Esthetic Gingival Rehabilitation - Depigmentation Using Scalpel & Laser : A Case Report

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Abstract :

Gingival pigmentation often occurs as a result of an abnormal deposition of melanin pigment, due to which gums appear black. Treatment procedures such as, gingivectomy,scalpel surgery electrosurgery, cryosurgery, chemical agents, abrasion with diamond bur, Nd: YAG laser, semiconductor diode laser, and CO_2 laser have been used for removal of melanin hyper pigmentation. The following case report describes two different surgical depigmentation techniques: scalpel surgery and a diode laser. Resultsof depigmentation were satisfactory with diode laser and conventional scalpel.Uneventful healingwith no repigmentation occurred.

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Introduction :

Gingival pigmentation is a discoloration of the gingival/oral mucosa, which is associated with several etiological factors. These factors are varied which include drugs, genetics, endocrine disturbances,heavy metals and syndromes such as Albright's syndrome, PeutzJegher's syndrome, and also in inflammation. Habitssuch as tobacoo smoking stimulates melanin pigmentation and the intensity of pigmentation is related to the duration of smoking and the number of cigarettes consumed. Now pigmentation it is found more in females and it is mostly specified to certain localized area i.e. anterior labial gingiva.[1]

Most common endogenous pigment i.e. Melanin which is produced by melanocytes is a nonhemoglobin-derived brown pigment, these melanocytes are present in the basal layer of the epithelium. Hyperpigmentation is mainly due to excessive deposition of melanin which gets seated in the basal and suprabasal cell layers of the epithelium. Melaningranules which are produced by melanoblastsgets intertwined between epithelial cells at the basal layer of the gingival epitheliumwhich resultsin pigmentation of gingiva. The degree of pigmentation may vary from person to person and depends on variety of factors especially the melanoblastic activity.[2]

Pigmentation of gingiva is completely normal and does not correlate with any medical condition, complaints of "black gums" are common, particularly in patients having a very high smile line (gummy smile).

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

Different Techniques for Depigmentation Include[3]:

1. Scalpel technique (conventional)
2. Cryosurgery
3. Electrosurgery surgical unit
4. Lasers technique
5. Chemical methods including acoustic agents - not used now a days
6. Method aimed at masking the pigmented gingival from less pigmented gingival areas
   a. Free gingival graft
   b. Acellular dermal matrix allograft

The present case series describes two simple and effective surgical depigmentation techniques - The scalpel technique and a diode laser surgery – for gingival depigmentation, which have produced good results with patient satisfaction.

Treatment Protocol:

A 24-year-old male patient reported to the Department of Periodontics with the compliant of "black colored gums. On intra-oral examination she had deeply pigmented gingiva from right first premolar to left first premolar. The use of a scalpel and laser was planned to perform the depigmentation. The entire procedure was explained to the patient and written consent was obtained. A complete medical, family history and blood investigations were carried out to rule out any contraindication for surgery.

Local anesthesia was infiltrated in the desired region from premolar to premolar (Lignocaine with adrenaline in the ratio 1:100000 by weight) . The properly initiated tip of the diode laser unit (xolar laser) that was angled at an external bevel of 45 degrees with energy settings of 1.5 watts with continuous wave (CW) was used in back and forth stroke with gradually progressing towards deeper areas along the same initial laser incision to remove the tissue. During the procedure, any tissue tags left out after laser ablation were wiped with sterile gauze soaked in saline every 3-5 min and thorough inspection was done to confirm no pigmented areas were left out. Another site was treated with conventional scalpel technique i.e. a Bard Parker handle with a No. 15& 15c blade was used to remove the pigmented layer and Pressure was applied with sterile gauze soaked in local anesthetic agent to control hemorrhage during the procedure. The entire pigmented epithelium along with a thin layer of connective tissue with scalpel was removed. The exposed surface was irrigated with saline the surgical area was covered with a periodontal dressing The patient was advised to use chlorhexidine mouthwash 12 hourly for 1 week. The patient was reviewed at the end of 1 week to be satisfactory. The patient had no complaints of postoperative pain or sensitivity. At the end of 3 months, the gingiva appeared healthy and no repigmentation was seen. The healing process was proceeding normally and patient did not report any discomfort.

Results:

Uneventful healing was observed in 1st week with pink coloured gingiva compared no adjacent non treated area resulting in a significant improvement in esthetic appearance of the patient. Acceptance of the treatment by the patient was good and results were excellent as perceived by the patient. Helaing was same with both the technique. At the scalpel blade site, the patient complained of moderate pain, but at the site treated with diode laser, only slight or no pain was recorded. However, the pain had reduced considerably 1 week after the surgery .

Method	Immediately	1 week post-op	1 month post-op
Scalpel	Ulcer	Complete epithelization	Complete epithelization
Laser	Ulcer	Incomplete epithelization	Complete epithelization

Discussion :

Gingival pigmentation is frequently caused by deposition of melanin via active melanocytes which are mainly located in the basal layer of the oral epithelium. Physiologic pigmentation is probably genetically determined, but as Dummet[4] suggested, the ratio of pigmentation is partially related to mechanical, chemical, and physical stimulation. Pigmentations can be removed for esthetic reasons. Different treatment modalities have been used for this aim. Selecting a technique for gingival depigmentation is totally based on clinical experience, patient's affordability and individual preferences. cosmetic rehabilitation is becoming common now a days specially related to gingival melanin pigmentation. Various treatment modalities are used for this purpose like scalpel, electrosurgery, and cryosurgery to lasers.

The semiconductor diode laser is emits a continuous- wave or gated-pulsed pattern mode. Laser light at 800 to 980 nm is rarely absorbed by the water, but in hemoglobin it gets absorbed in high amounts and in other pigments also. The laser is an excellent soft tissue surgical laser, indicated for cutting and coagulating

gingiva and oral mucosa, and for soft tissue curettage or sulcular debridement. The advantages of diode lasers are the smaller size of the units as well as the lower financial costs. Diode laser did not produce any deleterious effect on the root surface. Thus, it is generally considered that diode laser surgery can be performed safely in close proximity to dental hard tissue[5].

Scalpel surgery causes unpleasant bleeding during and after the operation and it is necessary to cover the exposed lamina propria with a periodontal pack for 7 to 10 days. The diode laser causes minimal damage to the periosteum and bone under the gingiva being treated, and it has the unique property of being able to remove a thin layer of epithelium cleanly. Although healing of laser wounds is slower than healing of scalpel wounds, a sterile inflammatory reaction occurs after laser use[6].

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 operation, and it is necessary to cover the surgical site with periodontal dressing for 7 to 10 days[7].

Fig 1. Pre-operative

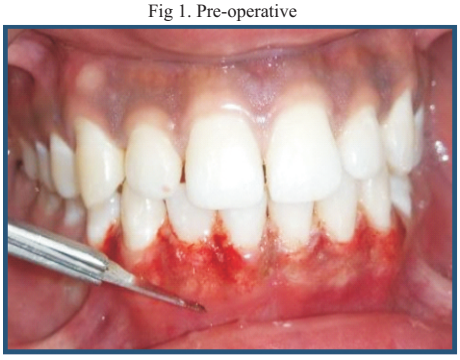

Fig 2.scalpel

Fig 3.Diode laser

Fig 4.Co-pack

Fig 5. Post-operative

Conclusion

The need and demand for esthetic demand has become a need which requires the removal of pigmented gingival areas to create a pleasant and confident smile, which may alter the personality of an individual. Attaining this by using any of the methods described above makes it easier for the patient to have confident smile.Diode laser is a safe and effective alternative procedure for the treatment of gingival melanin pigmentation. Its benefits include ease of usage, effectiveness in the treatment of superficial benign pigmented lesions, convenience in dental clinics, and decreased trauma for the patient.

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