

Gingival depigmentation using Scalpel technique versus laser technique: A case report

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Abstract: *Gingival melanin hyperpigmentation is a major esthetic concern for many people. Melanin pigmentation is known to be caused by melanin granules within the gingival epithelium. Though it is not a medical pathology, many people complain of dark gums as unesthetic. Various depigmentation techniques have been employed, such as scalpel technique, gingivectomy, gingivectomy with free gingival autografting, cryosurgery, electrosurgery, chemical agents such as 90% phenol and 95% alcohol, abrasion with diamond burs, Nd:YAG laser, semiconductor diode laser, and CO₂ laser. In the present case, two techniques namely; scalpel technique and diode laser technique for gingival depigmentation have been performed so as to compare and evaluate the two techniques.*

Key words: *Gingival melanin hyperpigmentation, depigmentation, melanin, laser*

Key message: *The use of scalpel technique for the depigmentation is the most economical as compared to other techniques, which require more advanced armamentarium. The application of diode laser appears to be a safe and effective alternative procedure for the treatment of gingival melanin hyperpigmentation.*

I. Introduction

Melanin, a nonhemoglobin-derived brown pigment, is the most common of the endogenous pigments. Melanin pigmentation is the result of melanin granules produced by melanoblasts intertwined between epithelial cells at the basal layer of the gingival epithelium.^[1] Gingival depigmentation can be considered a periodontal plastic surgical procedure whereby the gingival hyperpigmentation is removed by various techniques.^[2] Different techniques for depigmentation include Scalpel technique, Cryosurgery, Electrosurgery. Lasers like Nd: YAG laser, Er: YAG laser, CO₂ laser have been used. Chemical agents including caustic agents, were used earlier, but not used nowadays. Other methods aimed at masking the pigmented gingiva from less pigmented gingiva include Free gingival graft and Acellular dermal matrix allograft.^[2,3]

II. Case History

A 23 - year old male patient visited the Department of Periodontics with the chief complaint of “black” discoloration of gums. Intra-oral examination revealed that he had deeply pigmented gingiva of both upper and lower jaws extending from right first premolar to left first premolar. The patient desired treatment for the same. A complete medical and family history were recorded and blood investigations were carried out to rule out any contraindications for surgery. The entire procedure was explained to the patient and informed written consent was obtained. A scalpel technique for depigmentation was performed on maxillary pigmented gingiva and laser technique was performed on mandibular pigmented gingiva.

Depigmentation with Scalpel technique

Depigmentation was performed under adequate local anesthesia in maxillary anterior region from premolar to premolar. A Bard Parker handle with a No.15 blade was used to remove the pigmented layer. Pressure was applied with sterile gauze to arrest bleeding during the procedure. Entire pigmented epithelium along with a thin layer of connective tissue was removed (Fig.1) and the exposed surface was irrigated with saline. Care was taken to see that all remnants of the pigment layer were removed. The surgical area was covered with a periodontal dressing.

Post-surgical antibiotics and analgesics were prescribed. The patient was advised to use chlorhexidine mouthwash 12 hourly for two week. The patient was reviewed at the end of 1 week. The healing was uneventful and patient did not report any discomfort. At the end of 1 month, re-epithelialization was complete and healing was found to be satisfactory. Patient had no complaints of postoperative pain or sensitivity. However, certain localized areas of repigmentation were seen at 3 months (Fig. 3)

Depigmentation with Diode laser

Patient and operating staff wore special diode-laser protective eye glasses. Highly reflective instruments or instruments with mirrored surfaces were avoided as there could be reflection of the laser beam. Surgery was performed under local anesthesia. A diode surgical laser unit (Zolar photon diode, wavelength 810 nm, power 4 W) was used for depigmentation of the mandibular anterior gingiva up to first premolar. The diode laser was emitted in continuous mode and operated in a contact method using a flexible fiber optic handpiece. Energy settings of 0.5-1.5 watts were used with small brush like strokes with gradual progression deeper along the same initial laser incision to remove the tissue. During the procedure, laser ablated the gingival epithelial surface little by little to reach the pigments without causing any bleeding. To enhance visualization, normal saline-soaked cotton or gauze was used to remove epithelial remnant. The wound looked fresh with no bleeding (Fig 2). Topical application of vitamin E was done over operated area and patient was advised to continue vitamin E application for one week twice a day. Patient was instructed to avoid eating hot and spicy food for the first 24 hours. No infection or postoperative complications such as pain or bleeding were encountered at 1 week.

III. Discussion

Physiologic pigmentation is probably genetically determined, but as Dummett (1960)^[4] suggested, that the degree of pigmentation is partially related to mechanical, chemical, and physical stimulation^[5]. Pigmentations can be removed for esthetic reasons. Different treatment modalities have been used for this aim^[6] varying from scalpel, electrosurgery, and cryosurgery to lasers.^[2,3] The selection of a technique for depigmentation of the gingiva should be based on clinical experience, patient's affordability and individual preferences. Since the diode laser basically does not interact with dental hard tissues, it 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 diode laser exhibits thermal effects using the "hot-tip" effect caused by heat accumulation at the end of the fiber, and produces a relatively thick coagulation layer on the treated surface. The usage is quite similar to electrocauterization. Tissue penetration of a diode laser is less than that of the Nd: YAG laser, while the rate of heat generation is higher^[7].

The healing period of scalpel wounds is shorter than with diode laser. 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^[8].

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^[9].

IV. Conclusion

The need and demand for esthetics requires the removal of unsightly pigmented gingival areas to create a pleasant and confident smile, which altogether may alter the personality of an individual. This could be easily attained by using any of the methods described above. The application of diode laser appears to be a safe and effective alternative procedure for the treatment of gingival melanin hyperpigmentation. 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.



Fig.1 Immediate Post- operative photograph after scalpel technique



Fig 2: immediate post- operative photograph after laser technique



Fig: 3: 3 month follow up

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