

Sequential Approach toward Treatment of Score 3 Gingival Pigmentation with 9-month Follow-up: A Case Report

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Abstract

The demands placed on cosmetics have grown over time, and the latest developments in gingival aesthetics and smile design are rather telling. Gingival pigmentation has grown in importance as a component of overall aesthetics, particularly on the labial portion of front teeth. Despite not being a medical condition, many individuals find black gums to be unattractive. This case report describes a straightforward surgical depigmentation that was carried out without the need for complex equipment or tools.

Keywords: Depigmentation, Gingival melanin pigment, Scalpel surgery, Smile design.

INTRODUCTION

The deposition of coloring matter, coloration, or discoloration by a pigment pertaining to the gingiva is gingival pigmentation (GP).^[1]

Melanin is non-hemoglobin-derived brown pigment, most common of the endogenous pigments. It is a derivative of tyrosine and is synthesized in the melanocytes. The melanocytes are embryologically derived from neural crest ectoderm. In the human fetus, it enters the epidermis and presumably the oral epithelium from the 11th week onward.^[2] Once in the epithelium, these cells constitute a self-producing population normally situated within the basal layer of the fully developed human epidermis, although they have been observed suprabasally in human oral epithelium.^[3]

Gingival health and appearance are essential components of an attractive smile. Oral melanin pigmentation is well documented in the literature and is considered to be multifactorial, whether physiological/pathological and can be caused by a variety of local and/or systemic factors (Durnmet, 1979) including genetic, tobacco use, and prolonged administration of certain drugs, especially antimalarial agents and tricyclic antidepressants.^[4]

The gingiva is most commonly affected intraoral tissue responsible for an unpleasant appearance. Melanin pigmentation often occurs in the gingiva as a result of an abnormal deposition of melanin. This pigmentation may be seen across all the races^[5] and at any age^[6] and it is without gender predilection.^[7]

Although melanin pigmentation of the gingiva is completely benign and does not present a medical problem, complaints of black gums are common, particularly in patients having a very high smile line (gummy smile).

The smile lines can be analyzed according to the following classification:

1. Class 1: Very high smile line - More than 2 mm of the marginal gingiva visible or more than 2 mm apical to the cemento-enamel junction visible for the reduced but healthy periodontium. This could be gummy smile.
2. Class 2: High smile line - Between 0 and 2 mm of marginal gingiva visible or between 0 and 2 mm apical to the cemento-enamel junction visible for the reduced but healthy periodontium.
3. Class 3: Average smile line - Only gingival embrasures are visible.
4. Class 4: Low smile line- gingival embrasures and cemento-enamel junction not visible.^[8]

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GP has three dimensions: etiology, distribution, and severity. The existing indices on GP are as follows.

Oral pigmentation index (DOPI)^[9]

This index of oral pigmentation is the commonly used index due to its simplicity and ease of use. The scores are as follows:

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

Melanin index^[10]

This index has classified pigmentation as follows:

1. No pigmentation
2. One or two solitary unit(s) of pigmentation in papillary gingiva without the formation of a continuous ribbon between solitary units
3. More than three units of pigmentation in papillary gingiva without the formation of a continuous ribbon
4. One or more short continuous ribbons of pigmentation
5. One continuous ribbon including the entire area between canines.

GP index^[11]

1. Score 0: Absence of pigmentation
2. Score 1: Spots of brown to black color or pigments.
3. Score 2: Brown to black patches but not diffuse pigmentation
4. Score 3: Diffuse brown to black pigmentation, marginal, and attached.

CASE REPORT

Patient aged 22 came to the Department of Periodontology, People Dental Academy, Bhopal with the complaint of dark-colored gingiva. On examination, the patient had high smile line, and according to DOPI, the patient had heavy clinical pigmentation (deep brown or bluish-black color) that was visible when she was talking or smiling (Figure 1). On GP index, the patient had score 3 GP, i.e., diffuse, brown to black pigmentation, marginal, and attached.

There was no relevant medical history related to the pigmented gingiva of the patient. Considering the esthetic concern of the patient, the depigmentation procedure was carried out.

METHODS

The conventional scalpel method was opted for the treatment procedure.

It is also called split-thickness epithelial excision and surgical stripping. Conventional scalpel method involves the surgical excision of gingival epithelium using a scalpel and allowing the denuded connective tissue to heal by secondary intention. It is simple, most economical and convenient to perform with

minimum time and efforts. Healing with this technique is faster in comparison to other surgical techniques.

Although lower cost and lower rate of recurrence favor the surgical stripping of gingiva, it is associated with pain, post-operative discomfort, intra- and post-operative bleeding and requires placement of periodontal dressing. Thinner gingival biotypes and narrow papillary areas contraindicate the use of this technique.^[12]

Procedure

The patient was given oral hygiene instructions and underwent scaling and the depigmentation procedure was done after the patient was clinically plaque and gingivitis-free. Gingival depigmentation was carried out from canine to canine. In the first appointment maxillary arch was treated and in the next week, mandibular arch was taken up for treatment.

2% block anesthesia was injected into the maxillary arch. With the use of No. 15 scalpel blade, split-thickness epithelial incision was made and the tissue was excised (Figure 2a).

Pressure gauge was applied to control the bleeding. The patient was given post-surgical instructions and was asked to avoid spicy food. The patient was prescribed amoxicillin 500 mg (TDS) for 3 days along with painkillers. The patient was recalled after 7 post-operative day to analyze and proceed with the mandibular arch.

After 7th day, the patient came with the healed maxillary arch and we then performed the split-thickness epithelial excision in the mandibular arch (Figure 2b).

The patient was recalled after 7th post-operative day after treating the mandibular arch and check-up was done (Figure 3a).



Figure 1: Pre-operative

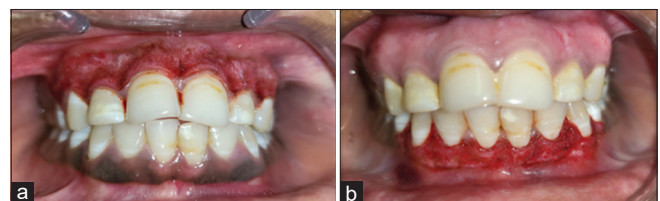


Figure 2: Gingival depigmentation using scalpel method in maxillary arch (a) and mandibular arch (b)

The patient was recalled again after 1 month. The gingiva appeared pink and healthy with a firm consistency and completely devoid of inflammation (Figure 3b).

The patient was recalled after 9 months (Figure 4).

Patient's esthetics were highly improved and at the end of 9 months, no further repigmentation was seen. According to DOPI, the patient presented with mild clinical pigmentation (mild light brown color). On GP index, the patient presented with score 1 GP, i.e., spots of brown-to-black color or pigmentation.

DISCUSSION

Gingival depigmentation can be defined as a periodontal plastic surgical procedure whereby the gingival hyperpigmentation is removed or reduced by various techniques.^[13] Depigmentation is not a clinical indication but a treatment of choice where esthetics is a concern and is desired by the patients.

Roshni and Nandakumar in 2005 classified different gingival depigmentation methods.^[14] Different methods that aimed at removing the pigmented gingiva include surgical methods and chemical method. Surgical method includes scalpel surgical technique, bur abrasion method, electrosurgery, cryosurgery, lasers, and radiosurgery. There also are different methods that aimed at masking the pigmented gingiva which include free gingival graft and acellular dermal matrix allograft.

Scalpel surgical technique was one of the first techniques described for gingival depigmentation and still enjoys the status of being the most popular treatment modality. This technique was first illustrated by Dummet and Bolden in 1964.^[15] Scalpel surgical technique is highly recommended in consideration of the equipment constraints in developing countries. It is simple,

easy to perform, cost effective, and above all with minimum discomfort and esthetically acceptable to patient.

Bur abrasion method was first documented and reported by Ginwalla *et al.* in 1966.^[16] It is a relatively simple and versatile technique and requires minimum time and effort. Technique involves de-epithelization of pigmented areas of the gingiva using high-speed rotary instruments after adequate local anesthesia.

In electrosurgical technique,^[17] loop electrode is used for excision and ball electrode is used to coagulate. Minimal bleeding with a clean field increased the efficacy of the work. Light brushing strokes are used and the tip is kept moving all the time.

In laser technique, melanin-pigmented gingiva is ablated with a flexible, hollow-fiber delivery system in the contact mode, under standard protective measures. Laser has the advantages of easy handling, short treatment time, hemostasis, decontamination, and sterilization effects. Laser is found to be a good and safe choice for the removal of pigmented gingiva.

Besides mechanical methods, chemicals methods are also there, which are no longer in use because of their destructive nature and difficulty in controlling the depth of their penetration. A mixture of 90% phenol and 95% alcohol has been used by Hirschfeld and Hirschfeld in 1951.^[18]

In this present case, scalpel surgical technique was highly recommended in consideration of the equipment constraints that may not be frequently available in clinics. Post-surgery, certain localized areas of repigmentation were seen at the end of 1 month. At the end of 9 months, no further repigmentation was observed.

Results were compared with regard to the depigmentation achieved after 9 months. According to DOPI index, we achieved the score of mild clinical pigmentation from the heavy clinical pigmentation. Moreover, according to the GP index, score 1 was achieved from score 3 which the patient presented on the 1st day of her visit.

CONCLUSION

The scraping technique using the scalpel is one of the most economic and also does not require extensive armamentarium. However, scalpel surgery causes unpleasant bleeding during and after the procedure and it is necessary to cover the surgical site with periodontal dressing for 7–10 days. Although the initial results of de-pigmentation procedure are highly encouraging, repigmentation is a common problem. The patient was highly pleased with the improvement of her esthetics which also helped her to gain her confidence back.

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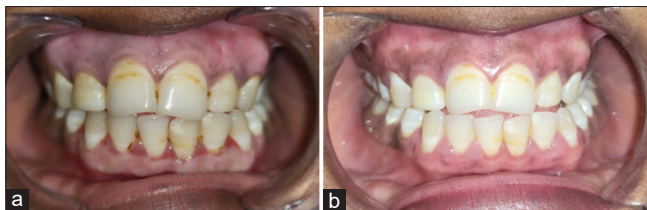


Figure 3: Healing after 1 week (a) and healing after 1 month (b)



Figure 4: After 9-month follow-up

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