

Gingival Pigmentation : As Pink As You Can Think - A Case Series

Introduction

A smile expresses a feeling of joy, success, affection, courtesy, self confidence & kindness. A smile is more than a method of communication. It is a means of socialization & personal well being. Aesthetics is dealing with nature, creation & appreciation of beauty. Facial aesthetics is majorly determined by an individual's smile.

Oral aesthetic zones are:

- Lips
 - Delineate portion of mouth on display
- Gingiva
 - Frames & defines shape of individual teeth
- Teeth
 - Ultimate focus of observers assessment

The gingiva is most commonly affected intraoral tissue responsible for an unpleasant appearance. Melanin pigmentation of the gingiva occurs in all races¹. Melanin, a brown pigment, is the most common natural pigment contributing to endogenous pigmentation of gingiva and the gingiva is also the most predominant site of pigmentation on the mucosa. Melanin pigmentation is the result of melanin granules produced by melanoblasts intertwined between epithelial cells at the basal layer of gingival epithelium². Earlier studies have shown that no significant difference exists in the density of distribution of melanocytes between light-skinned, dark-skinned, and black individuals. However, melanocytes of dark-skinned and black individuals are uniformly highly reactive than in light-skinned individuals³.

Gingival depigmentation is a periodontal plastic surgical procedure whereby the gingival hyperpigmentation is removed or reduced by various techniques. The first and foremost indication for depigmentation is patient demand for improved esthetics. Various depigmentation techniques have been employed with similar results. Selection of the technique should be based on clinical experiences and individual preferences. One of the first and still popular techniques to be employed is the surgical removal of undesirable pigmentation using scalpels⁴. There is only limited information in the literature on depigmentation using surgical techniques. The procedure essentially

involves surgical removal of gingival epithelium along with a layer of the underlying connective tissue and allowing the denuded connective tissue to heal by secondary intention. The new epithelium that forms is devoid of melanin pigmentation⁴.

The present case series describes simple and effective surgical depigmentation technique. This report describes the effects of surgical depigmentation on oral mucosa and it is hoped that the results will be used to suggest an effective method for treatment of similar oral mucosal lesions. All these cases have produced good results with patient satisfaction.

Case Reports

Case 1

A 20-year-old female patient complaining of heavily pigmented gums visited Department of Periodontology, IDEAS Dental College, Gwalior. On examination, it was seen that the patient had a very high smile line that revealed the deeply pigmented gingiva from first premolar to first premolar (Figure 1). Considering the patient's concern, surgical depigmentation procedure was planned. The entire procedure was explained to the patient and written consent was obtained. Routine oral hygiene procedures were carried out and oral hygiene instructions were given. Local anesthesia was infiltrated in the maxillary anterior region from first premolar to first premolar. Using a number 15 Bard Parker blade, scrapping of the pigmented epithelium up to the level of the mucogingival junction was carried out, leaving the connective tissue intact (Figure 2). After complete removal of the entire epithelium, abrasion with diamond bur was done to get the physiological contour of the gingiva. Bur was used with minimal pressure with feather light brushing strokes.

A periodontal dressing (Coe-Pak) was placed on the surgical wound area for patient comfort and to protect it for 1 week. The patient was kept on analgesics for a period of 5 days and was advised to use 0.12% chlorhexidine gluconate mouthwash for 2 weeks postoperatively. During postoperative period, the wound healing was uneventful without any discomfort. Three months postoperative examination showed well-epithelialized gingiva, which was pink in color and pleasant (Figure 4)

Case 2 and 3

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A 25-year-old female patient and 32 year Male patient visited the Department of Periodontics, IDEAS Dental College with the chief complaint of "black" colored gums (Figure 5 & 9). Their oral examination revealed that they had deeply pigmented gingiva from right first premolar to left first premolar. The depigmentation procedure with scalpel was planned accordingly. After administration of local anesthetic, a Bard Parker handle with a No. 15 blade was used to remove the pigmented layer (Figure 6 & 10). Pressure was applied with sterile gauze soaked in local anesthetic agent to control hemorrhage during the procedure. The entire pigmented epithelium along with a thin layer of connective tissue with scalpel was removed. The exposed surface was irrigated with saline the surgical area was covered with a periodontal dressing.

Post-surgical instructions were given to the patients along with antibiotics and analgesics. The patients were advised to 0.2% chlorhexidine gluconate mouth wash 12th hourly for 1 week. The patients were reviewed at the end of 1 week (Figure 7&11). The healing process was proceeding normally and it was quite uneventful on the surgical area. At the end of 3 months, re-epithelization was complete and healing was

found to be satisfactory (Figure 8&12).

Discussion

Background

There are wide variations in the gingival colour in healthy persons. Most of the times, these variations are in the form of blackened spots and are caused by the presence of melanin pigments. In some cases, the presence of pigmentation indicates nothing more than a physiological phenomenon, whereas in other cases, it is pathologic in nature. As far as the physiologic pigmentation is concerned, the gingival colour variations are dependent on the intensity of the melanogenesis, the degree of epithelial cornification, the depth of epithelialization and the arrangement of the gingival vasculature (5).

Etiology

- Multifactorial
 - Genetic(6)
 - Drugs(7)
 - Endocrine(8):
- Addison's disease
- Peutz-Jeghers Syndrome
- Albright syndrome
 - Post-inflammatory:
- Chronic Inflammation: The gingiva becomes redder when there is an increase vascularisation or the degree of epithelial keratinization becomes reduced or disappears. The color becomes paler when vascularisation is reduced or epithelial keratinization increases. So it gives red and bluish red color (venous stasis)
 - Acute Inflammation: Color changes are more marginal, diffuse or patch like depending upon underlying acute condition. In ANUG it is seen as Marginal involvement. In hepatic gingivostomatitis is of diffuse type. In acute reactions to chemical irritation it represents as patch like or diffuses type. Initially there is red erythema; in severe acute inflammation the red colour gradually becomes a dull whitish gray.

Types

- Localized
- Generalized/ multiple
- Endogenous pigmentation

Pigment	Color	Disease
Hemosiderin	Brown, Red, Purple	Yaws, Hemangiomas, Kaposi's Sarcoma, Angiodysplasia, HFE
Hemorrhoidin	Pink, Red, Purple	Erythema, Petechiae, Fibrinoid Vessels, Hemorrhagic mucositis
Melanin	Brown, Black or grey	Hemangiomas, Melasma, Nevus, Melanoma, Basaloid Melanoma with cysts

Source	Color	Disease
Silver Amalgam	Grey, Black	Tarso, and Inorganic Estoma
Chlorine Bleach Mercury	Grey, Black	Tarso, Estoma
Fluoride	Grey	Irritation of perioral and Medicines
Chlorogenic Bacteria	Black, Brown, Green	Supercilial colonization, Hairy Tongue

Exogenous pigmentation

Exogenous pigmentation

Melanin, a brown pigment, is the most common natural pigment contributing to endogenous pigmentation of the gingiva. Physiologic pigmentation of the oral mucosa (mostly gingiva), is clinically manifested as multifocal or diffuse melanin pigmentation with variable amounts in different ethnic groups worldwide^{1,9} and it occurs in all races^{1,10}. Melanin is deposited by

melanocytes, mainly located intertwined between the basal and the suprabasal cell layers of epithelium^{2,11}, often observed to a greater degree at the incisors¹². In Caucasians, most melanocytes have striated granules that are incompletely melanized and vary in size from 0.1 to 0.3 mm. But, the amount is insufficient to cause pigmentation (less than 10% demonstrate pigmentation). A high amount of melanin granules is found in individuals of African and East Asian ethnicity⁶. In them, the granules are more completely melanized and form larger complexes of size about 13 μm; hence, clinical pigmentation is evident. Therefore, the size and degree of melanization of these granules is directly proportional to the degree of pigmentation¹². Also, there appears to be a positive correlation between gingival pigmentation and degree of dermal pigmentation¹³. However, melanin pigmentation of the gingiva is symmetric and does not alter the normal gingival architecture¹.

In dark-skinned and black individuals, an increased melanin production has long been known to be the result of genetically determined hyperactivity of melanocytes. Melanocytes of dark skinned and black individuals are uniformly highly reactive, whereas in light skinned individuals, melanocytes are highly variable in reactivity^{14,15}. In general, individuals with fair complexion will not demonstrate overt tissue pigmentation, even though comparable numbers of melanocytes are present within their gingival epithelium¹⁶.

Methods of Depigmentation:

1. Surgical methods: The saturation of melanin pigments can causes unesthetic dark gingival display^{4,12,17}
 - Criteria for patient selection
 - Skin shade not very dark toned, but gingiva is deeply pigmented.
 - Periodontal health not compromised or is pretreated.
 - Adequate thickness of the periodontal tissues.
 - The depigmentation procedure is recommended after periodontal health is restored.
 - The thickness of the periodontal tissues helps to establish selected thickness of the epithelium to determine the extent of surgeons excisions required.
- Following techniques can be performed¹⁷.
 - Gingivo-abrasion technique.
 - Split thickness epithelial excision.
 - Combination of abrasion a split thickness epithelial excision
 - Gingivo-abrasion technique:
 - Simple and effectivetechnique.
 - A medium grit football shaped diamond bur is used at high speeds on the epithelium to denude it.
 - The pressure used with the

diamond should be minimal and copious irrigation is recommended. Hand instruments with a circular cutting edge may also be used.

- A periodontal pack is then placed over the denuded epithelium
- Split thickness epithelial excision technique:
 - A split thickness tissue of epithelium is removed on the attached part of the mucosa. A circumferential incision involving the entire pigmented area is made.
 - Tissue holding forceps are then used to raise the epithelium.
 - A sharp no. 11 blade is used to tease the epithelium away leaving the connective tissue intact.
 - The epithelium excised may be in separate fragments. Periodontal pack is given for a week.
- Combination technique
 - In cases where pigments are present very close to marginal gingiva and where the gingival pattern has areas of depressions and elevation on the facial aspect, a combination technique is advised.
 - Gingival abrasion is used near marginal gingiva and areas where a split thickness excision is difficult.
 - A split thickness gingival excision is then performed to remove the remaining pigmented epithelium
 - The main objective to the depigmentation surgery is to remove the epithelium leaving the connective tissue intact.
 - However over a period of time pigments redeposit in the epithelium.
 - It has been observed that deposition of pigments is faster after the abrasion tech as against the excision tech.
- Free Gingival Grafts¹⁸
- 2. Cryosurgical depigmentation^{19,20}:
 - Physical and chemical changes induced by freezing lead to cell destruction and tissue death. While most vital tissues freeze at approximately 2°C. Ultra low temperature below 20°C results in total cell death.
 - Superficial gingival cryosurgery as well as full thickness, gingival freezing in humans and animals have demonstrated healing by "Complete regeneration" and sterile inflammatory reaction.
- 3. Lasers²¹:
 - Various laser techniques for ablation of cutaneous pigmented lesion and oral lesion has been advocated. Among them are Nd:Yag²² Semiconductor diode laser²³ CO2 laser²⁴ Argon Laser²⁵
 - Recurrence of pigmentation following therapy
 - Pigment recurrence has been documented to occur following the surgical procedure, within 24 days to 8-year long period. Perlmutter¹² et al. (1986) showed that gingival surgical procedures performed solely for



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cosmetic reasons offer no permanent results. Repigmentation refers to the clinical reappearance of melanin pigment following a period of clinical depigmentation. The mechanism suggested for the spontaneous repigmentation is that the melanocytes from the normal skin proliferate and migrate into the depigmented areas.

In the present case series 3 cases, were treated using epithelial excision techniques (conventional slicing). The depigmentation procedure by scalpel technique is simple, easy to perform, noninvasive, and above all, cost effective. According to Almas and Sadiq¹⁷ (2002), the scalpel wound heals faster than that in other techniques

However, scalpel surgery causes unpleasant bleeding during and after the operation, and it is necessary to cover the surgical site with

periodontal dressing for 710 days²⁶. Scalpel and abrasion technique relatively simple and versatile and it required minimum time and effort. No sophisticated and expensive armamentarium was required; only blade and bur were sufficient.

Conclusion

The need and demand for esthetics requires the removal of unsightly pigmented gingival areas to create a pleasant and confident smile, which altogether may alter the personality of an individual. This could be easily attained by using the method described above. Its benefits include ease of usage, effectiveness in the treatment of superficial benign pigmented lesions, convenience in dental clinics, and decreased trauma for the patient.

Reference

References are available on request at editor@healtalkht.com

Legends

Case 1

- FIG.1 Pre Operative
- FIG. 2 De epithelialization Done
- FIG.3 One Week Post operatively
- FIG. 4 3 Months Post Operatively

Case 2

- FIG. 5 Pre Operatively
- FIG. 6 Deepithelialization Done
- FIG. 7 One Week Postoperatively
- FIG.8 3 Months Postoperatively

Case 3

- FIG.9 Pre Operatively
- FIG.10 Deepithelialization Done
- FIG.11 One Week Postoperatively
- FIG.12 3 Months Postoperatively

Case 1



Case 2



Case 3

