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Case Report

GINGIVAL DEPIGMENTATION: CASE SERIES FOR FOUR DIFFERENT TECHNIQUES

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Abstract :
Gingival melanin pigmentation occurs in all races in variable amount caused by melanin granules. The degree of pigmentation varies from person to person. Excessive gingival pigmentation may be a major esthetic concern for many patients. Methods of de-epithelialization of the pigmented or discolored areas of gingiva using different methods such as scalpel method, bur method or laser method are well documented. The procedure for all three techniques has been described and evaluated here. Following presentation encloses a case series in which depigmentation of upper anterior gingival was carried out. The case presented with moderate to severe pigmented gingival (DOPI score $\geq$ 3) which were treated with one of the above mentioned techniques. The results of these cases suggested that ablation of the gingiva by a Diode laser, abrasion with a scalpel or rotary round bur is good enough to achieve esthetic satisfaction and fair wound healing without infection or severe pain.

Keywords : Bur abrasion, Depigmentation, Gingiva, Laser, scalpel technique.

Introduction :

A smile is a method of communication and is a mean of socialization and attraction. The harmony of the smile is determined by the shape, the position and the color of the teeth or lips as well as by the gingival tissues. Thus, gingival health and appearance are essential components of an attractive smile.[1] Review of literature suggested oral melanin hyper pigmentation an esthetic problems, caused by a variety of local / systemic factors[2,3] including genetic factors, tobacco use[4,5]; prolonged administration of certain drugs such as antimalarial agents and tricyclic antidepressant.[6]

The color of oral pigmentation varies depending on the quantity and depth or location of the melanin pigments.[7]

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Melanin pigmentation is caused by melanin granules in gingival tissue, which are produced in melanosomes of melanocytes. Melanocytes are primarily located in the basal and suprabasal cell layers of the epithelium.[8] In addition, the oral pigmentation is due to the activity of melanocytes rather than the number of melanocytes in the tissue.[9, 10, 11] This pigmentation is seen among all races and at any age and it is without gender predilection.[12] In dark-skinned or black individuals, an increased melanin production has long been known to be the result of genetically determined hyperactivity of melanocytes.[11,13] Melanocytes of dark skinned or black individuals are uniformly highly reactive, whereas in light skinned individuals, melanocytes are highly variable in reactivity.[11,13] In general, even though comparable numbers of melanocytes are present within their gingival epithelium, individuals with fair complexion will not demonstrate overt tissue pigmentation.

Although melanin pigmentation of the gingiva is completely benign and does not present a medical problem, complaints of 'black gums' or 'dark gums' are common. Dental treatment is usually sought for esthetic reasons, especially by fair skinned people having moderate or severe gingival pigmentation, mostly in patients with a high smile line. Gingival depigmentation is a periodontal

plastic or esthetic surgical procedure whereby the gingival hyperpigmentation is removed or reduced by various techniques. For depigmentation of gingiva different treatment modalities have been reported like- Bur abrasion, scalpel method, cryotherapy, electrosurgery and laser.[14] Hence the aim of our study was to compare four different depigmentation techniques for removing melanin pigmentation of gingiva.

Case reports :

Four patients [two male, two female], aged 20–25 years visited the Department of Periodontics, A.B.Shetty Memorial Institute of Dental Sciences, Mangalore, India for routine oral prophylaxis. On intraoral examination, diffused blackish pigmentation of gingiva was seen which was more prominent in the upper anterior region in all the cases. The unsightly gingival pigmentation was pointed out to the patients and they were made aware about the array of aesthetic treatment options available. The patients had also noticed the gingival pigmentation and of their own accord opted to undergo the depigmentation procedure. The patients' history revealed that the blackish discoloration of gingiva was present since birth, suggestive of physiologic melanin pigmentation. Clinical examination revealed pronounced bilateral melanin pigmentation. Their medical history was non-contributory. The patients were in good general health and there were no contraindications for the surgeries. Considering the patient's concern, gingival de-epithelization procedure was decided. Use of scalpel de-epithelization, bur abrasion with round bur or ceratip gingival trimming burs® (Kormet USA LLC)[15], or laser method was planned.

Depigmentation procedures were planned after obtaining patients consent. All patients underwent phase-I therapy which included oral hygiene instructions, scaling and polishing. Depigmentation procedure was scheduled once inflammation was resolved. The procedure was carried out from premolar to premolar region.

Fig-I. Baseline: A. Patient 1: 23 years old female (DOPI score 3); B. Patient 2: 21-years-old female (DOPI score 3); C. Patient 3: 25 years old male (DOPI score 3); D. Patient 4: 23 years old male (DOPI score 4)[2]

Scalpel technique (Surgical stripping method)[15]:

After administering local anesthesia (lidocaine 2% with 1:80,000 epinephrine), the uppermost layer of the gingiva was carefully scraped using 15 number blade which was held parallel to the long axis of the teeth. Minimum force/pressure was used to avoid post-operative gingival pitting. Bleeding was controlled with a sterile gauze pressure pack. Surgical areas were covered with a periodontal pack and post-operative instructions were given.[16] Analgesics were prescribed for the management of pain. After one week the pack was removed and the surgical area was examined. The healing was uneventful and satisfactory. No post-surgical complications were encountered.

Fig-II. Scalpel technique : A. preoperative view; B. Immediate post-operative; C. 10 days follow-up

Bur method :

A). Round diamond bur method:

For depigmentation with round diamond bur, revolving bur was used on the surface of pigmented gingiva and moved with feather light strokes without giving any pressure. It was not kept at one place for long time as it may result in thermal trauma and permanent harm to underlying tissue. Medium size round bur was used because small bur might produce small pits rather then surface abrasion. The bleeding was controlled and checked for any pigmented area remained and removed it to prevent relapse. Bleeding was stopped by applying pressure by a gauze piece on the denuded epithelium. Removal of gingival melanin pigmentation should be performed cautiously and the adjacent teeth should be protected, since inappropriate application may cause gingival recession, damage to underlying periosteum and bone, delayed wound healing, as well as loss of enamel.[1]

Fig-III. Bur abrasion: A. preoperative view; B. Immediate post-operative; C. 10 days follow-up

Keywords : Bur abrasion, Depigmentation, Gingiva, Laser, scalpel technique. - Rahul Shah

Fig. I

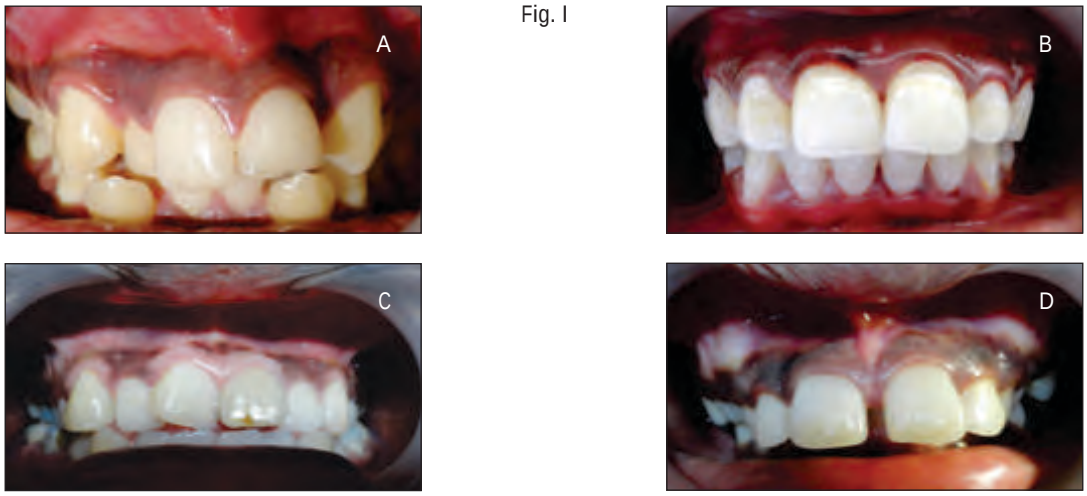

Fig. II

Fig. III

Fig. IV

Fig. V

B). Ceramic gingival trimming bur method:

Suitable for use in various sectors of mucosa surgery, the tissue trimmer CeraTip® constitutes an ideal alternative to electrotomes, curettes and scalpels when it comes to depigmentation of gingiva. For depigmentation by CeraTip®, its tip should be applied to the tissue at 300000 – 450000 rpm without cooling. The tissue can be modeled without hardly any bleeding due to thermal coagulation caused by the rotational energy of the CeraTip®. However, there is the risk of injury due to jamming and slipping of the instrument.[17]

Fig-IV. Bur abrasion: A. preoperative view; B. Immediate post-operative; C. 10 days follow-up

Laser Method:

After applying topical anesthesia (lidocaine 15% topical aerosol USP), diode laser (810 nm) was used for depigmentation method. The gingival epithelium and part of connective tissue was used using pulsed mode. Pulse length and pulse interval were used for 80 microseconds. The tip was used moving brush stroke to prevent heating of the tissue. The area was irrigated using saline and was covered with periodontal dressing.[14]

Fig-V. Laser ablation: A. preoperative view; B. Immediate post-operative; C. 10 days follow-up

Discussion :

Oral pigmentation occurs in all races of humans. There are no significant differences in oral pigmentation between males and females. The intensity and distribution of pigmentation of the oral mucosa may be variable, not only between races, but also between different individuals of the same race and within different areas of the same mouth. Physiologic pigmentation is probably genetically determined, but as Dummett suggested, the degree of pigmentation is also related to mechanical, chemical, and physical stimulation.[18,19]

Melanin pigmentation is frequently occurring by melanin deposition by active melanocytes located mainly in the basal layer of the oral epithelium. Pigmentations can be removed for esthetic reasons. Different treatment modalities have been used for this aim. The selection of a technique for depigmentation of the gingiva should be based on clinical experience, patient's affordability and individual preferences.

It is known that the healing period for scalpel wounds is faster than other techniques; however, scalpel surgery causes unpleasant bleeding during and after the surgery, and it is necessary to cover the lamina propria with periodontal packs for 7 to 10 days.[12]

The process of healing in bur method is similar to the scalpel technique. It is also comparatively simple, safe and non-aggressive method which can be easily performed and readily repeated, if necessary, to eradicate any residual repigmentation.[14] Also, these techniques do not require any sophisticated equipment and are hence economical. Pre- and post-surgical care is similar to that of the scalpel technique. However, extra care should be taken to control the speed and pressure of the bur so as not to cause unwanted abrasion or pitting of the tissue. Feather light brushing strokes with minimum pressure and copious saline irrigation should be used without holding the bur in one place to get excellent results.[21]

With laser, easy handling, short treatment line, homeostasis, sterilization effects and excellent coagulation (small vessels and lymphatics) are known advantages. Also, elimination of using periodontal dressing is possible by using laser. However, laser surgery has some disadvantages. Delayed type of inflammatory reaction may take place with mild post-operative discomfort lasting up to 1–2 weeks. Epithelial regeneration (re-epithelialization) is delayed (lack of wound contraction) as compared to conventional surgery. Also, expensive and sophisticated equipment makes the treatment very expensive. Another disadvantage is loss of tactile feedback while using lasers.

Conclusion :

Though the initial results of depigmentation procedure are highly encouraging, there is a chance of repigmentation. Documented chances of repigmentation after scalpel technique are 21.4%, and laser therapy are 22.8%.[22] This process may be attributed to the fact that active melanocytes from the adjacent pigmented tissues might migrate to the treated areas.[9] However it is safe to conclude that the procedure adopted should be simple, cost effective and less painful with minimal tissue loss and should be comfortable to the operator as well as patient.

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