

# Aesthetic Treatment of Gingival Melanin Hyperpigmentation with Four Different Methods : A Comparative Case Report

Dr. Poonam M. Singh  
Professor & Guide

Dr. Kinjal Kagrana  
P.G. Student

Dr. Rithu Rawal  
P.G. Student

Department of Periodontology, Padmashree Dr. D.Y. Patil Dental College & Hospital, Nerul, Navi Mumbai

## Abstract

**Purpose:** The purpose of this study was to evaluate the clinical effectiveness and patient's satisfaction with treatment of gingival melanin hyperpigmentation with four different methods for depigmentation.

**Methods:** An 18 years old female with the concern of her unaesthetic anterior gingiva was chosen for this study. Clinical photographs were taken at the preoperative stage & the patient was treated under local anesthesia. In the maxillary right quadrant & left quadrant, the gingival deepithelization was conducted with a No.15 blade and a bard parker handle & a high speed diamond bur respectively, whereas, in the mandibular left & right quadrant with a semiconductor diode laser & an electrocautery respectively. Clinical parameters such as bleeding, wound healing, pain and difficulty of procedure & photographs were taken immediately after the procedures and at 1<sup>st</sup>, 2<sup>nd</sup>, & 4<sup>th</sup> week to evaluate clinical color changes.

**Results:** Gingival areas in all the four quadrants were depigmented with satisfaction with slight pain & discomfort at 1 week in 1<sup>st</sup> & 2<sup>nd</sup> quadrant. Four weeks after the procedure, there was a significant improvement in gingival melanin hyperpigmentation.

**Conclusions:** All the four methods seem to be effective in the esthetic treatment of gingival melanin hyperpigmentation.

**Key Words:** Gingiva, Scalpel scrapping, Bur abrasion, Laser, Electrocautery.

## Introduction

Gingival health and appearance are essential components of an attractive smile. Hyperpigmentation of gingiva is caused by excessive melanin deposition by melanocytes which reside in basal and suprabasal cell layers of epithelium and is transferred to basal cells where it is stored in the form of melanosomes.<sup>1</sup>

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 with high smile line (gummy smile), thus cause aesthetic problems and embracement particularly if pigmentations are visible during speech and smiling.<sup>2</sup> 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.<sup>3</sup>

In general, individuals with fair skin will not demonstrate overt tissue pigmentation, although comparable numbers of melanocytes are present within the gingival epithelium. Pigmented granules are present only when melanin granules synthesized by melanocytes are transferred to keratinocytes. This close relationship between melanocytes and keratinocytes was as epidermal-melanin unit.<sup>4</sup>

Various depigmentation techniques have been employed, with similar results like Scalpel surgical technique, Bur abrasion, Cryosurgery, Electrosurgery, Lasers (Erbium: (Er:YAG) lasers, Semiconductor diode laser etc.), 90% phenol & 95% alcohol, Free Gingival Grafts.<sup>5-11,14</sup> Selection of technique should be based on clinical experience and individual's preferences.

The present case report introduces a simple and effective surgical depigmentation method that yield good result, along with good patient satisfaction, wherein four different methods of depigmentation have been tried and compared in four different quadrants of patients mouth Scalpel scrapping, Bur abrasion, Semiconductor diode laser, Electrocautery. Problems encountered with some of these techniques have been discussed.

## Case Report

An 18 years old female was referred to Department of Periodontics, Dr. D.Y. Patil Dental College & Hospital, Nerul, Navi Mumbai; by the Department of Oral Medicine and Oral Radiology, with the concern of her unaesthetic anterior gingiva. Melanin hyperpigmentation was found on labial surface of both maxillary and mandibular arches. Color of the gingiva was dark to black (Fig 1). Patient was given oral hygiene instructions, underwent scaling and depigmentation was done after the patient was clinically plaque and gingivitis free. Gingival depigmentation was carried out from 2<sup>nd</sup> to 2<sup>nd</sup> premolar. A random distribution of the four different methods in the four different quadrants was done. The procedures were explained verbally to the patients and the consent forms were signed. Clinical parameters such as bleeding, wound healing, pain and difficulty of procedure were evaluated immediately after and then after 1, 2 and 4 week interval. A list of clinical observations and patient responses prepared by Ishii et al (2002)<sup>12</sup> & Kawashima et al (2003)<sup>13</sup> was used for evaluation. Each parameter was described as A, B, C, D as seen in (Table 1). Pain level threshold was

evaluated by Visual Analogue Score (VAS) as seen in (Table 2). VAS score consists of a horizontal line 100mm long, starting at the left end with the descriptor "no pain" and ending at the right end with "unbearable pain". Patients were asked to mark the severity of pain. The distance of this point, in milliliters, from left end of the scale was recorded and used as VAS score.

## For the Maxillary Right Quadrant

The Scalpel scrapping technique was done. After proper isolation of the surgical field, the operative site was anesthetized 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 (Fig 2). Raw surface was irrigated with normal saline solution. Surface was cleaned and checked for bleeding. Exposed depigmented surface was covered with Coe-Pack periodontal dressing for 1 week.

## For The Maxillary Left Quadrant

Bur abrasion technique with high speed rotary instrument under adequate local anesthesia was done. A large diamond round bur (2 to 2.5mm) (Dia BURS BR-12 EF, MANI Inc, Tochigi Ken, Japan) with copious saline irrigation was used. Pressure was minimal with feather light brushing strokes and without holding bur in one place. Care was taken not to cause pitting of gingival surface or to remove too much of tissue. However some areas were left due to presence of very thin gingiva to avoid exposure of bone in region of attached gingiva and also to prevent gingival recession (Fig 3). Exposed depigmented surface was covered with Coe-Pack periodontal dressing for 1 week.

## For Mandibular Left Quadrant

A semiconductor diode laser (DOCTOR SmileWiser) was used. Proper protective eye wear was worn by the patient, assistant as well as the doctor. The diode laser was set at W - 980 nm, F - 25 kHz, P- 1.5 Watt in a continuous contact mode. A light brushing stroke was used and the tip was kept in motion all the time. No local anesthesia or coe pack was given to the patient. Remnants of ablated tissue were removed with gauze dampened in saline (Fig 4).

## For Mandibular Right Quadrant

Electrocautery was used for depigmentation in the cut and coagulate mode with a power setting of 2. A loop electrode was used for depithelizing the gingiva. A light brushing stroke was used and the tip was kept in motion all the time.



Keeping the tip in one place could lead to excessive heat build up and destruction of the tissues (Fig 5). Exposed depigmented surface was covered with Coe-Pack periodontal dressing for 1 week.

The patient was instructed to avoid smoking, eating spicy food or brushing the bare wound. Patient was also prescribed Tab Combiflam TDS for 3 days for pain management. Patient was also asked to rinse with 10 ml of 0.2% Chlorhexidine digluconate mouthwash, twice daily for 1min for two weeks.

**Results**

No post-operative infection or scarring, gingival recession or deformity occurred in any of the sites on the first and subsequent visits. The healing on all the four quadrants was uneventful. The patient's acceptance of the procedure was good and the results were excellent, as evaluated by the Clinical Evaluation Scores (Table 3) and perceived by the patient. The follow up period spanned 1, 2 weeks and 1 month. There was no repigmentation. The patient is being monitored for longitudinal period for any repigmentation. See (Fig 6 17) for 1, 2 weeks and 1 month follow up.

**Discussion**

There is a wide variation in gingival color in normal healthy persons. Degree of vascularization, thickness of keratinized layer and amount of pigment containing cells determine the color of gingiva<sup>14</sup>. Various clinical and experimental reports describe different depigmentation methods.

A free gingival graft used to eliminate the pigmented areas requires an additional surgical site (donor site) and color matching and causing additional discomfort. Furthermore, presence of a demarcated line is commonly observed around the graft in the recipient site may itself pose an aesthetic problem.<sup>15</sup>

Removing gingival margin by gingivectomy or the entire attached gingiva by "push back" procedure may also be used. However it is associated with alveolar bone loss, prolonged healing by secondary intention, excessive pain and discomfort caused by exposure and denudation of underlying bone.<sup>4</sup>

Cryosurgery is followed by considerable swelling and 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 (2 step procedure).<sup>6</sup>

In the case reported here, a simple and effective method of depigmentation was used. The results were excellent and at 1 month follow up; there was no evidence of repigmentation of the gingiva. Bleeding with scalpel scrapping and bur abrasion was seen immediately after the procedure. Slight pain was noticed with scalpel scrapping and bur abrasion after 1 week which gradually was lost in 2 weeks time. After 1 week, gingiva showed moderate to fast epithelization. Healing was uneventful with a considerable improvement in aesthetics. Although electrosurgery and laser required use of sophisticated equipments, they achieved satisfactory results and were relatively easy to perform as compared with scalpel scrapping and bur abrasion with no post operative pain, bleeding or discomfort. Also no local anaesthesia or periodontal pack was required in the site treated with laser. 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. Small burs cannot make smooth surfaces easily and have a tendency to make small pits in the surgical sites which require further correction<sup>15</sup>. With electrosurgery 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<sup>17</sup>. The superior efficiency of electrosurgery over bur abrasion or epithelial excision seen in this case report could be explained based on Exploding cell theory<sup>6</sup>. According to this theory it is predicted that the electrical energy leads to molecular disintegration of melanin cells, present in basal and suprabasal cell layers of operated and surrounding sites. Thus, electrosurgery has a strong influence in retarding migration of melanin cells from the locally situated cells, which were detected clinically to be removed. Patient is being monitored for longitudinal period for repigmentation. Post surgical repigmentation of gingiva has been previously reported.<sup>18,19</sup>

**Summary**

In summary, all the four procedures, scrapping with scalpel, bur abrasion, electrosurgery and laser seem to be effective in the esthetic treatment of gingival melanin hyperpigmentation.

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**Table 1 Clinical Evaluation Scores**

Evaluation	Score
Bleeding	A none B slight C moderate, D severe
Color	A improvement, B slight improvement C no change, D deterioration
Pain	A none, B slight C moderate, D severe
Difficulty of procedure	A very easy, B easy, C difficult, D impossible
Wound healing	A complete epithelization, B incomplete epithelization C ulcer, D tissue defect or necrosis

**Table 2 Visual Analogue Scale**

Score 0	No pain
0.1-3.0	Slight pain
3.1-6.0	Moderate pain
6.1-10.0	Severe pain



**Fig. 1**



**Fig. 2**



**Fig. 3**





**Table-3**

Results	Scalpel blade	Bur abrasion	Electrocautry	Laser
<b>Bleeding</b>				
• Immediate	D	D	A	A
• 1 Week	B	A	A	A
• 2 Week	A	A	A	A
• 1 Month	A	A	A	A
<b>Color</b>				
• Immediate	-	-	-	-
• 1 Week	A	A	A	A
• 2 Week	A	A	A	A
• 1 Month	A	A	A	A
<b>Pain</b>				
• Immediate	B	-	-	-
• 1 Week	A	B	A	A
• 2 Week	A	A	A	A
• 1 Month	-	A	A	A
<b>Wound Healing</b>				
• Immediate	-	-	-	-
• 1 Week	B	B	B	B
• 2 Week	A	A	A	A
• 1 Month	A	A	A	A
Difficulty	C	C	B	A

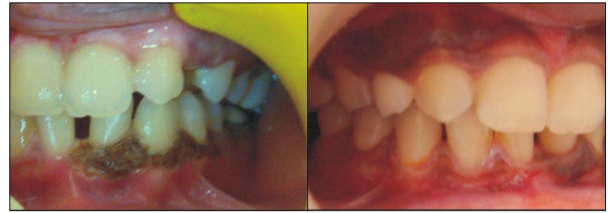


Fig. 4

Fig. 5

1 Week post-operative

1st Quadrant

2nd Quadrant



Fig. 6

Fig. 7

3rd Quadrant

4th Quadrant

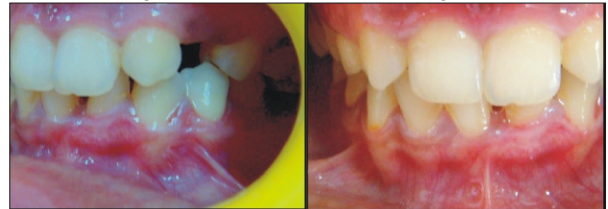


Fig. 8

Fig. 9

2 Week post-operative

1st Quadrant

2nd Quadrant



Fig. 10

Fig. 11

3rd Quadrant

4th Quadrant



Fig. 12

Fig. 13

1 month post-operative

1st Quadrant

2nd Quadrant



Fig. 14

Fig. 15

3rd Quadrant

4th Quadrant



Fig. 16

Fig. 17

Address for Correspondence : Dr. Poonam M. Singh, Flat No. 6, Meera Shyam Building, Goshala Road, Mulund West, Mumbai-400080  
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