

Case Report**Brown to Pink Gingiva: Report of Two Cases**

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**Abstract:** Gingival pigmentation is a major concern for a large number of patients visiting the dentist. The patients with excessive gingival display and pigmentation are more concerned aesthetically. Melanin hyper pigmentation usually does not present as a medical problem, but patients may complain about their unaesthetic black gums. The gingiva is the most frequently pigmented intraoral tissue, with the highest rate observed in the area of the incisors. Aesthetic periodontal plastic surgery is a boon in patients having "dark gums" and "gummy smile." This is a case report representing a simple surgical technique of de-epithelization which has been successfully used to treat gingival hyperpigmentation caused by excessive melanin deposition.

Keywords: Depigmentation; Melanin; Melanocytes; Pigmentation; Oxyhemoglobin; Gingiva.

**Introduction**

The pigments are not only the most beautiful, but also some of the most vital substances in the body. The pigments of biological origin are frequently striking and of brilliant color.<sup>1</sup> Melanin, carotene, reduced hemoglobin and oxyhemoglobin are the main pigments contributing to the normal color of the oral mucosa. The color of the gingiva is determined by several factors, namely number and size of the blood vessels, epithelial thickness, quantity of keratinization and pigments within the gingival epithelium.<sup>2</sup>

Melanin pigmentation of the gingiva occurs in all races. Melanin, a brown pigment, is the most common cause of endogenous pigmentation of gingiva and is the most predominant pigmentation of mucosa.<sup>3</sup> Melanin is deposited by melanocytes, mainly located intertwined between the basal and the suprabasal cell layers of epithelium, often observed to a greater degree at the incisors.<sup>4</sup> In Caucasians, most melanocytes have striated granules that are incompletely melanized and vary in size from 0.1 to 0.3  $\mu\text{m}$ . 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 ethnicity.<sup>5</sup> In them, the granules are more completely melanized and form larger complexes of size about 1–3  $\mu\text{m}$ ; hence, clinical pigmentation is evident. Therefore, the size and degree of melanization of these granules is directly proportional to the

degree of pigmentation.<sup>6</sup> Also, there appears to be a positive correlation between gingival pigmentation and degree of dermal pigmentation.<sup>7</sup> 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.<sup>8</sup> In general, individuals with fair complexion will not demonstrate overt tissue pigmentation, even though comparable numbers of melanocytes are present within their gingival epithelium.<sup>9</sup>

Gingival hyperpigmentation is seen as a genetic trait in some populations and is more appropriately termed physiologic or racial gingival pigmentation.<sup>10</sup> Melanin hyperpigmentation usually does not present as a medical problem, still the patients with excessive gingival display and pigmentation are more concerned aesthetically. This problem is aggravated in patients with a "gummy smile" or excessive gingival display while smiling. 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.<sup>3</sup>

**Methods aimed at removing the pigment layer<sup>7,8,9,11</sup>****1. De-epithelization**

a. Scalpel technique

b. Gingival abrasion technique using diamond bur

c. Combination of the scalpel and bur

## 2. Gingivectomy

### 3. Gingivectomy with free gingival autografting

### 4. Acellular dermal matrix allograft (ADMA)

### 5. Electrosurgery

### 6. Cryosurgery

a. Using liquid nitrogen

b. Using a gas expansion system

### 7. Chemical agents

a. 90% phenol and 95% alcohol

b. Ascorbic acid

### 8. Laser

a. Nd:YAG

b. Semiconductor diode laser

c. CO<sub>2</sub> laser

d. Argon laser

### Case reports:

A male and a female patient aged 20 and 29 yrs respectively visited department of Periodontics, Rama Dental College, Hospital and Research Centre, Kanpur. On examination, the patient had a very high smile line (more than 2 mm of gingiva was visible on smiling)<sup>12</sup> that revealed the deeply pigmented gingiva from second premolar to second premolar [Figure 1,4]. Pigmentation was unsightly and hence depigmentation procedures were planned.



*Figure 1 Case 1: Pigmented gingiva pre operatively*

A complete medical history and blood investigation was carried out to rule out any systemic contraindication for surgery. The patients were given oral hygiene instructions, underwent scaling and the

depigmentation procedure was taken up after the patients were free of inflammation. Gingival depigmentation was carried out from second premolar to second premolar. Scraping technique was used for the male patient as he had thin gingival biotype [Figure 2]. Whereas, slicing technique was used for the female patient as the patient had thick gingival biotype [Figure 5,6]. Both the patients had grade 4 pigmentation according to Dummet's classification.<sup>12</sup>



*Figure 2- Case -1- De-epithelialized gingiva immediately after surgery*

**Case 1 :** After administering local anaesthesia (Lidocaine 2% with 1:80,000 Epinephrine), the uppermost layer of the gingiva was carefully scraped using 15 number blade which was held parallel to the long axis of the teeth. Minimum force/pressure was used to avoid post-operative gingival pitting. Bleeding was controlled with a sterile gauze pressure pack. Care was taken to remove all the remnants of melanin pigment as thoroughly as possible. However, some areas were left due to presence of very thin gingiva to avoid exposure of bone in region of attached gingiva.



*Figure 3 Case 1: Showing post operative healing after 1 month of surgery*

Surgical areas were covered with a periodontal pack and post-operative instructions were given. Analgesics were prescribed for the management of pain. After one week the pack was removed and the surgical area was examined. The healing was uneventful and satisfactory. No post-surgical complications were encountered. Three month post operative examination showed well epithelialized gingiva, which was pink and pleasant but with few sites showing remnants of pigmentation [Figure 3].

**Case 2:** After administering local anesthesia (Lidocaine 2% with 1:80,000 Epinephrine), the uppermost layer of the gingiva was carefully scraped using 15 number blade which was held parallel to the long axis of the teeth. Split thickness flap was raised and epithelium was removed as it contains melanin. Bleeding was controlled with a sterile gauze pressure pack. Care was taken to remove all the remnants of melanin pigment as thoroughly as possible



*Figure 4-Case 2: Pigmented gingiva pre operatively*

However, some areas were left due to presence of very thin gingiva to avoid exposure of bone in region of attached gingiva. Surgical areas were covered with a periodontal pack and post-operative instructions were given. Analgesics were prescribed for the management of pain. After one week the pack was removed and the surgical area was examined. The healing was uneventful and satisfactory. No post-surgical complications were encountered. Three month post operative examination showed well epithelialized gingiva, which was pink and pleasant but with few sites showing remnants of pigmentation [Figure 7].



*Figure 5-Case 2: Depigmentation by split thickness flap technique*



*Figure 6-Case 2: De-epithelialized gingiva immediately after surgery*



*Figure 7 Case 2: Post operative healing after 1 month of surgery*

### Discussion:

Oral pigmentation occurs in all races of humans. There are no significant differences in oral pigmentation between males and females. The intensity and distribution of pigmentation of the oral mucosa may be variable, not only between races, but also between different individuals of the same race and within different areas of the same mouth. Physiologic pigmentation is probably genetically determined, but as Dummett<sup>13</sup> (1946) suggested, the degree of pigmentation is also related to mechanical, chemical, and physical stimulation.<sup>14</sup>

Pigmented gingival tissue, many at times forces the patients to seek cosmetic treatment. Though the pigmented gums might not always be of concern from medical point of view, still it is reported as a complaint in smile conscious individuals, especially the ones with gummy smile. Several treatment modalities have been suggested and presented in the literature ranging from a simple slicing method<sup>5</sup> to free gingival grafts<sup>15</sup> or "push back"<sup>16</sup> operation where alveolar bone may be exposed leading to bone loss, secondary healing, discomfort and pain. However, many easy, simple and effective techniques<sup>5,1</sup> are described, which gives desired results. The epithelium melanin unit is formed by the melanocytes and keratinocytes.

The technique used in this case report is scalpel de epithelization. The new

epithelium that forms is devoid of pigmentation. Scalpel de-epithelization is relatively simple and effective, and most economical of all the other techniques available. It does not require any sophisticated armamentarium, is easy to perform and, most importantly, requires minimum time and effort. Also, the healing period for scalpel wound is faster than other techniques. However, it might result in unpleasant hemorrhage during or after surgery. Hence, it is necessary to cover the lamina propria with periodontal dressing for 7–10 days. It also has chances of infection or recurrence. Results reported are excellent. This technique is highly recommended in the Indian subcontinent considering equipment constraints and patient affordability.<sup>8</sup>

**Conclusion:** Various techniques are available with some advantages and some drawbacks. However, choice of the technique should be dependent on individual preference, clinical expertise and patient affordability. More data is required on comparative techniques to ensure the long term predictability and success.

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