

LASER –ASSISTED CROWN LENGTHENING AND GINGIVAL DEPIGMENTATION TO ENHANCE AESTHETICS-A CASE REPORT.

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ABSTRACT:

Gingival hyper pigmentation is of prime aesthetic concern reported by many young patients, in day to day dental practice. Gingival depigmentation is a periodontal plastic surgical procedure whereby the gingival hyperpigmentation is removed or reduced by various techniques. Recently, laser ablation has been recognized as one of the most effective, comfortable and reliable techniques. The present case report showcases the effectiveness and thoroughness of gingival depigmentation and crown lengthening carried out with a diode laser. Depigmentation with , diode lasers can be used in periodontics because of their excellent soft tissue ablation and haemostatic characteristics.

KEYWORDS: Gingival Pigmentation, Depigmentation, Dode laser.

INTRODUCTION

Gingival hyper pigmentation is of prime aesthetic concern reported by many young patients, especially those who present with gummy smiles reporting in day to day dental practice. Frequently, gingival hyperpigmentation is caused by excessive melanin deposition by melanocytes situated in the basal layer.¹

Necessity of depigmentation arises from the fact that “A smile is not a mere curve of the lips”. It is the extent of teeth and gums seen in the 'Smile Window'. Hyperpigmented marginal gingiva is a dampening factor in an otherwise acceptable smile window.² People do not appreciate dark colored gingiva due to esthetic reasons. Though physiologically normal, the gingival pigmentation is the cause of many misconceptions due to superstitious reasons. It is thus conceivable that gingival pigmentation is a psychosocial problem.³

Gingival depigmentation is a periodontal plastic surgical procedure whereby the gingival hyperpigmentation is removed or reduced by various techniques.⁴

Successful treatment of gingival hyperpigmentation for esthetic purposes has been previously reported using surgical, chemical, cryosurgical and electrosurgical techniques with different degree of success.^{5, 6} Recently, laser ablation has been recognized as one of the most effective, comfortable and reliable techniques. Different lasers have been used for gingival depigmentation including carbon dioxide, diode, Nd: YAG, Er: YAG and Er, Cr: YSGG lasers with varied success.⁷⁻⁹

The diode laser which has been introduced in dentistry few years back is a solid-state semiconductor laser that typically uses a combination of Gallium (Ga), Arsenide (Ar), and other elements, such as Aluminium (Al) and Indium (In). It has a wavelength ranging from 810 to 980 nm. This energy level is absorbed by pigmentation in the soft tissues and makes the diode laser an excellent haemostatic agent.⁵ The present case report showcases the effectiveness and thoroughness of gingival depigmentation and crown lengthening carried out with a diode laser.

Case report:

A 26-year-old female patient came to us with a chief complaint of dark gums and excessive gingival display during smiling and speech (**Fig.1**). She was extremely self conscious because of her dark gums and short clinical crown height with respect to both the central incisors and canines in the maxillary arch and requested for any cosmetic treatment which would eventually enhance the aesthetics on smiling. Her medical history was non-contributory.

On examination, it was found that her clinical crown was much shorter than the anatomic crown, and the patient had the personal desire to have “longer teeth” along with correction of her dark gums. The treatment recommended was to complete a laser-assisted crown lengthening and depigmentation of the gingiva in the anterior region from premolar to premolar in the maxilla.



Fig.1 Pre-operative view of melanin pigmented gingiva and excess gingival display



Fig.2 Laser settings for laser-assisted crown lengthening



Fig.3. Laser –assisted crown lengthening



Fig.4 Immediate postoperative view



Fig.5. Immediate postoperative view after gingival depigmentation



Fig.6. One month postoperative view of pateint's smile line

Procedure

Topical anaesthetic gel was applied to the surgical field. Special eye glasses were worn by the patient and the staff to fulfil with the FDA laser safety rules. The properly initiated tip of the diode laser unit (Picasso, AMD laser technologies, USA; wavelength 810 nm) angled at an external bevel of 45 degrees and at energy settings of 0.5-1.5 watts in Continuous Wave (CW) was used with small brush like strokes back and forth with gradual progression deeper along the same initial laser incision to remove the tissue. A 400µm strippable fiber was used with a power setting of 1.5 watts initially in Pulsed Wave mode (PW) set at 0.20 ms of pulse duration and 0.10 ms of pulse interval for de-epithelialization procedure. (Fig.2 and Fig.3).

Crown lengthening (gingival recontouring more appropriately) was completed and checked for any tissue tags (Fig.4). The laser tip was held close to the gingiva and ablation was performed using paint brush strokes proceeding from the mucogingival junction towards the free gingival margin.

After removal of the overlying epithelial tissue, power setting was increased to 2 W to attain rapid ablation for removing the pigments present deep beneath the basement membrane and minimize the hemorrhage from the connective tissue (Fig.5). During the procedure, any tissue tags left out after laser ablation were wiped with sterile gauze soaked in saline every 3-5 min and thorough inspection was done to confirm no pigmented areas were left out. Patient was prescribed analgesics for use when required and was discharged with necessary post operative instructions. The patient was reviewed at one week and the post operative healing was uneventful. The patient was recalled after one month (Fig.6) and 3 months for evaluation of any repigmentation. There was no incidence of any repigmentation (Fig. 7 and Fig. 8).

Discussion

There are increasing demands for cosmetic rehabilitation for gingival melanin pigmentation. Several modalities have been suggested for gingival depigmentation, varying from scalpel, electrosurgery, and cryosurgery to lasers.⁵⁻⁹

Scalpel surgery causes unpleasant bleeding during and after the operation, and it is necessary to cover the surgical site with periodontal dressing for 7 to 10 days. Electrosurgery requires more expertise than scalpel surgery. Prolonged or repeated application of current to tissue induces heat accumulation and undesired tissue destruction. Contact with periosteum or alveolar bone and vital teeth should be avoided.⁵ Cryosurgery is followed by considerable swelling, and it is also accompanied by increased soft tissue destruction.¹⁰

Depigmentation with lasers achieves good results, among the many lasers available, high power lasers such as diode lasers can be used in periodontics because of their excellent soft tissue ablation and haemostatic characteristics.⁵

The Diode laser was chosen for the present case since it has an affinity for melanin or other dark pigments; it works more efficiently when the beam is applied under the presence of a pigment. The advantage of laser is easy handling, short treatment time, haemostasis and decontamination and sterilization effects.

The patient did not complain of any pain or discomfort, during and/or after the procedure. Patient was satisfied. Though repigmentation after depigmentation has been reported using various techniques, our present case, no repigmentation was seen after a short three month follow-up.



Fig.7 One month postoperative view of gingival depigmentation



Fig.8 Three month post operative view of gingival depigmentation

CONCLUSION

Treatment of gingival pigmentation with associated crown lengthening by diode laser was found to be a safe and efficient procedure. Post-operative patient satisfaction in terms of aesthetics and pain was excellent. The gingiva healed unevenly with no infection, pain, swelling, or scarring.

References:

1. Atsawasuwan P, Greethong K, and Nimmanon V. Treatment of gingival hyperpigmentation for esthetic purposes by Nd: YAG laser: Report of 4 cases. J Periodontol 2000; 71: 315-21. <http://dx.doi.org/10.1902/jop.2000.71.2.315>
2. Kumarswamy A.. Beauty is indeed skin deep; Ann Plast Surg. 1980 Jun;4(6):462-8.
3. T.K. Pal. Gingival melanin pigmentation – A study on its socio psychological attitude.JIDA 1994; vol 65; March.
4. Nandakumar K, Roshna T. Anterior Esthetic Gingival Depigmentation and Crown Lengthening: Report of a Case. J Contemp Dent Pract 2005 August ;(6)3:139-147.
5. Sushma L, Yogesh D, Marawar PP. Management of gingival hyperpigmentation using surgical blade and diode laser therapy: A comparative study. J Oral Laser applications 2009; 9:41-7.
6. Tal H, Landsberg J, Kozlovsky A. Cryosurgical depigmentation of the gingiva: A case report. J Clin Periodontol 1987; 14:614-17. <http://dx.doi.org/10.1111/j.1600-051X.1987.tb01525.x>
7. Esen E, Haytac MC, Oz IA, et al. Gingival melanin pigmentation and its treatment with the CO2 laser. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2004; 98: 522-27. <http://dx.doi.org/10.1016/j.tripleo.2004.02.059>
8. Azzeh MM. Treatment of gingival hyperpigmentation by erbium-doped: yttrium, aluminum, and garnet laser for esthetic purposes. J Periodontol 2007; 78: 177-84. <http://dx.doi.org/10.1902/jop.2007.060167>
9. Berk G. Treatment of Gingival Pigmentation with Er, Cr: YSGG laser. J Oral Laser Applications 2005; 5: 249-53.
10. Prasad D, Sunil S, Mishra R, Seshadri. Treatment of gingival pigmentation: A case series Indian J Dent Res 2005;16:171-176. <http://dx.doi.org/10.4103/0970-9290.29901>

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