Original Research Paper

Volume-8 | Issue-6 | June-2018 | PRINT ISSN No 2249-555X

Dental Science

GINGIVAL DEPIGMENTATION WITH DIODE LASER AND ELECTROSURGERY: A COMPARATIVE REPORT OF 2 CASES

C. Prabu*	Post Graduate Student, Department Of Periodontics *Corresponding Author
R. Madhumala	Professor & Hod , Department Of Periodontics
R. Saranyan	Professor,department Of Periodontics
N. Sayeeganesh	Professor,department Of Periodontics
D. Jayachandran	Professor,department Of Periodontics
K. Priya	Reader,department Of Periodonticsa
B. Manovijay	Senior Lecturer,department Of Periodontics

ABSTRACT Gingival hyperpigmentation is believed to be a genetic trait in populations and is more appropriately termed physiologic or racial gingival pigmentation; a condition, which affects all races differently. Gingival depigmentation is most frequently performed as an esthetic periodontal plastic surgical procedure. The different treatment modalities that have been reported for depigmentation are bur abrasion, partial thickness flap, cryotherapy, electrosurgery, and lasers..In this paper we have compared the results of electrosurgery and diode laser and the efficacy of two techniques. Maxillary anterior region was an area of concern for the patient.

KEYWORDS : Depigmentation, electrosurgery, laser , pigmented gingiva

INTRODUCTION

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 gingivalepithelium.[1]Melanin pigmentation of the gingiva occurs in all races.[2]

Gingival hyperpigmentation is seen as a genetic trait in some populations irrespective of age and gender; hence it is termed physiologic or racial gingival pigmentation.[2,3] The degree of pigmentation varies from one individual to another which is mainly dictated by the melanoblastic activity.[4] Melanin pigmentation of gingiva is symmetric and persistent and it does not alter normal gingival architecture. Melanosis of gingiva is frequently encountered among dark-skinned ethnic groups, as well as in medical conditions such as Addison's syndrome, Peutz-jegher's syndrome, and VonRecklinghausen's disease (neurofibromatosis).[5] Melanocytes of dark-skinned and black individuals are uniformly highly reactive than in light-skinned individuals.[6]

Gingival depigmentation is a periodontal plastic surgical procedure whereby the gingival hyperpigmentation is removed or reduced by various techniques. The first and foremost indication for depigmentation is patient demand for improved esthetics. Various depigmentation techniques have been employed with similar results. Selection of the technique should be based on clinical experiences and individual preferences.

Methods of Depigmentation:

- Scalpel surgical technique.
- Cryosurgery
- Electrosurgery
- Lasers: Neodymium; Aluminum-Yitrium Garnet (Nd- YAG) lasers. Erbium-YAG lasers. Carbon-di-oxide CO2 laser
- Chemical methods of depigmentation.
- Methods aimed at masking the pigmented gingiva with grafts from less pigmented area free gingival graft, acellular dermal matrix allograft.

CASE REPORTS

Case 1

A healthy 21-year-old male patient reported to the Department of Periodontology, Vinayaka Missions Sankarachariyar Dental College, with the chief complaint of "blackish gums" which esthetically interfered with his smile [Figure 1]. The patient requested for any cosmetic therapy which would eventually enhance the esthetics on smiling. The patient's history revealed that the blackish discoloration of gingiva was present since birth suggestive of physiologic melanin pigmentation. His medical history was non contributory. On intraoral examination, generalized diffused blackish pigmentation of gingiva was observed on the labial surface of both maxillary and mandibular arches; however it was healthy and completely free of any inflammation.

FIGURE 1: PRE OPERATIVE VIEW

Considering the patient's concern, a surgical gingival de-epithelization procedure was planned using electrosurgery unit for the right side and diode laser for the left side of the maxillary arch.

At the maxillary left anterior region from central incisor to canine diode laser having wavelength 810 to 980 nm at 1.5 to 2 Watt power in a continuous wave mode with flexible fiber optic quartz delivery system was used After the selected power settings were entered, the laser was activated. The procedure was performed in contact mode. The tip was held in light contact with the tissue and the procedure was performed with light sweeping brush strokes (Fig.2). High volume suction was used. Exposure parameters are set using the recommended guidelines, followed by careful removal of epithelium containing melanin layer. The laser tip was directed to the target tissue until blister formation occurred. Blistered gingiva was scraped off with wet, saline moistened gauze to remove the epithelium containing .There was absolutely no bleeding during the procedure (Figure No.3).

FIGURE 2 : Contact of laser tip with the pigmented tissue

FIGURE 3: Immediately after the surgery

Similarly epithelial excision was done on the right side with the electrosurgery unit using the loop electrode [Figure 4]. Care was taken not to expose the bone on the attached gingiva and not to remove excessive tissue on the marginal gingiva thereby disturbing the gingival harmony.

FIGURE 4:De-epithelisation using the electrosurgery unit

Visual Analogue Scale was used to quantify pain levels and patient's discomfort. The VAS consisted of a horizontal line of 10 cm (100 mm) with two end-points representing 'no pain' and 'worst pain imaginable'. Patients are asked to rate their pain by placing a mark on the line corresponding to their current level of pain. The distance along the line from the 'no pain' marker is then measured with a ruler giving a pain score out of 10.

- 0: No pain
- 0.1-3: Slight pain
- 3.1-6: Moderate pain
- 6.1-10: Severe pain.

Each patient was given the instructions to complete the VAS index cards two and 24 hours after the procedure.

On completion of depigmentation, postoperative instructions were given to the patient Patient was recalled after 1 week for reevaluation. Wound healed uneventfully on both the sides. Patient experienced pain on the laser treated site for three days post operatively. On 1 month postoperative follow-up, the areas were completely healed.

FIGURE 5: Post operative view after 1 month

Case 2

A 24-year-old female patient reported with similar findings and underwent the same procedure

Patients were recalled after 7 days and the following was recorded:

- Healing – absence of pain, bleeding, and infection
- Postoperative pain and itching if any
- Inflammation and color change

DISCUSSION

There are wide variations in gingival color in normal healthy persons. The degree of vascularization, the thickness of the keratinized layer, and the amount of the pigment containing cells will determine the color of the gingiva.[7] There are few studies published so far regarding clinical methods of treatment of pigmented gingiva. The techniques that were tried in the past to treat gingival pigmentation include chemical cauterization,[8] gingivectomy,[9] scalpel scraping procedure,[10] and abrasion of gingiva.[11] The recent techniques of gingival depigmentation in practice are cryotherapy,[12] free gingival autograft,[13] and laser therapy[14] and these have achieved satisfactory results.

LASER is an acronym for Light Amplification by Stimulated Emission of Radiation, based on theories and principles first put forth by Einstein in the early 1900s. The first actual laser system was introduced by Maiman in 1960.[15] Laser light is a man-made single-photon wavelength. The process of lasing occurs when an excited atom is stimulated to remit a photon before it occurs spontaneously. Stimulated emission of photons generates a very coherent, collimated, monochromatic ray of light.[16]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, ablation of lesions, incisional and excisional biopsies, gingivectomies, gingivoplasties, de epithelization, soft tissue tuberosity reductions, operculum removal, coagulation of graft donor sites and certain crown lengthening procedures. Surgical hard lasers, however, can cut both hard and soft tissues.

There are many advantages of lasers over surgical procedures. According to Wigdor et al (1995), these include:

1. Dry and bloodless surgery,
2. Instant sterilization of the surgical site,
3. Reduced bacteremia,
4. Reduced mechanical trauma,
5. Minimal postoperative swelling and scarring and
6. Minimal postoperative pain.

All these above-mentioned advantages are evidently experienced in the above case. During procedure, there was no bleeding, which is almost always present when surgical approaches like bur abrasion, scraping, partial thickness flap or gingivectomy are used. Also, postoperatively, no pain was experienced by the patient and no swelling or any other signs of infection were noticed.

Lasers can be used for patients to reduce anxiety or fear of drill. It provides a 'needle-free' approach or no anesthesia dentistry. Also, laser dentistry requires less chairside time compared with more traditional treatments and hence results in more patient cooperation and more efficient dental practice. There is increased coagulation and a necrotic slough is formed over the surface of soft tissue after treating with lasers. There is no need of sutures and a faster and more comfortable healing is seen. Thus, it provides faster and better treatment of gum disease.

Electrosurgery has its own limitations in that its repeated and prolonged use induces heat accumulation and undesired tissue destruction.

The present study had a split-mouth design which is an excellent method to determine the clinical relevance of comparison of the two depigmentation techniques to remove gingival pigmentation. In this study, patients demonstrated more pain and discomfort in the electrosurgically treated sites during the first 24 h postoperatively. The VAS is an established method for assessing pain or discomfort responses of patients. The VAS as a method of pain measurement has been reviewed extensively and was found to be a reliable method. [17,18] Although, this method of pain assessment has its own limitations like the validity of VAS measures may be dependent on the instructions used for patients and subjects,[19] measuring the distance along a horizontal or vertical line may be time consuming[19] and method is subjective.[17,18].Post-operative evaluation of the VAS score revealed that the discomfort and pain level associated with electrosurgery was significantly higher than diode laser at 24 h postoperatively.It was concluded that carbon-dioxide laser surgery proved an effective technique for gingival depigmentation .

Though the initial result of the depigmentation surgery is highly encouraging, repigmentation is a common problem. The exact mechanism of repigmentation is not known. Different studies show variation in the timing for early repigmentation. To return to the full

clinical baseline repigmentation it takes about 1.5–3 years.[20] This variation may be due to the different techniques performed or due to the patient's race. Thus, the gingival depigmentation procedure, if performed primarily for cosmetic reason, will not be of permanent value, because pigmentation tends to return to baseline values.[20] The benefits of both the treatment modalities include ease of usage, effectiveness and convenience in dental clinics.

CONCLUSION

The methods used here produced desired results and above all, the patients were satisfied with the outcome. Discomfort and pain level associated with electrosurgery was higher than diode laser. It was concluded that carbon-dioxide laser surgery proved an effective technique for gingival depigmentation .

References

1. Cicek Y, Ertas U. The normal and pathological pigmentation of oral mucous membrane: A review. J Contemp Dent Pract 2003;4:76-86.
2. Dummett CO. Oral pigmentation. First symposium of oral pigmentation. J Periodontol 1960;31:356-60.
3. Dummet CO, Barens G. Oromucosal pigmentation: An updated literary review. J Periodontol 1971;42:726-36.
4. Perlmutter S, Tal H. Repigmentation of gingival following injury. J Periodontal 1986;57:48-50.
5. Shafer WG, Hine MK, Levy BM. Text Book of Oral Pathology. Philadelphia: WB Saunders Co.; 1984. p. 89-136.
6. Szako G, Gerald SB, Pathak MA, Fitz Patrick TB. Racial differences in the fate of melanosomes in human epidermis. Nature 1969;222:1081.
7. Begamaschi O, Kon S, Doine AI, Ruben MP. Melanin repigmentation after gingivectomy: A five year clinical and transmission electron microscopic study in humans. Int J Periodontics Restorative Dent 1993;13:85-92.
8. Hirschfeld I, Hirschfeld L. Oral pigmentation and method of removing it. Oral Surg Oral Med Oral Pathol 1951;4:1012.
9. Dummet CO, Bolden TE. Post surgical repigmentation of the gingiva. Oral Surg Oral Med Oral Pathol 1963;16:353-6.
10. Almas K, Sadig W. Surgical treatment of melanin pigmented gingiva: An esthetic approach. Indian J Dent Res 2002;13:70-3.
11. Pal TK, Kapoor KK, Parel CC, Mukharjee K. Gingival melanin pigmentation- A study on its removal for esthetics. J Indian Soc Periodontol 1994;3:52-4.
12. Tal H, Landsberg J, Koztovsky A. Cryosurgical depigmentation of the gingiva -.A case report. J Clin Periodontol 1987;14:614-7.
13. Tamizi M, Taheri M. Treatment of severe physiologic gingival pigmentation with free gingival autograft. Quintessence Int 1996;27:555-8.
14. Trelles MA, Verkruysse W, Segui JM, Udaeta A. Treatment of melanotic spots in the gingiva by Argon laser. J Oral MaxillofacSurg 1993;51:759-61.
15. Maiman TH. Stimulated optical radiation in ruby. Nature 1960;187:493-94.
16. Clayman L, Kuo P. Lasers in maxillofacial surgery and dentistry. New York: Thieme; 1997:1-9.
17. Eslamian L, Borzabadi-Farahani A, Edini HZ, Badiee MR, Lynch E, Mortazavi A. The analgesic effect of benzocaine mucoadhesive patches on orthodontic pain caused by elastomeric separators, a preliminary study. Acta Odontol Scand 2013;71:1168-73.
18. Eslamian L, Borzabadi-Farahani A, Hassanzadeh-Azhiri A, Badiee MR, Fekrazad R. The effect of 810 nm low-level laser therapy on pain caused by orthodontic elastomeric separators. Lasers Med Sci 2013.
19. Price DD, Bush FM, Long S, Harkins SW. A comparison of pain measurement characteristics of mechanical visual analogue and simple numerical rating scales. Pain 1994;56:217-26.
20. Begamaschi O, Kon S, Doine AI, Ruben MP. Melanin repigmentation after gingivectomy: A five year clinical and transmission electron microscopic study in humans. Int J Periodontics Restorative Dent 1993;13:85-92.