anterior esthetic segment) diode laser (Zerona®) with “Gingivectomy” mode is used for depigmentation. Exposure parameters are set using the recommended guidelines, followed by careful removal of epithelium containing melanin layer (Fig 2). There was absolutely no bleeding during the procedure.

At the right counterpart, conventional/traditional technique was used, wherein a #15 blade is used for depigmentation (Fig 3,4)

On completion of depigmentation (Fig 5), a periodontal dressing was placed over the surgical area. Post operative instructions were given to the patient, NSAID in the form of Diclofenac sodium was given thrice daily for 3 days. Patient was recalled after 1 week for
reevaluation. Wound healed uneventfully on both the sides (Fig 6).

Patient experienced pain on the laser treated site for 3 days post operatively. On 1 month post operative follow-up, the areas were completely healed. Fig 7 shows 1 year follow-up with no signs of repigmentation. Depigmentation was not carried out for mandibular anterior region because they were of no esthetic concern for the patient.

**Discussion**

**Scalpel surgical technique**

One of the first, and still popular, techniques to be employed was the surgical removal of undesirable pigmentation using scalpels. The procedure essentially involves surgical removal of gingival epithelium along with a layer of the underlying connective tissue and allowing the denuded connective tissue to heal by secondary intention. The new epithelium that forms is devoid of melanin pigmentation.\(^4\) An attempt was made to remove gingival pigmentation surgically in 6 Indian males. Three different techniques were employed; these were slicing, bone denudation and abrasion. The areas subjected to complete denudation showed no reappearance after 6 months of observation, 50% cases of slicing and abrasion techniques showed a mild degree of repigmentation after 24 to 56 days.\(^5\) In this particular case the scalpel method of depigmentation gave satisfactory results from both clinical and patients point of view. The area healed completely in 10 days with normal appearance of gingiva (Fig 6).

**Lasers**

The removal of the melanin pigmentation of dog gingiva by carbon-dioxide laser irradiation was studied previously. The irradiated gingiva was examined macroscopically and histopathologically. One week after irradiation, the pigmentation in the gingiva disappeared in all 5 cases macroscopically. Three weeks after irradiation, no reappearance of pigmentation was observed in either macroscopic or microscopic investigations, excluding severe and extensive cases. Hence the authors suggested that it is possible to remove gingival melanin pigmentation by carbon-dioxide irradiation.\(^7\)

Thissen M et al (1997) reported laser treatment for further depigmentation in vitiligo patients, 8 patients with remaining pigmentation of arms, hands and face were treated once with a ruby laser, patients were monitored for developing repigmentation during the 9 months after treatment. A permanent state of depigmentation was reached after laser therapy. The authors concluded that ruby laser treatment can be an effective, fast and safe method for removing cosmetically disturbing remnants of normal pigmentation in vitiligo patients.\(^8\)

The efficacy of carbon-dioxide (Co2) laser vaporization in ablating gingiva, oral mucosal and cutaneous melanin in dogs was tested. 3 dogs with pigmentation of the oral mucosa, gingiva and skin were recruited for the study. The procedure was performed by using 3 W continuous-wave carbon-dioxide laser. Clinical and Histologic examination showed carbon-dioxide laser to be effective in eliminating pigmented areas. No recurrence of melanin was detected in either the oral mucosa or gingiva during the follow up period of 11 weeks. In the skin small amount of melanin repigmentation was noticeable.\(^9\)
It was concluded that carbon-dioxide laser surgery proved an effective tool for obliterating superficial melanin discoloration and it is also suggested that, to prevent recurrence of the pigmentation, the area must be cleared completely of melanin, directing the laser beam carefully along the visible margin of the area.

Atsawasuwan et al (2000) reported the use of Nd: YAG laser for gingival depigmentation
in 4 cases. The Nd: YAG laser was set at 6 Watts, 60 milijoules per pulse, and 100 pulses per second. They found no recurrence of pigmentation during the follow up period of 11 to 13 months. The authors concluded that Nd : Yag laser had shown to be a good option for gingival depigmentation, and caution must be exercised in delicate areas near marginal gingiva while using Nd : YAG laser.10

However the literature on use of diode laser for depigmentation is scarce. In this particular case report, 1 year follow up result is comparable to that of conventional method. However, patient experienced discomfort for initial 10 days of healing.

**Conclusion**

Gingival depigmentation is most often a patient demanded esthetic periodontal treatment. Both scalpel and laser techniques were equally effective in this procedure; however we observed that patient discomfort during the initial healing period is more in laser procedures.

**References**


