



Dermapen & Vitamin-E For Gingival Depigmentation: A Case Report

1Dr. Chella Priya, 2Dr. S. Gopalakrishnan, 3Dr. Uma Sudhakar

1PG student, 2Professor, 3Professor and Head

1Thai Moogambigai Dental College,

2Thai moogambigai dental college,

3Thai Moogambigai Dental College

Abstract

Introduction

Gingival pigmentation is mainly physiological due to the production of melanin. This study aimed to evaluate the effectiveness of a microneedling technique using topical Vitamin- E application in treating gingival hyperpigmentation.

Methods

A microneedling technique was performed using a Dermapen instrument, followed by the topical application of Vitamin-E on the pigmented gingiva. Visual Analogue Score and Wound Healing Index were analyzed. A one-month follow-up was conducted.

Results

The results point out that Dermapen is effective and a safe means to removal of hyperpigmentation from the gingiva. The reported case demonstrated a noticeable improvement at the end of the sessions.

Conclusions

Microneedling combined with topical Vitamin-E is a novel, non-invasive dental technique that can effectively treat gingival hyperpigmentation.

INTRODUCTION:

Oral pigmentation is a discoloration of the gingival or oral mucosa which is associated with exogenous and endogenous factors. Melanin, a non-hemoglobin-derived brown pigment, is the most common of the endogenous pigments¹. Etiological factors include drugs (eg: chloroquine, quinine, minocycline, zidovudine, chlorpromazine, ketoconazole, bleomycin, cyclophosphamide), heavy metals (e.g. lead, bismuth, mercury, silver, arsenic, and gold), Benign and malignant lesions, cultural intentional tattooing, amalgam tattoo, graphite tattoo iatrogenic, gingival tattoo and systemic problems, genetics, endocrine disturbances, syndromes as Albright's syndrome, Acromegaly, Nelsons syndrome, Peutz Jegher's syndrome, and also in Addison's

disease, melanoma, Kaposi sarcoma(malignancy associated with human immunodeficiency virus infection) Nevo cellular nevus and blue nevus, Haemochromatosis,oral melanoacanthoma,Unusual pigmentations of the gingiva and in inflammations². Adverse habits such as smoking can also stimulate melanin pigmentation and the intensity of pigmentation is related to the duration of smoking and the number of cigarettes consumed³. Endogenous Gingival hyperpigmentation is also known as physiological or racial gingival pigmentation as it is thought to be a genetic trait in some groups, regardless of age or gender. Furthermore, dark-skinned ethnic groups frequently encounter gingival melanosis (neurofibromatosis)⁴.

Melanin pigmentation appears as early as 3 h after birth in the oral tissues and in some cases is the only sign of pigmentation on the body. It is generally agreed that pigmented areas are present only when melanin granules synthesized by melanocytes are transferred to the keratinocytes. This close relationship is known as the 'epidermal-melanin unit'⁵. The pigmentation is mostly localized at the anterior labial gingiva. it is predominant in females more than males. Gingival pigmentation is presented as a diffuse deep purplish discoloration or as irregularly shaped brown and light brown or black patches, striae or strands. It is because the melanin colour arises from the basal layer of the gingival epithelium due to the entanglement of melanin granules generated by melanoblasts between epithelial cells⁶.

The process of pigmentation consists of three phases⁷:

- 1)Activation of melanocytes.
- 2)Synthesis of melanin.
- 3)Expression of melanin.

It is essential to understand the cause of a mucosal pigmentation before planning the treatment of such lesion⁸.Gingival depigmentation is a periodontal plastic surgical procedure through which the hyperpigmentation of gingiva is removed/reduced by various techniques⁸. This depigmentation procedure is carried out by various methods such as by scalpel, electrosurgery, cryosurgery, lasers and radiosurgery, free gingival grafting, acellular dermal matrix allograft by rotary bur as each technique having its own significance, advantages, and disadvantages⁹.

Oral pigmentation index (DOPI)¹⁰:

This index of oral pigmentation is the commonly used index due to its simplicity and ease of use. The scores are as follows:

- No clinical pigmentation (pink-colored gingiva)
- Mild clinical pigmentation (mild light brown color)
- Moderate clinical pigmentation (medium brown or mixed pink and brown color)
- Heavy clinical pigmentation (deep brown or bluish black color)

This article demonstrates a comparative evaluation of managing gingival pigmentation using microneedling technique with a follow-up of 1-month.

Case presentation:

A 30 year old male patient visited the Department of Periodontics with a complaint of black coloured gums. Additional historical accounts indicated that it had existed since childhood, indicating physiological melanin pigmentation. Overall, the patient's oral hygiene was systemically healthy and good. Hence planned to evaluate the efficacy of Micro Needling (MN) using Dermapen with Vitamin-E Capsules for Gingival Depigmentation (GD).



PRE-OP



MICRO NEEDLING



POST OP- AFTER 1 DAY



POST OP- AFTER 1 MONTH

Local anesthesia was infiltrated in the mandibular anterior region from premolar to premolar (Lignocaine with adrenaline in the ratio 1:100000 by weight). Dermapen was used to create micropunctures in gingiva. Pressure was applied with sterile gauze soaked in local anesthetic agent to control hemorrhage during the procedure. After removing the entire pigmented epithelium along with a thin layer of connective tissue, the exposed surface was irrigated with saline and Vitamin-E application was given. Post-surgical Analgesics (ibuprofen with paracetamol, three times daily for 3 days) were prescribed. The patient was advised to use chlorhexidine mouthwash 12 hourly and vitamin-E capsule for twice application for 1 week. The patient was reviewed at the end of 1 week to be satisfactory. The patient had no complaints of postoperative pain or sensitivity. At the end of 3 months, the gingiva appeared healthy and no repigmentation was seen. The healing process was proceeding normally and patient did not report any discomfort.

MICRONEEDLING:

The Microneedling (MN) Technique using Dermapen is a nonsurgical procedure that is known as collagen induction therapy involving repetitive punctures on the skin. In dermatology, MN has been utilized considerably in recent years as it is an effective, simple, economical, well-tolerated, cosmetically and therapeutically beneficial procedure¹¹.



Dermapen

VITAMIN- E¹²:

- The vitamin E can be rubbed on gums from an open capsule to promote gum tissue healing.
- Promotes cell regeneration.
- Protects against free radicals.
- It strengthens the body natural defense against microorganisms.
- Reduces inflammation.



Vitamin-E Capsule

Results:

Visual Analogue Score (VAS)¹³- Hayes and Patterson 1921 &

Wound Healing Index (WHI)¹⁴- Huang et al 2005 were analyzed.

Visual analogue score:

Day 0 – 0

Day 1 – 0

Day 2 – 0

Wound Healing Index:

1 day post-op: Grade III

1 week-post-op: Grade IV

1-month post-op: Grade IV

0 : no pain

1-3 : mild pain

4-6 : moderate pain

7-10 : severe pain

1 : tissue necrosis

2 :ulcer formation

3: incomplete
epithelialization4: complete
epithelialization

4-6 : moderate pain

7-10 : severe pain

Discussion:

Although there is a lot of interest in employing MicroNeedling (MN) for gingival depigmentation, there is not much information available about their use. One of the efficient strategies for treating gingival hyperpigmentation is MN therapy. Among the various MN devices, the derma roller and the Dermapen are the most popular. Unlike other MN devices, the Dermapen is the only device that can be applied intraorally by virtue of its small size and interchangeable head, offering convenient application inside the oral cavity and allowing its use for a larger number of patients. This device is a wireless electric device with automated features that enables the operator to adjust speeds, pressures, and penetration depths, reducing the possibility of operator-associated risk factors.

During the procedure, a precise bleeding pattern triggered by MN must be performed for optimal results. This creates microholes in the connective tissues that facilitate the penetration of the therapeutic medication, stimulating new collagen production and affecting melanocytes¹⁵. We used topical Vitamin-E as a therapeutic medication for weekly twice application; it improves wound healing and cell regeneration with anti-inflammatory effect¹².

In our study, we established better aesthetic outcomes that is compatible with a case report that was done by Mostafa D, who applied Ascorbic Acid to gingival mucosa using the MN technique, resulting in complete gingival depigmentation that lasted for six months¹¹. There are studies which have concluded that vitamin E promote wound healing and regeneration without complications¹².

However, the longevity of GD depends on the treatment methods and genetic and ethnic factors.

Conclusion:

Thus, to conclude that depigmentation of hyperpigmented gingiva by MN using dermapen with topical application of vitamin E is simple, is simple, easy to perform, cost effective, and above all it causes less bleeding & discomfort and is esthetically acceptable to the patient. Additional sittings are required for dermapen to achieve more successful treatment and chances of recurrence should be observed in long term trials. Therefore it should be confirmed in future randomized controlled trials.

References:

1. M. Javali, R. Tapashetti, J. Deshmukh "Esthetic management of gingival hyperpigmentation: report of two cases", *Int J Dent Clin*, 3 (2011), pp. 115-116
2. Meleti M, Vescovi P, Mooi WJ, van der Waal I. Pigmented lesions of the oral mucosa and perioral tissues: A flow-chart for the diagnosis and some recommendations for the management. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*. 2008;105:606–16.
3. Tamizi M, Taheri M. Treatment of severe physiologic gingival pigmentation with free gingival autograft. *Quintessence Int*. 1996;27:555–8.
4. Dummett CO. Oral pigmentation. First symposium of oral pigmentation. *J Periodontol*. 1960;31:356–60.
5. H. Sanjeevini, P. Pudakalkatti, B. Soumya, N. Aarati "Gingival depigmentation: 2 case reports" *World J Med Pharm Biol Sci*, 2 (2012), pp. 1-4
6. Treatment of gingival hyper-pigmentation for aesthetic purposes using the diode laser. Prabhuji M, Madhupreetha S, Archana V. <https://epaper.zwp-online.info/epaper/1339/export-article/18> *Laser*. 2011;2:18–19.
7. A.B. Lerner, T.B. Fitzpatrick Biochemistry of melanin formation *Physiol Rev*, 30 (1950), p. 91
8. Jonathan A. Ship, Martin S. Greenberg, Michael Glick (Eds.), *Burket's oral medicine: pigmented lesions of the oral mucosa* (tenth ed.), BC Decker Inc, Hamilton Ontario (2003)
9. Comparative evaluation of gingival depigmentation using tetrafluoroethane cryosurgery and gingival abrasion technique: two years follow up. Kumar S, Bhat GS, Bhat KM. *J Clin Diagn Res*. 2013;7:389–394.
10. Dummett CO, Gupta OP. Estimating the epidemiology of gingival pigmentation. *J Natl Med Assoc*. 1964;56:419–20.
11. Mostafa, D., Sr, A Alaizari, N., M AlOtaibi, S., Ahmed Aldosari, N., Rabie Al-Anazi, J., S Alsughayer, R., M AlFayir, H., S AlHarthi, M., & H AlAnazi, M. (2023). Gingival Depigmentation Using Microneedling Technique With Topical Vitamin C: A Prospective Case Series. *Cureus*, 15(2), e35345. <https://doi.org/10.7759/cureus.35345>
12. Sanadi, R., & Singh, U. (2018). Cyanoacrylate Vs Vitamin E Application after Laser Depigmentation: A Clinical Study. *IOSR Journal of Dental and Medical Sciences*, 17(1), 41-48.
13. Hayes M. H. S., Patterson D. G. (1921). Experimental development of the graphic rating method. *Psychol. Bull*. 18, 98–99.
14. Huang LH, Neiva RE, Wang HL. Factors affecting the outcomes of coronally advanced flap root coverage procedure. *J Periodontol*. 2005;76:1729–1734.
15. Review of applications of microneedling in dermatology. Iriarte C, Awosika O, Rengifo-Pardo M, Ehrlich A. <http://10.2147%2FCCID.S142450> *Clin Cosmet Investig Dermatol*. 2017;10:289–298.