

Dermabrasion treatment of gingival dyschromia caused by racial melanosis: case report comparing two techniques

Rodolfo José Gomes de Araújo¹

Felipe Vilhena Brilhante²

Deise Kersten Alves Ferreira³

Bruna de Fátima Kzam Soeiro do Nascimento³

1) Universidade Federal do Pará, Departamento de Odontologia (Belém/PA, Brazil).

2) Private practice (Belém/PA, Brazil).

3) Escola Superior da Amazônia, Departamento de Odontologia (Belém/PA, Brazil).

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Abstract: Gingival pigmentation results from excessive production of melanin by melanocytes in the basal layer of the epithelium. Gingival pigmentation consists of dark spots located on masticatory mucosa, most commonly in the attached gingiva or free gingiva, caused by different etiologies. This gingival pigmentation is not a health problem, however, many patients feel embarrassed due to the darkened aspect of their gingiva while smiling.

Among the surgical periodontal therapy indicated to improve darkened gingiva, those techniques that use scalpel blades, round diamond burs, cryosurgery, electro-surgery, lasers and free gingival grafts with autogenic epithelium can be highlighted. The aim of this paper is to report a clinical case in which the patient's gingival melanin pigmentation was treated using diamond burs and scalpels, and also to describe a periodontal plastic surgery pro-

cedure to correct or improve the amount of gingival melanin pigmentation present on mandibular and maxillary dental arches of the patient. After the surgical procedure successfully performed, and considering the high degree of satisfaction of the patient, the authors concluded that the presented technique is easy to perform and stands out in face of the excellent results achieved. **Keywords:** Periodontics. Esthetics. Pigmentation. Surgery, oral.

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Contact address: Rodolfo José Gomes de Araújo
Av. Senador Lemos, 443/308 - Umarizal - Belém/PA - CEP: 66.050-000 - E-mail: rjgaraujo@gmail.com

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» Patients displayed in this article previously approved the use of their facial and intraoral photographs.

INTRODUCTION

In order to achieve a beautiful smile, not only the teeth, but also the gingiva plays an important role in the aesthetics of the individual. Gingival pigmentation, when not related to the appearance of the skin, is a disharmonious factor in the smile. Gingiva depigmentation as a cosmetic procedure improves the overall appearance and the smile. The color of the pigmented gingiva ranges from light to dark brown or black.¹

The buccal mucosa, as well as the skin, is covered by layers of cells that make up the epithelial tissue, supported by connective tissue. The epithelial tissue is composed of two major cell groups, the keratinocytes and the non-keratinocyte cells. The keratinocytes make up about 90% of all constituent cells of the epithelial tissue. The keratinocytes are stratified epithelial cells potentially able to produce keratin. Different types of cells are part of the group called non-keratinocyte cells, among which are the following: melanocytes, Langerhans cells, Merkel cells and lymphocytes.²

Gingival dyschromia are changes in the normal coloration of the gingival tissue, which can affect attached gingiva, interdental gingiva and the alveolar mucosa. Most of the individuals complain about pigmentation, but they are unaware of the therapeutic possibilities for its solution.³

The pigmented lesions in the oral cavity represent a group of several clinical entities of a varied nature. The pigmented lesions are characterized by darkened spots due to excess deposition of melanin in the epithelial basal layer. In the oral cavity, they affect especially the free marginal gingiva and the attached gingiva.⁴

The racial melanosis is a benign gingival condition which affects both men and women equally and is influenced by the ethnic characteristics of black and asian people and their descendants¹. The intensity of the pigmentation is directly relat-

ed to the amount of granules of melanin produced by the melanocytes. The higher the activity of melanocytes, the greater the amount of melanin deposited.

The pigmented lesions of the oral cavity can be divided into two groups, according to their origin: endogenous and exogenous lesions. The endogenous lesions can be caused by several reasons that may be related, or not, to systemic disorders. In the case of physiological melanin deposition, racial melanosis most commonly affects individuals of african origin. Melanotic pigmentation can also indicate the presence of syndromes, such as Peutz-Jeghers syndrome and Addison's disease.⁵

The exogenous variety is associated with the use of tobacco, drugs such as phenolphthalein and also with the accidental implantation of amalgam residues in the gingival tissues.⁵ Although the racial pigmentation is benign, patients show a great desire to have it removed⁴. Several surgical techniques have been proposed in order to achieve the gingival depigmentation. However, it is important for the dental surgeon to establish a correct diagnosis of the pigmented lesion, determining the differential diagnoses with other pigmented lesions which also affect the oral tissues, especially the gingival tissue.

Currently, several surgical techniques have been proposed for the gingival depigmentation of melanin spots. The indication, however, can be based on the patient's complaint, and on the correct diagnosis of racial melanosis.

The gingival depigmentation of melanin spots has common methods and also different ones, including the use of chemicals (e.g.: phenol, 90% + alcohol, 95%), external bevel gingivectomy, dermabrasion with diamond burs or scalpel blades, gingival or connective tissue grafts, laser depigmentation and cryosurgical depigmentation. Among these techniques, we can highlight the dermabra-

sion using manual and/or rotational instruments because of its low operating costs and simplicity of execution.⁶ The selection of a technique should be based on the provider's clinical experience and on individual preferences.

Lopes⁹ and Koegler,¹⁰ among others, compared the dermabrasion technique with other types of treatments provided with the same goals. And both authors have achieved better results while using scalpel blades or diamond arms.

In the present report, the gingiva depigmentation was performed using the dermabrasion technique with scalpel and diamond burs. The aim was to evaluate the effect of both procedures based on the postoperative pain level, healing status and recurrence of pigmentation.

CASE REPORT

A 27-year-old melanoderma female patient, systematically healthy, complaining of dissatisfaction with the aesthetics of her smile, was seen in the Continuous Education in Periodontics course developed by ORALIS Clinic in Belém do Pará (Brazil). In the clinical assessment, blackened spots were detected on her attached gingiva and intermediate gingiva, on both her mandibular and maxillary arches. A detailed history was recorded to

establish the cause of the hyperpigmentation, and she was diagnosed with racial melanosis (Fig 1).

The dermabrasion technique using diamond burs and regular scalpel was recommended for the removal of such pigmentation. The patient was informed of the procedures to be performed. The patient signed an informed consent for the treatment and also the publication of images for scientific purposes.

Before the procedure, the patient underwent initial periodontal treatment consisting of oral hygiene education, ultrasonic scaling and removal of biofilm retention areas. As part of the surgical protocol, intraoral antisepsis was made with 0.12% chlorhexidine digluconate solution mouthwash for 30 seconds and extraoral antisepsis with 2% chlorhexidine digluconate solution.

The patient was anesthetized with 2% lidocaine hydrochloride with 1:100,000 epinephrine by infiltrative technique. No preoperative medication was used.

In the upper right hemi-arch, the dermabrasion was performed using regular scalpel with 15c scalpel blades attached to scalpel handles and Goldman-fox tissue pliers angled at 45 degrees to the gingival tissue (Fig 2). The epithelium and the connective tissue are abraded with smooth

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Figure 1: Initial intraoral photograph.



Figure 2: In the upper right hemisphere, the scalpel technique was used.

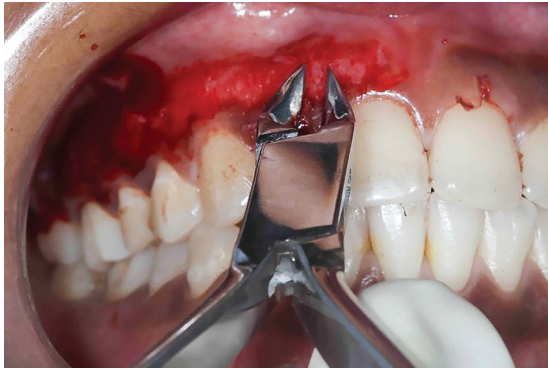


Figure 3: Removal of the entire epithelium on the right upper hemi-arch, with 15c scalpel blades and Goldman-fox pliers.

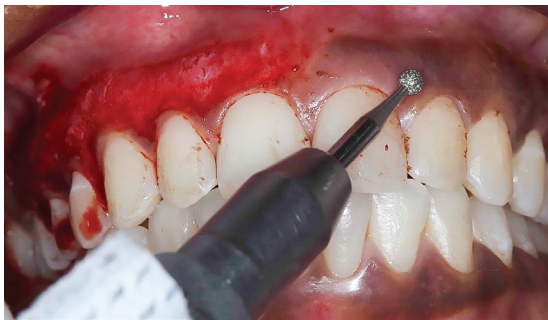


Figure 4: Removal of the epithelium in the upper left hemisphere with diamond drill bit 3018 long rod coupled, at low rotation.



Figure 5: Immediate appearance after surgery in the upper arch.

movements until the complete removal of the gingival pigmentation. The procedure allows the raw connective tissue to undergo healing by secondary intention. The new epithelium that forms is devoid of melanin pigmentation (Fig 3). On the left maxillary hemi-arch treatment, the epithelial abrasion technique was performed with long-shaft round diamond bur (#3018) on a controlled low-speed hand-piece, abundantly irrigated with cooled sterile saline solution (Fig 4). During the procedure, the gingival tissue was gently abraded by antero-posterior movements of the bur. In order to determine the penetration depth of the bur, the removal of all epithelial layer, clinically represented by the homogeneous bleeding characteristic of connective tissue exposure, was considered the final endpoint. Hemostatic control was performed only by the compression of gauze moistened in cold saline solution (Fig 5). Pain control was obtained with acetaminophen 750 mg, as needed, but with a maximum consumption of 8 tablets. The plaque control protocol stated the application of 0.12% chlorhexidine digluconate solution, topically and as mouthwash twice a day during the healing period of the surgical wound.

Both techniques have been employed in the same patient on the same surgical procedure to achieve a better comparison condition and minimize the influence of external factors.

Figure 6 shows the appearance of the patient in the 1-week-postoperative period. Note how the healing process of the maxillary arch was evolving. And there was no report of pain or discomfort in any of the hemi-arches. Differences were noted on the healing pattern in the maxillary right hemi-arch, where the scalpel technique was employed: the healing process was slower. Therefore, in the mandibular arch, dermabrasion with diamond burs was performed. The area evolved as reported above.

After a 30-day healing time, the operated area recovered its original features concerning form and function. The healing pattern was considered the process responsible for the return of the tissue form and function, as present before the surgical procedure (Figs 7 and 8).

DISCUSSION

In 1951, an attempt was made to apply phenol and alcohol on the pigmented gingiva. However, besides its difficulty to control the depth, the attempt failed to completely eliminate the pigments and to avoid recurrence of gingiva pigmentation. It was difficult to control the depth. Several other attempts were made to depigment the gingiva, many of these techniques are still used nowadays, but the scalpel technique is still the most widely used. Due to its economic advantages in comparison with other techniques, which require more advanced instruments, it is, therefore, highly recommended considering the limitations of equipment faced in developing countries.⁶

The present case report had a split-mouth design, which is an excellent method to determine the clinical relevance of comparing the two gingival depigmentation techniques. When comparing the techniques within a subject, it minimizes the influence of numerous inter-subject factors, such as age, facial complexion, among others.



Figure 6: Appearance of upper arch healing after 7 days.



Figure 7: The treatment of choice in the lower arch was dermabrasion with diamond drills in both hemiarches.



Figure 8: Final intraoral appearance after 30 days.

The term “gingival melanin repigmentation” refers to the reappearance of pigmentation after a certain period and it is described as a spontaneous condition, being associated with the migration of melanin-producing cells from the nearby areas to the treated site. To avoid the possibility of repigmentation, during the clinical planning, the repigmentation itself has to be considered, and there must be a complete removal of melanin and of melanocytes present on the site.^{5,6,9,10}

The wide variation in the time of repigmentation might be related to the technique used and the patient’s race. The mechanism is not fully understood, and there is little information about the behaviour of melanocytes after surgical damage, but according to the theory of migration, active melanocytes adjacent to pigmented tissue migrate to the treated areas.⁶

The repigmentation can also be attributed to the melanocytes that are left during surgery as stated by Ginwalla et al⁷ The melanocytes may become activated and then start the synthesis of melanin. Ginwalla⁷ showed repigmentation in 50%

of the cases studied, within 24 and 55 days. Dummett⁵ operated 9 cases of pigmented gingiva using gingivectomy. Repigmentation occurred in 67% of them, as early as 33 days after surgical removal.

Ginwalla et al,⁷ performed three different techniques: dermabrasion, split-flap with conservation of the periosteum, and full exposure of bone tissue; in different areas of the gingiva of six patients. After a follow-up period of 6 months only the fully exposed areas showed no signs of repigmentation. Farnoosh et al,⁸ followed for 20 months 20 patients treated by dermabrasion with diamond burs. Repigmentation was seen in only two cases, both of which were heavy-smoking patients.

The benefits of both methods of treatment include ease of use, effectiveness and convenience in dental clinics. There is a need for research on repigmentation to study the factors affecting the rate and time required for the recurrence. Research should also focus on finding a solution to avoid recurrence and, while no solution is found, repeated depigmentation should be performed to eliminate the pigmented gingiva.

References:

1. Ashri N, Gazi M. More unusual pigmentations of the gingiva. *Oral Surg Oral Med Oral Pathol.* 1990 Oct;70(4):445-9.
2. Tal H, Landsberg J, Kozlovsky A. Cryosurgical depigmentation of the gingiva: a case report. *J Clin Periodontol.* 1987;14:614-17.
3. Sagebiel RW, Clarke MA, Hutchens LH. Dendritic cells in oral epithelium. In: Squier CA, Mayer J. *Current concepts of the histology of oral mucosa.* Springfield: Thomas; 1971. p. 143-66.
4. Squier CA, Johnson NW, Hopps RM. *Human oral mucosa.* London: Blackwell; 1976. p. 35-9.
5. Haertel G. Avaliação comparativa entre técnicas de dermo-abrasão para remoção de pigmentação melanica gengival [dissertação]. Campinas (SP): Faculdade São Leopoldo Mandic; 2009.
6. Deepak P, Sunil S, Mishra R, Sheshadri. Treatment of gingival pigmentation: a case series. *Indian J Dent Res.* 2005 Oct-Dec;16(4):171-6.
7. Dummett CO. Oral pigmentation: physiologic and pathologic. *NY State Dent J.* 1959 Nov;25(9):407-12.
8. Mobio S, Noujeim Z, Boutigny H, Jensen M, Cassia A, Soueidan A. Pigmentation and pigmented lesions of the gingival mucosa. *Rev Belge Med Dent (1984).* 2008;63(1):15-28.
9. Rosa DS, Aranha AC, Eduardo CP, Aoki A. Esthetic treatment of gingival melanin hyperpigmentation with Er: YAG laser: short-term clinical observations and patient follow-up. *J Periodontol.* 2007 Oct;78(10):2018-25.
10. Hirschfeld I, Hirschfeld L. Oral pigmentation and a method of removing it. *Oral Surg Oral Med Oral Pathol.* 1951 Aug;4(8):1012-6.
11. Bergamaschi O. Repigmentação melânica da gengiva após a execução do retalho dividido, deslocado apicalmente, com fenestração periosteal linear protegida [dissertação]. São Paulo: Universidade de São Paulo; 1979.
12. Perlmutter S, Tal H. Repigmentation of the gingiva following surgical injury. *J Periodontol.* 1986 Jan;57(1):48-50.
13. Sharon E, Azaz B, Ulmansky M. Vaporization of melanin in oral tissues and skin with a carbon dioxide laser: A canine study. *J Oral Max Surg.* 2000 Dec;58(12):1387-94.