

Original Article

Comparative Evaluation of Gingival Depigmentation by Diode Laser and Scalpel Techniques: 12 Month Follow-Up

Shekhar Prashant¹, Surangama Debnath², Kausar Parwez Khan³, Swati Singh⁴

¹Reader, ²Prof&Hod, ³Sr Lecturer, ⁴PG Student

Department of Periodontology, Hazaribagh College of Dental Sciences and Hospital, Hazaribagh, Jharkhand, India

ABSTRACT

Background: Pigmentation of the gingiva is a negative factor in an otherwise acceptable "smile window." Recently, laser techniques have gained popularity for depigmentation and seem to be the most reliable and satisfactory procedures. To our knowledge, this case series is unique and is the first reporting comparison of scalpel techniques and lasers in the literature. **Materials and methods:** The study included 20 patients who presented with a chief complaint of "black gums" and requested cosmetic therapy. Patients in group A were related using a diode laser. Procedure started with the application of topical anesthesia. Patients in group B were treated using scalpel techniques. Patients were followed for 3, 6, and 12 months. Gingival depigmentation was assessed using a new index system, gingival pigmentation index, on the day of first depigmentation and at the end of 12 months. **Results:** The mean age of the subjects in Group A was 25.76+/-1.34 years. And the mean age of subjects in Group B was 25.22+/-2.61 years. On first postoperative day, it reduced to 0 in both the groups. On applying student t test, there was no significant difference between both the groups. **Conclusion:** During the 12-month follow-up, the depigmentation achieved using both the techniques was found equivalent and satisfactory

Key words: Cosmetic, depigmentation, Gingival, laser.

Received: 15 April, 2018

Revised: 28 April, 2018

Accepted: 12 May, 2018

Corresponding author : Dr. Shekhar Prashant, Reader, Department of Periodontology, Hazaribagh College of Dental Sciences and Hospital, Hazaribagh, Jharkhand, India

This article may be cited as: Prashant S, Debnath S, Khan KK, Singh S. Comparative Evaluation of Gingival Depigmentation by Diode Laser and Scalpel Techniques: 12 Month Follow-Up. J Adv Med Dent Scie Res 2018;6(6):135-137.

INTRODUCTION

One of the major influences in the "smile window" is the gingival color. Different factors affect the color, like the number of blood vessels, epithelium thickness, keratinization extent, along with endogenous and exogenous factors.¹ Physiologic pigmentation is generally symmetric, tenacious, and does not affect the normal style, like gingival stippling.² Gingival hyperpigmentation frequently presents as triangular/diffuse /linear patches that are dark brown to black to yellow in color.³ Pigmentation can occur at any age irrespective of gender, but it varies amongst different ethnic groups and population.³ Melanin is present in gingiva amongst all the races.⁴ It is a brown pigment, that is natural and contributes to endogenous pigmentation of gums

and the gingiva is the most frequent site of pigmentation amongst the mucosa. Melanin pigmentation occurs due to deposition of melanin granules that are produced by melanoblasts present between the epithelial cells of the basal layer of gingival epithelium.⁵ Gingival depigmentation is considered a periodontal plastic surgery process, in which the gingival hyperpigmentation is aloof or decreased by different techniques. The prime indication for depigmentation treatment is the person's demand for improved esthetics. Different methods, like scalpel, gingival grafting,⁶ electrosurgery,⁷ cryosurgery,⁸ abrasion using diamond bur⁹ and different lasers¹⁰ have been employed for cosmetic treatment of melanin depigmentation. The main aim of the study was to evaluate

the gingival depigmentation technique using scalpel abrasion and diode laser and evaluate the results at the end of 12 months.

MATERIALS AND METHODS

The present prospective randomized study was conducted in the Department of Periodontology of study carried out at Hazaribagh College of Dental Sciences and Hospital, Hazaribagh, Jharkhand for a period of 1 year. Ethical committee clearance was obtained from institutional ethical board and all the subjects were informed about the study. A written consent was obtained from all in their vernacular language. The study included 20 patients who presented with a chief complaint of "black gums" and requested cosmetic therapy. They were randomly divided into group A and group B of 10 patients each. Patients in group A were related using a diode laser. Procedure started with the application of topical anesthesia (Lidocaine Topical Aerosol - LOX 10% spray) in the segment 2. The fiberoptic laser tip having 320 micro meter diameter at 2.50W power and pulsed mode was kept in contact with the pigmented area and laser was emitted in pulsed mode and operated between a frequency of 800-980 nm. Patients in group B were treated using scalpel techniques. After treatment all the patients were given appropriate instructions like avoidance of smoking, spicy food and beverages. Patients were followed for 3, 6, and 12 months. Gingival depigmentation was assessed using a new index system, gingival pigmentation index, on the day of first depigmentation and at the end of 12 months. Patient's satisfaction was evaluated by using a simple questionnaire. As per the Gingival pigmentation index, 0 was regarded as absence of pigmentation with pink color of gingiva. Score 1 was given to spots that were

brown to black in color. Score 2 was given to brown to black pigmentation more than spots but not diffuse and score 3 illustrated diffuse pigmentation. All the data thus obtained was arranged in a tabulated form and analyzed using SPSS software. Student t test was used for statistical analysis. Probability value of less than 0.05 was regarded as significant.

RESULTS

The study enrolled 20 subjects with 10 subjects in each group.

Table 1 shows the demographic details of the subjects. There were 6 males in group A and 5 males in Group B. The number of females were 4 in Group A and 5 in Group B. The mean age of the subjects in Group A was 25.76+/-1.34 years. And the mean age of subjects in Group B was 25.22+/-2.61 years. There was no significant difference in the demographic details between the two groups

Table 2 shows the gingival depigmentation index between the two groups. Preoperatively, gingival pigmentation index in Group A was 2.98+/-1.00 and in Group B was 3. On first postoperative day, it reduced to 0 in both the groups. At the end of the study i.e. during 12th month it was 0.87+/-0.23 in Group A and 0.89+/-0.11 in Group B. On applying student t test, there was no significant difference between both the groups.

Table 3 shows the comparative evaluation of depigmentation at the end of 12 months. In both the groups, at the end of 12 months there were 90% subjects with no pigmentation. Only 2 subjects i.e. 1 subject in each group showed the presence of pigmentation. On applying student t test, there was no significant difference between both the groups.

Table 1: Demographic details of the subjects

Demographic	Group A	Group B
Males	6	5
Females	4	5
Age	25.76+/-1.34	25.22+/-2.61

Table 2: Gingival depigmentation index amongst the groups

Value	preoperative	At first postoperative day	At 12 th month postoperatively
Group A	2.98+/-1.00	0	0.87+/-0.23
Group B	3	0	0.89+/-0.11

Table 3: Comparative evaluation of depigmentation at the end of 12 months

Value	Pigment absent	Pigment present	P value
Group A	9(90%)	1(10%)	>0.05
Group B	9(90%)	1(10%)	

DISCUSSION

The gingiva is the most frequently seen intraoral pigmented tissue.¹¹ Chief etiologic reason of oral pigmentation is extreme melanin storage that is seen more commonly amongst Caucasians and darker subjects.¹² Generally, gingival hyperpigmentation presents as light to dark brown in color and very rarely it is presented as blue-black areas that are visible on the facial aspects of gingiva. The appearance of pigmentation is diffuse, ribbon like bands, or intermittently patches with a well-defined margins.¹¹ Both endogenous and exogenous factors are responsible for hyperpigmentation. Endogenous factors like medical diseases such as Addison's condition, Pj syndrome, Von Recklinghausen's neurofibromatosis, etc.¹² The exogenous factors include heavy metal poisoning like copper, silver, arsenic, bismuth, lead, and gold or graphite.¹³ It generally presents as a cosmetic problem and is reported by the young individuals reporting to the dental practice. This hyperpigmentation can be managed by surgery, cryosurgery, and electrosurgical with variable success.^{14,15} With evolution in trends, lasers have been widely used to ablation of gingival tissues that contain melanin. Different types of dental lasers like carbon dioxide, Nd:YAG, diode etc have been used and successful treatment outcomes of gingival hyperpigmentation have been reported.¹⁶ Non-heat making lasers have also been used and are found to be effective, safe, and reliable with minimal postoperative discomfort and rapid wound healing.¹⁷ The delivery of diode laser is through a flexible quartz fiber-optic handpiece and it can be administered in pulsed or continuous mode. Its mechanism of action is by absorption by the pigments of the soft tissue, thus it is also an excellent hemostatic agent. The first known work on pigmentation of oral tissues was done by Adachi and Ramel³ in the year 1903. In our study, gingival pigmentation index in Group A was 2.98 \pm 1.00 and in Group B was 3. On first postoperative day, it reduced to 0 in both the groups. At the end of the study i.e. during 12th month it was 0.87 \pm 0.23 in Group A and 0.89 \pm 0.11 in Group B. In both the groups, at the end of 12 months there were 90% subjects with no pigmentation. Only 2 subjects i.e. 1 subject in each group showed the presence of pigmentation. On applying student t test, there was no significant difference between both the groups. Repigmentation has also been seen after depigmentation by different procedures. The exact pathophysiology behind repigmentation is not clear, but as per the migration theory, the melanocytes present in the adjacent pigmented gingival tissues tend to migrate to treated areas, leading to repigmentation.¹⁵ The severity of repigmentation can be evaluated after a thorough follow-up by the clinician. Different studies have shown a positive outcome after the

use diode laser for gingival depigmentation. As per the study by Perlmutter and Tal partial recurrence was observed after a follow-up of 7-8 years.¹⁵

CONCLUSION

Now days there have been increased awareness about the oral pigmentation. More number of subjects now desire a pigment free and cosmetic smile. Gingival hyperpigmentation is common these days due to a variety of exogenous factors. Our study showed that both scalpel and diode lasers are equally efficacious in management of hyperpigmentation and both offer long term successful results.

REFERENCES

1. Tal H, Oegjesser D, Tal M. Gingival depigmentation by erbium:YAG laser: Clinical observations and patient responses. *J Periodontol* 2003; 74:1660-1667.
2. Dummett CO. Pertinent considerations in oral pigmentations. *Br Dent J* 1985;158:9-12.
3. Adachi B, Ramel A. The skin pigment in humans and in the monkey (in German). *Z Morphol Anthropol* 1903;6:1.
4. Dummett CO. Oral pigmentation. First symposium of oral pigmentation. *J Periodontol* 1960;31:356.
5. Cicek Y, Ertas U. The normal and pathological pigmentation of oral mucous membrane: A review. *J Contemp Dent Pract* 2003;15;4(3):76-86.
6. Tamizi M, Taheri M. Treatment of severe physiologic gingival pigmentation with free gingival autograft. *Quintessence Int* 1996;27(8):555-58.
7. Gnanaesekhar JD, Al-Duwairi YS. Electrosurgery in dentistry. *Quintessence Int (Berlin)* 1998;29(10):649-54.
8. Yeh CJ. Cryosurgical management of melanin pigmented gingiva. *Oral Surg Oral Med, Oral Pathol Oral Radiol Endodont* 1998;86(6):660-63.
9. Bishop K. Treatment of unsightly oral pigmentation: A case report. *Dental Update* 1994;21(6):236-37.
10. Stabholz A, Zeltser R, Sela M, Peretz B, Moshonov J, Ziskind D, Stabholz A. The use of lasers in dentistry: Principles of operation and clinical applications. *Compendium of Continuing Education in Dentistry* 2003;24(12):935-48.
11. de Krom JC, van Waas MA, Oosterveld P, Koopmans AS, Garrett NR. The oral pigmentation chart: A clinical adjunct for oral pigmentation in removable prostheses. *Int J Prosthodont* 2005;18:66-70.
12. Cheraskin E. Diagnosis of pigmentations of the oral tissues. In: Dummett CO, consulting editor. *First Symposium on Oral Pigmentation*. *J Periodontol* 1960;31:375-82.
13. Rawal YS, Burrell R, Hamidi SC, Kalmar JR, Tatakis DN. Diffuse pigmentation of maxillary attached gingiva: Four cases of the cultural practice of gingival tattoo. *J Periodontol* 2007;78:170-6.
14. Perlmutter S, Tal H. Repigmentation of the gingival following surgical injury. *J Periodontol* 1986;57:48-50.
15. Tal H, Landsberg J, Kozlovsky A. Cryosurgical depigmentation of the gingiva: A case report. *J Clin Periodontol* 1987;14:614-7.
16. Sushma L, Yogesh D, Marawar PP. Management of gingival hyperpigmentation using surgical blade and diode laser therapy: A comparative study. *J Oral Laser Appl* 2009;9:41-7.
17. Berk G. Treatment of gingival pigmentation with Er, Cr: YSGG laser. *J Oral Laser Appl* 2005;5:249-53.

Source of support: Nil

Conflict of interest: None declared

This work is licensed under CC BY: **Creative Commons Attribution 3.0 License.**