CASE REPORT

Electrocautery assisted gingival depigmentation

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Abstract

The overproduction of melanin by melanocytes, primarily located in the basal and suprabasal layers of the epithelium, leads to gingival depigmentation and hyperpigmentation. This has become a social concern, prompting the use of various treatments. Gingival depigmentation via electrocautery ensures precise removal of pigmented tissue, fostering faster healing and enhanced aesthetics compared to traditional methods like bur abrasion and surgery. This minimally invasive approach offers efficiency and favorable outcomes in gingival appearance enhancement. Electrocautery stands as a promising option for individuals seeking effective treatment for gingival pigmentation concerns.

Keywords- *melanin, gingival depigmentation, hyperpigmentation, electrocautery, faster healing, minimally invasive approach.*

INTRODUCTION

The hue of gingiva is influenced by a multitude of factors including race, systemic and local conditions, physiology, and pathology. It exhibits a spectrum from pale pink to coral pink, deep red, or even violet, based on the presence of five primary pigments—melanin, melanoid, oxyhemoglobin, reduced hemoglobin, and carotene—with melanin being predominant.[1,2]

Systemic hormonal imbalances, pharmacotherapy, and external factors like heavy metals (such as mercury, bismuth, lead, iron) can contribute to gingival hyperpigmentation. Hirschfeld once associated oral pigmentation with Addison's disease, coining the term "melanoplakia".[3] Various scoring systems, like the Dummett–Gupta Oral Pigmentation Index and Hedin's classification, have been proposed for assessing pigmentation.

Table 1. Dummett-Gupta Oral Pigmentation Index[4]

Score	Scale of Pigmentation
Degree 1	Isolated—only 1 or 2 pigmented interdental papillae
Degree 2	Numerous pigmented interdental papillae
Degree 3	Short continuous ribbons
Degree 4	Long continuous ribbon

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Table 2: Hedin's Classification[5]

Score	Scale of Pigmentation
0	Pink–no pigmentation
1	Light Brown–mild pigmentation
2	Mixed Pink and Brown or Medium Brown
3	Deep Brown–Blackish Brown

Different procedures have been proposed for gingival depigmentation.

Roshni & Nandakumar[5] in 2005 classified different gingival depigmentation methods as:

1. **Methods used to remove the gingival pigmentation**:
   - A. **Surgical methods**:
     - i. Scalpel surgical technique
     - ii. Bur abrasion method
     - iii. Electro-surgery
     - iv. Cryosurgery,
     - v. Lasers,
     - vi. Radiosurgery.
   - **B. Chemical methods**
2. **Methods used to mask the gingival pigmentation**:
   - i. Free gingival graft.
   - ii. Acellular dermal matrix allograft.

Case Report

A female patient aged 25 years with a chief complaint of "darkened gums" visited Department of Periodontology. The patient was systemically healthy and not under any medication. Upon clinical examination, periodontal tissues were healthy, but bilateral melanin pigmentation was present in the maxilla [Figure 1]. Dummett–Gupta oral pigmentation (DOP) index[6] was used to determine the level of depigmentation, and the score was diagnosed as"4".

The local anesthetic solution was administered via infiltration at the treatment site for electrosurgery. Ablation of pigmented tissue was performed using a straight electrode from the electrosurgery unit, employing standard safety precautions. The electrode was moved in light brushing

Figure 1: Bilateral melanin pigmentation

strokes to prevent excessive heat accumulation and tissue damage [Figure 2]. Any remaining ablated tissue was cleared using sterile gauze moistened with saline solution. After the procedure, periodontal dressing was applied and antibiotics were prescribed. [Figure 3 and Figure 4]

Figure 2: During procedure

Figure 3: Depigmented area

Figure 4: Coe-Pak placed

Figure 5: 1 week post-operative

Figure 6: 6 month post-operative

Patient was instructed to avoid smoking and hot, acidic, and spicy food that can jeopardize the healing process and cause patient discomfort. Following depigmentation, patient was recalled at week 1 [Figure 5] and 6 month [Figure 6] during postoperative period for clinical evaluation. No postoperative pain, hemorrhage, or scarring was observed and the healing was uneventful. On the final healing gingiva appeared pale pink which was satisfactory for both patient and operator [Figure 3]. DOP index post-operatively was scored as "1.

DISCUSSION

The degree of melanin pigmentation depends on the number and distribution of melanocytes and their capacity to transfer melanin and melanin uptake by keratinocytes.[7] Melanin-pigmented gingiva is often a demand for depigmentation mainly for esthetic reasons. To date, electrosurgery has been proposed as a beneficial technique for melanin depigmentation procedures. Melanocytes, located in mostly basal and suprabasal layers of gingival epithelium, should be eliminated for a proper depigmentation. The greater effectiveness of electrosurgery compared to epithelial excision or bur abrasion-scraping techniques, as observed in the current case series, may be attributed to Oringer's "Exploding Cell Theory" from 1975.[8] According to the theory, it is proposed that electrical energy induces the molecular disintegration of melanin cells located in the basal and suprabasal cell layers of the operated and surrounding sites. This suggests that electrosurgery strongly inhibits the migration of melanin cells from the locally situated cells,

which were clinically observed to be removed.[8] Thus, electrosurgery has a strong influence in retarding migration of melanin cells. Similar to our case studies were done by prasad et al.(2005)[9] and katharia et al. (2011)[10] in which they used light brushing strokes and also they kept moving the tip all the time. Prolonged or repeated application of electrode to the tissues was avoided as it induces heat accumulation and causes undesired tissue destruction. By this minimal bleeding with a clean field increased the efficacy of the work.

Repigmentation may also occur depending on the technique used and the race of the patients.[11] tion. According to the theory, melanocytes migrate from the adjacent pigmented tissues to treated sites resulting in repigmentation.[12] It is an outcome of histologic changes in the melanocyte activity and density of melanin pigments that can be seen from 15% to 30% even after 6 months of depigmentation.[13] It is important to remove as much melanocytes as possible in order to prevent them to migrate from periphery. In this study, patients were followed up for 3 months, and no repigmentation was observed during that time. However, the reason for this result may be the short follow-up period as the histological changes may vary depending on the race and technique used. In studies Re-pigmentation may also be attributed to the melanocytes which are left during surgery as stated by Ginwalla et al[14]These may become activated and start synthesizing melanin. Ginwalla reported re-pigmentation in 50% of their cases between 24 and 55 days. Dummett and Bolden operated pigmented gingiva by gingivectomy procedure in 9 cases. Re-pigmentation occurred in 67% of the areas, as early as 33 days after surgical removal. Perlmutter and Tal have also reported gingival re-pigmentation that occurred 7 years after removal of gingival tissues in one patient.

CONCLUSION

Electrocautery for gingival depigmentation is a very viable option for improving esthetic appearance. Among the different surgical options available for depigmentation, electrocautery has been proven to have minimal post-operative complications and maximum patient comfort.

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