

Gingival Depigmentation Using Different Techniques: A Follow up Study**Disha Nagpal, Shobha Prakash¹, Gagandeep Singh²**

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ABSTRACT:

The color of gingiva plays an integral role in evaluating health and disease. Gingival Melanin Pigmentation (GMP) is a focal pigmentation of endogenous origin. Although it does not present medical problem, complaints of 'black /dark gums' are common primarily for esthetic reasons. To address to these complaints gingival depigmentation is done using various treatment modalities like bur abrasion, scalpel scraping, split thickness flap, cryotherapy, electrosurgery and lasers. However, each of these techniques have their own advantages and disadvantages. In this study a comparison has been made between the most commonly used techniques for gingival depigmentation and the variations in the results pertaining to the same. The oldest methods like bur abrasion, cryotherapy to the latest like laser and most commonly used like scalpel scraping methods have been compared. This case report is an attempt to help the dentists' decide from the various methods available for gingival depigmentation and the various factors to be considered for a better clinical application.

Keywords: Color, Cryotherapy, Depigmentation, Gingiva, Laser, Scalpel

INTRODUCTION:

An attractive smile has always been the focal point of esthetic appearance and self esteem. Melanin pigmentation of gingiva along with contrast of shape, color of teeth line and texture enables us to determine a beautiful smile. Melanin pigmentation usually presents an unesthetic problem due to black color and is a common complaint among patients. Depigmentation is a periodontal plastic surgical procedure done for esthetic reasons. Various methods are presented in literature ranging from simple slicing method to free gingival graft, acellular dermal matrix allografts,

electrosurgery, cryosurgery, and abrasion with diamond burs and various types of lasers. Although these techniques may be simple and effective and give desired results, not much information in literature is available about effective depigmentation of gingiva by these methods. Hence, we present a comparative clinical case report of gingival depigmentation of these four techniques –

- Laser,
- Surgical scalpel scraping,
- Cryosurgery
- Rotary bur abrasion.

CASE REPORT

A patient aged 21 years (male) visited dental OPD with the chief complaint of dark gums. He gave a history of the brownish discoloration of gums since birth, suggestive of physiologic melanin pigmentation. On intraoral examination, hyperpigmented gingiva in both the arches extending in the region of first premolars of both arches was noticed. The medical history was non-contributory and gave no habit history like smoking. The treatment began with phase-I therapy i.e. oral hygiene instructions, scaling and polishing. Depigmentation procedure was scheduled once inflammation resolved. Different techniques i.e. laser, scalpel, rotary bur and cryotherapy for the four different quadrants from premolar to premolar were used. Before starting the procedure, gingival pigmentation index (Dummet Index, 1964) was recorded.

Gingival depigmentation was done from first premolar to central incisor of first quadrant with diode laser having wavelength 810 nm (Picaso Lite) at 1 W power in a continuous mode. After the selected power settings, the laser was activated. The procedure was performed in contact mode. The tip was held in light contact with tissue and light sweeping brush strokes were used. The charred tissue was removed with wet saline gauze. The patient did not experience any pain. Following the procedure, no periodontal dressing was given.

Depigmentation procedure from first premolar to central incisor of second quadrant was done with scalpel blade (no.15) using the slicing method. The gradual scraping of the gingival epithelium was done until the pigmentation was

completely eliminated. Pressure was applied with sterile gauze moistened in saline to control hemorrhage during the procedure.

In third quadrant, high-speed handpiece and straight and round diamond bur with copious irrigation were used. Emphasis was on applying minimal pressure and making feather light brush strokes to avoid pitting and excessive removal of the tissue leading to the underlying bone exposure. The marginal gingiva was very thin and some remnants were left in order to prevent gingival recession.



Figure 1: Preoperative



Figure 2: Quadrant 1- Laser



Figure 3: Immediate Post Op (Laser)

In fourth quadrant, from premolar to central incisor depigmentation procedure was carried out using cryotherapy (gas expansion cryoprobe using liquid nitrogen). Following the application of local anesthetic gel, the area was exposed to cryoprobe. Immediately after its removal, the tissue was frozen solid, taking on the appearance of a ball of ice. Thawing occurred in 15-20 sec. with the progression from the periphery to the centre of the ice ball. Thirty minutes after freezing, the tissue area was indiscernible from the adjacent gingiva. The patient was informed that some amount of postoperative swelling might ensue after the procedure. Analgesics (three times daily for 3 days) and 0.2% chlorhexidine digluconate rinse twice daily for 2 weeks were prescribed.



Figure 6: Quadrant3-Bur Abrasion Technique



Figure 7: Immediate Post Op (Bur Abrasion)



Figure 4: Quadrant 2- Surgical Scalpel Scraping Technique



Figure 8: Quadrant4-Cryotherapy



Figure 5: Immediate Post Op (Scalpel)



Figure 9: Immediate Post Op (Cryotherapy)



Figure 10: 3 Months Post Operative

Clinical parameters were recorded. The pain following treatment was measured using Visual Analog Scale (VAS) after 24 hours, 1 week post op and gingival pigmentation was assessed using Dummet Index after 3 months to check for any recurrence. The patient was evaluated for wound healing immediately and after 3 months using criteria given by Ishii et al and Kawashima et al.¹

CLINICAL EVALUATION AND INDICES

DUMMET ORAL PIGMENTATION INDEX (1964)¹: The degree of melanin pigmentation was determined based on the following scoring system:

- 0- No clinical pigmentation (pink- colored gingiva)
- 1- Mild clinical pigmentation (mild light brown pigmentation)
- 2- Moderate clinical pigmentation (moderate brown tissue)
- 3- Heavy clinical pigmentation (deep brown to black tissue)

Interpretation of Scores

0	No pigmentation
0.03-1	Mild pigmentation
1.03-2	Moderate pigmentation
2.03-3	Severe pigmentation

VISUAL ANALOG SCALE²

The visual analog scale (VAS) was used to evaluate the subjective pain level experienced by the patient. The VAS consisted of a horizontal line of 10 cm (100 millimeter) long, anchored at the left end by the descriptor “no pain” and at the right end by “unbearable pain”. The patient was asked to mark the severity of the pain. The distance of this point, in centimeters, from the left end of the scale was recorded and used as the VAS score: 0 = no pain; 1 - 3 = slight pain; 3.1 – 6 = moderate pain; 6.1 - 10 = severe pain.

Table 1: Clinical evaluation of pain (VAS)

	VAS 1 day post op	1 week post op
LASER	1	0.5
SCALPEL	3.2	1
BUR ABRASION	2.8	1
CRYOTHERAPY	2	1

Table 2: Recurrence of pigmentation (DOPI)

METHOD	IMME-DIATELY	3 MONTHS POST OPERATIVE
LASER	0	0.03
SCALPEL	0	0.03
BUR ABRASION	0	0.03
CRYOTHERAPY	0	1.3

Table 3: Wound Healing

METHOD	IMME-DIATELY	3 MONTHS POST OPERATIVE
LASER	C	A
SCALPEL	C	A
BUR ABRASION	C	A
CRYOTHERAPY	C	A

WOUND HEALING²

Wound healing was evaluated based on the following scores: A. complete epithelization, B. incomplete epithelization, C. ulcer, D. tissue defect or necrosis.

RESULTS

The pain evaluation was done 1 day postoperatively. Wound healing was almost similar after using all the techniques. On the VAS evaluation, the patient complained of moderate pain at sites operated on with scalpel blade but no pain was recorded at other sites. However, the pain had reduced considerably 1 week after the surgery. The GPI score showed that there was recurrence of pigmentation (score-1.3) three month post op in Mandibular (fourth quadrant) region treated with cryotherapy.

DISCUSSION

Gingival hyperpigmentation is seen as a genetic trait in some populations, and is more appropriately termed physiological or racial gingival pigmentation.³ Although physiologic gingival pigmentation is a normal condition in most cases, complaints of black gums resulting from esthetic concerns are particularly common among adolescents.⁴ Pigmentation can be removed for esthetic reasons using different treatment modalities. These methods include those with aim of removing pigment layer and those aimed at making the pigment layer. Of all these methods, scalpel scraping, diode laser, cryosurgery and bur abrasion are commonly used in dental setting.

In this study, these four methods have been compared. As assessed by VAS scale, patient had moderate pain in only the

region where scalpel scraping was done. Wound healing was similar in all the quadrants. After scalpel surgery the exposed lamina propria was covered with periodontal pack for 7 to 10 days.⁵ However, no periodontal dressing was given in area treated with laser because diode laser causes minimal damage to the periosteum and bone under the gingiva being treated; it has the unique property of being able to remove a thin layer of epithelium clearly. The laser wound is sterile and has no inflammatory reaction. Blood vessels in the surrounding tissue upto a diameter of 0.5mm are sealed; thus, the primary advantage is hemostasis and a relatively dry field.⁶ Hence, there are many advantages of laser over surgical procedure according to Wigdor et al, 1995⁷. These include dry and bloodless surgery, instant sterilization of surgical site, reduced bacterimia, less mechanical trauma, minimal post operative scaring, swelling and post operative pain.

There is abundant evidence in literature comparing Laser vs Scalpel (Lagvide S. et al, 2009⁸; Desai U et al, 2013⁹). Mani A., 2009² showed that for the management of gingival hyperpigmentation better results were achieved with semiconductor diode laser than conventional scalpel blade and abrasion with bur. Singh V, 2012¹⁰ compared the efficacy of Diode laser and cryosurgery using TTFE and found that both techniques were equivalent and satisfactory. However, no study compared all these four methods in one patient as done in the present case report.

Recurrence of pigmentation observed in area treated with cryotherapy may be attributed to inadequate dosage of cryo agent as the results of this therapy cannot be viewed immediately. The tissue biotype (thickness of gingiva) may be an important

factor in the recurrence of the repigmentation.

CONCLUSION

All the four methods used here are equally efficacious in depigmentation. However, each method has its own limitations eg. the cost of laser, bleeding and pain during the use of scalpel and rotary and the inability to correctly determine the dosage of cryotherapy. Thus, as for any other technique pros and cons should be weighed and the best technique chosen considering patient's needs and clinician's expertise.

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