Pink esthetics: a case series of gingival depigmentation
Khalid Gufran, Mariam Omer Bin Hamza, Mohammed S Khan, Faisal M Alsheddi, Saad A Alsheean, Mohammed A A Ansari

ABSTRACT
The presence of the melanin granules produced by the melanocytes which is responsible for the pigmentation of the gingival tissues. This hyperpigmentation appears as a blackish discoloration of the gums and though it does not carry any medical relevance but may require cosmetic surgery in lighter skinned individuals as it can affect the aesthetics. This paper presents a series of case reports in which gingival de-epithelization was carried out using two popular techniques – surgical technique and electrosurgery. Both the techniques were effective and gave satisfactory results. It was observed that more precision was needed with electrosurgery but it resulted in increased efficiency and a clean work area. On the other hand surgical technique using scalpel was easier with the same results. It is concluded that the scalpel technique still serves as a gold standard for effective depigmentation.

Key words: Depigmentation; Electrosurgery; Melanin; Scalpel technique

Introduction
Smile is considered as one of the most powerful emotion. Two main factors that can affect a confident smile are teeth and the gums. Hence other than the position health and the color of the teeth, gingival color and health also plays an important role in making a smile attractive. The natural and acceptable color of the gingiva is usually coral pink. There are several factors which is responsible for the color they include the number and size of blood vessels, thickness of the epithelium, degree of keratinisation and the colored pigments within the epithelium. 1 Gingiva happens to be the most pigmented tissue in the mucosa and most predominant natural pigment responsible for this appearance of the gingiva is a brown pigment called Melanin. Melanoblasts cells present in the gingival epithelium produces melanin granules which results in melanin pigmentation. 2 The variation in the degree of Gingival hyperpigmentation among different populations is considered physiological or racial pigmentation and it is not related to the gender or age hence it can be seen as a racial trait. 3,4 Since the pigmentation is related to the melanoblastic activity, its degree differs from person to person. 5 Usually the occurrence of gingival pigmentation is persistent and symmetrical without causing any alteration of the gingival structure. Dark skinned ethnic populations are more prone for melanosis of gingiva, it is mostly observed in African and East Asian. 6,5 Gingival pigmentation also increases in certain medical conditions such as Addison’s syndrome or Addisons disease. 7

The procedure of depigmentation of gingiva is a periodontal plastic surgical procedure which uses various techniques to reduce or remove the hyperpigmentation. Usually patient’s chief complaint of altered esthetics is the main indication for carrying out gingival depigmentation. Various techniques like scraping, free gingival autografting, cryosurgery, electrosurgery, and various types of lasers can be used for removing the hyperpigmented areas. 8 As each case presentation and demands differ, the technique employed should be selected according to the clinician’s preference and experience. Removal of the pigmented areas using scalpels is the earliest method advocated and still serves as the gold standard technique. This method involves removing the gingival epithelium along with its underlying connective tissue surgically using scalpels and the denuded connective tissue is allowed to heal by secondary intention. The melanin pigment is absent in the newly formed epithelium. 9 Every technique mentioned above has its own advantages and disadvantages but due to the simplicity and requirement of minimum effort and time by the scalpel technique and electrosurgery, it was planned to include these two techniques in the present cases for depigmentation.

Case Reports
Four patients all males aged between 25 to 30 years, reported to the clinic, college of dentistry, Salman Bin Abdul Aziz University, Alkhaj, with the common chief complain of “grayish-blackish gums” which affected the aesthetics of their smile. As these patients were conscious about their esthetics they were treated for gingival depigmentation using two different techniques. The norms for the assortment of the patients were the esthetic concerns in the periodontally healthy individuals. A detailed medical history about systemic diseases and medications which were related with the gingival melanin pigmentation were taken. Patients with acute pulpal or periodontal pain and abscesses were excluded from the study. Oral hygiene instructions were given to the patients and oral prophylaxis was carried out as a part of the first phase of the periodontal treatment. Once the gingival inflammation had subsided completely the patients were scheduled for the depigmentation procedure. The possibility of recurrence was informed to the patients and an informed consent was taken. The techniques followed in the present case series were the scalpel surgical technique & electrocautery as these consumed less time and could be carried out easily. Intraoral pictures were taken at every follow-up visit to compare the progress and also to access the occurrence of any repigmentation.

Case 1 and 2 (Scalpel technique i.e epithelial excision)
Considering the patient’s concern, for case 1 (Figure 1a-1f)and case 2 (Figure 2a-2f) surgical gingival de-epithelization procedure was planned using the scalpel technique, following the administration of a local anesthetic solution, blade no.15 with bard Parker handle was used to scrape the epithelium carefully with underlying pigmented layer from 1st premolar
to 1st premolar for both the arches. The raw surface was irrigated with saline solution. A pressure pack was placed using sterile gauze to control the bleeding. Care was taken that excessive tissue was not removed thereby avoiding any bone exposure. Once the procedure the completed a periodontal pack was placed at the surgical site and proper post-operative instructions were given to the patients in the language they could comprehend. Pain management was done by prescribing analgesics and the patients were recalled after a week. In the next appointment the surgical site was evaluated after removing the periodontal dressing. On examination the gingival appeared firm and healthy showing a normal pink appearance and texture. The patients did not complain of any discomfort and the healing seen was satisfactory with no post operative complications. The patients were very impressed with such a pleasing esthetic outcome.

Case 3 and 4 (Electrosurgical gingival depigmentation)

For the other two cases, a gingival de-epithelization procedure was planned using electrocautery unit to de-epithelize the hyperpigmented areas. Abscession of the effected tissues was carried out by means of loop electrode of the electrocautery unit under standard protective measures (Figure 3a-3f). Great caution was exercised while using the tip and prolonged contact with one area can lead to tissue damage due to excessive heat, hence the tip should constantly be in motion and used only in light brushing strokes. Sterile gauze soaked in saline was used to remove the abscessed tissue fragments. This was continued until the desired amount of pigmented tissue was ablated which can be easily achieved without any bleeding. On completion a periodontal pack was placed on the surgical site and proper post operative instructions were given in the patient’s language. As with the previous cases mild analgesics were prescribed for pain management and the patient was recalled after 1 week for the removal of the dressing. Healing observed was uneventful without any post surgical complication in both the arches. The surgical site was examined in the recall visits and on observation the gingiva appeared firm and healthy showing a normal pink appearance and texture. These patients were also pleased with the outcome and the results achieved were excellent.

Results

The results achieved for all the patients were satisfactory and pleasant. No post operative complications like pain, infection, bleeding nor scarring was observed during the follow up visits. The rate of healing observed was also adequate and uneventful. Patient’s acceptance for the procedure was good and results obtained were excellent as perceived by the patient. The patients were recalled for a follow-up up to a period of 6 months for scalpel depigmentation cases and 6 months for electrosurgical cases. There were no signs of repigmentation and the patients are being monitored longitudinally for any recurrences of pigmentation. However during the course of our study it was observed that the scalpel wound healed faster than by electrocautery.

Discussion

Proper elimination of the gingival melanin pigmentation can pose as a challenge with an increasing demand for esthetics from the patients. Thus, in this case series both the techniques were evaluated concerning its effectiveness in elimination of melanin pigmented areas of the gingiva. The normal appearance of a healthy gingiva varies widely from person to person. Principle factors that can determine the color of the gingival tissue includes - the degree of vascularization, the thickness of the keratinized layer and the amount of the pigment containing cells. There are few studies published so far regarding the clinical methods employed for the treatment of the pigmented gingiva. Several techniques have been attempted in

Figure 1. Case 1 Surgical gingival depigmentation. Figure 1a. Pre-operative, Figure 1b. Surgical scrapping, Figure 1c. After de-epithelization, Figure 1d. Periodontal pack, Figure 1e. Pre-operative, Figure 1f. Post-operative 6 months, Figure 2. Case 2 Gingival depigmentation by electrocautery Figure 2a. Epithelial excision with electrode, Figure 2b. After de-epithelization, Figure 2c. Periodontal pack, Figure 2d. One week post-operative, Figure 2e. Pre-operative, Figure 2f. Post-operative 6 months, Figure 3. Case 3 Gingival depigmentation by electrocautery, Figure 3a. Pre-operative, Figure 3b. Epithelial excision with electrode, Figure 3c. After de-epithelization, Figure 3d. One week post-operative, Figure 3e. Pre-operative, Figure 3f. Post-operative 6 months.
the past for gingival depigmentation, some of them include chemical cauterization, gingivectomy, scalpel scraping procedure, acellular dermal matrix accretion, and different types of laser therapy, and all of these have achieved satisfactory results.

Cryotherapy is a method which leads to destruction of tissue by rapid freezing. It works by freezing the cytoplasm of the cells which leads to the denaturation of proteins and eventually cell death. As this procedure is relatively painless it can be easily carried out without any use of local anesthesia and the results achieved are excellent which has shown to last for several years. However, certain limitations like difficulty in controlling the depth of penetration which could result in prolonged freezing and excessive tissue destruction, and the requirement of a special container which is not easily available for the storage of liquid nitrogen, prevents cryotherapy from becoming a popular technique. Furthermore valuable information like the mode of dispensing, shelf life or directions on how to use liquid nitrogen is not mentioned in the available literature. It would be valid to use alternative procedures that are easier, better, simpler and cost effective. Therefore the present study of case series explores few of the other methods available for depigmentation which could be used instead of cryotherapy.

Another effective mode of treatment for gingival depigmentation is by using lasers. A single step laser treatment is recently available which is usually sufficient to effectively removes the pigmented areas and moreover it does not require any periodontal dressing. Ease of handling, shorter treatment time, hemostasis and good sterilization effects achieved, are some of the advantages associated with lasers when used for depigmentation, but since this approach requires expensive and sophisticated equipments which are not available commonly makes lasers as an expensive treatment modality.

Another method described was ‘Free Gingival Grafting’ which is not advised for depigmentation routinely because it is considered as a comprehensive procedure. Presence of a second surgical site, additional discomfort and poor color matching at the recipient site are also some of the main drawbacks associated with this technique.

From the above mentioned techniques, the scalpel and electrosurgery were comparatively simple techniques to perform which required minimum time and effort and hence were carried out for performing gingival depigmentation in the present case series. Both the techniques achieved excellent results with maximum patient’s satisfaction. Though the initial result of the depigmentation surgery is highly encouraging, still recurrence of pigmentation is a common problem. Though the proper mechanism of repigmentation is unclear, the most favored hypothesis seems to be the “migration theory” which states that the active melanocytes from normal skin and hair matrix proliferate and migrate into the depigmented areas.

It has been routinely suggested according to the clinical trials that it takes about 1.5 to 3 years to return to full baseline repigmentation. However this time period may vary according to different clinical situations, thus if esthetics is the primary concern for which depigmentation procedure is performed then the results will never be permanent, because repigmentation will return to baseline value irrespective of a specific time frame. Thus in future even if gingival repigmentation occurs it would be easy to repeat the same procedure in the affected areas as it is cost effective, easy to perform and achieves good esthetics with minimum discomfort to the patients.

Though both the techniques achieved satisfactory results, surgical technique using scalpel is highly recommended as it is not limited to the availability of instruments which may not be routinely used in the clinics. Definite, precise and controlled excision can be performed using the blade. An added advantage with this technique is that it is possible to immediately appreciate the depigmented areas and there is less chances of any residual pigments being left behind. However, this technique resulted in more bleeding when compared to electrosurgery and also requires great care and expertise while excising the epithelium so as not to expose the bone and cause gingival recession. Hence, the only advantage of electrosurgical over scalpel surgery is less intra-operative bleeding.

In the present case series both the methods used were relatively easy and simple to perform, cost effective and above all achieved satisfactory results with minimum patient’s discomfort which resulted in successfully restoring good esthetics and confidence back to the patients.

However further studies are warranted to evaluate the effectiveness of the other latest techniques as well and should be compared with these simple standard techniques.

**Conclusion**

Both the surgical and electrosurgical procedures for gingival depigmentation were successful and our patients were satisfied with the results achieved. Few of the advantages of scalpel techniques like its simplicity, cost effectiveness and most importantly least discomfort caused to the patients makes it the most favorable method for gingival depigmentation. Hence we conclude that surgical technique still serves as the most simplest and effective depigmentation technique. During the follow-up period, no recurrence of gingival hyperpigmentation was found with both the techniques employed in this case series.

**Authors Affiliations**

1. Khalid Gufran, BDS, Lecturer, Department of Preventive Dental Sciences, College of Dentistry, Salman Bin Abdul Aziz University, Alkhajir, K.S.A.
2. Mariam Omer Bin Hamza, BDS, Registrar, Alkhajir Armed Forces Hospital, Alkhajir, K.S.A.
3. Mohammed Shoyab Khan, BDS, Lecturer, Department of Preventive Dentistry, College of Dentistry, Salman Bin Abdul Aziz University, Alkhajir, K.S.A.
4. Faisal Mohammed Alsheddi, Intern, College of Dentistry, Salman Bin Abdul Aziz University, Alkhajir, K.S.A.
5. Saad Abdullah Alsheehan, Intern, College of Dentistry, Salman Bin Abdul Aziz University, Alkhajir, K.S.A.

**References**


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Address for Correspondence
Mohammed Asif Ali Ansari, MDS, Reader, Department Of Oral and Maxillofacial Surgery, HKDET Dental College & Hospital, Humnabad, India.
Email: drasifansari@yahoo.co.in

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