



Case Report

ISSN: 2581-3218
IJDR 2024; 9(3): 75-77
Received: 13-08-2024
Accepted: 02-10-2024
© 2024, All rights reserved
www.dentistryscience.com
doi: 10.31254/dentistry.2024.9302

A minimal invasive approach of gingival depigmentation using diode laser therapy: A case report of 9 months follow-up

Swati Jaglan¹, Manoj Kumar²

¹ Department of Periodontics, Post Graduate Institute of Dental Sciences, Rohtak, Haryana, India

² Department of Endodontics and Conservative dentistry, Dr. Harvansh Singh Judge Institute of Dental Sciences & Hospital, Panjab University, Chandigarh, India

Abstract

In the field of dentistry dental esthetics of individual is very important. It not only provides beautiful smile but build individuals confidence among people while communicating and smiling. Gingival melanin pigmentation is a common finding among individuals. A patient's very personal perception of how they look and want to seem might be enhanced by aesthetic dentistry treatment. In this case report a systemically healthy 24-year-old female patient reported with complaint of black discoloration of gums in upper and lower front teeth region. On intraoral examination it was found a continuous band of melanin deposits involving entire gingival units of maxillary and mandibular dentition. After thorough phase-I periodontal therapy patient was recalled on follow-up and a depigmentation procedure was recommended using diode-laser technique for upper and lower anterior teeth after patient interest in less invasive procedure. Patient and clinician related outcomes were satisfactory without any reoccurrence and complication postoperatively.

Keywords: Gingiva, Lasers, Melanin, Pigmentation.

INTRODUCTION

Dentistry now places a lot of emphasis on aesthetics, and practitioners must now focus on both treating biological and functional issues as well as obtaining acceptable gingival aesthetics. The smile is an aesthetic and psychological expression of self-assurance that incorporates the teeth, lips, and gingival tissue. The most frequent natural pigment that contributes to the endogenous pigmentation of gingiva is the brown pigment melanin [1]. Numerous techniques, including bur abrasion, surgical scraping, cryotherapy, electrosurgery, and laser therapy, have been recorded for de-epithelializing the pigmented portions of gingiva. A technique should be chosen based on clinical experience and personal preferences. Since the beginning of the 1980s, lasers have been employed in dentistry [2]. Various lasers, including the carbon dioxide (CO₂) laser, Nd:YAG laser, semiconductor diode laser, argon laser, Er:YAG laser, and Er,Cr:YSGG laser have been described as dependable, effective, and pleasant methods for depigmentation surgery with little to no postoperative discomfort and quick wound healing [3]. At the moment, laser therapy has distinguished itself because it targets melanocytes, which convert light into energy by absorbing it. The wavelength of apatite and water affects its efficacy.

As a solid-state semiconductor laser, the diode laser commonly combines the elements gallium (Ga), arsenide (Ar), and additional substances like aluminum (Al) and indium (In) to convert electrical energy into light energy [4]. The main aim of this case report is complete elimination of gingival melanin pigmentation to enhance esthetics, reduces reoccurrence, minimizing postoperative complications and to compare patient related, clinician related outcomes using diode laser technique. This study sought to report a clinical instance of gingival depigmentation using a diode laser while taking into account the cosmetic complaint of patients with gingival hyperpigmentation and the benefits of laser therapy.

CASE REPORT

A 24-year-old systemically healthy female without any history of smoking, tobacco chewing reported to outpatient department of periodontics with chief complaint of black discoloration of gums in upper and lower front teeth region from past 2-3 years. On intra-oral examination a continuous dark greyish-black band of hyper pigmented zone present in maxillary and mandibular attached gingiva involving interdental

*Corresponding author:

Dr. Swati Jaglan

Department of Periodontics,
Post Graduate Institute of
Dental Sciences, Rohtak,
Haryana, India

Email:
swatijaglan2018@gmail.com

papilla of entire dentition depicted in figure 1 A,B. Diagnosis of physiologic gingival pigmentation with score=3(using gingival pigmentation index) [5] was made. Using Hedin melanin index [6] score=4 was given which showed a continuous ribbon including the entire area between premolars right to left area for both maxillary and mandibular arches. In order to get aesthetic outcomes, the patient was interested in using a less invasive technique. After completion of phase I therapy patient was recalled on follow-up and depigmentation procedure was decided using diode laser technique keeping in mind of less invasive procedure for patient. An average smile line was identified using Liebert and Deruelle classification [7] for smile line showed in figure 1A. A diode laser (980nm) therapy for depigmentation was decided as a less invasive procedure and based on patient and clinician preference. After applying 10% povidone iodine antiseptics topically to the patient's intra- and extraoral surfaces, we utilized 2% lignocaine and 1:1,00,000 adrenaline as a local anesthetic to anesthetize the patient from the upper left second premolar to the upper right second premolar region.

Using the same anesthesia, the mandible underwent the terminal infiltration procedure in the bottom groove from the left canine to the right canine. The surgical team and the patient both wore safety eyewear during the laser therapy. Using a surgical device with a diode laser with a wavelength of 980 nm and a power of 1200 mW, depigmentation was completed. The laser light was continually emitted from a flexible optical fiber tip showed in figure 1E. The laser's settings were 215 J of energy, 1200 mW of power, and 3 minutes of time. Light brush strokes were applied while maintaining light contact between the tissue and the laser's tip depicted in figure 1E.

According to figure 1C-E, ablation progressed from the attached gingiva toward the free marginal gingiva in apico-coronal direction. The upper left quadrant to the distal aspect of second premolar was ablate first, followed by the upper right quadrant to the distal aspect of second premolar (see figure 1C,D), and finally the lower quadrant from mesial line angle of left first premolar to mesial line angle right first premolar (see figure 1E). We moved in a round and irregular pattern, being cautious not to touch nearby structures. Caution was considered not to ablate the marginal gingiva keeping in mind of future gingival recession consequences. To improve visibility, we removed the epithelial tissue using gauze dampened with 0.9% saline solution. Following complete removal of the pigmented gingiva, the patient was instructed for postoperative instructions and analgesic tablet Ibuprofen 400mg was prescribed as required for 3 days.

Patient was recommended to use 0.12% chlorhexidine mouthwash twice daily for 2 weeks. Recall interval for patient was after 1 week, 1 month, 3 months and 9 months post-operatively(see figure 1F-L). At each interval patient was examined for wound healing (using healing score according to Ishi et al. and Kawashima et al.) [8,9], swelling (using swelling score according to Ishi et al and Kawashima et al.) [8,9], gingival color improvement (improvement, slight improvement, no change, deterioration), pain (using VAS scoring), esthetic satisfaction and any post-operative gingival recession at follow-up visits.

RESULTS

A satisfactory result was obtained in terms of patient related outcomes and clinician related outcomes in current case report. When the patient was evaluated at the end of 1 month, 3 months and 9 months, the gingiva was healthy and there was no melanin pigmentation, absence of edema related to maxillary and mandibular operated area. A complete epithelialization, absence of any swelling, improved gingival color and with VAS score showing slight pain for first 24 hours during 1st week followed by no pain afterward was recorded at follow-up visits. Patient was fully satisfied with the esthetic results of treatment procedure. No post-operative gingival recession was observed at operated site of both maxillary and mandibular region at follow-up visits of 9 months.



Figure 1: Picture depicting pre-operative, intra-operative and post-operative procedures of depigmentation using diode laser therapy

Figure 1A, 1B: Pre-operative pictures showing a continuous band of greyish-black band of melanin hyper-pigmentation with respect to maxillary and mandibular teeth in esthetic zone; 1C, 1D, 1E pictures showing intra-operative procedure using diode laser technique for removal of hyper-pigmented area in esthetic region leaving a 0.5-1mm band of marginal gingiva intact in surgical area; 1F: follow-up after 1week interval; 1G,1H follow-up after 1 month; 1I,1J follow-up after 3 months; 1K,1L follow-up after 9 months.

DISCUSSION

Various treatment modalities exist for gingival depigmentation procedure. We chose diode laser modality which is less invasive, easy to perform, require short treatment time, hemostasis, least or nil postoperative discomfort/pain and does not required periodontal dressing after surgical procedure. Diminished discomfort and pain was due to protein coagulum production. Each depigmentation procedure has its own advantages and disadvantages. Scalpel technique is easy, cost-effective, and convenient to complete with the least amount of time and effort [10]. But it involves pain, post-operative discomfort, intra- and post-operative hemorrhage, and periodontal dressing placement [10]. This procedure should not be used if you have a thinner gingival biotype or narrow papillary areas [11]. Cryosurgery is a low-cost procedure that produces long-lasting, superior aesthetic results, heals quickly, and has a low recurrence rate [12]. Cryosurgery is preferred over other depigmentation techniques due to its lack of bleeding, pain, and scarring, ease of application at papillary areas, lack of sophisticated instruments, and lack of necessity for regional anesthetic, sutures, or medicines [12]. The drawbacks of this approach include post-operative edema and difficulties in managing penetration depth [13]. Radiosurgery another technique induces coagulation, which lessens bleeding, but it calls for at least two treatment sessions [14]. The drawbacks of this unique technology include the need for multiple sittings, technique sensitivity, and increased cost [14].

CONCLUSION

A complete elimination of melanin deposits using less invasive technique without any reoccurrence at follow-up visit of 9 months was obtained using diode laser (980nm) therapy for depigmentation procedure. Patient was fully satisfied with the results without any postoperative pain and complications.

Conflicts of Interest

The author reports no conflicts of interest.

Funding

None declared.

Author Contribution

Concept and design of study -Swati Jaglan, Manoj Kumar. Acquisition of data- Swati Jaglan. Analysis and interpretation of data- Swati Jaglan, Manoj Kumar. Drafting the article or revision- Swati Jaglan, Manoj Kumar. Final approval- Swati Jaglan, Manoj Kumar

ORCID ID

Swati Jaglan: <https://orcid.org/0000-0002-5799-8938>

Manoj Kumar: <https://orcid.org/0009-0007-5441-6350>

REFERENCES

1. Humagain M, Nayak DG, Uppoor AS. Gingival depigmentation: A case report with review of Literature. *J Nepal Dent Assoc.* 2009;10:53–6.
2. Esen E, Haytac MC, Oz IA, Erdoğan O, Karsli ED. Gingival melanin pigmentation and its treatment with CO2 laser. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2004;98:522–7.
3. Suthprasertporn S. Treatment of gingival melanin hyperpigmentation by Er,Cr:YSGG laser: Report of 2 cases. *Thai J Periodontol.* 2007;1:46–55.
4. Lagdive S, Doshi Y, Marawar PP. Management of gingival hyperpigmentation using surgical blade and diode laser therapy: A comparative study. *J Oral Laser Appl.* 2009;9:41–7.
5. Kumar S, Bhat SG, Bhat MK. Development in techniques for gingival depigmentation-An update. *Indian J Dent.* 2012;3:213–21.
6. Hedin CA. Smokers' melanosis occurrence and localization in the attached gingiva. *Arch Dermatol.* 1977;113:1533–8.
7. Liébart M, Fouque-Deruelle C, Santini A, Dillier F, Monnet-Corti V, Glise J, et al. Smile line and periodontium visibility. *Perio.* 2004;1:17–25.
8. Ishii SA, Kawashima Y, Watanabe H, Ishikawa I. Application of an Er:YAG laser to remove gingival melanin hyperpigmentation: Treatment procedure and clinical evaluation. *J Jpn Soc Laser Dent.* 2002;13:89–96.
9. Kawashima Y, Aoki A, Ishii S, Watanabe H, Ishikawa I. Er:YAG laser treatment of gingival melanin pigmentation. *Int Congr Series.* 2003;1248:245–8.
10. Verma S, Gohil M, Rathwa V. Gingival depigmentation. *Indian J Clin Pract.* 2013;12:801–3.
11. Bergamaschi O, Kon S, Doine AI, Ruben MP. Melanin repigmentation after gingivectomy: A 5-year clinical and transmission electron microscopic study in humans. *Int J Periodontics Restorative Dent.* 1993;13:85–92.
12. Kumar S, Bhat GS, Bhat KM. Comparative evaluation of gingival depigmentation using tetrafluoroethane cryosurgery and gingival abrasion technique: Two years follow up. *J Clin Diag Res.* 2013;7:389–94.

13. Prasad SS, Agrawal N, Reddy NR. Gingival depigmentation: A Case report. *People's J Sci Res.* 2010;3:27–30.
14. Sherman JA, Gürkan A, Arıkan F. Radiosurgery for gingival melanin depigmentation. *Dent Today.* 2009;28:118. 120-1.

HOW TO CITE THIS ARTICLE-

Jaglan S, Kumar M. A minimal invasive approach of gingival depigmentation using diode laser therapy: A case report of 9 months follow-up. *Int J Dent Res* 2024; 9(3):75-77. doi: 10.31254/dentistry.2024.9302

Creative Commons (CC) License-

This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY 4.0) license. This license permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited. (<http://creativecommons.org/licenses/by/4.0/>).