

Treatment of Gingival Hyperpigmentation by Surgical Scalpel Technique- A Case Report

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Citation of this Article: Dr. K. Rajashekar, Dr. K. Naresh, Dr. S. Gangaraju, “Treatment of Gingival Hyperpigmentation by Surgical Scalpel Technique- A Case Report”, IJDSIR- August - 2021, Vol. – 4, Issue - 4, P. No. 90 – 95.

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Type of Publication: Case Report

Conflicts of Interest: Nil

Abstract

Melanin pigmentation occurs in all races of mankind. The degree of melanin pigmentation may be different from person to person. Though the gingival pigmentation doesn't cause any clinical problems, but it poses a major esthetic problem to the patient. It demands for cosmetic therapy in patients with gingival melanin pigmentation. This case report presents a simple surgical technique of de-epithelization which was successfully used to treat gingival hyperpigmentation, and highlights the esthetically pleasing smile.

Keywords: Gingiva, Melanin, Melanosomes, Hyperpigmentation, Depigmentation, De-epithelization, Aesthetics.

Introduction

The color of the gingiva is determined by several factors mainly number and size of the blood vessels, epithelial thickness, degree of keratinization and pigmentation. Melanin, Carotene, reduced hemoglobin and Oxyhemoglobin are the pigments for normal color of the oral mucosa¹. Oral melanin pigmentation occurs in all

races of mankind². The intensity and distribution of pigmentation of oral mucosa is variable, between races but also between different individuals of the same race and within different areas of the same mouth. The large number of pigmentation depends upon i) the intensity of melanogenesis, ii) depth of epithelial cornification, iii) arrangement of gingival vascularity². Melanin, a brown pigment, is the most common natural pigment contributing to endogenous pigmentation of gingiva, and gingiva is also the most predominant site of pigmentation in the oral mucosa³. Melanin pigmentation occurs as a result of melanin granules produced by melanoblasts which are intertwined between epithelial cells at the basal layer of gingival epithelium.³

The degree of pigmentation is depends on melanoblastic activity and density of melanophores in the gingiva.

Dummet² proposed the Dummet Oral Pigmentation Index (DOPI) assessment: 1964

- Score 0: Pink tissue (No clinical pigmentation).

- Score 1: Mild light brown color (Mild clinical pigmentation).
- Score 2: Medium brown or blue- black tissue (Heavy clinical pigmentation).
- Score 3: Deep brown or blue-black tissue (Heavy clinical pigmentation).

Gingival hyperpigmentation is seen as a genetic trait in some populations irrespective of age and gender hence it's termed as physiologic or racial gingival pigmentation.^{2,4} Melanin pigmentation of gingiva is symmetric and persistent, it does not alter normal gingival architecture⁵. Melanosis of gingiva is frequently seen among dark skinned ethnic groups, also in medical conditions such as Addison's syndrome, Peutz- jagher's syndrome and Von Recklinghausen's disease (neurofibromatosis)⁶. In dark skinned and black individuals increased melanin production in the skin and oral mucosa is predominant as a result of genetically determined hyperactivity of their melanocytes. Melanocytes of dark skinned and black individuals are uniformly highly reactive than in light skinned individuals⁷. Although clinically melanin pigmentation of the gingiva does not present any medical problems it is an esthetic concern of the patient. Demand for cosmetic therapy is made, especially by fair skinned people with moderate or severe gingival pigmentation⁸. Gingival depigmentation is a periodontal plastic surgical procedure where the hyperpigmentation of gingiva is removed or reduced by various techniques. The first and most important indication for depigmentation is patient demand for esthetics.

Depigmentation Procedures

1. De-epithelization
 - a. Scalpel technique^{9,10}
 - b. Gingival abrasion technique using diamond bur¹¹
 - c. Combination of the scalpel and bur¹²

2. Gingivectomy¹³
3. Gingivectomy with free gingival autografting¹⁴
4. Acellular dermal matrix allograft (ADMA)¹⁵
5. Electrosurgery¹⁶
6. Cryosurgery⁸
 - a. Using liquid nitrogen.
 - b. Using a gas expansion system.
7. Chemical agents¹⁷
 - a. 90% phenol and 95% alcohol
 - b. Ascorbic acid
8. Laser
 - a. Argon laser¹⁸
 - b. Semiconductor diode laser¹⁹
 - c. CO2 laser²⁰
 - d. Nd: YAG laser²¹

Different depigmentation techniques were being used with similar results. Selection of technique should be based on clinical experiences and individual preferences. The first and most popular technique is the surgical removal of undesirable pigmentation using scalpels⁹. The procedure essentially involves surgical removal of gingival epithelium along with a layer of the underlying connective tissue and allowing the denuded connective tissue to heal by secondary intention. The new epithelium that forms is devoid of melanin pigmentation⁹.

The present case report introduces a simple and effective surgical depigmentation technique that does not require special instruments or apparatus, yields esthetically acceptable results.

Case Report

A young male patient aged 21 years visited private dental clinic in Hyderabad with the chief complaint of "blackish gums" which esthetically interfered with his smile. The patient requested for any cosmetic therapy which would enhance the esthetics on smiling. The patient's history

reveals that the blackish discoloration of gingiva was present since birth suggestive of physiologic melanin pigmentation. No relevant medical history. On intraoral examination, generalized diffused blackish pigmentation of gingiva was observed, however it was healthy and completely free of any inflammation (Fig.1). Considering the patient's concern, a surgical gingival depigmentation procedure was planned.

Clinical Procedure

Thorough oral prophylaxis was done. Follow-up on the 7th day after oral prophylaxis was taken, in that it is seen that the patient was maintaining the oral hygiene.

Surgical procedure: In our case we performed the scalpel technique for the upper anterior region only. Following the administration of local anesthetic solution, Blade no. 11 with Bard Parker handle was used to scrap the epithelium with underlying pigmented layer carefully (Fig.2). The raw surface was irrigated with saline. The surface was cleaned and bleeding stopped. Surgical area was covered with a periodontal pack and post-operative instructions were given (Fig.3).

Analgesic was prescribed for the management of pain and Post-operative antibiotics are prescribed. After one week, the pack was removed and the surgical area was examined. The healing was good without any post surgical complications. The gingiva appeared to be pink, healthy and firm giving a normal appearance. The patient was impressed with a good aesthetic outcome (Fig.5).



Fig 1: Pre-operative photograph showing pigmented gingiva.



Fig. 2: Surgical gingival de-epithelization



Fig. 3: Immediately after surgery



Fig. 4: Coe-pak periodontal dressing



Fig. 5: One month post-operative photograph showing pink depigmented gingiva.

Discussion

The color of the attached and marginal gingiva is generally described as coral pink. It is determined by several factors, including the number and size of blood vessels, the thickness of the keratinized layer and the amount of the pigment containing cells²². Gingival melanin pigmentation occurs in all races of mankind. The degree of melanin pigmentation may be different from person to person.

The recent techniques of gingival depigmentation in practice are cryotherapy⁸, free gingival autograft¹⁴ and laser therapy^{17,18,19,20} and these have achieved satisfactory results.

The use of scalpel technique for the depigmentation is the most economical when compared to other techniques, which require more advanced armamentarium. 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 has its own limitations, repeated and prolonged use induces heat accumulation and undesired tissue destruction¹⁶.

Cryosurgery is followed by swelling and it is also accompanied by increased soft tissue destruction as the depth of penetration cannot be controlled²³. The CO₂ laser causes minimum damage to the periosteum and underlying bone and its unique characteristics of having ability to remove a thin layer of epithelium cleanly. Healing of laser wound is delayed when compared to scalpel wound, laser wound is a sterile inflammatory reaction. The treated gingiva and mucosa do not need any dressing when it is treated with laser. So re-epithelization will be faster²⁰.

Atsawasuwan et al.²¹ have reported four cases of gingival melanin hyperpigmentation using Nd: YAG laser and demonstrated good results; the complications being gingival fenestration and bone exposure. Erbium: YAG laser ablation was reported by Tal et al.⁸ to be quite effective and reliable.

Among all the techniques, we found the scalpel technique is relatively simple and versatile and it required minimum effort. No sophisticated and expensive armamentariums were required, only blade was sufficient.

Though the initial result of the depigmentation surgery is highly acceptable, repigmentation is a common problem. The exact mechanism of repigmentation is not known. Different studies shows variation in the timing for early repigmentation. To return to the full clinical baseline repigmentation it takes about 1.5 to 3 years²². This

variation may be due to the different techniques performed or due to the patient's race. Thus, gingival depigmentation procedure, if performed primarily for cosmetic reason, will not be of permanent value, because pigmentation tends to return to baseline values²².

In future, even if gingival repigmentation occurs in this patient, the same procedure can be repeated in the same region. Therefore, scalpel surgical technique is highly recommended in consideration of the equipment constraints in developing countries. It is simple, easy to perform, cost effective and above all provides minimum discomfort to the patient and esthetically pleasing results.

This case report describes a simple and effective surgical procedure for the treatment of gingival melanin hyperpigmentation resulting in improved esthetics and cosmetic appearance. This procedure can be performed by general dental practitioners to improve dark pigmented gingival appearance.

Conclusion

The depigmentation procedure was successful and the patient was satisfied with the result. we conclude that depigmentation of hyper pigmented gingival by scalpel surgery was simple, easy to perform, cost effective ,it causes less discomfort and esthetically acceptable by the patient.

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