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Laser - A treatment modality for black gums

[1]Kiran Dodani, Professor and HOD, Department of Periodontology, RKDF Dental College and Research Centre, Bhopal.

[2]Deepak Bhojwani, Consultant Oncosurgeon, Chirayu Medical College and Hospital, Bhopal.

[3]Ankur Singh Rajpoot, Reader, Department of Periodontology, RKDF Dental College and Research Centre, Bhopal.

[4]Preeti Rajput, Reader, Department of Oral Pathology and Microbiology, RKDF Dental College and Research Centre, Bhopal.

[5]Nidhi Choudaha, Professor, Department of Oral Pathology and Microbiology, RKDF Dental College and Research Centre, Bhopal.

Corresponding Author: Kiran Dodani, Professor and HOD, Department of Periodontology, RKDF Dental College and Research Centre, Bhopal.

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Abstract

Gingival pigmentation results from melanin granules, which are produced by Melan oblasts. The degree of pigmentation depends on megaloblastic activity. Although melanin pigmentation of the gingiva is completely benign and does not present a medical problem, complaints of 'black gums' are common particularly in patients who have a very high smile line (gummy smile). Disproportionally small teeth and gingival hyperpigmentation are major concerns for a large number of young patients visiting the dentist. Different treatment modalities have been reported for depigmentation of gingiva such as bur abrasion, scraping, partial thickness flap, cryotherapy, electrosurgery and laser. Laser depigmentation showed some beneficial effects like bloodless field during surgical procedure which healed uneventfully. Patient discomfort was more in laser treated site during the initial healing period as compared to scalpel. A case report is presented here on the cosmetic correction of "Black Gums" with diode laser.

Keywords: Gingival Pigmentation, Gingival Depigmentation, Lasers in Periodontal Surgery

Introduction

The gingiva is the most commonly affected intraoral tissue, which is responsible for an unpleasant appearance. Melanin pigmentation often occurs in the gingiva as a result of an abnormal deposition of melanin. Hyperpigmentation of the gingiva is caused by excessive melanin deposition by the melanocytes located mainly in the basal and the suprabasal cell layers of the epithelium. Brown or dark pigmentation and discoloration of

gingival tissue can be caused by a variety of local and systemic factors [1].

Melanin hyperpigmentation usually does not present as a dental problem, but it may it may reveal unesthetic appearance. This problem is commonly seen in patients with excessive gingival display while smiling. Depigmentation of gingiva is a periodontal plastic surgical procedure. Various depigmentation techniques have been tried and they showed with similar results. Selection of the technique should be based on an individual preference of the clinicians [2].

Methods of Depigmentation

- Scalpel surgical technique.
- Cryosurgery
- Electrosurgery
- Lasers: Neodymium; Aluminium-Yitrium Garnet (Nd- YAG) lasers. Erbium-YAG lasers. Carbon-di-oxide CO_2 laser
- Chemical methods of depigmentation.
- Methods aimed at the pigmented gingiva with grafts from less pigmented area free gingival graft, acellular dermal matrix allograft.

Removal of gingival melanin pigmentation should be performed cautiously and the adjacent teeth should be protected, since inappropriate application may cause gingival recession, damage to underlying periosteum and bone, delayed wound healing, as well as loss of enamel [5].

Laser Depigmentation has become widely used recently and is even preferred over scalpel technique by many clinicians. The documented advantages of lasers in periodontal surgery include less bleeding and reduced postoperative pain.6 Accelerated wound healing with laser use has not been scientifically validated. negative effects of lasers, especially Nd: YAG and CO2 lasers, include thermal damage to underlying bone when these lasers are used on thin soft tissue during gingivectomies. Tissue penetration from the laser may cause thermal damage 2 to 4 mm below the surface, causing underlying hard tissue damage [3].

The present case report introduces a simple and effective surgical depigmentation technique by laser which gives Esthetically acceptable results. The main advantage of laser is that it reduces patient discomfort and less postoperative pain.

Case report

A 19-year-old female patient visited to the department of Periodontology, RKDF Dental College & Research Centre, complaining of black gums (Figure 1). Patient was systemically healthy with good oral hygiene. Oral examination revealed deeply pigmented gingiva from right maxillary canine to left maxillary canine. Patient was explained about the treatment options available and the possibility of repigmentation after certain period of time and written informed consent was obtained. Phase I therapy was carried out during the initial visit.

Figure 1: Pre-operative

Local infiltration of lignocaine was administered. Exposure parameters are set using the recommended guidelines, followed by careful removal of epithelium containing melanin layer with the diode laser was done. There was absolutely no bleeding during the procedure (Figure 2). On completion of depigmentation, a periodontal dressing was placed over the surgical area (Figure 3).

Figure 2: Removal of epithelium with diode laser

Postoperative instructions were given to the patient, NSAID in the form of diclofenac sodium was given thrice daily for three days. Patient was recalled after 1 week for re-evaluation. Wound healed uneventfully. On 1-month postoperative follow-up, the areas were completely healed (Figure 4).

Figure 3: Periodontal dressing placed

Figure 4: Post-operative after 1 month

Result

There was no postoperative pain, hemorrhage, infection or scarring occurred in any of the sites. The patients were observed at 1 day, 7 days and 1 month after the procedure and the healing was found to be uneventful. The patient's acceptance of the procedure was good and the results were excellent, as perceived by patient.

Discussion

There are wide variations in gingival color in normal healthy persons. Degree of vascularization, the thickness of the keratinized layer and the amount of the pigment-containing cells will determine the color of the gingiva. Till date very little literature has been published regarding clinical methods of treatment of pigmented gingiva. The techniques that were tried in the past to treat gingival pigmentation include chemical cauterization, gingivectomy [7], scalpel scraping procedure and abrasion of gingiva. The recent techniques of gingival depigmentation in practice are cryotherapy, free gingival autograft and laser therapy and these have achieved satisfactory results. Electrosurgery has its own limitations in that its repeated and prolonged use induces heat accumulation and undesired tissue destruction [1]. Cryosurgery is followed by considerable swelling and it is also accompanied by increased soft tissue destruction as the depth of penetration cannot be controlled. The CO_2 laser causes minimum damage to the periosteum and underlying bone and it has unique characteristics of being able to remove a thin layer of epithelium cleanly [6].

Laser procedures require careful handling of laser tips and tissues. If the tip is dragging then the energy setting should be raised, but if charring or carbonization is occurring then the settings should be lowered. Excessive carbonization of tissue can lead to iatrogenic sequel including recession, and post operative pain.12 Minor

areas of carbonization can occur even with ideal settings, but these localized areas of charring, can be eliminated by rubbing hydrogen peroxide over the area with a cotton pellet or a micro brush dipped in the 3% hydrogen peroxide solution and scrubbed gently on the area. Since the laser is end cutting, dragging the tip rapidly across the tissue will not ablate the tissue, but either cause the tip to break, or result in bleeding and slow cutting.

Atsawasuwan et al (2000) reported the use of Nd: YAG laser for gingival depigmentation in four cases. They found no recurrence of melanin pigmentation during the follow up period of 11 to 13 months and he concluded that Nd: Yag laser also can be used for gingival depigmentation, procedure.8 However the literature on use of diode laser for depigmentation is present but still not authentic. In this particular case report, results obtained were comparable to that of conventional method of scalpel blade. However, patient experienced discomfort for initial 10 days of healing [8].

Conclusion

Gingival depigmentation is most often a patient demanded Esthetic periodontal treatment. Both scalpel and laser techniques were equally effective in this procedure; however, in this case report reduced patient discomfort and less post operative pain was observed in laser procedure.

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