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CASE REPORT

Management of Gingival Hyperpigmentation by the Surgical Scalpel Technique - Report of Three Cases

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ABSTRACT

A smile expresses a feeling of joy, success, sensuality, affection and courtesy and reveals self confidence and kindness. The harmony of the smile is determined not only by the shape, position and the colour of teeth, but also by the gingival tissues. Gingival tissues form an important part of what we can consider to be a pleasing smile. Often, patients complain about dark gums being unsightly. Gingival pigmentation results from melanin granules which are produced by melanoblasts. Gingival melanin hyperpigmentation is not a medical problem, but black gums are a common complaint and fair skinned people with moderate or severe gingival pigmentation frequently request cosmetic therapy.

Melanin is elaborated by specific cells called melanocytes which reside in the basal cell layer and is transferred to the basal cell where it is stored in the form of melanosomes. Three cases of gingival hyperpigmentation which were treated by the surgical scalpel technique are described here. Also discussed here in brief, are the various other techniques that can be used for the same.

Key Words: gingiva, melanin, depigmentation, cryosurgery

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antimalarial agents and tricyclic antidepressants [1].

The gingiva is the most commonly affected intraoral tissue which is responsible for an unpleasant appearance. Melanin pigmentation often occurs in the gingiva as a result of an abnormal deposition of melanin. Hyperpigmentation of the gingiva is caused by excessive melanin deposition by the melanocytes which are mainly located in the basal and the suprabasal cell layers of the epithelium [2]. Brown or dark pigmentation and discolouration of gingival tissue can be caused by a variety of local and systemic factors. Systemic conditions such as endocrine disturbances, Albright's syndrome, malignant melanoma, antimalarial therapy, Peutz-jeghers syndrome, trauma, hemochromatosis, chronic pulmonary disease and racial pigmentation are known causes of oral melanin pigmentation [3]. High levels of oral melanin pigmentation are normally

Introduction

Gingival health and appearance are the essential components of an attractive smile. Oral melanin pigmentation is well documented in literature and is considered to have multifaceted etiologies including genetic factors, tobacco use, systemic disorders and prolonged administration of certain drugs, especially

observed in individuals of African, East Asian or Hispanic ethnicity.

Clinical melanin pigmentation of the gingiva does not present a medical problem, although complaints of black gums may cause aesthetic problems and embracement, particularly if the pigmentations are visible during speech and smiling [4]. Gingival depigmentation is a periodontal plastic surgical procedure where by the gingival hyperpigmentation is removed or reduced by various techniques. The first and foremost indication for depigmentation is the patient's demand for improved aesthetics. Various depigmentation techniques have been employed, with similar results [Table/Fig 1]. Selection of a technique should be based on clinical experience and the individual's preferences.

(Table/Fig 1)

- I. Methods aimed at removing the pigmented layer⁵
 - A. Surgical methods of depigmentation
 - 1. Scalpel surgical technique⁶,
 - 2. Cryosurgery⁷,
 - 3. Electro surgery⁸
 - 4. Lasers. Neodymium Aluminium-Yttrium-Gamet(Nd:YAG) lasers⁹
 - a. Erbium: (Er:YAG) lasers
 - b. Carbon dioxide (CO2) lasers
 - 5. Chemical methods of depigmentation using caustic chemicals-
This method is not used nowadays.
 - II. Methods aimed at masking the pigmented gingiva with grafts from less pigmented areas.
 - 1. Free Gingival grafts¹⁰
 - 2. Acellular Dermal Matrix allograft.

Removal of gingival melanin pigmentation should be performed cautiously and the adjacent teeth should be protected, since inappropriate application may cause gingival recession, damage to underlying periosteum and bone, delayed wound healing, as well as loss of enamel.

The present case reports introduce a simple and effective surgical depigmentation technique that doesn't require sophisticated instruments or apparatus, but yet yields aesthetically acceptable results.

Case Reports

Three cases of gingival hyperpigmentation which were managed by deepithelialization of the gingiva using a

surgical blade are documented here. The procedures were explained verbally to the patients and the consent forms were signed. 3 months and 6 months of follow up showed no signs of repigmentation.

Case 1

A 27 years old female was referred to the Department of Periodontics, Meenakshi Ammal Dental College, by the Department of Oral Medicine and Radiology, with the concern of her unaesthetic anterior gingiva. Melanin hyperpigmented gingiva was found on the labial surface of both maxillary and mandibular arches. The color of her gingiva was dark to black [Table/Fig 2] (Fig 1). The patient had acceptable oral hygiene levels, with good plaque control. After proper isolation of the surgical field, the operative site was anaesthetized using 2% xylocaine hydrochloride with adrenaline (1:200000). Blade no.15, with bard parker handle was used to scrap the epithelium carefully with underlying pigmented layer [Table/Fig 3] (Fig.2, 3 and 4). The raw surface was irrigated with saline solution. The surface was cleaned and checked for bleeding. The exposed depigmented surface was covered with Coe-pack periodontal dressing for one week. The patient was prescribed 0.12% chlorhexidine mouth wash for two weeks. The healing was uneventful, with a considerable improvement in aesthetics [Table/Fig 4] (Fig.5 and 6).



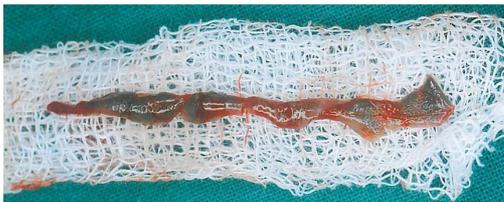
(Table/Fig 2)Fig 1



(Table/Fig 3) Fig 2



(Table/Fig 3) Fig 3



(Table/Fig 3) Fig 4



(Table/Fig 4) Fig 5



(Table/Fig 4) Fig 6

Case 2

An 18 years old female had a chief complaint of black gingiva [Table/Fig 5](fig.7). The procedures were performed with the same method as described in the previous case [Table/Fig 5] (fig.8). The wound healed well after two weeks. No pain or bleeding complications were found. The gingiva became pink and healthy within 3 weeks [Table/Fig 6] (Fig.9 and 10).



(Table/Fig 5) Fig 7



(Table/Fig 5) Fig 8



(Table/Fig 6) Fig 9



(Table/Fig 8) Fig 12



(Table/Fig 6) Fig 10



(Table/Fig 9) Fig 13

Case 3

A 21 years old female had a chief complaint of black gingiva [Table/Fig 7] (fig.11). The procedures were performed with the same method as in the previous case [Table/Fig 8] (Fig.12). The wound healed well after two weeks. No pain or bleeding complications were found. The gingiva became pink and healthy within 6 weeks [Table/Fig 9](Fig.13).



(Table/Fig 7) Fig 11

Results

In all the above three cases, no post operative pain, haemorrhage, infection or scarring occurred in any of the sites on the first and subsequent visits. The healing was uneventful. The patient's acceptance of the procedure was good and the results were excellent, as perceived by the patient. The follow up period spanned 3 months and 6 months. There was no repigmentation.

Discussion

There are wide variations in the gingival colour in normal healthy persons. The degree of vascularization, the thickness of the keratinized layer and the amount of the pigment containing cells determine the colour of the gingiva [11]. Melanin pigmentation is the result of melanin granules which are produced by melanoblasts which are intertwined between the epithelial cells at the basal layer of the epithelium. Brown or dark pigmentation and discolouration of gingival tissue, whether of a physiological or pathological nature, can be caused by a variety of local and systemic factors. This type of pigmentation is symmetric and

persistent and it doesn't alter the normal architecture. This pigmentation may be seen across all races and at any age and has no gender predilection [4]. A positive correlation between the gingival pigmentation and the degree of pigmentation in the skin, seems however evident [12].

Various clinical and experimental reports describe different depigmentation methods. Elimination of these melanotic areas through surgery and laser surgery, as well as by cryosurgical depigmentation through the use of a gas expansion system, has been reported. These treatment modalities are not widely accepted or popularly used.

Electrosurgery requires more expertise than scalpel surgery. Prolonged or repeated application of current to the tissues induce heat accumulation and undesired tissue destruction. Contact of current with the periosteum or the alveolar bone and vital teeth should be avoided [8].

Cryosurgery is followed by considerable swelling and it is also accompanied by increased soft tissue destruction. Depth control is difficult and optimal duration of freezing is not known, but prolonged freezing increases tissue destruction [7].

Another effective treatment for depigmentation is using lasers. A one step laser treatment is usually sufficient to eliminate the pigmented areas and do not require any periodontal dressing. This has the advantage of easy handling, short treatment time, haemostasis and decontamination and sterilization effects. But this approach needs expensive and sophisticated equipment that is not available commonly at all places and it makes the treatment very expensive [13].

CO2 lasers cause minimum damage to the periosteum and the underlying bone and they have the unique characteristic of being able to remove a thin layer of epithelium cleanly. Although the healing of the laser wound is slower than the scalpel wound, laser wound is a sterile inflammatory reaction. The treated gingiva

and mucosa do not need any dressing when they are treated with laser. So, re-epithelialization will be faster. Atsawasuwan [13] et al have reported four cases of gingival melanin hyperpigmentation using Nd: YAG laser and have demonstrated good results; the complications being gingival fenestration and bone exposure.

Free gingival grafting is quite an invasive and an extensive procedure and it has not been advised for depigmentation procedures routinely. It also has the disadvantage of a second surgical site, additional discomfort and poor tissue colour matching at the recipient site [14].

One of the first and still popular techniques to be employed was the surgical removal of portions of pigmented gingiva using scalpels [15]. The use of the scalpel technique for depigmentation is the most economical one as compared to other techniques which require more advanced armamentarium. However, scalpel surgery causes unpleasant bleeding during and after the operation and it is necessary to cover the surgical site with periodontal dressing for 7 to 10 days. Among the mentioned techniques, we found that the scalpel technique was relatively simple and versatile and that it required minimum time and effort [11].

In the cases reported here, a simple and effective method of depigmentation which doesn't require any sophisticated instruments was used. The results were excellent and at 6 months of follow up, there was no evidence of repigmentation of the gingiva. It is known that the healing period for scalpel wounds is faster than other techniques; however, scalpel surgery causes unpleasant bleeding during and after the operation and it is necessary to cover the lamina propria with periodontal packs for 7-10 days. In our cases, there was no scar after healing and the healing time was 2-4 weeks. Care should be taken while removing the pigmentation in the thin gingival tissue, so that the alveolar bone should not be exposed. Though the cryosurgery and laser therapy modalities achieved satisfactory results, they required

sophisticated equipment that is not commonly available in hospitals and clinics in developing countries. Therefore, the scalpel surgical technique is highly recommended in the consideration of equipment constraints in developing countries. It is simple, easy to perform, cost effective and above all, there is minimum discomfort and it is aesthetically acceptable to the patient.

The three case series documented here, have undergone a simple and effective surgical procedure for the treatment of gingival melanin hyperpigmentation, resulting in improved aesthetics and cosmetic appearance.

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