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Wound Healing Evaluation after Gingival Depigmentation Using Ceramic Soft Tissue Trimming Bur Versus Diode Laser: Randomized Clinical Trial

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Aim: To assess if ceramic soft tissue trimming bur equally efficient as a gingival depigmentation tool versus diode laser.

Materials and Methods: A total of 30 patients who needed depigmentation procedures in upper jaw. In this study we used split mouth design by dividing the upper jaws into 2 equal halves. In Group 1, The soft tissue trimming bur performed the depigmentation treatment. The depigmentation process in Group 2 was completed using a laser.

Results: Group I showed a significant difference at follow-up visits ($p<0.001$). Value recorded at 1 month (100.00±0.00) had the greatest mean value then 7 days (82.43±8.42) while value recorded at baseline (0.00±0.00) showed the least mean value. Pairwise assessments showed significantly different values ($p<0.001$). Group II had a significant variation at follow-up then 7 days (82.94±8.02) while at baseline (0.00±0.00) showed the least mean value. Pairwise comparisons showed significantly different values at different intervals ($p<0.001$).

Conclusion: The outcomes of the two methods of treatment were nearly identical. Techniques like as ablation and abrasion were sufficient to provide satisfactory aesthetic results and a satisfactory healing process free from pain or infection. Compared to diode lasers, soft tissue trimmers are less expensive and easier to operate.

Keywords: Depigmentation; gingiva; healing; laser; soft tissue; wound

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Introduction

The most affected oral tissue by pigmentation is the gingiva. physiologic melanin distribution is present in the epidermis of all patients except albinos. Pigmentation is not a disease so it's asymptomatic and it requires no treatment. Pigmentation has a lot of color variation as the gingival papillae alone may be affected, or it may spread across the gingiva and other sites of oral tissues.[1] People with dark skin and hair have higher levels of eumelanin, which is the more photoprotective substance.

Clinically, physiological pigmentation appears as diffuse or multifocal melanin pigmentation, with varying etiological frequency. It is prevalent in populations from Africa, Asia, and the Mediterranean region, and it results from higher melanocyte activity as opposed to higher melanocyte count. The most typical location for this type of pigmentation is attached gingiva. Certain stimuli promote melanocyte and fibroblast activity and proliferation. This stimulation then has an impact on the amount of melanin and collagen, especially an increase in type III collagen.[2]

Three stages make up the pigmentation process: expression of melanin, synthesis of melanin, and activation of melanocytes. The creation of chemical messengers such as melanocyte stimulating hormone takes place during the activation phase, which is triggered by several causes like as sunshine, stress hormones, and other stimulants that affect melanocytes. Melanocytes produce melanosomes, which are granules, during the synthesis phase. Tyrosine, an amino acid, is transformed into a compound known as dehydroxyphenylalanine (DOPA) by the enzyme tyrosinase. After then, tyrosinase changes DOPA into the secondary compound dopaquinone which is transformed into either dark melanin (eumelanin) or light melanin (pheomelanin) by a sequence of events. Melanosomes are moved from melanocytes to keratinocytes. Following this, the color of the melanin begins to appear on.[3]

Pathologically induced gingival pigmentation: Endocrine disorders include Nelson's syndrome, Addison's disease, Albright's syndrome, and acromegaly. Silver, arsenic, Lead, bismuth, mercury and gold are examples of heavy metals. Finally, Kaposi's sarcoma, the most prevalent cancer linked to HIV infection that has the ability to spread to every part of the body. AIDS-related Kaposi's sarcoma in the palate is the most affected site followed by the gingiva. Moreover, melanin pigmentation has been linked to a number of drug-induced conditions, including bleomycin, cyclophosphamide, quinine, minocycline, zidovudine, chlorpromazine, ketoconazole, and zidovudine. pigmentation following inflammation; chronic inflammatory mucosal lesions, primarily lichen planus.[4] Benign mucosal melanosis associated with smoker's melanosis affecting the gingiva.[5] Hemangioma: benign vascular proliferations in adulthood take the form of varicosities; and similar to hamartoma when they occur in children. Depending on how deep the vascular proliferations are, the lesion may appear blue or crimson depending on how close the arteries are to the surrounding epithelium. Amalgam tattoos can occur when metal ions are inadvertently displaced into the soft tissues of the mouth during amalgam restorative dental operations.[6] Graphite tattoos: these usually appear on the palate and are thought to be the result of a lead pencil implantation gone wrong. Furthermore, blue and nevocellular nevi are widespread on the gingiva and palate and can affect people of any age. For the patient seeking correction, gingival hyperpigmentation may be a major concern, particularly in cases of vertical maxillary excess, high lip line, and strong aesthetic demand. Additionally, darkening of the gingiva apparent when smiling may have negative psychological and cultural effects

that the patient finds upsetting. Melanocytes, which are found in the basal and suprabasal layers of the epithelium and produce and retain melanin pigments, are the primary cause of gingival pigment by converting tyrosine into melanin, stored in these layers in the form of melanosomes. The level of pigmentation is influenced by melanocyte activity, which is influenced by a person's race, genetic makeup, and hormone production.[7] Gingival epithelium and a layer of underlying connective tissue are surgically removed during the surgical depigmentation process, and the denuded connective tissue is then allowed to mend secondary intention. There is no melanin pigmentation in the newly formed epithelium.[8] For gingival depigmentation, a variety of techniques have been suggested, such as the use of a scalpel, bur abrasion, electrosurgery, cryosurgery, lasers, radiosurgery, chemical treatments, and free gingival graft. and an allograft of acellular dermis matrix. Therefore, the current study set out to determine whether ceramic soft tissue trimming bur was just as effective as a diode laser for gingival depigmentation.

Materials and Methods

This clinical trial study is a randomized split mouth, to evaluate clinically wound healing after different depigmentation procedures, at Department of Periodontology, Faculty of Dentistry, Ain Shams University.

The split-mouth design used in some clinical trials removes any bias related to the differences in healing capacity between patients and the only changing factor is the two treatment modalities assigned to each one of the two halves of the mouth. This design appears helpful because the goal of dental clinical trials is frequently to assess the impact of an experimental treatment on a place in the mouth, such as a tooth or the surface of a tooth.[9]

The treatment methods were randomly assigned to half of each subject's dentition, which was split by the mid-sagittal plane between the central incisor teeth[10] On average, fewer patients are needed because the patient acts as his or her own control, which might boost statistical efficiency. However, this study design requires that the patients display symmetric symptoms on both sides of the mouth. The maxillary arch is separated into two segments: Segment I is the right first premolar to the right central incisors, and Segment II is the left first premolar to the left central incisors. with one side used for ceramic soft tissue trimmer bur and the other for depigmentation laser. Thirty patients with gingival hyperpigmentation-related aesthetic issues were randomly chosen from the outpatient clinic of the Oral Medicine, Periodontology, and Oral Diagnosis Department of the Faculty of Dentistry, Ain Shams University, to undergo depigmentation operations in the upper jaw. Patients met the following eligibility requirements:

Both genders aged between 20-45 years.

• Patients with clinical pigmentation that seemed to be mixed pink and brown or medium brown in color were chosen. Healthy Patients not suffering from any disease affecting bone or blood.

- Patients ready to comply with oral hygiene measures.

Exclusion criteria:

1. Smokers
2. Thin tissue biotype gingiva
3. The presence of gingival recession
4. Inability or unwillingness to return for follow-up visits
5. Pregnant females
6. Drug abusers
7. Vulnerable Group of patients (Prisoners, Handicapped)

A thorough explanation of the study procedure was given to each patient. After that, the patients signed an informed consent form. Patients' information is kept private, as are the outcomes of the follow-up. The surgical sites awere divided into 2 groups based on the type of the depigmentation procedure used.

Group (I): The soft tissue trimming bur was used to complete the depigmentation treatment. The same day, seven days later, and one month later, the postoperative perspective.

Group (II): Using a laser, the depigmentation process was completed. The postoperative on the same day, on the seventh day, and one month later.

PRE-SURGICAL PROCEDURE

Clinical Examination, initial therapy, and clinical baseline data recording (Periodontal depth, clinical attachment loss, gingival index and plaque index) was done to both groups Pre- operatively. When the cases fulfill all the inclusion criteria a supragingival scaling and polishing was done to all patients and oral hygiene instructions were given.

SURGICAL PROCEDURE

Group I:

0.2% Chlorhexidine mouthwash, 10ml for 1 minute were performed before operation and the area was dried with sterile cotton.

Then administration of local anesthesia (Articaine hydrochloride 0.01 mg/ml) with infiltration technique. The depigmentation procedure was carried out by the soft tissue trimming bur (ceratip) of komet Germany (Figure 1) which is made of high-grade ceramics.

Using a high speed rotating tool, the ceramic trimmer was applied to the gingiva that was colored. The instrument was softly run in intermittent mode at 3,00,000–4,50,000 rpm. In order to prevent thermal coagulation from the heat produced during rotation, it was employed without a water coolant, the bur was brushed with feather light strokes and with the least amount of pressure possible to avoid pitting the gingival surface or removing too many tissues. Gingival remnants were removed with moist gauze piece. The patient was advised to use chlorhexidine mouthwash twice daily for 1 week. The postoperative assessment at the same day, 7th day and after 1 month was carried out.

Group II:

Before operation, application of 0.2% Chlorhexidine mouthwash, 10ml for 1 minute performed and the area was dried with sterile cotton.

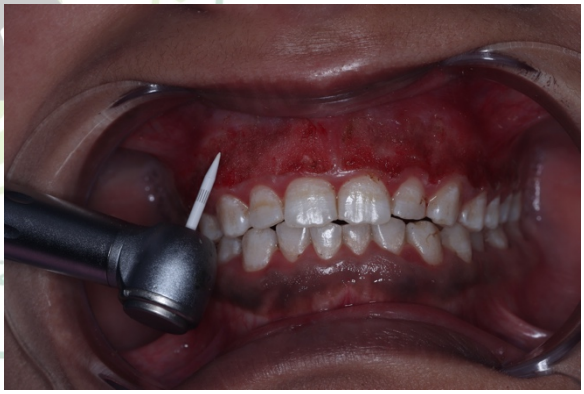

Figure (1) showing ceratip ceramic bur

Next, a local anesthetic using an infiltration approach (Articaine hydrochloride 0.01 mg/ml) is administered. Both the patient and the crew wore special eyewear to comply with LASER safety regulations. Using an abrasion technique and a diode laser (a ZOLAR PHOTON 3-Watt ideal dental soft tissue diode laser with an 810nm high quality diode), the depigmentation treatment was completed. When the diode LASER unit (diode laser device) was used to remove the tissue using small, back-and-forth brush-like strokes gradually moving deeper along the same initial LASER incision. The laser was angled

at an external bevel of 45° and set at an energy setting of 1 Watt continuous wave (CW). The de-epithelialization process was carried out using a 400 µm strippable fibre with a power setting of 1 W in continuous wave mode (CW). (Figure 2). Sterile gauze moistened with saline was used to remove any remaining ablated tissue remnants. The process was carried out in all of the quadrant's pigmented areas from a cervicofacial perspective. (Figure 3) The postoperative assessment at the same day, 7th day and after 1 month was carried out.

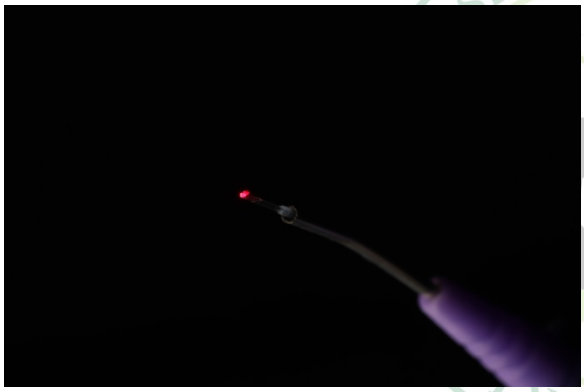

Figure (2) showing diode laser device ZOLAR PHOTON

Post-operative assessment

Wound healing was assessed on the basis of

- Healing index given by Landry.
- Visual analogue scale scores.
- Epithelization test with toluidine blue.

Healing index (HI):

Table 1 indicates the healing index proposed by Landry, Turnbull and Howley to describe the extent of clinical healing following periodontal surgery.[11] Visual analogue scale score. The pain VAS is a continuous scale comprised of a horizontal (HVAS) or vertical (VVAS) line, usually 10 centimeters (100 mm) in length.[12]

Table (1) healing index score

Healing index score	Clinical findings
Very poor	Tissue color: ≥50% of gingiva red Response to palpation: Bleeding Granulation tissue: Present Incision margin: Not epithelialized, with loss of epithelium beyond incision margin Suppuration: Present
Poor	Tissue color: ≥50% of gingiva red Response to palpation: Bleeding Granulation tissue: Present Incision margin: Not epithelialized, with connective tissue exposed
Good	Tissue color: ≥25% and<50% of gingiva red Response to palpation: No bleeding Granulation tissue: None Incision margin: No connective tissue exposed
Very good	Tissue color: <25% of gingiva red Response to palpation: No bleeding Granulation tissue: None Incision margin: No connective tissue exposed
Excellent	Tissue color: All tissues pink Response to palpation: No bleeding Granulation tissue: None Incision margin: No connective tissue exposed

Epithelization test with toluidine blue:

To stain tissues rich in DNA and RNA, toluidine blue, a basic thiazine metachromatic dye, has a strong affinity for acidic tissue components. A swab that has been previously soaked will be used to apply toluidine blue to the surgical site. We'll use a 1% acetic acid swab to eliminate any leftover TB. Under typical incandescent light, the retention of tuberculosis (TB) will be assessed at each site. The results will be documented and classified as mild, moderate, or severe staining.[13] (Figure 4)

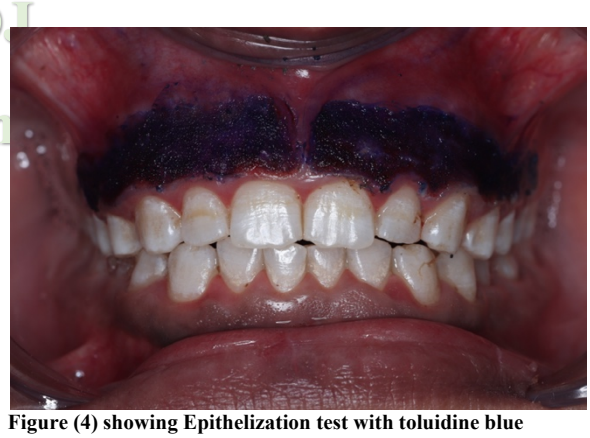

Figure (4) showing Epithelization test with toluidine blue

Statistical analysis:

Statistical analysis was performed with IBM® SPSS® Statistics Version 25 for Windows.

The mean, standard deviations (SD), and co nfidence intervals for numerical data were di splayed., performing the Kolmogorov-Smirnov and Shapiro-Wilk tests, and determining the mean and median values. Due to the non-parametric distribution of the data, the signed rank test was used for intergroup comparison, and Dunn's post hoc test was used for intragroup comparison after Freidman's test.. The significance level was set at p ≤0.05 within all tests.

Results

I-Healing index

A- Intergroup comparison:

Table (2) shows Mean and Standard deviation (SD) values for healing index in different groups.

- **Baseline:**

Group I and group II had the same mean value (2.00±0.00) (p=1).

- **Day 7:**

Group II (3.25±0.45) showed greater mean value than group I (3.19±0.40) yet the difference wasnot significant (p=0.564).

- **After 1 month:**

Group II (5.00±0.00) showed higher mean value than group I (4.94±23.68) yet the difference wasnot significant (p=1).

Table (2): Mean and Standard deviation (SD) values for healing index in different groups and follow-up intervals

Follow-up	Healing index (Mean±SD)		P-value
	Group I	Group II	
Baseline	2.00±0.00	2.00±0.00	1.000ns
7th day	3.19±0.40	3.25±0.45	0.564ns
1 month	4.94±23.68	5.00±0.00	1.000ns

*; significant (p ≤ 0.05) ns; non-significant (p>0.05)

B- Intragroup comparison:

Mean and standard deviation (SD) values for healing index for both groups at different follow-up intervals were presented in table (3)

- **Group I:**

There was a significant difference involving unlike follow-up intervals (p<0.001). Value verifiedat 1 month (4.94±23.68) showed the greatest mean value followed by 7 days (3.19±0.40) while value recorded at baseline (2.00±0.00) showed the lowest mean value. Pairwise assessments showed values verified at different intervals to be significantly different (p<0.001).

- **Group II:**

There was a significant difference follow-up intervals (p<0.001). Value recorded at 1 month (5.00±0.00) showed the in height mean value followed by 7 days (3.25±0.45) while value recorded at baseline (2.00±0.00) showed the least mean value. Pairwise comparisons showed significantly different from each other (p<0.001).

Table (3): Mean and Standard deviation (SD) values for healing index for both groups at follow-up intervals

Follow-up	Healing index (Mean±SD)	
	Group I	Group II
Baseline	2.00±0.00^{C}	2.00±0.00^{C}
7th day	3.19±0.40^{B}	3.25±0.45^{B}
1 month	4.94±23.68^{A}	5.00±0.00^{A}
P-value	<0.001*	<0.001*

*; significant (p ≤ 0.05) ns; non-significant (p>0.05)

II-Visual analogue scale (VAS)

A- Intergroup comparison:

Visual analogue scale (VAS) in different groups values were presented in table (4)

- **Baseline:**

Group I (3.44±0.89) showed a significantly higher mean value than group II (2.44±1.03) (P=0.001).

- **Day 7:**

Group I (0.88±0.629) showed higher mean value than group II (0.75±0.45) yet the difference wasnot significant (P=0.317).

- **After 1 month:**

Group I and group II had the same mean value (0.00±0.00) (p=1).

Table (4): Mean and Standard deviation (SD) values for VAS in different groups and follow-up intervals

Follow-up	VAS (Mean±SD)		
	Group I	Group II	P-value
Baseline	3.44±0.89	2.44±1.03	0.001*
7th day	0.88±0.62	0.75±0.45	0.317ns
1 month	0.00±0.00	0.00±0.00	1.000ns

*: significant (p ≤ 0.05) ns: non-significant (p>0.05)

B- Intragroup comparison:

Mean and standard deviation (SD) values for visual analogue scale (VAS) for both groups at different follow-up intervals were presented in table (5)

- **Group I:**

There was a significant difference between different follow-up intervals (p<0.001). Value recorded at baseline (3.44±0.89) showed the highest mean value followed by 7 days (0.88±0.62) while value recorded at 1 month (0.00±0.00) showed the lowest mean value. Pairwise comparisons showed values recorded at different intervals to be significantly different from each other (p<0.001).

Group II:

There was a significant difference comparing follow-up intervals (p<0.001). Value recorded at baseline (2.44±1.03) showed the highest mean value followed by 7 days (0.75±0.45) while valuerecorded at 1 month (0.00±0.00) showed the lowest mean value. Pairwise comparisons showed values recorded at different intervals to be significantly different from each other (p<0.001).

Table (5): Mean and Standard deviation (SD) values for VAS for both groups at different follow-up intervals

Follow-up	VAS (Mean±SD)	
	Group I	Group II
Baseline	3.44 ± 0.89^{A}	2.44 ± 1.03^{A}
7th day	0.88 ± 0.62^{B}	0.75 ± 0.45^{B}
1 month	0.00 ± 0.00^{C}	0.00 ± 0.00^{C}
P-value	<0.001*	<0.001*

*: significant (p ≤ 0.05) ns: non-significant (p>0.05)

III-Epithelialization test

A- Intergroup comparison:

Values of epithelialization test in different groups were presented in table (6)

- **Baseline:**

Group I and group II had the same mean value (0.00±0.00) (p=1).

- **Day 7:**

Group II (82.94±8.02) showed higher mean value than group I (82.43±8.42) yet the difference wasnot significant (p=0.856).

After 1 month:

Group I and group II had the same mean value (100.00±0.00) (p=1)

Table (6): Mean and Standard deviation (SD) values for epithelialization test in different groups and follow-up intervals

Follow-up	Epithelialization test (Mean±SD)		
	Group I	Group II	P-value
Baseline	0.00±0.00	0.00±0.00	1.000ns
7th day	82.43±8.42	82.94±8.02	0.856ns
1 month	100.00±0.00	100.00±0.00	1.000ns

*: significant (p ≤ 0.05) ns: non-significant (p>0.05)

B- Intragroup comparison:

Epithelialization test results for both groups at different follow-up intervals were presented in table (7) and figures (5- 9)

- **Group I:**

There was a significant difference comparing follow-up intervals (p<0.001). Value recordedat 1 month (100.00±0.00) which was the highest mean value followed by 7 days (82.43±8.42) while baseline value was the least (0.00±0.00).

- **Group II:**

There was a significant difference between different follow-up intervals (p<0.001). Value recorded at 1 month (100.00±0.00) showed the highest mean value followed by 7 days (82.94±8.02) while value recorded at baseline (0.00±0.00) showed the lowest mean value.

Table (7): Mean and Standard deviation (SD) values for epithelialization test for both groups at different follow-up intervals

Follow-up	Epithelialization test (Mean±SD)	
	Group I	Group II
Baseline	0.00±0.00^{C}	0.00±0.00^{C}
7th day	82.43±8.42^{B}	82.94±8.02^{B}
1 month	100.00±0.00^{A}	100.00±0.00^{A}
P-value	<0.001*	<0.001*

*; significant ($p \leq 0.05$) ns; non-significant ($p>0.05$)

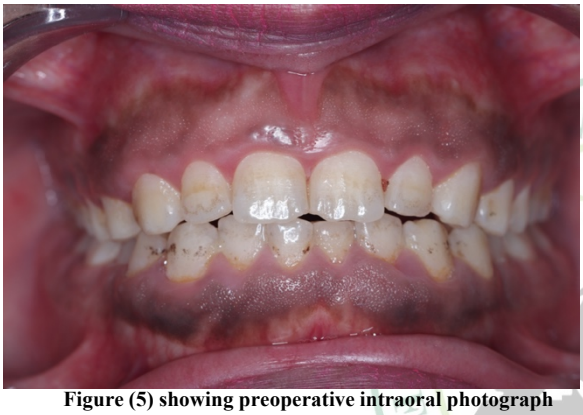

Figure (5) showing preoperative intraoral photograph

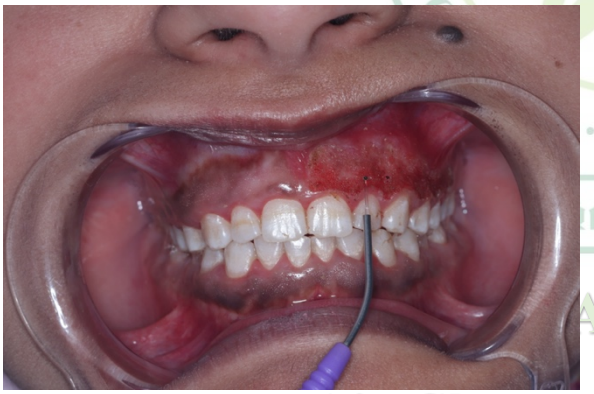

Figure (6) showing diode laser depigmentation.

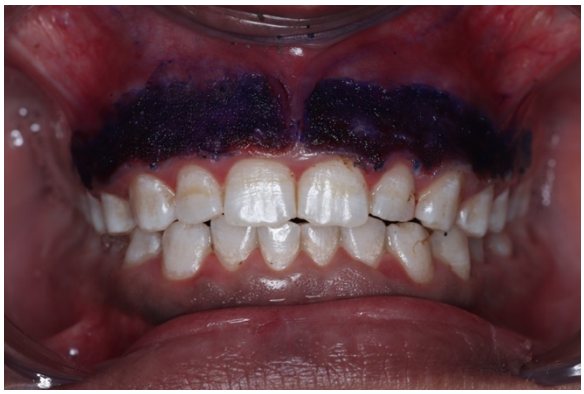

Figure (7) showing immediate post-operative photo after depigmentation and stainingwith toluidine blue stain

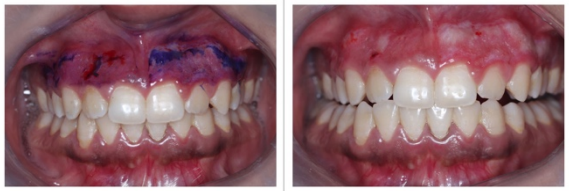

Figure (8) showing follow up after 1 week

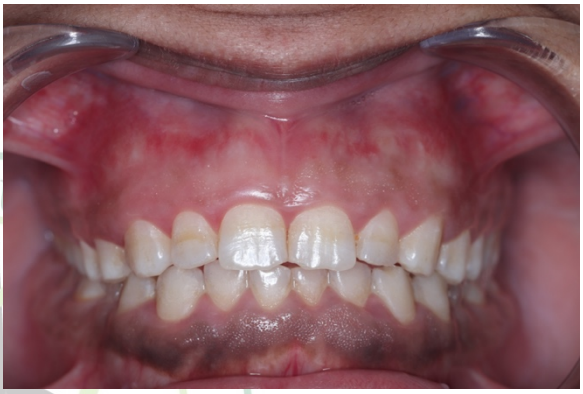

Figure (9) showing follow up after 1 month

Discussion

One of the most efficient, dependable, and comfortable methods for gingival depigmentation has recently been identified as laser ablation. Since it has nearly perfect absorption for melanin and haemoglobin, gingival depigmentation was accomplished in this study using an 810 nm and a 1W irradiation power settings diode laser. Additionally, diode lasers have a safer and more effective application than Er: YAGs, since they can reduce pain and inflammation following surgery, control bleeding, and promote gingival mucosa healing.[14]

The means, standard deviations (SD), and confidence intervals for numerical data were displayed. After hyper-pigmented areas were laser-ablated, the gingiva healed without incident, and full regeneration left the area looking firm and healthy pink. This was an indication that the therapy was successful. These results add to and validate earlier research on the effective use of laser therapy to treat gingival hyperpigmentation. It has been demonstrated that the photomodulation effects of lasers aid in angiogenesis, fibroblast stimulation, and lymphatic flow

acceleration, all of which promote repair and regeneration. Furthermore, the production of reactive oxygen species by the bactericidal impact of lasers may contribute to quicker healing in an otherwise sterile environment.[15] The surgical bur abrasion technique is a straight forward procedure that doesn't call for complicated tools. For gingivoplasty, ceramic trimming burs like ceratip were first introduced, more over, it is used for gingival depigmentation as these trimmers are made up of mixed ceramic composed of Zircondioxide partly stabilized by Yttrium and Aluminum ceramic. A delicate incision is secured, and the risk of necrosis is almost completely removed due to the heat generated that produces a good hemostasis and little bleeding. The instrument was softly run-in intermittent mode at 3,00,000–4,50,000 rpm. To prevent thermal coagulation from the heat produced during rotation, it was employed without a water coolant. To prevent pitting of the gingival surface and excessive tissue removal, minimal pressure was used along with feather-light brushstrokes that did not include holding the bur in one spot for an extended period of time. Regularly, gingival remains were extracted using a piece of wet gauze.[16]

The current study evaluated the amount of bleeding that occurred during surgery using the two methods. Comparatively speaking, areas treated with lasers had less bleeding than that with soft tissue trimming bur. This could be because of the hot tip effect that is produced upon tip start, aiding in energy concentration at the tip. This aids in eliminating the epithelium's outer layer without causing bleeding or mucosal damage. Moreover, it was discovered that the LASER shut blood vessels encircling tissue up to a 0.5 mm diameter, resulting in hemostasis, which helps the operator maintain a comparatively dry and clean field. Using various metrics, the effects of the two treatment regimens were compared in this study. Among these is the suggested healing index, which indicates the degree of clinical recovery following periodontal surgery. Healing was estimated with a 5-level score index each one with a 1/0 (not present/present) score. a wound with very poor healing receives a score of1, whereas excellent healing receives a score of 5 as it is characterized by pinkish color in all tissue area with no bleeding at palpation and absence of granulation tissue, incision margin andsuppuration.

The healing index results for all groups had the same mean value at baseline (2.00±0.00) (p=1). However, on the seventh day, Group II (3.25±0.45) had a higher mean value than Group I (3.19±0.40), but the difference was not statistically significant (p=0.564). Group II (5.00±0.00) had a greater mean value after one month compared to Group I (4.94±23.68), but the difference was not statistically significant (p=1).

In accordance with these findings, areas treated with bur also healed similarly to areas treated with lasers. To prevent excessive tissue necrosis, a diode laser was employed in contact mode in sweeping motion in this investigation. Care was made to ensure that the surgical area was not overexposed to laser radiation. Another finding is the thick coagulation layer on the treated surface created by the "hot tip" of the diode laser fiberoptic is the cause of the white fibrin slough observed in laser-treated cases. This is a typical feature of a laser wound in the initial few days of recovery. Some patients experienced little bleeding, edema, and discomfort right after surgery, but these inflammatory symptoms disappeared throughout the course of the follow-up.[17]

Visual Analogue Scale (VAS) for pain was assessed in this study to evaluate the pain difference the patient experienced with the two treatment modalities: The VAS was employed to quantify the level of pain both during and following the course of treatment.

The VAS score was taken during the intraoperative phase of treatment, and every patient was called back for a pain assessment on the seventh day.[18]

Group I (3.44±0.89) had a substantially higher mean value than Group II (2.44±1.03), according to the Vas test baseline results (P=0.001). The protein coagulum that develops on the wound surface may be the reason for the smaller difference in pain perception outcomes between the LASER group and the other groups. Radiation may close the ends of sensory nerve terminals like a biological bandage. The current study's findings were consistent with a Lagdive et al. 2009, that examined patients who were reporting much less pain in the diode LASER group as opposed to the scalpel group.[19] At 7th day Group I (0.88±0.629) showed higher mean value than group II (0.75±0.45) yet the difference was not significant (P=0.317). The Epithelialization test, which uses Toluidine blue, is another metric used to compare the two treatment methods. The extent to which the surgical site has healed and developed epithelium was assessed using it. To determine the surface area, the clinical photographs were digitized using a Digital Single-Lens Reflex (DSLR) camera with a Canon 800D lens and a 100mm macro lens, as well as a fixed lighting source and camera settings. The images of the surgical sites were then superimposed with a 1 mm × 1 mm digital grid to create a uniform appearance across all the digitized images. These digital photos were acquired right away following the depigmentationprocedure and on all the following visits. The spots with bluish stain were selected because they appeared to be incompletely epithelialized on the surface and were still undergoing wound healing. The same day, the seventh day, and one month after surgery, the surface areas of the stained spots in the two groups were compared. The findings demonstrated that, as the entire region is de-epithelized, Group I and Group II had the same mean value (0.000.00) at the base line (p=1). Group II (82.94±8.02) had a higher mean value on the seventh day compared to Group I (82.43±8.42), but the difference was not statistically significant (p=0.856). The study's findings indicate that both treatment techniques produced nearly total depigmentation and comparable cosmetic outcomes. Techniques like as ablation and abrasion were sufficient to provide satisfactory aesthetic results and a decent healing process free from pain or infection. Compared to diode lasers, soft tissue trimmers are affordable and simple to use.

Conclusion

it is evident from the results that both treatment regimens produced nearly total depigmentation and comparable cosmetic outcomes. Techniques like as ablation and abrasion were sufficient to provide satisfactory aesthetic results and a satisfactory healing process free from pain or infection. Compared to diode lasers, soft tissue trimmers are less expensive and easier to operate.

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Conflict of Interest

The authors have no conflicts of interest to declare.

Regulatory Statement

This study protocol was reviewed and approved by Faculty of Dentistry, Ain Shams University Research Ethics Committee (approval number FDASU-RecIM031830) .

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