

Reviving the Gums from Dark to Pink - Gingival Depigmentation: A Case Series

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ABSTRACT:

Pigmentation of gingiva is most often a physiologic phenomenon resulting from deposition of endogenous melanin by melanin granules of melanocytes in the epithelium. Although not a medical problem or a disease entity, it is a major concern among young individuals as it hampers esthetics. To restore the 'pinkness' of the gums, various techniques such as scalpel method, bur abrasion, electrosurgery, LASER, free gingival grafts & cryotherapy have been broadcasted. Though advancement in this field is vast, scalpel technique still trends to be a gold standard for gingival depigmentation. The present case study thus reports gingival depigmentation with different techniques such as scalpel technique (partial thickness flap), electrosurgery, rotary and LASER, also comparing the outcome, advantages & disadvantages of each technique.

Keywords: Depigmentation, Electrosurgery, Gingiva, LASER, Melanin, Rotary, Scalpel.

INTRODUCTION

Esthetics has become a target concern for the patients in today's era giving importance to esthetic/ cosmetic dentistry. A beautiful smile is determined by a harmonious inter-relationship of the pink with white.¹ Melanin is a naturally occurring brown pigment produced by melanocytes showing ethnic/racial predilection and committed to endogenous pigmentation of gingiva.² Commonly upregulated in individuals with dark complexion due to exaggerated activity of melanocytes which most of the times suggest its genetic predisposition.³

Melanin pigmentation is a multifactorial condition which can be physiologic or pathologic.⁴ Clinically it is neither a disease entity nor does it present any serious medical problem, but the presence of black colour creates unesthetic zone visible on smile and speech leading to the need of treatment.⁵ Depigmentation of gingiva is a periodontal plastic surgical procedure characterized by removal of melanotic areas by various techniques reported in the past such as scalpel

method, bur abrasion, electrosurgery, lasers, free gingival grafts & cryotherapy.^{6,7} Though all the treatment modalities provide desired results, there is no adequate literature on the most effective method of depigmentation.⁸

Thus we report a case series of gingival depigmentation by different techniques such as scalpel (partial thickness flap), electrosurgery, rotary and LASER.

CASE SERIES

All the four patients in this study reported to the Department of Periodontology, Darshan Dental College & Hospital, Udaipur sharing a common problem of discoloured gums visible on smile and asked for the treatment of its removal. All these patients were systemically healthy with no adverse habits of smoking (CDC classification). Gingival pigmentation was evaluated by Dummett-Gupta Oral Pigmentation Index (DOPI) – Dummett 1971.(Table 1) Gingival depigmentation with different techniques was performed after their written consent. Post-treatment pain was

scored according to McGill Pain Questionnaire (Table 2) for all the patients.

Table 1: Dummett-Gupta Oral Pigmentation Index (DOPI)

Dummett-Gupta Oral Pigmentation Index (DOPI) – Dummett 1971	
1	No clinical pigmentation (pink gingiva)
2	Mild clinical pigmentation (mild light brown color)
3	Moderate clinical pigmentation (medium brown or mixed pink and brown)
4	Heavy clinical pigmentation (deep brown or bluish black)

Table 2: McGill Pain Questionnaire

	Case 1	Case 2	Case 3	Case 4
Was the treatment painful?	2	1	1	1
Was burning smell during treatment interrupting?	1	2	1	2
Did you experience pain on the day of the treatment?	1	1	1	1
Did you experience pain during the 1st week after the treatment?	1	1	1	1
Did you experience itching during the 1st week after treatment?	2	1	2	1
Did you notice the cosmetic change during the 1st week after treatment?	5	5	5	5
Did the treatment meet your expectations?	5	5	5	5
Would you repeat the treatment if necessary?	yes	yes	yes	yes

1 - Not at all, 2 - Mild, 3 - Moderate, 4 - Severe, 5 - Very severe

Case 1 (Gingival Depigmentation by scalpel)

A 25-year-old male patient presented with the history of discolouration of gums indicative of physiologic melanin pigmentation. Gingiva on the labial surface of both maxillary & mandibular arches showed DOPI score of 4.(Figure 1) Surgical depigmentation procedure was planned after resolution of inflammation post phase I therapy. After adequate local anesthesia, partial split thickness gingival epithelium was sliced and scrapped up to the level of mucogingival junction with a no. 15 blade and Bard Parker

handle held parallel to gingival surface.(Figure 2)



Figure 1 : Pre-operative View (Scalpel)



Figure 2 : Immediate post-operative view (Scalpel)

Hemostasis at the site was obtained using pressure pack with sterile soaked gauze. The de-epithelialized area was covered with Coe-pak periodontal dressing for 1 week (Figure 3) and post-operative instructions given. Analgesics were prescribed for 3 days for relief of pain. 1 week later, pack was removed, healing and pain evaluated (Table 2), an uneventful healing was seen with no post operative complications. At 3 months, healthy and pink gingiva with few sites having remnants of pigmentation was seen.(Figure 4)



Figure 3 : Periodontal Dressing Placed (Scalpel)



Figure 4: 3 Months Post-operative View (Scalpel)

Case 2 (Gingival Depigmentation by electrocautery)

A young male patient aged 23 years presented with dark gums visible while smiling making

it displeasing. Gingival examination showed DOPI score of 4 on maxillary labial surface.(Figure 5) Depigmentation procedure was performed using electrocautery with a loop electrode.(Figure 6) Light brushing strokes with the tip in continuous motion were used to prevent heat- mediated tissue destruction. Care was taken to abstain contact with the underlying periosteum. Periodontal dressing was not placed. Healing and pain (Table 2) was evaluated after 1 week which showed no complications. At 3 months follow-up, complete healing with lack of pigmentation was seen.(Figure 7)



Figure 5: Pre-operative view (Electrocautery)



Figure 6: Operative view (Electrocautery)



Figure 7: 3 months post-operative view (Electrocautery)

Case 3 (Gingival Depigmentation by rotary)

A 16 yr old female patient with fair complexion presented with discoloured gums with DOPI score of 3 in maxillary labial

surface of gingival.(Figure 8) Gingival depigmentation in this patient was planned by rotary abrasive technique. A high speed handpiece and a flame shaped diamond bur with continuous saline irrigation using light brush strokes were implemented.(Figure 9) Periodontal pack was placed post-operatively.(Figure 10) Healing of the site and pain was evaluated 1 week later. At 3 months follow-up, completely healed pale pink gingiva was observed.(Figure 11)



Figure 8: Pre-operative View (Rotary Abrasive Method)



Figure 9: Operative View (Rotary Abrasive Method)



Figure 10: Periodontal Dressing Placed (Rotary Abrasive Method)



Figure 11: 3 months Post-operative View (Rotary Abrasive Method)

Case 4 (Gingival Depigmentation by LASER)

A male patient aged 22 years reported with discoloured teeth and dark gums and wanted treatment for the same. Intraoral examination showed intrinsic staining of teeth due to fluorosis and DOPI score of 3 for the maxillary and mandibular labial gingiva.(Figure 12)

Gingival depigmentation was performed using a diode laser with 810 nm wavelength at 1 W power in a continuous mode. After adequate anesthesia and activation of laser, the laser tip was used in a contact mode and ablation was carried out with light sweeping strokes. No Periodontal dressing was required due to absence of post-operative bleeding or pain.(Figure 13) 1 week later, pain & healing was evaluated. (Table 2) At 3 months, healthy pink gingiva with good patient satisfaction was seen.(Figure 14)



Figure 12: Pre-operative View (LASER)



Figure 13: Immediate Post-operative View (LASER)



Figure 14: 3 months Post-operative View (LASER)

DISCUSSION

It is rightly said that a beautiful and attractive smile increases the self-confidence of an individual to a higher level. Gingiva plays an integral role in maintaining the esthetics alongwith the teeth. The color of gingiva, one of the most important parameter is determined by the degree of vascularization, the thickness of keratinized layer & the amount of pigmentation.^{9,10} Melanin is one of the core factors responsible for hyperpigmentation. Though considered as a normal condition, the frequent complaint of black or dark gums visible on smile has become the main indication for the therapy with the aim of complete removal of pigmented layer.¹¹

In the present study, four techniques were implemented for depigmentation, which included scalpel, electrosurgery, rotary abrasion and LASER. Though, all the treatment modalities produced excellent results with good patient satisfaction, pain evaluation by McGill pain questionnaire⁷ showed moderate pain on scalpel technique, mild pain on rotary and no pain with electrocautery and LASER.

Scalpel technique of depigmentation proved to be simple, easy to execute and most economical method compared to other techniques requiring advanced armamentarium. Almas & Sadiq et al (2002) & Prasad et al (2010) reported that scalpel wound heals quicker than that of others.^{6,12} In our study also, scalpel technique showed faster healing as compared to the other three techniques.

Electrosurgery, based on Oringer's "exploding cell theory" explained disintegration of melanin by electrical energy^{13,14} and showed better efficacy than scalpel with no intraoperative bleeding. Cicek et al (2003) and Bhushari BM et al (2011) reported minimal patient discomfort and absence of bleeding while using electrocautery.^{4,15} Though electrosurgery in our study showed good results with no complications, its repeated and prolonged use induces heat accumulation and undesired tissue destruction.

In this study Rotary abrasion was also used for gingival depigmentation that showed healing similar to scalpel technique. The advantages of this technique are that it is simple, safe, economical & easily performed. However care should be taken to use copious saline irrigation, controlled pressure and speed of the rotary bur so as not to cause unnecessary damage to the tissue.^{10,11}

One of the latest techniques employed in our study is depigmentation by diode LASER where no postoperative periodontal dressing was required. Lagvide S. et al (2009) compared diode laser with scalpel and bur abrasion for gingival depigmentation and showed superior results with laser.¹¹ The extraordinary properties of laser produces a sterile and non-inflammatory wound that results from sealing of the surrounding vasculature producing hemostasis. Here, radiation energy is transformed into ablation energy resulting in cellular rupture and vaporization.¹⁶ Atsawasuwana and Greethong et al (2000) reported that laser beam produces bloodless field for surgery with minimal damage to underlying bone, and the treated gingiva and mucosa do not need any dressing.¹⁷

Our study described that all the four techniques were effective for gingival depigmentation. Keeping in mind the pro and cons of each technique, the 12 weeks post-treatment suggested the scalpel technique to be the best economic method for removal of pigmented gingival epithelium followed by laser in the advanced fields. Rotary and electrocautery have limited their use due to certain drawbacks.

Repigmentation has been the most important point of concern after depigmentation procedures. Begamaschi et al (1993) showed that it takes about 1.5- 3 years to return to the full clinical baseline repigmentation.¹⁸ In our study the 12 weeks follow-up did not show repigmentation. However, a long-term follow-up is necessary to study recurrence of pigmentation and factors affecting the rate, duration & pattern.

CONCLUSION

Gingival pigmentation has been a concern of esthetics increasing patient's demands for therapy. From the present study we concluded that all the four techniques were effective for gingival depigmentation. However, each of them had their own limitations such as bleeding & pain by scalpel & rotary, cost & technique sensitivity with laser & electrocautery. The best chosen technique depends on the patient preference, affordability and clinician's expertise. Future studies should be carried with the scope to identify methods to prevent repigmentation.

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