

Gingival Aesthetic Correction - A Case of Altered Passive Eruption with Melanin Hyperpigmentation : A Short Review & Case Report

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Abstract

Demand for cosmetic therapy of gingival component is common. Altered gingival contour and gingival melanin pigmentation pose an esthetic concern to many. Reshaping of gingival tissues through surgical procedure bring about beautifully scalloped gingiva and depigmentation of the gingival tissue brings about even tone pink gingiva. Hence, to achieve these, a case was of altered passive eruption with dark melanin hyperpigmented gingiva was treated by gingivectomy and gingival depigmentation using electro-surgery unit.

Introduction

Esthetics has become an important aspect of dentistry. Until recently dentists' and public's concept of dental esthetics was necessarily limited to alteration of the teeth themselves. Dentists concerned themselves with changing the position, the shape and color of the teeth – basically restoring missing unit or enhancing those already present. But now-a-days the growing concern of the individuals towards their appearance has led to incorporation of different periodontal treatment modalities in cosmetic dentistry based upon patients treatment needs. This has also led to change in domain of periodontics from being strictly a health service to one where smile enhancement has been brought to the forefront of treatment planning. The individual's ability to exhibit a pleasing smile directly depends upon the quality of the dental and gingival elements that it contains, their conformity to the rules of structural beauty, the relations existing between the teeth and lips during smile and its harmonious integration in the facial composition.¹

Gingival contour, shape and colour play an important role in maintaining of the overall esthetics. Gingiva is a distinctively pigmented intraoral tissue. The normal colour of which varies from pink to bluish black. Attached gingiva is the most common site for gingival melanin pigmentation. The color is often a diffuse, symmetric, ribbon like dark band or irregularly shaped patch with a well-demarcated border.²

Although gingival melanin pigmentation does not present a medical problem, clinicians are often faced with a challenge of achieving an acceptable gingival esthetics. 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. Gingival hyper-

pigmentation is seen as a genetic trait in some populations and is more appropriately termed physiologic or racial gingival pigmentation. This problem is aggravated in patients with a “gummy smile” or excessive gingival display while smiling. Today's growing esthetic concerns among the patients require the removal of unsightly pigmented gingival areas to create an esthetically-pleasant-smile.¹

Excessive gingival display can be majorly out of three causes; one being excess gingival tissue, second high smile line, and third short clinical crowns. Altered passive eruption is a condition wherein the relationship between the teeth, alveolar bone and surrounding soft tissues create an excessive gingival display and causes gummy smile. It has been classified into four stages (Table 1). It can cause esthetic problem and along with lip incompetence it can be a contributing factor for gingivitis. Garber and Salama suggested two treatment options- Gingivectomy in Class I-Type A and Resective osseous surgery with apically displaced flap.^{11, 12}

Hence, overall correction of gingival contour, shape and colour along with correct lip positioning will help achieve the necessary esthetics.

Evaluation of Gingival Pigmentation

According to Dummett Gupta Oral Pigmentation Index (DOPI): (1964)³

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

According to Melanin index Categories.⁴

- Class 0: No pigmentation.
- Class 1: Solitary unit(s) of pigmentation in papillary gingival without extension between neighboring solitary units.
- Class 2: Formation of continuous ribbon extending from neighboring solitary units.

Smile line

Analyzed by Liebart's Classification:⁵

Class 1: Very High Smile Line – >2 mm of the marginal gingiva is visible or >2 mm apical to the CEJ is visible.

Class 2: High Smile Line – Between 0 - 2 mm of marginal gingiva is visible or between 0 and 2 mm apical to the CEJ is visible.

Class 3: Average Smile Line – Only gingival embrasures are visible.

Class 4: Low Smile Line – Gingival embrasures and CEJ are not visible.

Gingival Depigmentation Procedures

Roshni & Nandakumar in 2005 classified different gingival depigmentation methods as:⁶

- I. Methods aimed at removing the pigmented gingiva:
 - A. Surgical Methods:
 - a. Scalpel surgical technique,
 - b. Bur abrasion method,
 - c. Electro-surgery,
 - d. Cryosurgery,
 - e. Lasers,
 - f. Radiosurgery.
 - B. Chemical Methods.
- II. Methods aimed at masking the pigmented gingiva:
 - A. Free gingival graft.
 - B. Acellular dermal matrix allograft.

Gingival depigmentation is a periodontal plastic surgical procedure whereby the gingival hyperpigmentation is removed or reduced by various techniques. The techniques that have been tried in the past to treat gingival hyperpigmentation include chemical cauterization, gingivectomy, scalpel scraping procedure and abrasion of gingival. The latest technique of gingival depigmentation like cryotherapy, free gingival auto graft and laser therapy have achieved satisfactory results. Recently, laser ablation has been recognized as one of the most effective, comfortable and reliable techniques.⁷

Goswami, et al.: Gingival Aesthetic Correction - A Case of Altered Passive Eruption with Melanin Hyperpigmentation: A Short Review and Case Report

Presented here is a case of gingival hyperpigmentation in which electrocautery techniques was used in different quadrants to treat the condition and to compare the clinical efficacy.

Conditions	Treatment Options
Altered Passive Eruption Type IA	Gingivectomy
Altered Passive Eruption Type IB	Flap with osseous resection
Vertical Maxillary Excess Degree 1	Orthodontics Orthodontics & Periodontics Periodontics & Restorative Dentistry
Vertical Maxillary Excess Degree 2	Periodontics & Restorative Dentistry Orthognathic Surgery
Vertical Maxillary Excess Degree 3	Orthognathic Surgery + Periodontics & Restorative Dentistry where necessary.

Table 1: The classification of altered passive eruption and its treatment options

Case Report

A 23-year-old female patient visited the Department of Periodontology, Rama Dental College with the chief complaint of blackish gums and small teeth. Short clinical crown and pigmented gingiva caused significant esthetic concern to the patient (Figure 1-2). She was systemically healthy, dark complexioned, non-smoker, non-alcoholic. Her only concern was dark gums. Oral examination revealed pigmented gingiva from right first premolar to left first premolar in maxillary and mandibular region. According to Dummett Gupta Oral Pigmentation Index (DOPI), score 3 was given for the clinical situation and a diagnosis of Generalized chronic gingivitis with Altered passive eruption Type IA was made. The patient requested for esthetically better gums, Initial therapy included Oral hygiene instructions, scaling and root planing and Re-evaluation of Phase I after 14 days. Gingivectomy procedure along with gingival de-pigmentation was planned using electro-surgery unit. The entire procedure was explained to the patient and written consent was obtained. To rule out any contraindication for surgery, a complete medical examination, family history and blood investigations were done. Local anesthesia was infiltrated in the maxillary and mandibular anterior region from premolar to premolar (lignocaine with adrenaline in the ratio 1:2,00,000).

Gingivectomy was the procedure of choice as per guidelines for crown lengthening. Trans gingival probing was done to assess supra alveolar tissue dimensions.

Pockets were marked with a Goldman-Fox pocket marker. Gingivectomy was then performed by electro-surgery. For gingival depigmentation the electrode application was used by a sweeping motion localized only in the pigmented regions (Figure 3-8). Care was exercised to use feather-light brushing strokes to remove the pigmented areas. The procedure was performed in a cervico-apical direction on all pigmented areas. Every five minutes, the operation field was wiped with sterile gauze soaked in 1% normal saline solution. The depigmentation procedure continued until no melanin pigments remained. Surgical area was then covered with a periodontal pack and postoperative instructions were explained to the patient. Patient was prescribed amoxicillin and clavulanic acid (625 mg tds for 3 days), diclofenac potassium 50 mg + paracetamol 325 mg + serratio-peptidase 10 mg for 3 days. Chlorhexidine mouth gargle was advised 3-4 times a day for two weeks. The healing was normal and patient did not report any discomfort. At the end of one month, re-epithelialization was complete and healing was found to be satisfactory (figure 9-10)

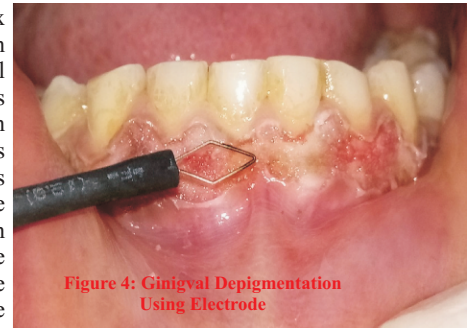


Figure 4: Gingival Depigmentation Using Electrode



Figure 5: Immediate Maxillary Post-Op Photograph Depigmentation And Gingival Recontouring Done Using Electrode



Figure 6: Coe-Pac Placed



Figure 7: Immediate Mandibular Post-Op Photograph Depigmentation And Gingival Recontouring Done Using Electrode



Figure 8: Coe-Pac Placed



Figure 1: Pre-operative photograph Maxilla

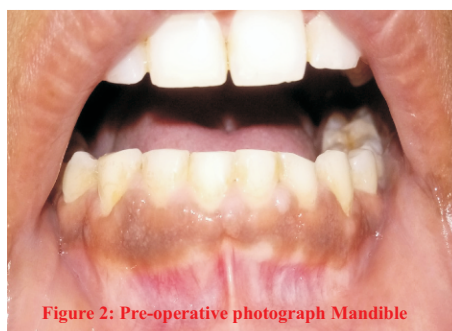


Figure 2: Pre-operative photograph Mandible



Figure 3: Gingival Depigmentation Using Electrode



Figure 9: 1week Post-Op Photograph

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Figure 10: 1month Post-Op Photograph
Discussion

Melanin pigmentation is caused by melanin deposition by active melanocyte located mainly in the basal layer of the oral epithelium. Pigmentation can be removed for esthetic reasons. Demand for cosmetic therapy of gingival melanin pigmentation is common and various methods have been used for de-pigmentation, each with its own merits and limitation (Pontes et al, 2006). The selection of a technique for de-pigmentation of the gingiva should be based on clinical experience, patient's afford ability and individual preferences.⁸

Type IA altered passive eruption poses a challenge for the periodontist to obtain optimal esthetics. Rossi et al. reported that altered passive eruption had familial trait¹⁴. In the present case, patient was not aware of his family history. Hence, the patient was managed as per the guidelines proposed by Garber and Salama¹³ crown lengthening was done using gin-givectomy procedure. A good amount of crown exposure and adequate attached gingiva was achieved which remained stable.

Electro-surgery is the use of high frequency (50 kHz) electrical energy in the radio transmission frequency band, which is applied directly to tissue to induce histological effects. The first documented case report using electro-surgery for de-pigmentation was by Ginwalla et al in 1966.⁹

The radio waves created by the device travel from the electrode tip to the patient and are returned to the device via an indifferent plate antenna placed under the patient's body in the vicinity of the surgical site. As the current passes, the impedance to the passage of current though the tissue generates heat, which boils the tissue water, creating steam, resulting in either cutting or coagulation of tissue.¹

The advantage of electro-surgery over other methods used for de-pigmentation is based on Oringer's (1975) "exploding cell theory". According to the theory, it is predicted that the electrical energy leads to molecular disintegration of melanin cells in basal and suprabasal cell layers of operated and surrounding sites. Thus, electro-surgery retards migration of melanin cells to the

treated site.¹⁶

But electro-surgery has its own limitations as it requires more expertise than scalpel surgery. Prolonged or repeated application of current to tissue induces heat accumulation and undesired tissue destruction. Contact with cementum, periosteum, alveolar bone and vital teeth should be avoided.¹⁰

This technique is uncomfortable to patients due to foul odor and the use of high-speed suction is mandatory. Contraindications to this technique include patients with a keloidal tendency, cardiac pacemakers, and history of recent active episode of herpes simplex infection.¹⁰

Lin et al. in their systematic review of treatment modalities for gingival depigmentation made analysis of pigmentation recurrence rates of six methods comprising Bur abrasion, scalpel, cryosurgery, electro-surgery, gingival graft and laser using random-effects Poisson regression, they reported least recurrence rates of cryosurgery with 0.32% and second least being that of electro-surgery 0.74%.¹⁷

Conclusion

Growing esthetic concerns require the removal of unsightly pigmented gingival area to create a pleasant and confident smile, which altogether may alter the personality of an individual. In the present case physiologic gingival hyper-pigmentation and short clinical crown was causing esthetic problem for the patient. Surgical de-pigmentation and crown lengthening by electro surgery caused considerable improvement in the esthetics. No bleeding was seen with regard to the electro-surgery technique as charred layer served as a surgical bandage to arrest bleeding. Based on our case report electro-surgery seems to be a promising treatment modality with less patient discomfort and less recurrence rate.

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