

CASE REPORT

Comparative Evaluation of Gingival Depigmentation using Scalpel and Diode Laser with 1 year Follow-up

S Anoop, Seba Abraham, R Ambili, Nuthen Mathew

ABSTRACT

Gingival hyperpigmentation is a major esthetic concern for many people. Though it is not a medical problem, many people complain of dark gums as unesthetic. Gingival depigmentation is a periodontal plastic surgical procedure, whereby the hyperpigmentation is removed or reduced by various techniques. For depigmentation of gingiva, different treatment modalities have been reported, such as scalpel, cryosurgery, electrosurgery, lasers, etc. This article compares management of two cases with scalpel and laser and also highlights the relevance of lasers.

Keywords: Laser application, Laser dentistry treatments, Dental laser.

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INTRODUCTION

Melanin pigmentation of the gingiva occurs in all the races.¹ Melanin, a brown pigment, is the most common natural pigment contributing to endogenous pigmentation of gingiva and the gingiva is also the most predominant site of pigmentation on the mucosa. Melanin pigmentation is the result of melanin granules produced by melanoblasts intertwined between epithelial cells at the basal layer of gingival epithelium.² Gingival depigmentation is a periodontal plastic surgical procedure, whereby the gingival hyperpigmentation is removed or reduced by various techniques. The foremost indication for depigmentation therapy is the demand by a person for improved esthetics. Various methods, like scalpel, free gingival autografting,³ electrosurgery,⁴ cryosurgery,⁵ abrasion with diamond bur⁶ and various types of lasers⁷ have been used for cosmetic therapy of gingival melanin depigmentation. This article illustrates a comparative evaluation of managing gingival pigmentation using scalpel and laser techniques with 1 year follow-up.

CASE REPORTS

Case 1

A 23-year-old female patient visited the Department of Periodontics, PMS College of Dental Science and Research, with the chief complaint of 'black' colored gums. Her oral

examination revealed that she had deeply pigmented gingiva (Fig. 1). The patient requested for any kind of esthetic treatment which could make her 'black' colored gums look better.

A scalpel surgery was planned to perform the depigmentation. A complete medical, family history and blood investigations were carried out to rule out any contraindication for surgery. Local anesthesia was infiltrated in the maxillary anterior region from premolar to premolar. A Bard Parker handle with a no.15 blade was used to remove the pigmented layer (Fig. 2). Pressure was applied with sterile gauze soaked in local anesthetic agent to control hemorrhage during the procedure. After removing the entire pigmented epithelium, the surgical area was covered with a periodontal pack (Fig. 3) and postoperative instructions were given. Analgesic was prescribed for the management of pain. Postoperative medications included amoxicillin 500 mg TID



Fig. 1: Preoperative view of case 1 showing heavily pigmented gingiva



Fig. 2: Immediate postoperative view of case 1 showing bleeding points

for 5 days and ibuprofen 400 mg 1 SOS. Patient was given postoperative instructions and advised to use 0.2% chlorhexidine mouth rinse twice daily.

After 1 week, the pack was removed, and the surgical area was examined. The healing was uneventful without any postsurgical complications. The gingiva appeared pink and friable. At 1 week, the gingiva showed gradual epithelization, but was in an immature state (Fig. 4). Patient had taken seven analgesic pills and the pain lasted for 4 days. Complete healing of the surgical site took 3 weeks. The patient was reviewed after 1 month (Fig. 5), 3 months (Fig. 6), 6 months and 1 year. By 6 months, pigmentation

reappeared (Fig. 7) and, by 1 year, pigmentation reached the preoperative level (Fig. 8).

Case 2

A 23-year-old female had a chief complaint of black gums. The patient's history revealed that the blackish discoloration of gingiva was present since birth, suggestive of physiologic melanin pigmentation. Her medical history was noncontributory. On intraoral examination, generalized diffused blackish pigmentation of gingiva was observed, however, it was healthy and completely free of any inflammation (Fig. 9). Considering the patient's



Fig. 3: Case 1 after giving periodontal dressing (Coe-Pak)



Fig. 6: Case 1 after 3 months postoperatively



Fig. 4: Case 1 after 1 week postoperatively showing pink and friable gingiva



Fig. 7: Case 1 after 6 months postoperatively



Fig. 5: Case 1 after 1 month postoperatively



Fig. 8: Case 1 after 1 year postoperatively showing repigmentation

concern, a surgical gingival de-epithelization procedure was planned with lasers.

A diode of 940 nm laser was used. Procedure started with the application of topical anesthesia. Depigmentation was performed with short light paint brush strokes in a horizontal direction to remove the epithelial lining (Fig. 10). Neither bleeding nor pain was experienced by the patient during the procedure (Fig. 11). Following the procedure, analgesics were administered. Patient was reviewed on the third day, when progressive healing of the surgical site was seen (Fig. 12). Patient did not report of any pain or

discomfort after the procedure and no analgesic pills were used. At 1 week review appointment, complete healing of the wound was seen. Healing was uneventful. Gingiva appeared pink and firm with normal appearance. The patient was reviewed for 1 year and the postoperative result remains stable (Figs 13 to 16).

DISCUSSION

The word laser is an acronym for Light Amplification by Stimulated Emission of Radiation. Maiman in 1960 developed the first working laser. The first application of a



Fig. 9: Preoperative view of case 2 showing heavily pigmented gingiva



Fig. 12: Case 2 after 3 days postoperatively showing progressive healing



Fig. 10: Intraoperative view of case 2 using a 940 nm diode laser



Fig. 13: Case 2 after 1 month postoperatively



Fig. 11: Immediate postoperative view of case 2 showing a clean area without any bleeding spot



Fig. 14: Case 2 after 3 months postoperatively



Fig. 15: Case 2 after 6 months postoperatively



Fig. 16: Case 2 after 1 year postoperatively showing stable result

laser to dental tissue was reported by Goldman et al in 1964 and Stern and Sognnaes in 1972. Clinical lasers are of two types: Soft and hard lasers. Soft lasers are claimed to aid healing and to reduce inflammation and pain. Its applications include frenectomies, incisional and excisional biopsies, gingivectomies, gingivoplasties, de-epithelization, operculum removal, coagulation of graft donor sites and certain crown lengthening procedures. Surgical hard lasers, however, can cut both hard and soft tissues.

In a split mouth study, Lagdive et al (2009)⁸ compared gingival depigmentation using scalpel and diode laser. There was no bleeding at the laser depigmentation areas in any patient. Compared to scalpel blade depigmentation, diode laser depigmentation showed delayed healing. Pertaining to sites operated on with the scalpel blade, two out of three patients complained of moderate pain and one patient complained severe pain on the visual analog scale. In contrast, sites treated with diode laser were rated as only slightly or not painful. All patients were satisfied with the esthetically significant improvement in the gingival color with both the techniques. The study concluded that the application of diode laser appears to be a safe and effective alternative procedure for the treatment of gingival pigmentation.

Ameet et al (2009)⁹ compared three different surgical techniques for gingival depigmentation: Lasers, scalpel and

abrasion with diamond bur on the same patient with 3 months follow-up. Compared to scalpel blade and bur abrasion depigmentation, diode laser showed delayed healing. At the VAS evaluation site operated on with the scalpel blade and bur abrasion, the patient complained of moderate pain, but at the site treated with diode laser, only slight or no pain was recorded. However, the pain had reduced considerably 1 week after the surgery. The melanin pigmentation index (MPI) score also showed that there was no recurrence of pigmentation at 3 months in the region done by laser. This was supported by the biopsies which were taken preoperatively and then at 3-month postoperatively.

Lee et al (2011)¹⁰ compared two different gingival depigmentation techniques using an Erbium:Yttrium-Aluminum-Garnet (Er:YAG) laser and rotary instruments using a split mouth study design. The patients were satisfied with the esthetically significant improvement with each method. The visual analog scale did not yield much difference between the two methods, with slightly more pain on the Er:YAG laser-treated site. The results of these cases suggest that ablation of the gingiva by an Er:YAG laser and abrasion with a rotary round bur is good enough to achieve esthetic satisfaction and fair wound healing without infection or severe pain. Prudent care about the gingival condition, such as the gingival thickness and degree of pigmentation along with appropriate assessment, is needed in ablation by the Er:YAG laser procedure. The study concluded that both depigmentation methods showed satisfactory results with regard to esthetics, safety and effectiveness.¹⁰ The results of present case report also show that both lasers and scalpel are equally effective for depigmentation giving esthetic results. However, there are many advantages of lasers over other surgical procedures which include the following:

1. Dry and bloodless surgery
2. Instant sterilization of the surgical site
3. Reduced bacteremia
4. Reduced mechanical trauma
5. Minimal postoperative swelling
6. Less healing time
7. Minimal postoperative pain
8. No need for periodontal dressing

All these above-mentioned advantages are evidently experienced in the above case. Scalpel surgical technique is highly recommended in consideration of the equipment constraints that may not be frequently available in clinics.¹¹

Postsurgical repigmentation of gingiva has been reported. Repigmentation is described as spontaneous and has been attributed to the activity and migration of melanocytic cells from surrounding areas.¹² In the present

case, certain localized areas of repigmentation were seen at the end of 6 months and in almost the whole gingiva by the end of 1 year in case 1. But case 2 showed no evidence of repigmentation till 1 year. This case report has few limitations as it was not a split mouth design, the pain threshold, the gingival texture, healing potential and chance of repigmentation will vary from person to person.

CONCLUSION

For many intraoral soft tissue surgical procedures, the laser is a viable alternative to the scalpel. In the modern dental practice using laser technology, procedures can be accomplished with less invasive methods, a more relaxed appointment and less postoperative discomfort. These benefits can be accomplished routinely and predictably with laser technology.

REFERENCES

1. Dummett CO. Oral pigmentation. First symposium of oral pigmentation. *J Periodontol* 1960;31:356.
2. 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.
3. Tamizi M, Taheri M. Treatment of severe physiologic gingival pigmentation with free gingival autograft. *Quintessence Int* 1996;27(8):555-58.
4. Gnanaesekhar JD, Al-Duwairi YS. Electrosurgery in dentistry. *Quintessence Int (Berlin)* 1998;29(10):649-54.
5. Yeh CJ. Cryosurgical management of melanin pigmented gingiva. *Oral Surg Oral Med, Oral Pathol Oral Radiol Endodont* 1998;86(6):660-63.
6. Bishop K. Treatment of unslightly oral pigmentation: A case report. *Dental Update* 1994;21(6):236-37.
7. 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.

8. 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;9:41-47.
9. Mani A, Mani S, Shah S. Management of gingival pigmentation using three methods: Lasers, scalpel, abrasion with diamond bur. A case report. *J Oral Laser Appl* 2009;227-32.
10. Kwang-Myung L, Dong-Yeol L, Seung-Il S, Young-Hyuk K, Jong-Hyuk C, Yeek H. A comparison of different gingival depigmentation techniques: Ablation by erbium: yttrium-aluminum-garnet laser and abrasion by rotary instruments. *J Periodontal Implant Sci* 2011;41(4):201-07.
11. Almas K, Sadiq W. Surgical treatment of melanin-pigmented gingiva: An esthetic approach. *Ind J Dent Res* 2002;13(2):70-73.
12. Mokeem SA. Management of gingival hyperpigmentation by surgical abrasion: Report of three cases. *Saudi Dent J* 2006;18(3): 162-66.

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