International Journal of Dentistry Scientific
Volume 2, Issue 2, June 2025
p-ISSN: 3031-7142

Treatment Of Gingival Enlargement With Gingivectomy And Gingivoplasty Using Scalpel Surgical Technique With Gingival Depigmentation: A Case Report

Mellani Cindera Negara[1*], Fatma harmadani[2], Haritsa Budiman[3], Riki Agung santoso[4], Tasya Alikha[5]

[1]Department of Periodontic, Faculty of Medicine, Universitas Sriwijaya
[2,3,4]Dentistry Study Program,Faculty of Medicine, Universitas Sriwijaya

Correspondence author email : mellanicinderanegara@fk.unsri.ac.id

Article info: Received : 19-3-2025 ; Revised : 17-4-2025 ; Accepted : 12-6-2025 ; Publish : 23-6-2025

Abstract : Background: Gingival enlargement is a condition of increase in the size of the gingiva and is considered as an extension of idiopathic gingival hyperplasia (fibromatosis) due to inflammation that can be caused by factor local or systemic. Clinically, this gingival enlargement gives an unattractive gingival appearance and can form pockets, so it needs to be corrected with gingivectomy and gingivoplasty. Gingival hyperpigmentation is a physiological pigmentation genetically, appearing with brown to black pigment on the gingiva and oral mucosa which is an aesthetic problem for patients. **Purpose:** This case report aims to describe a case of gingival enlargement managed by gingivectomy and gingivoplasty accompanied by gingival depigmentation. **Case presentation:** A 26-year-old female patient came with complaints of painless enlargement on the gums in the upper and lower front teeth. The enlargement on the gums had been noticed since 5 months ago, as well as brown discoloration on the gums of her upper and lower front teeth which she had noticed ten years ago.Initial treatment was scaling and root planing, after there was no change in the size of the gingiva, the treatment was continued with gingivectomy and gingivoplasty using the scalpel surgery technique, followed by gingival depigmentation. **Conclusion:** The gingival enlargement not show a decrease after scaling and root planing, gingivectomy can be performed to eliminating the pockets, and gingivoplasty to obtain a good physiological gingival shape. Gingival hyperpigmentation is an aesthetic problem that is a concern for patients and requires surgical intervention to remove pigment, one of which is gingival depigmentation with scalpel surgery.

Keywords : *Gingival Depigmentation, Gingivectomy, Gingivoplasty, Gingiva Hyperpigmentation Gingival Enlargement, Scalpel Surgery Technique*

INTRODUCTION

The periodontium functions include supporting the tooth, protecting it against oral microflora, and making the attachment of the tooth to the bone possible.because of this function, periodontal tissue is also called supporting tissue. There are various types of periodontal tissue such as bone tissue, periodontal ligament, cementum, and gingiva. In

addition to playing a role in supporting teeth to remain strong, periodontal tissue also plays a role in influencing aesthetics. Clinically, one of the periodontal tissues that can affect aesthetics is gingival tissue, because gingival tissue is periodontal tissue whose position is in the outermost layer[1].

However, sometimes there are several factors, both pathological and physiological, that can make the appearance of the gingiva look unaesthetic. Factors that damage the aesthetics of the gingiva are generally non-ideal conditions of the gingiva. Non-ideal conditions of the gingiva can be caused by gingival hyperpigmentation which makes the color of the gingiva darker and gingival enlargement which causes the anatomy and size of the gingiva to be non-ideal. Sometimes, these factors can appear simultaneously and/or are manifestations of other periodontal diseases, so that in its handling, comprehensive management is needed[1].

Comprehensive management can be started with several management phases in periodontal cases in the following order: a. preliminary phase, b. phase I (non-surgical phase), c. evaluation of phase I, d. phase II (surgical phase), e. evaluation of phase II, f. phase III (restorative phase), and finally g. phase IV (Maintenance). In the preliminary phase, we can perform emergency treatment first, in phase I, scaling, root planing is performed, and can be accompanied by splinting if needed. If in the evaluation of phase I the condition of gingival enlargement does not improve, then it is necessary to continue to phase II (surgery). In phase II (surgery) we can perform elimination using surgical methods. We can eliminate non-ideal conditions in the gingiva simultaneously in one region at the same time such as hyperpigmentation and gingival enlargement[2].

To eliminate gingival enlargement in phase II, gingivectomy can be performed to eliminate periodontal pockets including reshaping the gingival contour, and gingivoplasty to create a physiological gingival contour with the aim of reshaping the gingiva without pockets.[2] To eliminate gingival hyperpigmentation, depigmentation can be performed to eliminate or reduce hyperpigmentation is classified into two categories: methods to remove pigment and methods that cover pigment. Pigment removal can be done by surgical and non-surgical or chemical methods[2].

Surgical methods in periodontal case, especially cases of hyperpigmentation and gingival enlargement that can be applied include: bur abrasion, scalpel surgery, electrocautery, cryosurgery, radiosurgery, gingivectomy, gingivectomy with gingival

margin autograft, chemical application, and laser. Non-surgical methods mainly refer to chemical cauterization. Methods to cover gingival pigment include gingival grafting and the use of acellular dermal matrix allograft. All of these treatment modalities have their own advantages and disadvantages. One of the most frequently used methods is the scalpel method. The advantages of using this scalpel include: affordable cost, simplicity, and easy-to-find tools and materials[2]. In this case report, we discuss the procedure of gingival depigmentation and gingivectomy using scalpel technique in a 26-year-old woman with physiological gingival hyperpigmentation and gingival enlargement.

CASE REPORT

A 26-year-old female patient came to the South Sumatra Dental and Oral Hospital with complaints of enlarged upper right and lower front gums, the patient realized the complaint since 5 months ago, the gums are not painful, sometimes bleeding when brushing teeth, and the upper and lower front gums are brownish which she only realized since the patient was in junior high school, never sick but the patient feels less confident when smiling and wants her gums treated.

On the first visit, extraoral and intraoral examinations were performed. Extraoral examination showed that the face, eyes, neck, lips, lymph nodes and temporomandibular joints were normal. Intraoral examination showed that the mucosa did not show any abnormal, there were residual roots on 14, 26,35,46, caries on teeth 18, 17, 12,11,21,27,28,38. On examination of the gingiva region B, on tooth 12 it was found: edema (+), reddish color, soft consistency, pitting test (+), stippling (-), smooth surface, rounded interdental papilla, pocket depth of 5 mm. Gingival region E found: edema (+), reddish color, soft consistency, pitting test (+), stippling (-), smooth surface, rounded interdental papilla, pocket depth of 2-3 mm. There was debris and calculus in all regions. O'leary plaque index 62% (poor) and OHI-S 1.66 (moderate). Then there was a brown color on the attached gingiva of the upper and lower anterior teeth with a DOPI score of 1.8 (medium gingival pigmentation). During the first visit, scaling and root planing were performed on all regions, composite resin fillings on carious teeth, root removal, patients were given education on oral hygiene, how to brush their teeth, use of dental floss on crowded teeth areas.

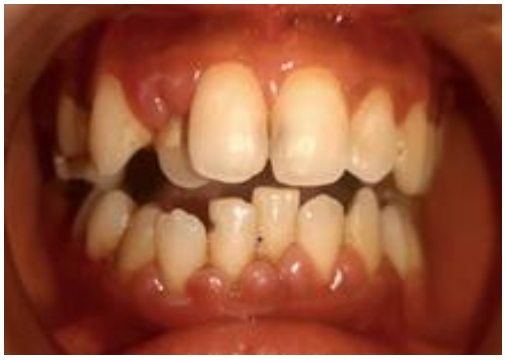

Figure 1. Intraoral Views of Visit I

On the second visit, a re-examination was carried out after 1 month of scaling and root planing. Intraoral examination showed no abnormalities in the mucosa, on examination of the gingiva region B, on tooth 12 it was found: edema (+), pale pink color, soft consistency, pitting test (+), stippling (-), smooth surface, rounded interdental papilla, pocket 4-5 mm. The gingiva region E was found: edema (+), pale pink color, soft consistency, pitting test (+), stippling (-), smooth surface, rounded interdental papilla, pocket depth of 2-3 mm, O'leary examination was 10.1%, and OHI-S was 0.3 (good), no calculus. Then there was a brown color on the attached gingiva of the upper and lower anterior teeth with a DOPI score of 1.8 (medium gingival pigmentation).

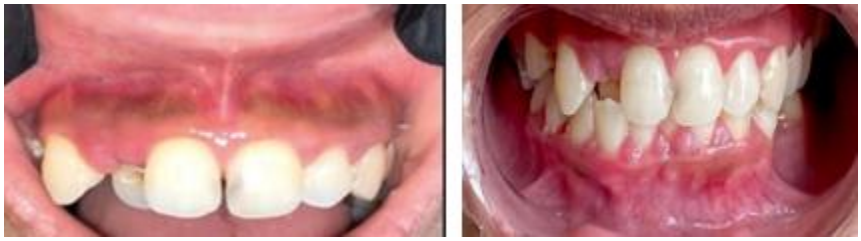

Figure 2. Intraoral view after phase I scaling and root planing.

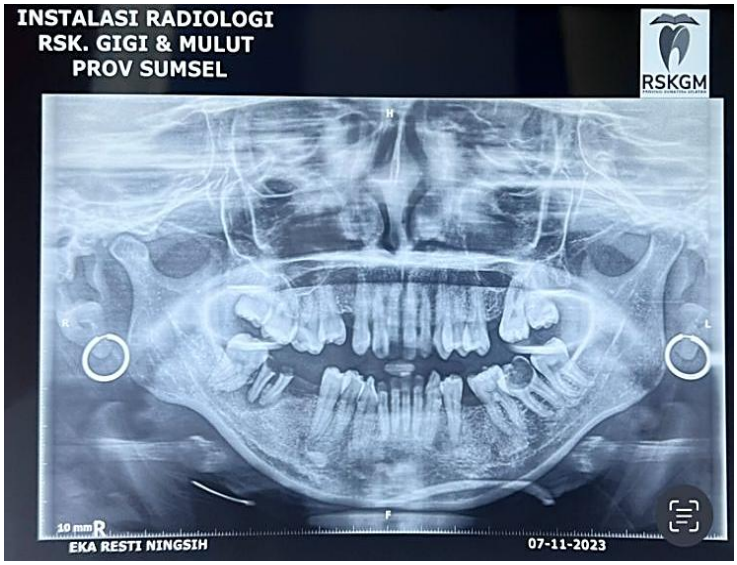

Figure 3. Panoramic Photo

Panoramic radiographic examination showed a decrease in the alveolar bone peak with a horizontal pattern on teeth 15,25,26,34,36,45,46. Based on clinical and radiographic examinations, the patient was diagnosed with plaque induced gingival enlargement accompanied by chronic periodontitis. After phase 1 treatment, the patient still had gingival enlargement, so phase II treatment was scheduled in the form of gingivectomy, gingivoplasty and gingival depigmentation.

TREATMENT PROCEDURE

The patient was scheduled for surgical treatment of gingivoplasty with gingival depigmentation on the lower jaw using the scalpel surgical technique. Then the following week was scheduled for gingivectomy, gingivoplasty with gingival depigmentation on the upper jaw using the same surgical technique.

The surgical procedure begins with vital signs examination and informed consent. Vital signs examination showed normal conditions. After patient and operator preparation, cheek retractors were installed in the patient's mouth to retract the buccal and labial mucosa to provide adequate access and view. Furthermore, plaque examination and prophylaxis were performed. Asepsis using povidone iodine with sterile gauze from extraorally around the patient's lips then into the intraorally in the work area. Anesthesia procedure using pehacaine with labial infiltration technique on the mucobuccal fold

between the mesial and distal adjacent teeth as much as 0.5 cc for each deposition. Furthermore, determining the bleeding point with a pocket marker.

Facial incision with blade no. 15c or using a Kirkland knife, while the proximal part with an Orban knife. The incision is made at the apical of the bleeding point by forming a 45° angle towards the coronal. The incision is attempted to be as close as possible to the bone surface but not to expose the bone, then lift the incised tissue using a curette or scaler, then remove the remaining tissue with tissue scissors. The final result is a thin gingival margin with a bevel. Then do scaling and root planing until the root surface is smooth. After the gingivectomy is complete, continue the gingivoplasty procedure.

Gingivoplasty is performed by sharpening the gingival margin, forming a scalloped marginal outline, thinning the attached gingiva in the form of a vertical interdental groove on the tooth using a scalpel no. 3, blade no. 15 and tissue scissors. Furthermore, irrigation using saline and surgical suction. Then bleeding control is performed by applying gentle pressure to the surgical area using sterile gauze soaked in adrenaline diluted with saline, the pressure is applied for ± 2-5 minutes.

Depigmentation surgery is performed by scraping or scraping the entire pigmented area until the pigment is gone using scalpel no. 3 and blade no. 15. The blade is placed parallel to the long axis of the tooth at the mucogingival junction to the peak of the interdental papilla, then scraping is performed carefully. Furthermore, the surgical area is cleaned of blood and saliva using saline and surgical suction. The wound area is irrigated with saline and dried with sterile gauze and then the wound is closed with a periodontal pack. The patient is then prescribed antibiotics, analgesics, and mouthwash, as well as post-surgical instructions. Follow-up is carried out after 1 week and 1 month after surgery. Good results are obtained, marked by a sulcus of no more than 3 mm, clinical appearance of the gingiva with interdental gingiva not rounded, without edema, rapid healing and the patient feels comfortable with minimal pain during the healing process. In attached gingiva, satisfactory results were obtained, characterized by the clinical appearance of the gingiva with a light pink color without pigmentation, rapid healing and the patient feeling comfortable with minimal pain during the healing process.

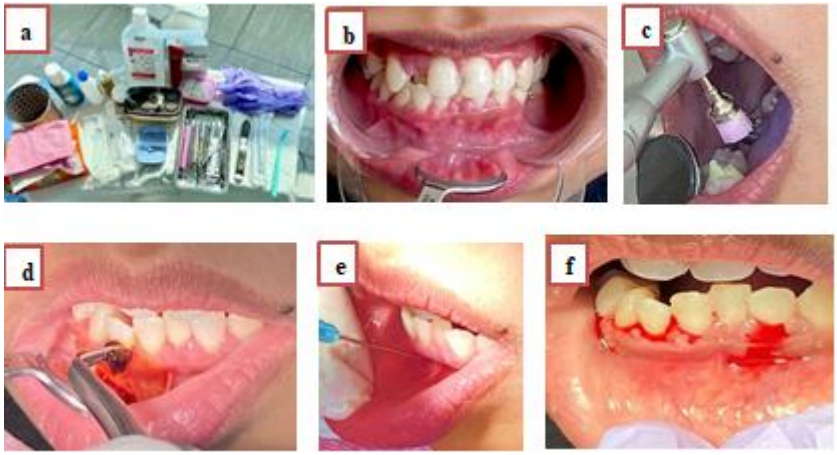

Figure 4 (a-f). procedure mandibular gingivoplasty a. Tools and materials, b. Clinical photo of the patient before treatment, c. Oral prophylaxis, d. Asepsis of the work area, e. Local anesthesia, f. Marking the surgical area with a pocket marker.

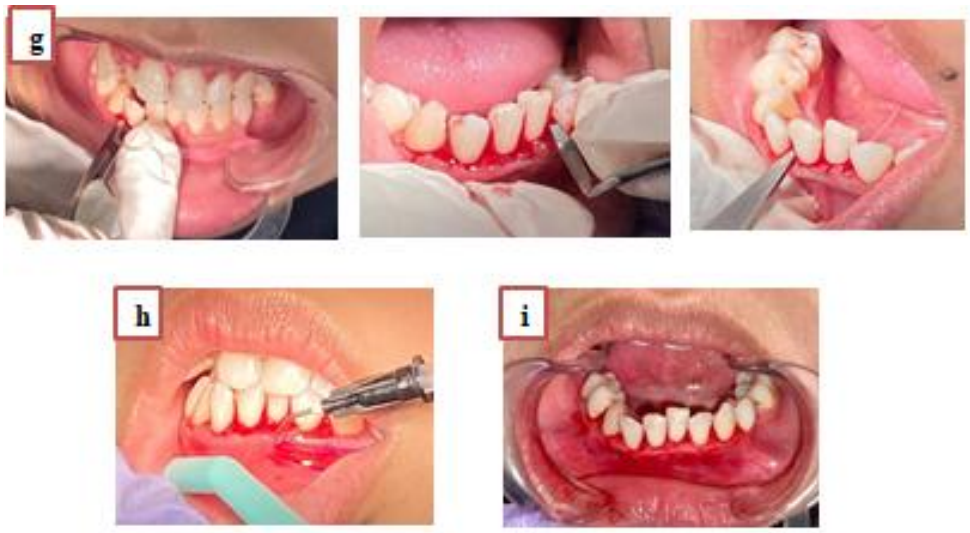

Figure 4(g-i). Lower jaw gingivoplasty procedure g. Lower jaw gingivoplasty surgery using scalpel no.3 and blade no.15, organ knife and tissue scissors, h. Cleaning the surgical area from blood and saliva, i. After controlling bleeding with gauze

Figure 5 (a-d). Lower jaw gingival depigmentation procedure, a. Lower jaw gingival depigmentation surgery with scrapping using scalpel no.3 and blade no.15, b. Cleaning the surgical area from blood and saliva, c. Bleeding control with gauze, d. Wound closure with periodontal pack/dressing.

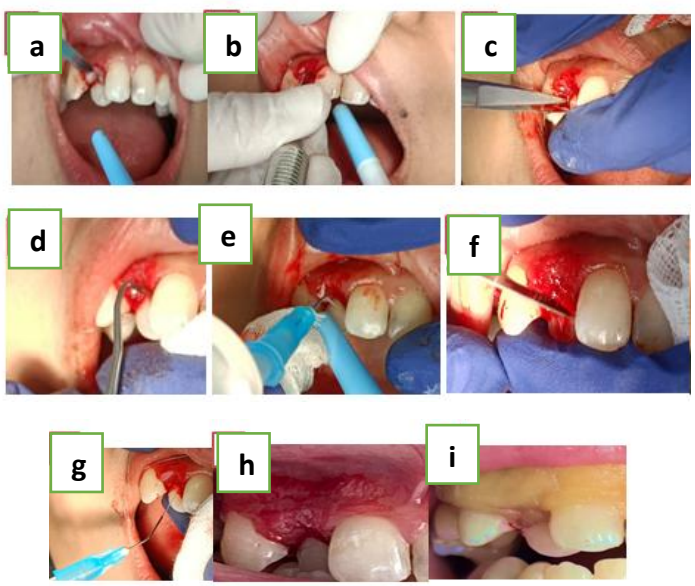

Figure 6 (a-i). Maxillary gingivectomy and gingivoplasty procedures a. incision using a scalpel b. tissue removal with a curette c. removal of residual tissue with scissors, d. scaling and root planing e. irrigation and bleeding control with gauze, f. Gingivoplasty procedure with a scalpel, g. post-gingivoplasty irrigation, h. post-surgery, i. dressing with a periodontal pack.

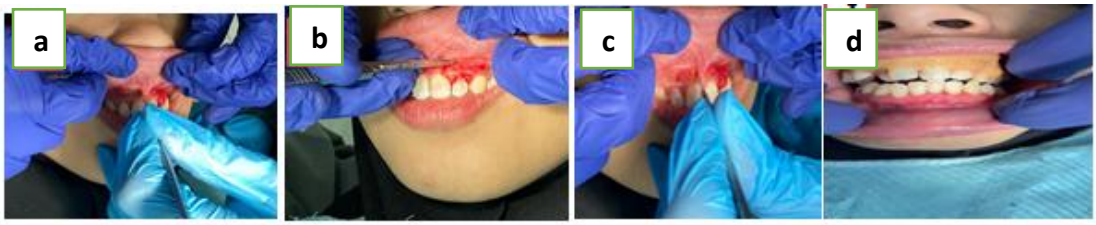

Figure 7 (a-d). Maxillary gingival depigmentation procedure a. Surgical depigmentation of the maxilla with scrapping using scalpel no.3 and blade no.15, b. Cleaning the surgical area from blood and saliva, c. Controlling bleeding with gauze, d. Closing the wound with periodontal pack/dressing.

Figure 8. Results of lower jaw treatment (a-c). a. Before lower jaw treatment. b. 1-week evaluation, the patient had no complaints, periodontal pack was removed, prophylaxis and irrigation were performed, the surgical area showed signs of healing. c. 1-month evaluation, optimal healing and no signs of inflammation were found in the surgical area.

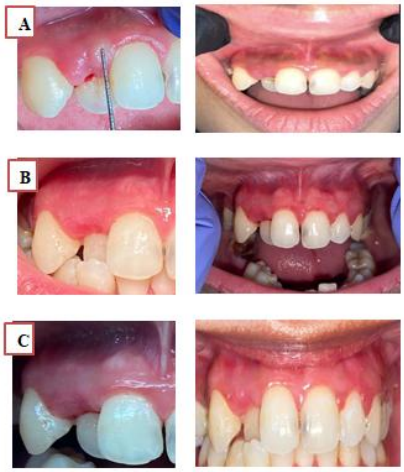

Figure 9. Results of maxillary treatment (a-f). A. Before treatment. B. 1-week evaluation, the patient had no complaints, the lower jaw periodontal pack was removed, prophylaxis and irrigation were performed, the surgical area showed signs of healing. C. 1-month evaluation, optimal healing and no signs of inflammation were found in the surgical area.

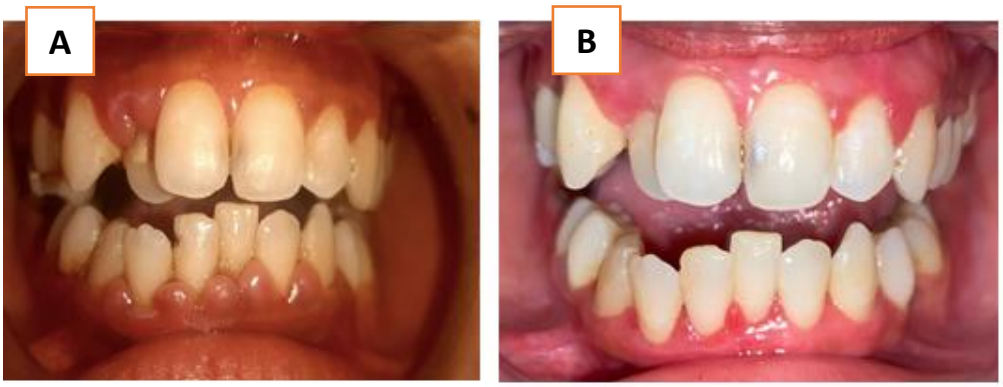

Figure 10. Treatment results (a-b). A. Before treatment. B. After treatment.

DISCUSSION

Scaling and rootplanning are the initial phases in the treatment procedure for periodontal disease. This action can significantly relieve gingival inflammation and eliminate pathological microorganisms in the subgingival area so that bleeding no longer occurs when brushing teeth. Scaling is an action to remove plaque, calculus and stains on the surface of the tooth crown. Rootplanning is the removal of necrotic and/or soft cementum tissue, dentin, calculus, fibers, and elimination of bacteria and toxins from the surface of the tooth root to obtain a smooth root surface. On a smooth surface, plaque is expected not to stick so that plaque and calculus do not accumulate[3]. In gingival enlargement, if the gingiva consists of fibrotic components that cannot be reduced after scaling and root planning treatment or the size of the gingival enlargement covers deposits on the tooth surface and interferes with access to remove deposits, then the treatment is surgical removal (gingivectomy or gingivoplasty)[4].

Gingivectomy is a periodontal surgical procedure that aims to eliminate periodontal pockets and gingival inflammation so that physiological, functional and aesthetic gingiva are obtained. Gingivoplasty is similar to gingivectomy, but the purpose is different. Gingivoplasty is the reshaping of the gingiva to create a physiological gingival contour with the aim of reshaping without periodontal pockets. In this case, after SRP was performed in region b, no deep pockets were found, so the treatment performed was gingivoplasty only[5].

Gingival hyperpigmentation appears as diffuse macular pigmentation that may be brown, gray, or black and may occur anywhere in the oral cavity with the buccal and

gingival surfaces most commonly involved. On the gingiva it appears as a continuous, dark brown, sharply demarcated band, like a ribbon, that does not extend to involve the marginal gingiva. Occasionally pigmentation may also be seen on the tongue, lips, and lingual gingiva as diffuse brown patches with indistinct borders[6]

According to Dummett, the distribution of oral pigmentation in black are as follows: in gingiva distributed up to, 60%; in hard palate up to 61%; on mucous membrane up to, 22%; and on tongue, 15%[7] Gingival pigmentation results from melanin granules produced by melanoblasts. Melanin, a brown pigment not derived from hemoglobin, is the most common endogenous pigment and is produced by melanocytes present in the basal and suprabasal cell layers of the epithelium[8]

Gingival hyperpigmentation has a multifaceted etiology, including genetic factors, such as physiologic or racial pigmentations being mostly observed in dark-skin populations, systemic diseases, like: endocrine disturbance, Albright's syndrome, malignant melanoma, Peutz-jeghers syndrome chronic pulmonary disease and Addison's syndrome, or to a medication induced as antimalarial therapy. Environmental factors can cause gingival hyperpigmentation caused by tobacco smoking, as gingival hyperpigmentation was higher in smokers than in non-smokers[9]

In general, gingival pigmentation can be classified as physiological or pathological. All patients except albinos have some degree of physiological melanin distribution throughout the epidermis. Physiological pigmentation develops during the first two decades of life but may not be noticed by the patient until later. The pigmentation process consists of three phases, namely, melanocyte activation, melanin synthesis and melanin expression. The activation phase occurs when melanocytes are stimulated by factors such as stress hormones, sunlight, etc. which lead to the production of chemical messengers such as melanocyte-stimulating hormones. In the synthesis phase, melanocytes create granules called melanosomes.

This process occurs when the enzyme tyrosinase converts the amino acid tyrosine into a molecule called dehydroxyphenylalanine (DOPA). Tyrosinase then converts DOPA into the secondary chemical dopaquinone. After a series of reactions, dopaquinone is converted into dark melanin (eumelanin) or light melanin (pheo-melanin). In the expression phase, melanosomes are transferred from melanocytes to keratinocytes which

are skin cells located above melanocytes in the epidermis. After that, the melanin color is finally visible on the surface of the skin[10]

Gingival depigmentation can be defined as a periodontal plastic surgical procedure in which gingival hyperpigmentation is removed or reduced by various techniques. Depigmentation is not a clinical indication but the treatment of choice when aesthetics are a concern and desired by the patient[11]

Several procedures have been proposed for gingival depigmentation, one of which is scalpel surgery. In this technique, the pigmented gingival epithelium along with the underlying connective tissue layer is surgically removed by dividing the epithelium with a knife. The scalpel method is one of the most economical techniques and also does not require extensive armamentarium. It is highly recommended considering the limited equipment that may not be readily available in the clinic. Moreover, it is known that the healing period of scalpel wounds is faster compared to other techniques. However, scalpel surgery causes bleeding during and after the procedure and it is necessary to cover the surgical area with a periodontal dressing for 7-10 days[12]

Scalpel surgical technique is highly recommended because it is simple, easy to perform, inexpensive, causes little discomfort, and is aesthetically pleasing to the patient. The combination of gingivectomy and gingival depigmentation with a scalpel, according to Kirkland and Orban, has advantages such as forming a good gingival contour and shape and accelerating the surgical process. The scalpel surgical technique can restore gingival aesthetics and healing well without infection and excessive pain[13]

According to Safiya Hassan, a comparison of laser and scalpel surgical techniques, both techniques produce equivalent long-term benefits[14] The procedure using scalpel surgery is cost-effective with good healing and minimal postoperative complications. Although bleeding is higher in the scalpel surgical technique when compared to laser and electrocautery, it can be handled with pressure/control of bleeding[15]

The results of Jacob et al's study showed excessive bleeding and discomfort to the operator during the gingival depigmentation procedure with scalpel surgery. Additional efforts to control the bleeding area sequentially resulted in an increase in the time required for the procedure in each patient compared to the laser group[16] Jagannathan et al's study showed that pain, discomfort, procedure duration, healing time and recurrence in the

scalpel gingival depigmentation surgery group were higher compared to the electrosurgery and laser groups[17]

According to Shaimaa Hussein, although the scalpel method has the advantage of being a simple and easy technique, it also shows its disadvantages, such as time-consuming procedures, pain, and the need for periodontal dressing application. The recurrence rate of gingival pigmentation was faster with the scalpel surgical technique compared to other techniques[18]

In this case, gingivectomy and gingivoplasty accompanied by gingival depigmentation were performed on the upper and lower jaws. Depigmentation was performed using a no. 3 scalpel and blade no. 15 with a scraping motion until all pigment was removed, during the procedure the surgical area was cleaned with sterile gauze. The wound area was then covered with a periodontal pack/dressing for 7 days. In the post-surgery care control after 1 week, the periodontal pack was removed and the wound area had shown signs of healing, the patient was very satisfied with the surgical results. The 1-month post-surgery control showed healing of gingival hyperpigmentation and no recurrence was seen.

CONCLUSION

Gingival enlargement is an aesthetic problem of concern to patients, occurs due to local factors, namely plaque bacteria. Treatment of gingival enlargement that does not shrink after SRP and after SRP treatment the pocket does not disappear, then the treatment that can be done is gingivectomy followed by gingivoplasty. The importance of maintaining oral hygiene by performing plaque control so that there is no recurrence of gingival enlargement.

Gingival hyperpigmentation is an aesthetic problem of concern to patients even though it is not a medical problem. Gingival depigmentation with scalpel surgical techniques is the recommended treatment option because the technique and tools are simple, economical, easy, and restore good gingival aesthetics in this case report

REFERENCES

1. Putri MH, Herijulianti E, Nurjannah N. Ilmu pPencegahan penyakit Jaringan keras dan jaringan pendukung Gigi. Jakarta:EGC;2002.p25-52

2. Reddy S. Essential of clinical Periodontology and Periodontics Ed3. Newdelhi: jaypee;2011.p.266-267
3. Goldman HM, Cohen DW, 1980, *Periodontal Therapy,* 6 th ed. The CV. Mosby Company, p.640-90,773-93
4. Chapple I dan Gilbert A., 2002, *Understanding Periodontal Disease: Assessment and Diagnostic Procedured in Practice,* QuitEssentials Publishing Co.Ltd,.p.1-10
5. Newman MG, Takei HH, Caranza FA, 2006, *Clinical Periodontology,* 10 th ed. Philadelphia: WB Saunders Co; p.74-94, 263-9,432-53,631-50,749-61
6. Ravikiran Ongole, Praveen BN. Textbook Of Oral Medicine, Oral Diagnosis And Oral Radiology 2nd Ed. 2013. Elsevier.P. 64
7. Michael G. Newman, Henry H. Takei, Perry R. Klokkevold. Carranza's Clinical Periodontology, 12th Edition. 2015. Elsevier.p.45
8. Abdelmagyd HA, Al-Ahmari MM, Shetty SR. Treatment of gingival hyperpigmentation using different techniques. J Datta Meghe Inst Med Sci Univ 2019;14:50-5.
9. Sarah I. Bin Muharib, Atheer A. Almasoud. Different Surgical Techniques For Gingival Depigmentation And Their Outcomes. A Literature Review. Volume 24. Issue 4 October / December 2020. International Journal Of Medical Dentistry
10. Rehab A. Abdel M, Mona ED, Amany A. R. Gingival pigmentation (cause, treatment and histological preview). Future Dental Journal 3 (2017)
11. Edala Venkata Gana Karthik, Kaarthikeyan G, Dhanraj Ganapathy. Gingival Depigmentation Techniques: A Review. *Int J Dentistry Oral Sci.* 2021;8(7):2946-2949.
12. Siti Sopiatin, Ira Komara, and Ina Hendiani , (2022), "Is Conventional Management of Hyperpigmentation Still the Best Choice? – A Case Report" in *The International Online Seminar Series on Periodontology in conjunction with Scientific Seminar*, KnE Medicine,pages 169–178. DOI 10.18502/kme.v2i1.10849
13. Syaify, Ahmad. Sutriyanti. Depigmentation of Gingival Smoker's Melanosis Using Scalpel Surgical Technique: A Case Report. in *The International Online Seminar Series on Periodontology in conjunction with Scientific Seminar*, KnE Medicine, pages 270–281. DOI 10.18502/kme.v2i1.10860

14. Hassan , Safiya . Dhadse P. Bajaj P . Chitrika S. A Comparison Between the Efficacy of Scalpel and Laser Procedures for Treating Gingival Hyperpigmentation: A Case Report. 2022. DOI: 10.7759/cureus.27954
15. Subash, Maria AM. Arun M, Fazal IJ, Nimisha G. Surgical depigmentation of gingiva using scalpel. 2020. Eastern J Med Sci.
16. Jacob O, Kosala M, Panwar M. Evaluation of treatment outcome in gingival hyperpigmentation with scalpel Vis-à-vis laser: A split-mouth study. Indian J Dent Sci 2021;13:251-9.
17. Jagannathan R, Rajendran S, Balaji TM, *et al.* Comparative Evaluation of Gingival Depigmentation by Scalpel, Electrosurgery, and Laser: A 14 Months' Follow-up Study. J Contemp Dent Pract 2020;21(10):1159–1164.
18. Hussein, Shaimaa. Management of Gingival Hyperpigmentation by Scalpel Surgery and Bur Abrasion. 2022. International Journal of Dentistry and Oral Health.