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Case Series

An Overview on Gingival Depigmentation Procedures : Case Series and Follow up

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Abstract

The gingival complex plays an important role in the overall esthetics of a smile . Melanin, which is a brown pigment, is the most common natural pigment that contributes to endogenous pigmentation of the gingiva. For depigmentation of gingiva many treatment modalities have been reported like Scraping, Bur Abrasion, Partial Thickness Flap, Cryotherapy, Electrosurgery and Laser. The present article describes five cases of gingival melanin hyperpigmentation - Scraping, Bur Abrasion, Partial Thickness Flap, Electrocautery and Laser Technique. The purpose of the article is to discuss and compare the different techniques employed for depigmentation.

Keywords: Melanin; Depigmentation; Scraping; Bur Abrasion; Partial Thickness Flap; Electrocautery; Laser

Introduction

Gingival pigmentation is present in all types of races . The intensity and distribution of colour is different. The colour of the gingiva is determined by many factors, that is:

- Number and size of the blood vessels,
- Epithelial thickness,
- Quantity of keratinization and
- Pigments within the gingival epithelium [1].

Gingival pigmentation results from melanin granules, which are produced from melanoblasts. Melanin is a non-hemoglobin-derived brown pigmentation. It is the most common of the endogenous pigments which is produced by melanocytes present in the basal and suprabasal cell layers of the epithelium [2,3].

The oral pigmentation is because of the activity of melanocytes and not the number of melanocytes in the tissue [4]. This hyperpigmentation is common as a genetic variation in some populations independent of their age and sex known as physiological or racial gingival pigmentation [5]. Although physiological melanin pigmentation is not a medical problem; patients complain of their black gums which are unesthetic. This problem can be seen more in patients with a "gummy smile" or excessive gingival display while smiling. Fair-skinned people with moderate or severe gingival pigmentation undergo cosmetic treatment of the black gums [6].

Oral Pigmentation Index scoring criteria, given by Dummett in 1964 are as follows [7]:

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

Herewith we are reporting a series of 5 cases who were successfully treated for gingival hyperpigmentation. Each case was employed with a different technique for depigmentation. After explaining the case and treatment modality to be performed on them, a written patient consent was obtained, routine oral hygiene procedures were carried out and oral hygiene instructions were given.

Case Report

Case 1: Scrapping technique

A 21-year-old healthy male patient was reported to the Department of periodontics, NPDCH with the complain of his unaesthetic

anterior gingiva. Hyper-pigmented gingiva was observed on the labial surface of both maxillary and mandibular arches. The color of his gingiva was dark black which was given score 3. Patient was not ready for any sophisticated treatment such as laser and cautery, hence we choose using scalpel. The gingiva was depigmented by scrapping technique. A Kirkland knife was used to remove the pigmented layer. Pressure was applied with a sterile gauze to control the hemorrhage during procedure. After removing the entire pigmented epithelium, the exposed surface was then irrigated with saline. It was taken care that all remnants of the pigment layer were removed carefully. A periodontal pack was placed to reduce the postoperative discomfort (Figure 1a-1d).

Figure 1: a. Pre-operative, b. Scrapping technique, c. Immediate post-operative, d. 6 Month follow-up.

Case 2: Abrasion bur technique

A 18-year-old healthy male patient came to department of periodontics, NPDCH with chief complaint of black gums. On examination moderate melanin pigmentation was seen which was given score 2. Patient was not ready for any sophisticated treatment such as laser and cautery, hence we choose using bur technique. The abrasive depigmentation was performed in this case, using bur under local anaesthesia. The melanin hyperpigmented gingiva was removed using a round bur with a low speed. Feather light brushing strokes with minimum pressure and copious saline irrigation should be used without holding the bur in one place to get best results. After the procedure, the gingiva was examined for the thoroughness of pigment removal and covered with periodontal dressing. Postoperative instructions were given (Figure 2a-2d).

Figure 2: a. Pre-operative, b. Bur technique, c. Immediate post-operative, d. 6 Month follow-up.

Case 3: Partial thickness flap

A 27 years old, healthy male patient who reported to the department of periodontics, NPDCH, with a chief complaint of dark appeared gums while smiling. On examination the patient diffuse melanin pigmentation could be seen, which was scored as 3 and with good oral hygiene. The treatment modality chosen was Partial thickness Flap, because patient had thick gingiva and this technique could easily performed on patient. After anesthetizing the area, a horizontal incision was made to demark attached gingival from the oral mucosa at the mucogingival junction in the area and a split thickness flap was raised and excised with B.P blade no: 15 and 11, maintaining the normal architecture of the gingiva. Periopack was then placed and post-operative instructions were given (Figure 3a-3d).

Figure 3: a.Pre-operative, b. Partial-thickness technique, c. Immediate post-operative, d. 6 Month follow-up.

Case 4: Electrocautery

A 24 years old, healthy male patient visited the department of periodontics, NPDCH, complaining of dark gums. History revealed that it was present since childhood which is suggestive of physiological melanin pigmentation. The score was given as 3. Patient was explained for electrocautery technique. The melanin hyperpigmentation was treated using this technique. A diamond electrode was used for de-epithelizing the gingiva. It was used in a light brushing strokes maintaining the tip was kept in motion all the time. Keeping the tip in one place could cause excessive heat build up and hence destruction of the tissue. The ART-E1 electrosurgery unit was used. The setting on the cutting electrode was set with 4 RF/2MHz, power supply of 230±10% 50/60Hz, 0.9A 210 VA. The output power was kept 38 watts rms ± 5% (Compared with 18 watts from a standard Valley Lab Electrocautery). The working frequency was adjusted to 1.5 MHz ± 5%. Procedure was performed under local anaesthesia, periodontal dressing was given along with post-operative instructions later on (Figure 4a-4d).

Figure 4: a. Pre-operative, b. Electrocautery technique, c. Immediate post-operative, d. 6 month follow-up.

Case 5: Laser technique

A 22 yrs old healthy male, reported to the department of periodontics, NPDCH with the demand for cosmetic correction of "black gums" and "gummy smile". Degree of gingival pigmentation was given score as 2. A semiconductor diode laser was used in this technique. Safety glasses were worn by both the operating assistance and patient, reflected mirror surface were avoided for safety of the case. Patient was explained for this technique and after the consent depigmentation was done using this technique with light brushing strokes after application of anesthesia and the tip was kept in motion all the time. The diode laser (PicassoLite Diode Laser) at power setting of 2.5W fibre tip was used in a contact mode and moved, in a paint brush stroke. Remnants of the ablated tissue were removed using a sterile gauze which was dampened with saline solution. Then the wound was covered with periodontal pack (Figure 5a-5d).

Figure 5: a. Pre-operative, b. Laser technique, c. Immediate post-operative, d. 6 month follow-up.

Discussion

Gingival hyperpigmentation is a major concern for patients and many a times the patient ask for cosmetic treatment. Gingival depigmentation is a periodontal plastic surgical procedure where the gingival hyperpigmentation is removed or reduced by many different techniques.

Scrapping technique: One of the first and most accepted techniques to be seen was the surgical removal of undesirable pigmentation. It is the most effective method of depigmentation which does not need any sophisticated instruments. However, it might result in unpleasant haemorrhage and discomfort to patient during or after surgery. The procedure involves surgical removal of the gingival epithelium. The new epithelium which then forms is of without melanin pigmentation [5,8]. In our particular case the depigmentation showed better results from both clinical and patient point of view. The area healed completely in 10 days with normal appearance of gingiva. No pigmentation were noted on 6 months follow-up (Figure 1d).

Bur technique: The process of healing in bur method is more or less similar to the scalpel technique [9]. It is also comparatively simple, safe and easily done and readily repeated. Also, these techniques do not need any sophisticated equipments and are hence very economical. Pre- and post-surgical care is again similar to that of the scalpel technique. But additional care should be taken

regarding the control of speed and pressure of the bur so as not to cause any undesirable abrasion or pitting of the tissue [10]. No pigmentation was noted on 6 months follow up in our case (Figure 2d).

Partial-thickness flap: Scalpel surgical technique is highly recommended with the consideration in respect to the equipment constrains in developing countries. It is also simple, easy to perform, cost effective and above all with very minimum discomfort and esthetically acceptable to patient. This technique is contraindicated in cases with thin gingival areas, as removal of pigmented gingival epithelium may lead to gingival recession [11]. In present case, uneventful healing was observed after 10 days. No pigmentation was observed on 6 months follow-up (Figure 3d).

Electrocautery technique: Result was satisfactory, but the more postoperative discomfort and pain was observed compared to other technique. Electrosurgery has advantages regarding minimal bleeding and a cleaner work field. According to Oringer's "Exploding cell theory" [12] it is predicted that electrical energy leads to the molecular disintegration of melanin cells of the operated and surrounding sites. Thus, electrosurgery has a strong influence in retarding migration of melanin cells. However, electrosurgery requires more expertise than the other techniques mentioned. Prolonged or repeated application of current to the tissues induces heat accumulation and undesired tissue destruction [13]. Contact of current with the periosteum and vital teeth should be taken care of [14]. No pigmentation was noted on 6 months follow-up (Figure 4d).

Laser technique: Laser surgery has advantage such as bleeding is minimised and surgical duration is shortened. Laser technique has additional advantages that is sterilization effects and great coagulation. Incidence of repigmentation was minimal as compared to scalpel technique. Delayed type of inflammatory reaction may take place and mild post-operative discomfort lasting up to 1 - 2 weeks. Also, expensive and sophisticated equipments are required which makes the treatment very expensive. Another disadvantage is the loss of tactile feedback while using lasers [15]. In this case there were no pigmentation noted on 6 months follow-up (Figure 5d).

Conclusion

Facial appearance depends on many oral and extraoral factors. Aesthetics has become a very important and significant aspect of dentistry. People with high smile line demand for cosmetic surgery, which require removal of excessively pigmented gingival areas (Depigmentation) to create a great and confident smile, which altogether may enhance the personality of an individual. This can be achieved with any of the five techniques described in this case series. The methods used here are very easy and the results are quiet satisfactory and are effective. We observed minimal bleeding during surgery but patient discomfort during the initial healing period is more in electrocautery and laser procedures. However, it is safe to conclude that scaping, bur, split thickness technique adopted are simple, cost effective and less painful with minimal tissue loss and is comfortable to the operator as well as patient.

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