



**Esthetic Management Of Gingival Hyperpigmentation A Comparative Evaluation Of Two Different Techniques :
A Clinical Study.**

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Abstract

Introduction: The color of gingiva influences the smile of person and affects esthetics, the present study was conducted to evaluate the effect of gingival depigmentation by scalpel and electrosurgery. Materials and Methods: The treatment done in this study was scalpel surgical technique and electrocautery as they could be easily done and were less time consuming. Healing and recurrence of pigmentation were postoperatively evaluated. Intraoral pictures were taken at every follow-up visit to compare the progress and also to access the occurrence of any repigmentation. One-way ANOVA and unpaired t-test were used for statistical analysis. Results: There was statistically significant reduction seen for both the study techniques after 3 months postoperatively as compared to baseline with no complications leading to pain, infection, bleeding, or scarring postoperatively. During the 3th month follow-up, there were no signs of repigmentation in both the treatment modalities. Cases were followed up for any reoccurrences of pigmentation longitudinally. Conclusion: Satisfactory results were obtained with both the surgical and electrocautery procedures for gingival depigmentation. Hence, the

surgical technique still serves as the simplest and effective depigmentation technique. During the follow-up period, no recurrence of gingival hyperpigmentation was found with both the techniques employed in this study.

Keywords: Depigmentation, electrocautery, gingival melanin hyperpigmentation, scalpel

Introduction

Gingival pigmentation may occur alone or may be associated with skin lesions. It can be accompanied by oral pigmentation on the lip, tongue, palate, or buccal mucosa. Gingival pigmentation can be seen in isolated patches or may have a generalized distribution on the attached gingiva. There are different causes of pigmentation, some physiologic and others malignant with high chances of fatality.¹

Gingival depigmentation is carried out on a routine basis in periodontal practice. The procedure is considered to be noninvasive and uncomplicated. Patients are assured that they can expect a speedy recovery.¹

It is well known that melanin is the primary pigment responsible for variations in color noted with regard to complexion. Variation in the melanin pigmentation that is specifically seen in racial pigmentation is attributed to

variations in the activity of melanocytes in the basal cell layer of the oral epithelium rather than their number; this is more common in dark-skinned individuals regardless of their ethnic background. Moreover, smoking is one of the most defined causes of oral pigmentation in light- and dark-skinned individuals since melanin has a protective role against noxious agents present in tobacco smoke^{2,4}. Duration and amount of smoking are important factors that usually directly determine the intensity of pigmentation.⁵

Using the scalpel technique to remove unesthetic gingival pigmentation is a conventional and relatively simple approach that is still considered the gold standard. It does not need sophisticated equipment and costly devices, and is easily performed under simple local anesthesia⁶. This technique involves the surgical removal of the gingival epithelium and a layer of the underlying connective tissue. The denuded tissues heal by secondary intention, which may be associated with unpleasant bleeding during and after the procedure, with the probability of some discomfort and pain postoperatively.^{2,3}

Different Techniques Used For Depigmentation:

1. Scalpel technique
2. Cryosurgery
3. Electrosurgery
4. Lasers
 - Nd-YAG laser
 - Er-YAG laser
 - Co2- laser
5. Chemical methods using caustic agents- Method not used nowadays
6. Method aimed at masking the pigmented gingival from less pigmented areas
 - Free gingival graft⁶.
 - Acellular dermal matrix allograft⁸.

To prevent repigmentation, it has been suggested that the gingival tissue should be cleared of melanin completely, including free gingiva and interdental papilla; because repigmentation may start as a result of migrating melanocytes from these areas⁷. Additionally, it has been recognized that the race and exposure to environmental tobacco smoking may contribute to an increase in the gingival pigmentation, and could be related to increase of repigmentation following successful therapy. The principles, techniques, and management of the problems associated with gingival melanin pigmentation are still not fully established.²

Presented here is a case of gingival hyperpigmentation in which two different techniques were used in the two arches to treat the condition and to compare the clinical efficacy of scalpel and electrocautery.

Case Report

A 27 year old male patient visited the department of Periodontics, Malla Reddy Dental College for Women with chief complaint of “blackish gums.”. The medical history was non-contributory. Intra-oral examination revealed generalized blackish pigmentation of the gingiva; though it was healthy and free of any inflammation.

Considering the patient’s esthetic concern, different options were explained to the patient, and after getting approval from institutional ethical committee, the procedure was planned.

Procedure

After explaining the whole procedure to the patient, and taking written consent, scalpel technique was planned for upper anterior region and electrosurgery for lower anterior region. A complete detailed medical and family history, along with blood investigations were carried out to rule out any contraindication for surgery.

Conventional Scalpel Technique

After block anesthesia using 2% lignocaine, two vertical incisions were given distal to permanent canine right and left side using No.15 scalpel blade. A split-thickness flap was raised and excised, maintaining the normal architecture of gingiva. Bleeding was controlled using pressure pack with sterile gauze. Sterile saline-soaked gauze was placed on the recipient site to control bleeding. The exposed depigmented surface was covered with Coe-Pak periodontal dressing for one week. Analgesic was prescribed for the management of pain. After 1 week, the pack was removed and the surgical area was examined.

Electrosurgical technique

Electrocautery unit (electrosurgery unit) was used to de-epithelize the hyperpigmented areas in mandibular arch. Ablation of the pigmented tissues was done using surgical loupes by means of electrocautery unit under standard protective measures. Remnants of ablated tissues were removed with the sterile gauge damped in saline solution. This was repeated until the desired depth of tissue removal was achieved.

Surgical area was covered with noneugenol-based periodontal dressing "coe pack" and postoperative instruction was given to the patient. An analgesic was prescribed for pain management and patient was recalled after 1 week for follow-up and removal of periodontal dressing¹⁰.

Depigmentation procedure in relation to scalpel :



Fig 1 :pre-operative view showing depigmentation



Fig 2: Depigmentation procedure performed with a scalpel



Fig 3 : pigmented tissue



Fig 4:immediate post view



Fig 5 : coe - pack given



Fig 6: post-operative view after 3 months.

Depigmentation procedure in relation to Electrocautery:



Fig 7 : Depigmentation procedure performed with a Electrocautery



Fig 8 : immediate Post-operative view



Fig 9 : coe- pack given



Fig 10 : post operative view after 3 months

Results

Results were compared with regard to the post operative pain, swelling, time, cost efficiency and healing after application of the two modalities. In the scalpel technique, after one week the wound area was still erythematous and raw. This was in contrast to the electrosurgical site, where erythema was less, although edema was more.

Healing was uneventful without any complication in both the maxillary and mandibular arch. On intraoral examination, the gingiva gave a normal, pink healthy appearance. Patient was recalled after 1 month, and postoperative photographs were taken.

Discussion

Melanin is nonhemoglobin derived brown pigments that often occur in the gingiva as a result of increased

deposition of melanosomes in the basal layer. Pigmented gingival tissue forces the patient to go for esthetic treatment. Degree of vascularization, the thickness of the keratinized layer and the amount of the pigment-containing cells determines the color of gingiva⁵. Various treatment plans have a different outcome in respect of pain, bone exposure, bleeding, healing, and patient comfort. The selection of a technique for the depigmentation of the gingiva should be based on clinical experience, patient's affordability and individual preferences. The mechanism of repigmentation is not very clear, but according to the migration theory, active melanocytes moves from the adjacent pigmented tissues and migrate to the treated areas, causing repigmentation^{9,5}.

Scalpel surgical technique is highly recommended in consideration of the equipment constraints that may not be frequently available in clinics. However scalpel surgery causes unpleasant bleeding during surgery, pain and discomfort after surgery and it is necessary to cover the surgical site with periodontal dressing for 7 to 10 days. The scalpel technique by some authors, has been reported to be relatively simple and versatile and it requires minimum time and effort but actually in the present case, more time in the dexterity was required^{4,6}.

Superior efficacy of electrosurgery as compared to scalpel has been explained on the basis of Oringer's(1975) 'exploding cell theory'. According to this theory it is stated that the electrical energy leads to molar disintegration of melanin cells in basal and subbasal layers of the operated and the surrounding sites. Thus electrosurgery has a strong influence in retarding migration of melanin cells from the locally situated cells. However, in the present case report, no difference in the recurrence of pigmentation was observed in scalpel and electrosurgical technique. The dissection of partial

thickness flap by scalpel required more surgical expertise as compared to electrosurgery. Electrosurgery, however, has the disadvantage that prolonged or repeated application of current to tissue induces heat accumulation and undesired tissue destruction. Thus, contact with periosteum or alveolar bone and vital teeth should be avoided¹⁰.

The electrosurgery group experienced less pain, reduced healing discomfort and scar formation. Other advantages were reduced bleeding, and hence clear view of the surgical site, use in difficult to reach areas, reduced chair side time of the surgical procedure and operator fatigue¹⁰

Conclusion

It can be said that the two techniques produced comparable results with regard to healing and there was no recurrence with any of the procedure. However with regard to immediate postoperative evaluation, the scalpel technique left a bleeding surface, while no such bleeding was seen with the electrosurgical technique as the charred layer served as a surgical bandage to arrest bleeding. Although electrosurgery needs to be used with caution and have the advantage of minimal bleeding, technical expertise is required. However the healing at one week was best with electrosurgery compared to the scalpel technique. Thus within the confines of the present case report, it can be concluded that all the two modalities produced comparable results in the long term.

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