

EFFICACY OF DIFFERENT TECHNIQUES OF GINGIVAL DEPIGMENTATION: A COMPARATIVE EVALUATION WITH A CASE REPORT

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ABSTRACT

For many people, excessive gingival pigmentation is a major cosmetic concern. Melanin granules seen in the gingival epithelium are recognised to be the cause of melanin pigmentation. Despite the fact that Not a medical condition, many people find brown gums unattractive. This article describes a case of hyperpigmentation in a split mouth design that was treated with a bur scalpel, diode laser, and electrosurgical technique, along with a comparison of healing.

Keywords: bur, laser , electrocautery, scalpel, depigmentation.

INTRODUCTION:

The harmony of a smile is not only determined by the shape, position, and colour of the teeth, but also by the gingival tissues. Gingival health and appearance are essential components of an attractive smile.¹ A smile expresses a feeling of joy, success, affection, and courtesy and also reflects self-confidence. Oral melanin pigmentation is well described in the literature and is thought to have a variety of etiologies, including as genetics, tobacco use, systemic illnesses, and extended use of several medications, particularly antimalarials and tricyclic antidepressants.²

It has been observed that there is a positive correlation between gingival pigmentation in children and parental smoking. This pigmentation may be induced by the stimulation of melanocytes by stimuli present in tobacco smoke such as nicotine and benzopyrene.³ All races experience gingival melanin pigmentation Increased melanin production in the skin and oral mucosa has long been recognised to occur in people with dark complexion and people of colour. a result of their melanocytes' hyperactivity, which is genetically determined. Previous research has demonstrated that there is no appreciable

variation in the density of melanocyte dispersion between light-skinned, dark-skinned, and black people. However, melanocytes of dark-skinned and black people are consistently more reactive than those of people with light skin.⁴ Though hypermelanin pigmentation of the gingiva does not present a medical problem, patient's complaint of 'black gums' is more of an esthetic problem and embarrassment particularly if gingiva is visible during speech and smiling (high lip line).⁵

The gingival color of normal healthy person is typically coral pink. However, wide variations are observed. The factors which affect the gingival color include vascularity, thickness, keratinization and gingival pigmentation.⁶ Gingival depigmentation is a periodontal plastic surgical procedure whereby the gingival hyperpigmentation is removed or reduced by various techniques.⁷ Chemical cauterization, gingivectomy, and scalpel therapy have all been tried in the past to address gingival hyperpigmentation.

Cryotherapy, free gingival autograft and laser therapy are some of the most recent methods for gingival depigmentation that have produced good outcomes. Laser ablation has recently gained recognition as one of the most efficient, comfortable, and dependable procedures.⁸

However, it is not widely employed because of the expensive nature of the laser equipment. Additionally, there aren't many studies that compare their effectiveness.

CASE REPORT:

A 28-year-old male patient visited the Department of Periodontology Babu Banarasi Das College Of Dental Sciences the chief complaint of generalized blackish pigmentation of the gingiva; though it was healthy and completely free of any inflammation. Considering the patient's esthetic concern, different options were explained to the patient and after getting approval from the institutional ethical committee, the procedure was planned.

PROCEDURE:

After giving the patient and his parents a thorough explanation of the procedure and obtaining their written agreement, we intended to use a soft tissue trimmer bur for the left upper anterior region.

Electrosurgery for the left anterior mandibular teeth and laser and scalpel for the right and left anterior mandibular teeth. To rule out any surgical contraindications, a thorough medical and family history was taken, along with blood tests.



Fig 1A:Pre-operative view

Ceramic soft tissue trimming bur:

Materials used for specific treatment included Soft tissue trimming bur.

Depigmentation with precision soft tissue trimmer (DFS Precicut®): Soft tissue trimmer was used in the high-speed rpm without water coolant spray to excise and contour soft gingival tissue.(fig-1) The heat produced by the bur due to friction results in an immediate tissue coagulation and minimal bleeding, therefore, the use of coolant (water) was avoided. After removing the entire pigmented epithelium with precision soft tissue trimmer, the exposed surface was irrigated with saline. Care was taken to see that all remnants of the pigmented layer were removed. The surgical area was then covered with a Coe-Pak™ (GC America).⁹



Figure1B: Bur technique

Laser Technique:

The mandibular left anterior teeth were depigmented using a Sunny Gold® diode laser with a wavelength of 980 nm.

The laser was operated at a power output in continuous mode 2 W. Under conventional precautions, melanin-pigmented gingiva was abated in the contact mode (Fig. 2) using a flexible, hollow-fiber delivery device. The benefits of using a laser include its ease of handling, quick healing times, hemostasis, and ability to disinfect and sterilise. All pigmented areas underwent the operation following local anaesthesia. Sterile gauze moistened with saline was used to remove any remaining ablated tissue remnants. This process was continued until the required tissue depth was reached.

Removal was successful. Laser was determined to be a suitable and safe option for gingiva eradication that was pigmented. Figure 2 displays the postoperative image right after application.



Figure 2: Laser technique

Electrosurgical Technique :

Electrosurgery was used to arrange the depigmentation process for the mandibular right anterior teeth. The Bonart® brand of electrosurgical equipment was utilised. It was operated in cutting and coagulation mode with a power setting of 5. Following local anaesthesia, excision was performed with a loop electrode (Fig. 3) and coagulation was achieved with a ball electrode. Reduced bleeding and a pristine field improved the work's effectiveness. The brush was employed lightly, and the tip was constantly in motion. It was advised to avoid applying the electrode to the tissue for an extended period of time or repeatedly because this could lead to heat buildup and undesirable tissue destruction. Enough precautions were taken to prevent electricity from coming into touch with the periosteum and important teeth because it is known to have undesirable effects.



Figure 3: Electrosurgical method

Conventional Scalpel Technique

Using a No. 15 scalpel blade, two vertical incisions were made distal to the permanent canines of the left sides following block anaesthesia with 2% lignocaine. As seen in Figs. 3 and 4, a split thickness flap was elevated and removed while preserving the gingiva's typical design. Using sterile gauze and a pressure pack, the bleeding was managed. To stop the bleeding, sterile gauze soaked in saline was applied to the recipient site.

CoePak periodontal dressing was applied to the exposed depigmented area and left on for a week. A prescription for an analgesic was written to treat pain. The surgical region was checked and the pack was removed after a week.



Figure 4: Electrosurgical method

Postoperative view:



Figure 5. Bur technique



Figure 6: laser technique



Figure 7: electrosurgical method



Figure 8: Conventional scalpel technique



Figure 9:One month postoperative view

RESULTS

The three modalities were used, and the outcomes were compared in terms of postoperative pain, swelling, recovery time, cost effectiveness, and time. After a week, the scalpel technique wound area remained raw and erythematous. This was in contrast to the electrosurgical side, which had more

edema but less erythema. The region that underwent laser surgery displayed the greatest clinical picture, devoid of both edema and erythema.

All four of the clinical modalities that were used resulted in equivalent healing after one month and after nine months. After nine months, the general clinical picture remained mostly unchanged, with no

recurrence of pigmentation seen in any of the three modalities.

In contrast, the laser site reported the least amount of patient discomfort at the end of a week, followed by the electrosurgical site, while the scalpel side recorded the most pain.

From the perspective of the clinician, laser surgery needed the least amount of manual skill and time, while electrosurgery required the greatest amount of time and dexterity. Laser Technology bleeding during surgery was more for the scalpel technique, while almost no bleeding was seen in laser and electrosurgery.

DISCUSSION

Oral pigmentation occurs in all races of man. There is no significant difference in the oral pigmentation between males and females. However, the intensity and distribution of pigmentation of the oral mucosa is variable. It not only varies between races, but also between different individuals of the same race and also within different areas of the mouth of an individual. Physiologic pigmentation is probably genetically determined, but the degree of pigmentation is partially related to mechanical, chemical and physical stimulation also (Cicek, 2003 and Dummet, 1960).

Melanin pigmentation results from active melanocytes, which are mostly found in the oral epithelium's basal layer, depositing melanin on the skin. It is possible to eliminate pigmentation for aesthetic purposes. There is a widespread need for cosmetic therapy for gingival melanin pigmentation, and a number of depigmentation techniques have been developed, each with advantages and disadvantages of their own (Pontes AE, Pontes CC, Souza, Novaes Jr, Grisi, Taba Jr, 2006). The choice of a gingival depigmentation technique should take into account the patient's budget, personal preferences, and clinical experience.

Given the limitations of the technology, which may not always be available in clinics, the scalpel surgical technique is strongly advised. Nevertheless, painful bleeding occurs during and after scalpel surgery, and the surgical site must be covered with a periodontal dressing for seven to ten days.¹⁰

Although other authors have claimed that the scalpel approach is very easy to use, flexible, and requires little time or effort,⁴ in this particular instance, more time and dexterity were needed.

Oringer's (1975) "exploding cell theory" has been used to explain why electrosurgery is more effective than

scalpels. This idea predicts that the electrical energy causes the melanin cells found in the basal and suprabasal layers of the operated site and its surroundings to molecularly disintegrate.¹¹

As a result, electrosurgery significantly affects the rate at which melanin cells migrate away from locally located cells.

Nonetheless, in the current case report, there was no discernible difference in the recurrence of pigmentation between the electrosurgical and knife techniques.

Furthermore, compared to scalpel surgery, electrosurgery has been observed to demand greater skill.¹² Once more, the outcomes differed from the current study, where using a knife to dissect a partial thickness flap required greater surgical skill than electrosurgery.¹³ However, the drawback of electrosurgery is that repeated or extended application of current to tissue results in heat buildup and undesirable tissue destruction. Therefore, it is best to prevent contact with the periosteum, alveolar bone, and essential teeth.¹⁴

After surgery, the laser group felt less pain than the scalpel group. The idea behind it is that the coagulum protein, which forms on the surface of the wound, acts as a biological dressing for the wound¹⁵ and seals off the ends of sensory nerves.¹⁶ This supports other research that indicates the

benefits of laser therapy include hemostasis, quick treatment times, easy handling, a decontaminating and sterilising action, and the elimination of the need for even a periodontal dressing.¹⁷

In the present study, bleeding during surgery was assessed between bur techniques. bur treated areas showed relatively less bleeding than soft tissue trimming bur treated area. This may be because, initiation of tip provides a hot tip effect, which helps in concentrating energy at the tip.

The bur treated tissue resulted in an immediate tissue coagulation minimal bleeding caused by the rotational energy of the DFS PreciCut® precision soft tissue trimmer.

CONCLUSION:

It may be concluded that there was no recurrence with any of the methods observed, and that all four techniques yielded equivalent healing results. In contrast, no such bleeding was observed with the electrosurgical and laser approaches because the charred layer acted as a surgical bandage to stop the bleeding. This is significant because the scalpel technique left a bleeding surface for rapid postoperative examination. Technical proficiency is necessary even though laser and electrosurgery offer the advantage of

less bleeding but still need to be used with caution. It is also necessary to account for the expensive laser equipment.

It can be concluded that soft tissue trimmer are comparable in achieving aesthetic satisfaction. Hence, the soft tissue trimmer

could also be used for depigmentation as it is very cost effective, readily available and acceptable by the patients.

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