



Gingival Depigmentation Using Surgical Excision Technique: A Histopathological Case Series

Authors

**Dr RG Shiva Manjunath¹, Arijit Sarkar^{1*}, Neeraj Chandra^{2#},
Vartika Shrivastava^{2#} Akhilesh Shewale²**

¹HOD and Guide, Department of Periodontics and Implantology, IDS, Bareilly, Uttar Pradesh

^{1*}, ^{2#}PG student, Department of Periodontics and Implantology, IDS, Bareilly, Uttar Pradesh

²PG student, Department of Periodontology, SDKS Dental College and Hospital, Nagpur, Maharashtra

Abstract

Melanin pigmentation of the gingiva occurs in all races. Melanin, a brown pigment, is the most common natural pigment contributing to endogenous pigmentation of gingiva and the gingiva is the most frequently pigmented intra oral site. According to the early prevalence studies the distribution of oral pigmentation in black individuals is as follows gingiva 60% hard palate, 61% mucous membrane, 22% and tongue 15%. Gingival pigmentation occurs as a diffuse, deep-purplish discoloration or as irregularly shaped brown and light brown patches. It may appear in the gingiva as early as 3 hours after birth and often is the only evidence of pigmentation. Melanin pigmentation is the result of melanin granules produced by melanoblasts intertwined between epithelial cells at the basal layer of gingival epithelium. This case series presents a simple surgical technique of De-epithelization which has been successfully used to treat gingival hyperpigmentation caused by excessive melanin deposition and highlights the relevance of an esthetically pleasing smile specially in smile conscious individuals.

Introduction

Intraoral soft tissue esthetics has become a significant aspect of dentistry which clinicians are facing in their day to day practice. Achieving acceptable gingival esthetics as well as maintaining its biological and functional integrity. Gingival health and appearance are essential component of an attractive smile. Oral pigmentation is a discoloration of the oral mucosa or gingiva associated with several exogenous and endogenous factors¹. Etiology for oral pigmentation are diverse which includes drugs, heavy metals, genetics, endocrine disturbances,

syndromes such as Albright syndrome, Peutz-Jeghers syndrome and also in inflammation². Adverse habits such as smoking can also stimulate melanin pigmentation and the intensity of the pigmentation is related to the duration of smoking and the number of cigarettes consumed and the pigmentation is mostly located in the anterior labial gingival portion. Hyperpigmentation is extensively occurred in males compared to females³.

Melanin hyper pigmentation usually does not present as a medical problem, but patient's may complain their black or brown gums are

unaesthetic. This problem generally becomes a clinical concern in patients with a “gummy smile” or excessive gingival display while smiling. Melanin pigmentation is caused by melanin granules in gingival tissues, which are produced in melanosomes of melanocytes which are primarily located in the basal and suprabasal cell layers of the epithelium and the pigmentation depends on the activity of melanocytes rather than the number of melanocytes in the tissue. The melanocytes are dendritic cells unattached to the surrounding epithelial cell that behave as unicellular exocrine glands. Active melanocytes converts tyrosine to melanoprotein(melanin) which is transferred to the basal and prickle cell layers⁴. The colour of the oral melanin pigmentation vary from light to dark brown or black, depending on the amount and distribution of melanin in the tissues. Melanin pigmentation is generally seen across all the races and can occur at any age⁵.

Melanin pigmentation of the gingivais completely a benign condition and demand for depigmentation is made primarily for esthetic reasons usually in patients having a very high smile line.

Smile lines are usually analyzed according to the following classification(Liebart MF)⁶.

Class 1-Very high smile line – more than 2mm of the marginal gingival visible during smile.

Class 2- High smile line- 0- 2 mm of marginal gingival visible during smile.

Class 3- Gingival embrasures visible only during smile.

Class 4- Gingival embrasures and cemento-enamel junction not visible during smile.

Gingival depigmentation can be considered as aperiodontal plastic surgery procedure whereby the gingival hyperpigmentation is removed by various techniques and the selection of technique should be primarily based on clinical experiences and individual preferences with primary indication of demand for improved esthetics.

Different Techniques Used For Depigmentation:

1. Methods aimed at removingScalpel technique

- A. Cryosurgery⁷
- B. Electrosurgery⁸
- C. Lasers
 - o Nd-YAG laser⁹
 - o Er-YAG laser¹⁰
 - o Co2- laser¹¹
 - o Soft tissue Diode Laser (most commonly used)¹²
- D. Chemical methods using caustic agents¹³- Method not used nowadays

2. other techniques-

- A. Free gingival graft¹⁴
- B. Acellular dermal matrix allograft.¹⁵

Case 1-(Figure 1)

A young male patient aged 20 years old visited department of periodontics with the chief complaint of blackish gums which esthetically interfered with his smile, and requested for any cosmetic therapy which would eventually enhance the esthetics on smiling. Patients history revealed presence of diffuse hyperpigmentation since birth suggestive of physiologic melanin pigmentation with non contributory medical history.

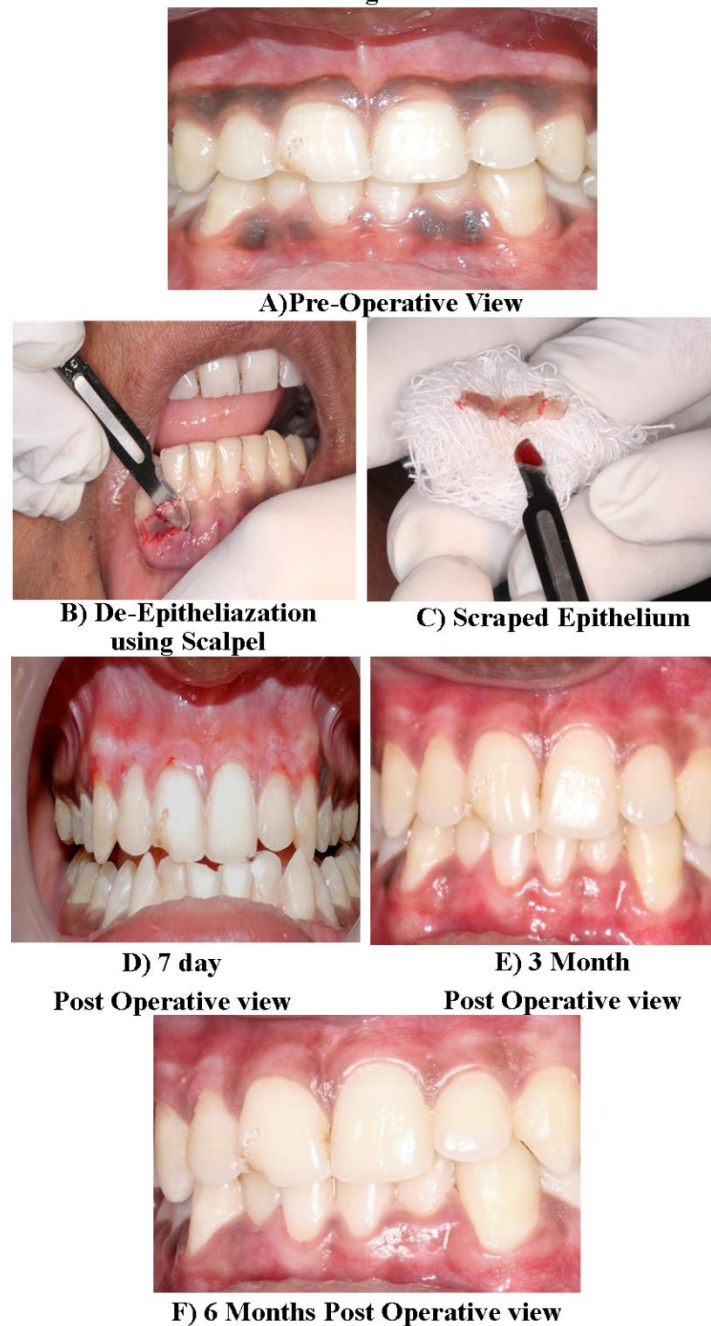
On intra oral examination, generalized diffused blackish pigmentation of the gingiva (Dummet class 3)was observed, however it was healthy and completely free of any inflammation.

Considering the patient concern a surgical scalpel technique was performed both upper and lower arch.Details of the treatment protocol was duly explained to the patient before starting of the treatment procedures and accordingly a written Inform consent was taken from the patient .surgery was performed in a single visit. Prior to surgery all necessary aseptic measures were taken care of followed by which a Local anesthetic solution was administered in form of infiltration in both the arches and only the pigmented epithelium was removed from the upper and lower anterior region using a 15 no blade and Bard Parker handle and the normal architecture of the gingival was

maintained. Bleeding was controlled using pressure pack with sterile gauze. Remnants of tissues were removed using sterile gauze. Then washed with saline and kept in 10% neutral buffered formalin solution and send to Department of oral pathology for further histological investigations. Surgical area was covered with a periodontal pack and post operative instructions

were given to the patient. An analgesic Diclomol® twice a day was prescribed for the management of pain and surgical pack was removed after one week. Healing was uneventful without any post surgical complication in both the arches. On intra oral examination after one week the gingiva appeared pink, healthy and firm giving a normal appearance with pleasing aesthetic outcome.

Figure 1



Case 2:A 23 years old male patient reported to our department with the complaint of blackish gums and wants to correct the same .The treatment protocol was explained to him and prior

to the day of operation an written inform consent was taken from the patient .All the procedures were carried out as mentioned in case report 1.(Figure 2)



Histo-pathology-

The histopathological examination was carried out on excised tissue.

A)Under the Low power view withHaematoxylin& Eosin stained tissue shows multiple bits of tissue showing epithelium arranged in form of pseudo-epitheliomatous hyperplasia with connective tissue entrapment overlying connective tissue stroma.

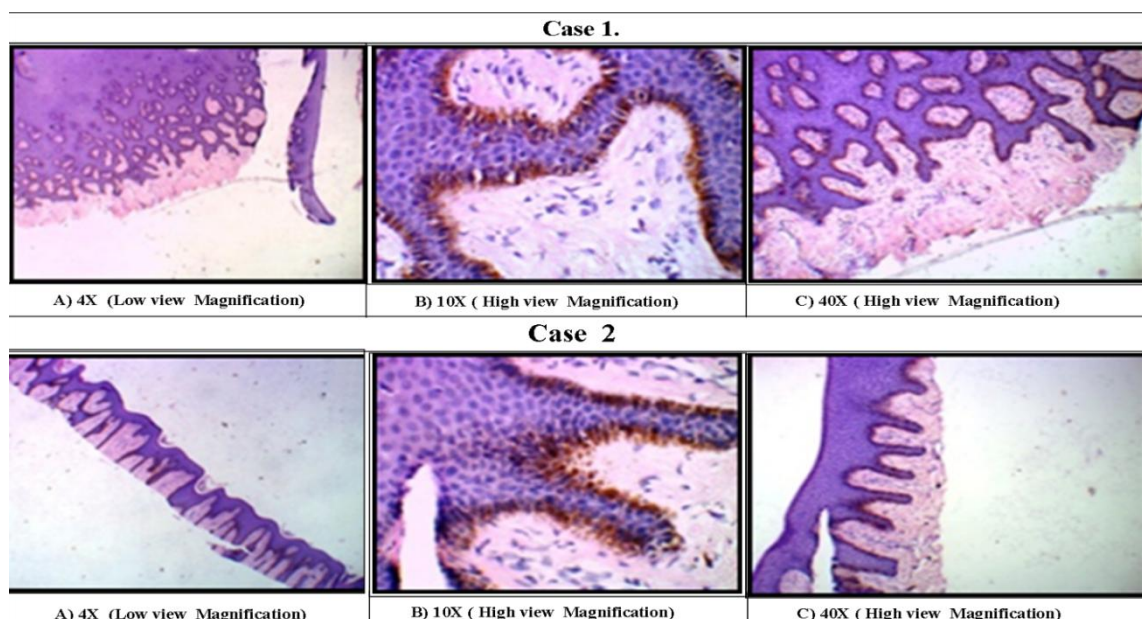
B)High power viewwithHaematoxylin& Eosin stained the epithelium is para-keratinized stratified squamous epithelium with long thin rete ridges and predominant melanocytes in the basal layer.

The entrapped connective tissue is mature comprising of plump to spindle shaped fibroblast, endothelial lined blood vessels with extravassated R.B.Cs.

C)However some melanocytes are present in the supra-basal layer also . Presence of melanocytes clearly correlates the colour of the gingiva ,which suggested that melanocytes are responsible for the gingival hyper-pigmentation.

Overall feature suggested Normal gingival mucosa with hyperpigmentationbased on a clinic-pathological correlation.

Histo-pathological appearance.



Discussion

There are wide variations in the gingival colour in normal healthy persons. The degree of vascularization, the thickness of the keratinized layer and the activity of melanocytes which determine the colour of the gingiva. Melanin pigmentation is the result of the melanin granules which are produced by melanoblasts and are intertwined between the epithelial cells at the basal layer of epithelium. The use of scalpel technique for the depigmentation is the most economical as compared to other techniques, which require more advanced armamentarium. However, scalpel surgery causes unpleasant bleeding during and after the procedure, and is necessary to cover surgical site with periodontal dressing for 7 to 10 days. Though the initial result of the depigmentation surgery is highly encouraging, still repigmentation is a common problem whose exact mechanism is still not known. The exact mechanism of skin repigmentation is unclear, but the "migration theory" seems to be favored. Samuel Perlmutter¹⁶ suggested mechanism of skin repigmentation to be the "migration theory". According to this theory, active melanocytes from normal skin and hair matrix proliferate and migrate into the depigmented areas. Clinical trials have routinely suggested that it takes about 1.5 to 3 years¹⁷ to return to full baseline repigmentation however time period may vary from different pattern of clinical conditions thus if depigmentation procedure is performed primarily for cosmetic reason it will never be of permanent value, because repigmentation will return to baseline value irrespective of a specific timeframe. Thus in future even if gingival repigmentation occurs the same procedures could be repeated in the same region as it is easy to perform, cost effective and above all provides minimum discomfort to the patient and gives esthetically pleasing results.

Conclusion

The case series presented reported no post-operative pain, haemorrhage, infection in any of

the sites on the first and subsequent visits. Healing were uneventful and patient acceptance of the procedure was good and the results were excellent, as perceived by the patient. Hence the following method can be considered as the predictable, minimally invasive and most inexpensive treatment modality for treating gingival depigmentation.

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