

Gingival Depigmentation By Scalpel, Diode Laser And Electrosurgery - A Case Report

Abstract

The color of the gingiva depends on the ethnicity and varying degree of melanin deposition. Gingival and cutaneous melanin pigmentation is a common aesthetic problem. This problem is aggravated in patients with a gummy smile or excessive gingival display. The gumminess in cases of skeletal class II malocclusion, bimaxillary protrusion and fairer individuals would make a smile unpleasant. Various techniques of depigmentation have been explained in the literature to treat this entity. Here we present a case of hyperpigmentation treated with scalpel, diode laser and electrosurgical procedure in a split mouth design with a note on comparison of healing.

Key Words

Gingival Depigmentation, Melanin, Diode Laser, Electrosurgery, Healing, Hyperpigmentation

Introduction:

The harmony of the smile is determined not only by the shape, the position and the color of the teeth but also by the gingival tissues. Gingival health and appearance form an essential component of an attractive smile.^[1] Gingival pigmentation varies among different ethnic groups. Among same race, the depth of color depends on density of melanin and degree of melanoblastic activity.^[2] Melanin pigmentation results from melanin granules, which are produced by melanoblasts.

Melanin hyperpigmentation of gingiva usually referred by patients as black gums is considered to be unaesthetic. This problem looks exaggerated in patients with a "gummy smile" or excessive gingival display while smiling. Gingival depigmentation is a periodontal plastic surgical procedure whereby the gingival hyperpigmentation is removed or reduced by various techniques. The foremost indication for depigmentation therapy is the demand by a patient for improved esthetics.^[3] Techniques available for esthetic depigmentation includes abrasion with diamond bur, slicing with scalpel, cryosurgery, electro surgery, gingivectomy with free gingival autograft, acellular dermal matrix allografts, and various types of lasers have been used for cosmetic therapy of gingival melanin depigmentation.^[3]

This case presents the comparison of conventional surgery by scalpel, electro surgery and diode laser for removal of

gingival hyperpigmentation including patient's comfort, operator's ease, complications, outcome and prognosis.

Case Report:

A 27 years old male patient presented to the department of Periodontology, Subharti dental college and hospital, with the chief complaint of "black" colored gums. Patient requested for any kind of esthetic treatment which could make his "black" colored gums look better. Medical history was non-contributory. Intra-oral examination revealed that he had deeply pigmented gingiva (**Fig.1**). A complete medical, family history and blood investigations were carried out to rule out any contraindication for surgery. The entire procedure was explained to the patient and written consent was obtained. A split mouth design including three different depigmentation techniques were adopted. The depigmentation treatment procedure was carried out with conventional scalpel surgery on one side and diode laser on contralateral side in upper anterior teeth and in lower anteriors depigmentation was done with electro surgical electrode.

After adequate local anesthesia, maxillary right heavily pigmented gingiva up to the first premolar was de-epithelized with a scalpel blade (No.11) by a slicing method (**Fig.2**). Depigmentation was carried out from mucogingival junction towards tip of interdental papilla. Care was taken to avoid pitting of gingival surface or to

¹ Deepa D

² Ambika Chawla

³ Priyanka Srivastava

¹ Professor

² Ex - Post Graduate Student

³ Post - Graduate Student

Department of Periodontology

Subharti dental College and Hospital

Meerut-250005, U.P, India

Address For Correspondence:

Dr. Deepa D

Professor, Department of Periodontology

Subharti Dental College and Hospital

Delhi-Haridwar By-pass road

Meerut-250005, U.P, India

Ph:09639923588

e-mail: deepa_arun@rediffmail.com

Submission : 6th March 2012

Accepted : 18th November 2012

Quick Response Code



Fig.1: Pre-operative Photograph



Fig.2: Pre-operative Photograph With Scalpel

remove too much tissue. Care was also taken to remove all remnants of melanin pigment as thoroughly as possible. A semiconductor diode laser (980 nm wavelength, 2.5 W) was used for depigmentation on the contralateral side (Fig.3). Laser ablation was started from mucogingival junction towards tip of interdental papilla. The motion of ablation was performed as light brushing strokes and tip was kept in motion all the time. Remnants of the ablated tissue were removed using sterile gauze dampened with saline solution. The procedure was repeated until desired depth of tissue removal was achieved.

Electrosurgical technique was performed with the loopelectrode (Fig.4). A blended cutting & coagulating (fully rectified) current was used. In all the steps the electrode was activated and moved in a concise "shaving" motion. Extreme care was exercised to avoid contacting the tooth surface. For hemostasis, the ball electrode was used (Fig.5). Periodontal Pack was placed and post-surgical instructions were given to the patient along with the prescription of anti-inflammatory analgesics. The patient was advised 0.2% chlorhexidine gluconate mouth wash 12 hourly for one week. The patient was reviewed at the end of one week (Fig.6). The healing process was uneventful on scalpel surgical area than compared to diode laser and electrosurgically treated sides. Areas of raw wound surface were visible on electrosurgical treated site. But, patient did not report any discomfort. Patient was reviewed at the end of two weeks (Fig.7); slight pain was experienced by the patient in area treated with electrosurgical treated site. At the end of one month, re-epithelization was complete and healing was found to be satisfactory on all the treated sites (Fig.8).

Discussion:

Oral pigmentation occurs in all races of man. There are no significant differences in oral pigmentation between males and females. The intensity and distribution of pigmentation of the oral mucosa is variable, not only between races, but also between different areas of the same mouth. Melanin pigmentation is frequently caused by melanin deposition by active melanocytes located mainly in the basal layer of the oral epithelium. Pigmentation can be removed for esthetic reasons^[3].

Different treatment modalities have



Fig.3: Pre-operative Photograph With Diode Laser Tip



Fig.8: One Month Post-operative Photograph



Fig.4: Operative Site With Electrosurgical Tip



Fig.5: Immediate Post-operative Photograph



Fig.6: One Week Post-operative Photograph



Fig.7: Two Weeks Post-operative Photograph

been used for this purpose.^[4] Selection of a technique for depigmentation of the gingiva should be based on clinical experience, patient's affordability and individual preferences. Scalpel surgical technique is highly recommended in consideration of the equipment constraints that may not be frequently available in clinics. It is known that the healing period for scalpel wounds is faster than other techniques.^[5]

Electrosurgery requires more expertise than scalpel surgery. Prolonged or repeated application of current to tissue induces heat accumulation and undesired tissue destruction. Contact with periosteum or alveolar bone and vital teeth should be avoided.^[6] Semiconductor diode laser is preferred for depigmentation as laser light at 800 to 980 nm is poorly absorbed in water, but highly absorbed in haemoglobin and other pigments, as compared to other lasers.^[7] In the present report it was associated with better healing response than electrosurgical treated site.

The healing period of scalpel wounds was shorter than with diode laser and electrosurgery. In area treated with scalpel, the tissue had not been subjected to the effects of thermocoagulation and carbonization from the laser irradiation or burn from electrosurgery.

Also there is lack of bleeding and clot formation in the electrosurgery and laser wounds, which are present after use of scalpel and form the "first phase" of healing. Although healing of laser wound is slower than healing of scalpel wounds, a sterile inflammatory reaction occurs after procedure. Blood vessels in the surrounding tissue up to a diameter of 0.5 mm are sealed; thus, the primary advantage is haemostasis and a relatively dry operating field.^[6]

There was an inherent delay in epithelial migration and a denatured zone is formed within the connective tissue after

electrosurgery probably due to lateral heat generated within the tissue by the active electrosurgery electrode. Prolonged or repeated application of current to tissue induces heat accumulation and undesired tissue destruction. Contact with periosteum or alveolar bone and vital teeth should be avoided.

Conclusion:

The depigmentation procedure was successful and the patient was satisfied with the result. Hence we conclude that depigmentation of hyper pigmented gingiva by scalpel surgery is simple, easy to perform, cost effective and above all it causes less discomfort. Diode laser proved to be effective alternative for gingival depigmentation with benefits like ease of usage, convenience in dental clinics and decreased trauma to patient. While electrosurgical procedure provided blood free working area, contouring and festooning was easy with various electrodes. As far as healing was concerned, it was relatively better with

scalpel surgery compared to diode laser and electro surgery at the end of one week but no difference was found at the end of one month. However, further long term longitudinal studies are required to evaluate and confirm the results with assessment of repigmentation.

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Source of Support : Nil, Conflict of Interest : None declared