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Efficacy of Vitamin C in treatment of Gingival Hyperpigmentation: A Case Report

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Abstract
Introduction: *Gingival hyperpigmentation can be defined as a darker gingival colour beyond what is normally expected and is removed or reduced by using different techniques of gingival depigmentation like scalpel, bur abrasion, LASER, cryosurgery, radiosurgery, electrocautery, chemicals and gingival grafts.*
Objective: *To evaluate the efficacy of Vitamin C (Ascorbic acid) in treating gingival hyperpigmentation.*
Case Description: Anterior gum region of the mandibular arch was anesthetized topically by Lignocaine 15% w/w. Then, 1-1.5 ml ascorbic acid was injected into the gingiva, using an insulin syringe, once weekly for 4 weeks. Follow up was done at intervals of 15 days, 1 month and 3 months follow up. Dummet Oral Pigmentation Index (DOPI) was taken at baseline and at respective follow-ups.
Results: Vitamin C showed effective depigmentation of gingiva after 3 months.
Conclusion: *Vitamin C seems to be significant in treatment of gingival pigmentation*

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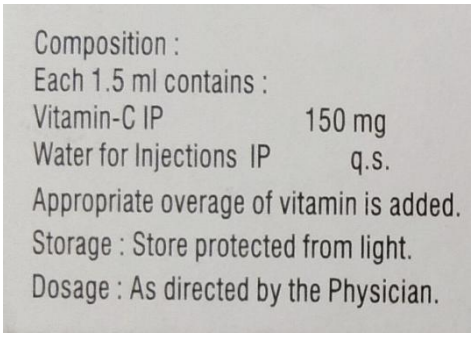
I. Introduction

In modern era of dentistry, esthetics has a very important role to play. Gingival hyperpigmentation or "Black gums" is a commonly seen feature in developing countries like India. Even though it is not a clinical problem, clinicians are often faced with a challenge of achieving gingival esthetics. Melanin, a brown pigment, is the most common cause of endogenous pigmentation of gingiva and is the most predominant pigmentation of mucosa. Gingival hyper-pigmentation is seen as a genetic trait in some populations and is more appropriately termed physiologic or racial gingival pigmentation[1]. This problem is aggravated in patients with a "gummy smile" or excessive gingival display while smiling. Gingival depigmentation is a process to remove the hyperpigmented gingiva. Most of the pigmentation is physiologic but sometimes it can be a precursor of systemic diseases. Accordingly, treatment of the pigmentation is determined either surgically or chemically. There are various methods of depigmentation which includes the use of scalpel, LASER, electrocautery, radiosurgery, chemicals and gingival grafts. Vitamin C or Ascorbic acid, which is a water soluble vitamin and an anti-oxidant has emerged as an effective non-surgical therapy of gingival depigmentation.

II. Case Description

A 20 year old female patient attended our out-patient department with the chief complaint of black gums in the upper and lower front teeth region which she found embarrassing during smiling. On examination, she had gummy smile and so gingival depigmentation procedure was carried out. The maxillary arch was surgically treated with 890 nm Diode LASER.

The mandibular arch were anesthetized using topical lignocaine spray. For the mandibular arch, after LA was given topically, 1-1.5 ml vitamin C was injected slowly by an insulin syringe (40 U) in the papilla and other areas of gingiva where pigmentation was present, once weekly for 4 weeks.



III. Results

A. Pre-operative B. Vitamin C injected C. 15 days Post-Op

D. 1 month Post-Op E. 3 months Post-Op

Figure 1: Treatment with VITAMIN C

DUMMET ORAL PIGMENTATION INDEX (DOPI) Values

	VITAMIN C
Pre-Operative	3
1 month Post-Op	2
3 months Post-Op	1

IV. Discussion

Recently, Vitamin C which is a potent antioxidant , has emerged as a new agent for depigmentation. Enzyme tyrosinase(Cu containing) is responsible for melanin production. Enzyme Tyrosine is converted to Dopaquinone with the help of an enzyme called Tyrosinase. A Series of chemical reactions convert this dopaquinone into melanin. Vitamin C interacts with the copper ions at the tyrosinase active site and inhibits action of the enzyme tyrosinase, thereby reducing melanin formation[2]. There was a statistically significant reduction in the pigmentation scores and surface area of pigmentation after four weeks. No recurrence of pigmentation was observed after three months. Injectable Vitamin C is a considerably effective, economic and minimally invasive technique of depigmentation especially in individuals with a thin gingival biotype.

Vitamin C inhibits melanin synthesis through downregulation of tyrosinase enzyme activity[3].

Mostafa D et al. used Dermapen to deliver Vitamin C to the affected area also revelaed significant results[4]. The **dermapen** was used in intermittent motion on the sextant gingival area for 30-40 seconds/tooth. When bleeding pinpoints were observed on all areas of pigmented gingiva, the gingival mucosa was irrigated with a saline

solution and sterile gauze was applied to dry the area. Then, topical AA powder (1000 mg/ml) was mixed with saline in a small glass dish forming a paste. The mixed slurry paste was applied to the gingival mucosa using for 10 minutes as and the treated area was left without dressing[4].

Yussif N et al. compared the efficacy of Vitamin C as a minimally invasive non surgical technique with conventional surgical technique of depigmentation yielded similar results with a drawback of time consumption as Vitamin c takes minimum 4 weeks to respond. This also shows that Vitamin C has a future of delivering atraumatic depigmentation procedure to the patient[5].

In a systematic review by Sanadi and Deshmukh, various studies incorporating the use of Vitamin C in reducing melanin pigmentation, found that Vitamin C can be effectictively used for depigmentation[3] and no recurrence has been found till date.

V. Conclusion

Cosmetic expectations have increased with time and nowadays patients are more concerned with gingival esthetics and smile designing. Gingival pigmentation especially on the labial aspect of anterior teeth has become an important component of esthetics. Gingival pigmentation though not a major complication, yet it greatly affects the facial appearance. The patient's medical history is important in determining its cause whether physiological or pathological. Vitamin C as a non-surgical gingival depigmentation agent was found to be effective in mild gingival melanin hyperpigmentation

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