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Management of Gingival Hyperpigmentation by Scalpel Technique: A Case Report

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Abstract

Introduction: Gingiva is a mucous membrane closely attached to the periosteum of the jaw. The color of the gingiva varies from pink to dark brown. Melanocyte activity determines the degree of pigmentation. Gingival hyperpigmentation is considered normal variation, but the brown or black discoloration is aesthetically displeasing to some patients. Thus, surgical intervention may be necessary. **Purpose**: This report aims to discuss the gingival depigmentation procedure using a scalpel in a 39-year-old woman with gingival physiological hyperpigmentation. **Case presentation**: A 39-year-old female visited the dental hospital complaining of dark brown upper front gums since 1 year ago. Based on clinical and radiographic examinations, the patient was diagnosed with generalized chronic periodontitis accompanied by gingival hyperpigmentation in the anterior maxilla and mandible. The patient underwent a nonsurgical phase treatment, i.e, scaling and oral hygiene instructions. Then, gingival depigmentation surgery was performed using the scraping technique. One week and one month follow-up gave satisfactory results, marked by the clinical appearance, rapid healing, and the patient felt comfortable with minimal pain during the healing process. **Conclusion**: The scalpel technique is one of the procedures performed in cases of gingival hyperpigmentation. This technique can restore the aesthetics of the gingiva in a simple, safe, and non-invasive way and shows satisfactory results, and has a fast wound healing time.

Keywords: Gingival hyperpigmentation; periodontal surgery; scalpel technique

Introduction

Gingiva is a mucous membrane that is closely attached to the periosteum of the upper and lower jaw. Gingiva generally has a clinical appearance of coral pink, firm & resilient consistency, and is attached to the underlying bone and its surface with stippling texture on the attached gingiva. The color of the gingiva varies from pink to dark brown.[1]

Brown pigmentation is caused by melanin deposits in the gingival epithelial layer. Melanin is the most common natural pigment that contributes to endogenous gingival pigmentation. These granules are produced by melanoblasts in the basal layer of the gingival epithelium. Oral pigmentation distribution varies from person to person due to racial differences between individuals of the same race and different areas within the mouth. The degree of pigmentation depends on melanocyte activity, genetic factors, hormones, and UV radiation [2,3]

The gingiva appears darker in Africans, Asians, Caucasians, Hispanics, and other dark-skinned individuals. The number of melanocytes doesn't vary the gingival color; the

melanocyte activity does. In dark-skinned individuals, melanocytes are more active than in fair-skinned one.[3]

Physiological pigmentation appears as diffuse macular that may be brown, gray, or black and appear anywhere in the oral cavity, with the buccal and gingival surfaces that most commonly involved.[2] On the gingiva, it appears as a continuous dark brown band with a sharp border, ribbon-like, which does not extend into the marginal gingiva.[4] Occasionally, pigmentation may also be seen on the tongue, lips, and lingual gingiva as diffuse brown patches with indistinct or diffuse borders.[5] This gingival hyperpigmentation is considered normal, but the brown or black discoloration is aesthetically displeasing to some patients.[6] Thus, surgical intervention may be necessary to remove the hyperpigmentation.[7,8]

Gingival depigmentation can be defined as a periodontal surgery performed to remove or reduce gingival hyperpigmentation using various methods such as the scalpel technique, free gingival autograft, electrosurgery, cryosurgery, abrasion with diamond burs, and laser therapy. Depigmentation is not a clinical indication but a treatment option when the aesthetic aspect is a concern and desired by the patient instead. The choice of technique should be based on clinical examination and personal preference.[7]

The scalpel technique is one of the first treatments introduced to solve gingival depigmentation and is still very popular. This technique was first introduced by Dummet and Bolden in 1963. The disadvantage of using the scalpel technique is the possibility of bleeding during and after surgery, which can be avoided by performing a proper surgical procedure. Scalpel technique can restore gingival aesthetics, and the healing is quite good without infection and excessive pain after surgery.

In this case report, we will discuss the procedure of gingival depigmentation using a scalpel in a 39-year-old woman with gingival hyperpigmentation.

Case report

A 39-year-old female visited the Dental and Oral Hospital of South Sumatra Province complaining that her upper front gums had been darker brown for 1 year and had become darker as she got older. It is known that the patient's parents underwent the same condition. The patient's general health is in good condition, no systemic disease, the patient does not have a smoking habit, and is not on regular medication. She feels uncomfortable and is not confident in her condition.

On the initial visit, extraoral examination included face, eyes, neck, lips, and

temporomandibular joints in normal condition. The mucosal status showed no abnormalities. Clinical examination showed brown discoloration of the anterior attached gingiva of the upper and lower jaws (Fig. 1), reversible pulpitis in 17, 24, 26, 35, missing teeth of 16, 25, 27, 34, 37, 38, 45, 46, 47, attrition of 43, 33, 34, malposition of upper and lower jaw teeth, gingival recession in 31, 41, and 24, good OHI-S score and O-Leary score 23.9%.

Figure 1. Pre operative clinical condition

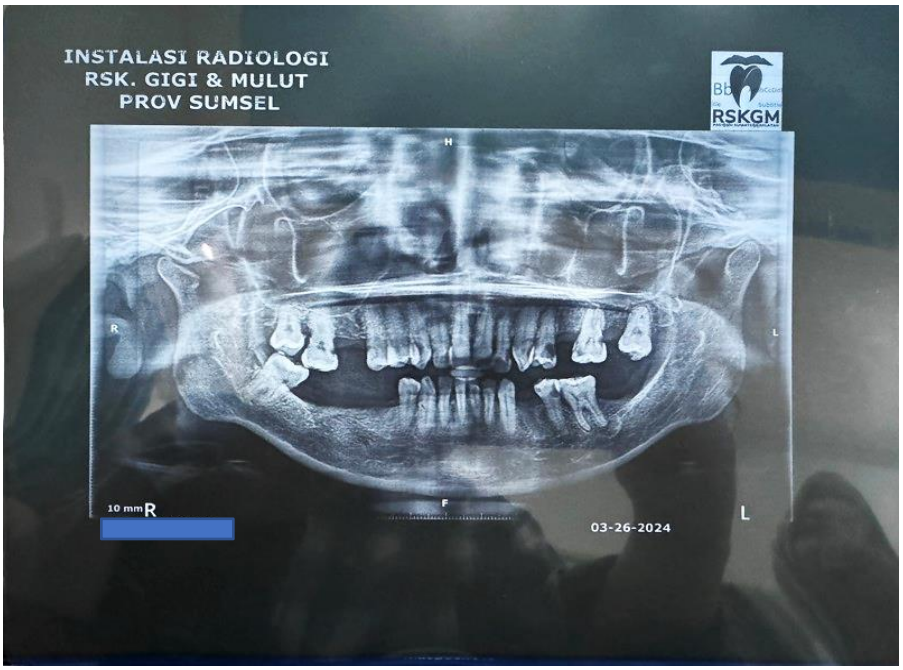

Figure 2. Radiograph examination

Panoramic radiograph examination (Fig.2) showed a horizontal defect in the alveolar bone crest for sectant a, b, c, e, f, a vertical defect in 22, 23, 36, region, and Miller Class II

furcation involvement site 36. Based on clinical and radiographic examinations, the patient was diagnosed with generalized chronic periodontitis accompanied by gingival hyperpigmentation in the anterior maxilla and mandible.

The patient underwent a nonsurgical phase (phase I therapy) that consisted of supragingival and subgingival scaling on the upper and lower jaws. Oral hygiene education was provided, including a proper tooth brushing method, the use of dental floss in every area, particularly where teeth are uneven and difficult to clean, and motivation to maintain oral hygiene. Treatment was evaluated after 1 week. One week follow-up showed an O'leary plaque score <10%, no calculus, and no signs of gingival inflammation, normal pocket depth. The patient was then given oral hygiene instructions and then scheduled for surgical treatment of gingival depigmentation on the upper jaw with a scalpel surgical technique.

The surgical procedure begins with the assessment of the patient's vital signs, and informed consent is obtained. Afterwards, oral prophylaxis was performed using povidone iodine with sterile gauze extraoral around the patient's lips and also the intraoral area. Local anesthesia was administered (Fig.3). Tissue marking was done on the working area (incision marked), then the area of the gums that had been anesthetized was checked for numbness.

Figure 3. Local anesthesia administered

The gingival depigmentation was performed using the scraping technique (Fig. 4) using a scalpel no. 3 and blade no. 15 with a thickness of 0.2 mm. The blade was placed parallel to the long axis of the tooth from the pigmented gingiva at the mucogingival junction to the peak of the interdental papilla, carefully and with controlled pressure (Fig. 5). Irrigation was performed using sterile saline and surgical suction. Bleeding is controlled by applying gentle pressure for about 10 minutes to the surgical area using sterile gauze soaked in

adrenaline diluted with saline. Then, the surgical area was irrigated again with saline and dried with sterile gauze. A periodontal dressing is used to close the wound (Fig.6). Furthermore, the patient was prescribed antibiotics, analgesics, antiseptic mouthwash, and post-operative instructions.

Figure 4. Scraping technique using a scalpel

Figure 5. Post-operative condition

Figure 6. Periodontal dressing

One week and one month follow-up showed satisfactory results, marked by the clinical appearance of the gingiva as a light pink color without hyperpigmentation, rapid healing, and the patient was comfortable with minimal pain during the healing process (Fig.7).

(a) **(b)**

Figure 7. Follow-up visit: (a) 1 week, (b) 1 month.

Discussion

One of the techniques that is often used in gingival depigmentation management is the scalpel technique. This procedure involves removing the gingival epithelium along with the underlying connective tissue layer and allowing the connective tissue to heal with secondary intent.[1]

Pigmentation is asymptomatic and no treatment is required, but the patient commonly feels uncomfortable because of this condition.[8] Also, gingival pigmentation is seen as color variations that can be uniform, unilateral/bilateral, mottled, macular, or patchy and may involve the gingival papilla itself or extend to the entire gingiva and other oral tissues. Eumelanin is present in large amounts in individuals with dark skin and hair, also it is more photoprotective.[2]

Physiological pigmentation manifests clinically as multifocal or diffuse melanin pigmentation with variable prevalence in different ethnic groups. It is commonly observed in African, Asian, and Mediterranean populations, and is strongly attributed to melanocyte activity rather than the number of melanocytes. The definitive diagnosis of this case is physiological gingival pigmentation of the oral cavity due to the diffuse and bilateral clinical picture, absence of smoking habits, use of drugs, or systemic conditions [2,3]

Gingival depigmentation in this patient was done using a scalpel with a scraping technique. This case was the advanced stage of the previous periodontal treatment, which is scaling and root planing. The surgical procedure aims to remove hyperpigmentation in the anterior gingival region, to improve the overall appearance (esthetics) of the smile, as the gums are a highly visible part of the smile.[9] It must be done carefully, and the operator must not damage healthy teeth. Improper procedure might cause gingival recession, damage to the periosteum and alveolar bone, and impaired wound healing.[10]

In this patient, depigmentation treatment was performed on the maxilla area from 13-23 using a conventional technique with a scalpel. This method offers several advantages, including procedural simplicity, ease of application, safety, non-invasiveness, and cost-effectiveness, contributing to greater patient comfort.[11] The depigmentation results are also satisfactory, and the wound heals quickly.[12,13] According to Shaimaa Hussein et al, although the scalpel method has the advantage of a simple and easy technique, there are disadvantages to this technique, such as time-consuming procedures, pain, risk of bleeding during surgery, and a greater risk of infection with the scalpel. The recurrence rate of gingival pigmentation is faster with the scalpel surgical technique compared to other techniques.[14] This method provides satisfactory results from both the clinical and patient perspectives. Because this method causes excessive bleeding during and after surgery, the surgical site needs to be covered with a periodontal dressing for 7-10 days.[15]

Conclusion

The scalpel technique remains a commonly utilized procedure for managing gingival hyperpigmentation. It offers a straightforward, safe, and minimally invasive approach to restoring gingival aesthetics. In addition, the technique has demonstrated satisfactory clinical outcomes and promotes relatively rapid wound healing.

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