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Case Report on Gingival Depigmentation with Scalpel Technique

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Abstract

Physiological pigmentation of the oral mucosa appears as multifocal or widespread melanin pigmentation, varying in intensity across different ethnic groups (Cicek, 2003) [4]. The main factors influencing gingival color include the thickness of the gingival epithelium, the quantity and size of blood vessels, the degree of keratinization, and the presence of various pigments. Melanin, a brown pigment, is the most common endogenous pigment responsible for natural gingival pigmentation.

The gingiva is the most frequently pigmented part of the oral mucosa. Melanin pigmentation occurs in the basal layer of the gingival epithelium, where melanin granules produced by melanoblasts become interspersed among epithelial cells.

While melanin hyperpigmentation of the gingiva does not pose any medical risk, many individuals perceive dark gums as aesthetically displeasing. This concern becomes more prominent in those with a "gummy smile" or excessive gingival exposure during smiling.

Gingival depigmentation is a periodontal plastic surgery procedure aimed at eliminating or reducing gingival hyperpigmentation through various techniques. This procedure is typically performed based on the individual's aesthetic concerns rather than clinical necessity. Multiple depigmentation methods are available, including chemical agents like phenol, alcohol, and ascorbic acid; conventional techniques such as scalpel surgery, gingival abrasion, and free gingival grafting; as well as advanced methods like acellular dermal matrix allografts, laser depigmentation, electrosurgery, cryosurgery, and radiosurgery.

The current case report presents a straightforward and efficient surgical depigmentation technique that delivers aesthetically pleasing outcomes and ensures patient satisfaction without the need for advanced instruments or equipment.

Keywords: Gingival Depigmentation, Cryosurgery, Electrosurgery

Case Report

A 25-year-old male patient came to the department of periodontics of Panineeya Mahavidyalaya Institute of Dental Sciences and Research center with the chief complaint of dark-coloured gums (Fig 1) Intraoral examination showed intense gingival pigmentation extending from the right first premolar to the left first premolar. Dummett Oral Pigmentation Index (DOPI) was recorded, revealing a score of 2, indicating heavy clinical pigmentation. The patient expressed a desire for aesthetic treatment to improve the appearance of her dark gums.

Fig 1: Pre-operative picture of 25-year-old male complaining of pigmented gums

Scalpel surgery combined with bur abrasion was planned for the depigmentation procedure. The entire process was explained to the patient, and written consent was obtained. A thorough medical and family history assessment, along with blood investigations, was conducted to rule out any contraindications for surgery. Local anesthesia (Lignocaine with adrenaline in a 1:100000 ratio by weight) was administered through infiltration in the maxillary anterior region, extending from premolar to premolar. A Bard Parker handle with a No.15 blade and a high-speed handpiece with a diamond bur were used to excise the pigmented layer (Fig 2). Hemorrhage was controlled during the procedure by applying pressure with sterile gauze soaked in local anesthetic solution. The entire pigmented epithelium, along with a thin layer of the underlying tissue, was carefully removed.

Fig 2: No.15 blade being used to remove the pigment layer in maxillary anterior gingiva

The pigmented layer was excised (Fig 2). Hemorrhage was managed by applying pressure with sterile gauze soaked in a local anesthetic solution. The entire pigmented epithelium, along with a thin layer of underlying connective tissue, was carefully removed. After removing the pigmented epithelium along with a thin layer of connective tissue using the scalpel, diamond bur abrasion was performed to achieve the natural contour of the gingiva. The exposed surface was irrigated with saline. Minimal pressure was applied using feather-light brushing strokes, ensuring the bur was not held in one spot to avoid tissue damage. Care was taken to remove all residual pigment.

Fig 3: Intraoperative pictures 1st quadrant and 2nd quadrant

The surgical site was then covered with a periodontal dressing (Fig 4) Postoperative medications included antibiotics (Amoxicillin 500 mg, three times daily for five days) and analgesics (Ibuprofen with Paracetamol, three times daily for three days). The patient was advised to rinse with chlorhexidine mouthwash every 12 hours for one week.

Fig 4: Operative area covered with Periodontal dressing

The patient was evaluated after one week, showing normal healing progress without any reported discomfort (Fig 5).

Fig 5: 1-week post-operative picture

The patient was instructed to continue using chlorhexidine mouthwash for one more week. By the end of one-month, complete re-epithelialization was observed with satisfactory healing. The patient reported no postoperative pain or sensitivity. However, minor localized areas of repigmentation were noticed. After three months, the gingiva appeared healthy, with no signs of further repigmentation.

Fig 6: 6 months post-operative picture showing healthy gingiva with no increase in extent of repigmented areas

Discussion

Oral pigmentation is a common occurrence across all human populations, without notable differences between genders. The extent and pattern of pigmentation in the oral mucosa can vary significantly, not only among different ethnic groups but also between individuals of the same group and even across different regions within the same mouth. While genetic factors primarily govern physiologic pigmentation, external factors such as mechanical, chemical, and physical stimuli may influence its intensity, as proposed by Dummet in 1960 (Cicek, 2003) [4].

Melanin pigmentation commonly results from melanin deposition by active melanocytes, primarily found in the basal layer of the oral epithelium. For aesthetic purposes, these pigmentations can be eliminated. Various treatment methods have been employed to achieve this (Pontes *et al*., 2006) [9]. The choice of gingival depigmentation technique should depend on clinical expertise, patient affordability, and individual preferences.

Electrosurgery demands greater skill compared to scalpel surgery. Excessive or repeated application of electric current can lead to heat buildup, resulting in unintended tissue damage. It is essential to avoid contact with the periosteum, alveolar bone, or vital teeth (Ozbayrak *et al*., 2000) [8].

Cryosurgery often causes significant swelling and increased soft tissue damage. Controlling the depth of freezing is challenging, and the ideal freezing duration remains uncertain, with prolonged freezing potentially leading to more tissue destruction (Almas & Sadiq, 2002) [1].

Laser depigmentation produces favorable outcomes, but it requires advanced equipment, occupies substantial space, and is costly. Free gingival grafts can also eliminate pigmentation, but they involve an additional surgical site for tissue harvesting and may pose challenges in color matching (Mokeem, 2006) [7]. Despite their effectiveness, these techniques are not widely preferred or commonly practiced.

The scalpel surgical technique is widely recommended, especially in clinics where advanced equipment may not be readily available (Almas & Sadiq, 2002) [1]. This technique offers a faster healing period compared to other methods. However, it may result in significant bleeding during and after the procedure, requiring the exposed lamina propria to be protected with a periodontal dressing for 7 to 10 days (Almas & Sadiq, 2002) [1]. Post-surgical gingival repigmentation has been reported in previous studies, attributed to the spontaneous migration and activity of melanocytic cells from adjacent tissues (Mokeem, 2006) [7]. In the present case, small, localized areas of repigmentation were noticed after one month. However, no additional repigmentation was observed at the three-month follow-up. The case is under continued observation to assess the extent and rate of any further repigmentation.

Conclusion

The depigmentation procedure yielded successful outcomes, leaving the patient satisfied. Therefore, it can be concluded that scalpel surgery combined with bur abrasion for the treatment of hyperpigmented gingiva is a straightforward, cost-effective technique. It is easy to perform, causes minimal discomfort, and provides aesthetically pleasing results for the patient.

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