Comparative Evaluation of Success of Depigmentation by Laser and Scalpel Method in Split Mouth Technique: A Case Report

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Abstract

Background: Melanin hyperpigmentation can lead to unesthetic smile due to brown- or black-colored pigmented gingiva. The situation might get aggravated if the patient has gummy smile. The esthetic correction can be possible by depigmentation procedure. There are different modes of depigmentation procedure. The present case was designed to evaluate the success of depigmentation by laser and scalpel technique in terms of post-operative pain, healing, and color matching. The depigmentation treatment procedure surely enhances the esthetics of smile and increases the confidence to smile. Although there are chances of repigmentation with time, it has become a popular treatment option in cases of melanin hyperpigmentation.

Keywords: Melanin, Depigmentation, Esthetics, Diode laser, Scalpel technique.

Introduction

Modern dentistry is inclining toward the esthetics day by day. The patients are also more concerned about the esthetics. Visibility of blackish or brownish pigmented gingiva has become a major concern for young patients. Clinically, the smile becomes more unpleasant in patient with gummy smile. Gingival surface might become unesthetic due to the presence of melanin pigmentation as it results in brown- to black-colored gingiva and was discussed by Dummett (1959).[1] Melanin pigmentation is a physiological condition. Melanin hyperpigmentation in oral mucosa is clinically manifested as localized or generalized diffuse type. The amount of pigmentation varies among the individuals (Cicek, 2003).[2] Due to some systemic diseases like Peutz-Jeghers syndrome, Addison's disease melanin pigmentation in gingiva may appear. The treatment for the physiologic melanin pigmentation is depigmentation. There are several modes of depigmentation procedure as follows:

Methods aimed at removing the pigmented gingiva

A. Surgical methods
   1) Gingivectomy by Scalpel surgical technique (Bergamaschi *et al*., 1993).[3]
   2) Lasers (Stabholz *et al*., 2003).[4]
   3) Electrosurgery (Gnanaesekhar and Al-Duwairi, 1998).[5]
   4) Radiofrequency surgery.
   5) Bur abrasion method (Bishop, 1994).[6]
   6) Cryosurgery (Yeh, 1998).[7]

B. Chemical method

Methods aimed at masking the pigmented gingiva

A. Free gingival autograft (Tamizi and Taheri, 1996).[8]
B. Acellular dermal matrix allograft (Pontes *et al*., 2006).[9]

The present case report will enlighten about the comparison of success of depigmentation by laser and scalpel method.

Case Report

A 20-year young male patient complains of unesthetic smile due to brownish-black gingiva. Whenever the patient

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smiles spontaneously, some part of the pigmented gingiva is visible (Figure 1). On clinical examination, the gingiva appears to be brownish-black due to the presence of diffuse generalized bilateral melanin pigmentation both in maxillary and mandibular arch (Figure 2). Medical history was taken to rule out the presence of any pathological conditions which can predispose to such pigmentation. No systemic diseases were found. The treatment plan was chalked out and plan was to compare the success of depigmentation by laser and scalpel technique. The entire treatment plan was clarified to the patient and written consent was taken. Under local anesthesia (lignocaine with adrenaline in the ratio 1:80,000 by weight), depigmentation was done by scalpel (No 15 BP Blade) in upper left anterior region (Figure 3) and by diode (wavelength 800 nm) laser in upper right anterior region (Figure 4) at the same time. During the procedure, pressure was applied with sterile gauze soaked in local anesthetic agent to control bleeding. Care was taken to remove the entire pigmented epithelium along with a thin layer of connective tissue (Figure 5). On the left side, periodontal dressing (Coe-Pack) was given (Figure 6). Post-surgical antibiotics (amoxicillin 500 mg, thrice daily for 5 days) and analgesics (ibuprofen with paracetamol, twice daily for 3 days) were prescribed. The patient was advised to rinse with chlorhexidine mouthwash twice daily for 2 weeks. The patient was recalled after 2 weeks. Healing on the right side was little bit delayed (Figure 7). The patient complained about less pain postoperatively at the site treated with diode laser compared to opposite site. After 1 month, surface epithelialization was completed. Healing was found to be satisfactory on both sides after 1 month. The esthetics of the smile was enhanced as the color matching was satisfactory too.

Discussion

Physiologic melanin pigmentation might be due to genetic cause. However, Dummet (1959)[1] suggested that the degree of pigmentation might be governed partially by few important factors such as mechanical, physical, and chemical stimulation. The main disadvantage of laser therapy is delayed healing. The main advantage of the laser therapy is less bleeding peroperatively as compared to conventional scalpel technique. Depigmentation is not a permanent treatment modality. Literature says that repigmentation occurs with time. Repigmentation might occur due to the activity and migration

Figure 1: Pre-operative extraoral

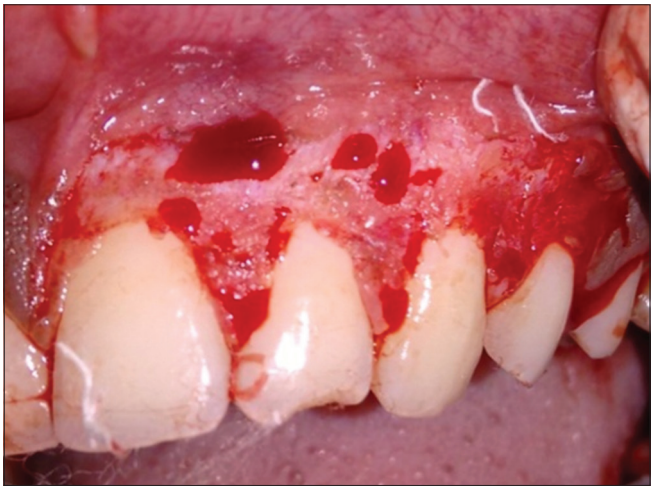

Figure 3: Depigmentation by scalpel in the left upper quadrant

Figure 2: Pre-operative intraoral

Figure 4: Depigmentation by laser in right upper quadrant

Figure 5: Comparison of both sides

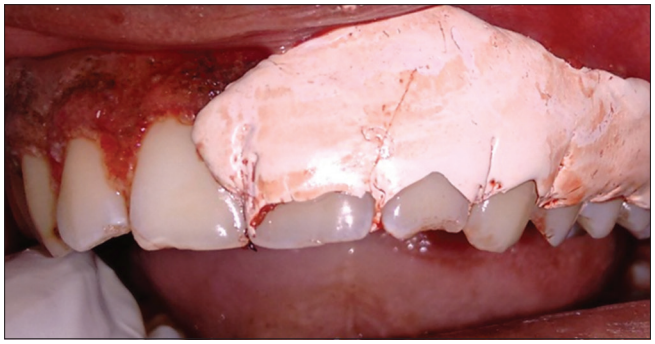

Figure 6: Periodontal pack given in the left quadrant

Figure 7: Two weeks post-operative

of melanocytic cells from surrounding areas (Mokeem, 2006)[10] or left out melanin pigmentation during depigmentation.

In 2009, Lagdive *et al*.[11] have done a split mouth study to compare gingival depigmentation using scalpel and diode laser. There was no bleeding at the laser depigmentation areas in any patient. Diode laser depigmentation showed delayed healing than scalpel blade depigmentation. Analyzing visual analog scale, it was found that the patient with laser therapy experienced less post-operative pain. In contrast, sites treated with diode laser were rated as only slightly or not painful.

According to Mani *et al*. (2009),[12] diode laser showed delayed healing compared to scalpel blade and bur abrasion depigmentation as they compared three different surgical techniques for gingival depigmentation: Lasers, scalpel, and abrasion with diamond bur on the same patient with 3 months follow-up. At the VAS evaluation, they found that the patient complained of less pain at the site treated with diode laser compared to other sites.

The present study also showed some similar results. According to the present study, the site treated with laser showed delayed healing first 2 weeks and the patient experienced less pain compared to the site treated with scalpel. The color matching after 1 month was satisfactory with both the techniques.

Conclusion

Depigmentation is an effective treatment option for esthetic correction of gingival melanin hyperpigmentation. The selection of a technique for depigmentation of the gingiva should be based on clinical experience, patient's affordability, and individual preferences. The patient compliance is good with depigmentation by laser peroperatively due to less bleeding and postoperatively due to less pain. However, laser treatment is expensive too. The scalpel method is easy and cost effective. Case selection is also important for ultimate patient's satisfaction as there is chance of repigmentation.

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