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CASE REPORT

Black to Pink: Clinical Evaluation of Two Different Surgical Approaches for the Treatment of Hyperpigmentation

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ABSTRACT

Background: Gingival hyperpigmentation poses an esthetic concern to many patients. Techniques available to perform these procedures are mucosal stripping by scalpel, bur abrasion, partial thickness flap, gingivectomy, free gingival grafts, by use of chemotherapeutic agents, electrosurgery, cryosurgery and lasers. This paper compares two different surgical approaches for the treatment of hyperpigmentation with their advantages and disadvantages.

Methods: Gingival depigmentation procedure of the maxillary gingiva was carried out by scalpel technique and mandibular gingiva by electrosurgical method.

Results: Both the techniques yielded satisfactory results in eliminating the hyperpigmented areas. Follow-up was done after 1, 2 and 4 weeks and 1 year. At the end of 1 week, patient expressed slight tenderness and discomfort with the mandibular gingiva treated with electrosurgical method. Repigmentation appeared after 1 year on both arches but with less pigmentation on maxillary gingiva compared with mandibular gingiva.

Conclusion: Scalpel technique offers advantage of being easy, effective, less discomfort with esthetically acceptable results in comparison with electrosurgical method.

Keywords: Depigmentation, Gingiva, Scalpel, Electrosurgery, Repigmentation.

INTRODUCTION

Esthetics plays an important role in a person's life. An ever increasing demand and desire to look more beautiful and attractive, has become a primary concern especially among the younger generation. As rightly said, the harmony of a smile is determined not only by the shape, position, color of the teeth but also by the color of the gingiva.[1] When the color of the gingiva appears dark due to pigmentation, it may concern the patients esthetically and they may demand its removal. Thanks to the advancements in science and technology that has invented various methods to fulfill these desires of the patients and give them a beautiful pleasing and an attractive smile.

Melanin, a natural pigment contributes to the endogenous pigmentation of skin. Pigmentation is said to appear on gingiva as early as 3 hours after birth and often is said to be the only evidence of pigmentation.[2] Melanin, is produced by melanocytes which are dendritic cells located in the basal and spinous layer epithelium. Melanosomes are the organelles that contain an enzyme called tyrosinase which hydroxylates tyrosine to dihydroxyphenylalanine which in turn is converted to melanin.

Gingival hyperpigmentation is seen as a genetic trait in some populations irrespective of age and gender, hence it is termed as physiologic pigmentation. The degree of pigmentation varies from one individual to another depending upon the melanoblastic activity; however, it is said that in fair/light skinned individuals, the reactivity of melanocytes is variable.[3] Gingival hyperpigmentation can be localized or generalized. Though hyperpigmentation does not cause any medical problem, it may cause concern to the patients cosmetically and esthetically, hence the foremost indication is patients demand for it.

Techniques used by various authors for depigmentation are 'scraping technique by scalpel'.[4-6] Ginwalla et al in 1966 used slicing and bur abrasion technique.[7] Chemicals like phenol and alcohol were used for this purpose earlier, which are not in use and are of just historic interest. Gnanaesekhar and Al-Duwari, 1998 used electrosurgery for depigmentation.[8] Cryotherapy depigmentation procedures were carried out successfully.[9,10] Lasers have been used for depigmentation purpose successfully.[11,12]

The scalpel method involves removal of epithelium and an underlying layer of connective tissue thereby allowing it to heal by secondary intention.

Abrasion is done using large round diamond bur with high speed hand piece, needs copious amount of irrigation with minimal pressure and light brushing strokes. Sometimes bur abrasion is used in conjunction with the scalpel technique.

Electrosurgery in dentistry has been in use since 1914. It is a precise application of heat to the soft tissue site to be cut by electrodes. Two types are available: monopolar terminal

unit and bipolar terminal unit. In monopolar unit, current begins with the device and travel along a wire to the oral site and then to an indifferent plate placed behind the patients back as the surgical electrode contacts the oral soft tissues, heat is produced and controlled cutting is achieved. Current used in oral electrosurgery is fully rectified and filtered. The advantages of this method are immediate hemostasis, electrode can be bent to the desired clinical need, ease of use, consistent cutting, minimal trauma, less discomfort. Its disadvantages include, fear of use, burning flesh odor, low tactile sensitivity, fear of bone damage, disruption in the action of pacemakers and poor post-operative healing.[13]

Cryotherapy is a method of tissue destruction by rapid freezing. This method utilizes liquid nitrogen of—190ºC using dip stick method. A small cotton bud is dipped in liquid nitrogen and applied to the pigmented area for 20 to 30 seconds. This method does not require local anesthesia and is said to be a painless procedure with excellent results. The disadvantages with this method being multiple sittings, depigmented areas cannot be evaluated during the procedure, fast evaporation of the liquid, difficulty in controlling the depth of penetration and the cost factor.[14]

Lasers have been used for depigmentation purpose successfully, but they require sophisticated equipment, occupy large space and is expensive.

A free gingival graft can also be used to eliminate pigmented areas; however, it requires a donor site and color matching is a problem. So these procedures are not used routinely.

Selection of technique is best based on clinical experience, thickness of gingival biotype and individual preferences. The literature regarding comparison studies by different techniques is limited.

Hence, a study was designed to clinically assess the outcome of two different surgical techniques in the same patient and compare the results.

CASE REPORT

A 22-year-old healthy female dental student with wheatish skin color complained of her black gums and wanted to correct them to pink color for cosmetic reasons. According to her, the gums appeared pigmented since her childhood and hindered her from delivering an attractive smile (Fig. 1).

Examination revealed uniform generalized pigmentation on both the arches extending from the margin to the mucogingival junction (Fig. 2).

MATERIALS AND METHODS

Procedure

Initial oral examination revealed satisfactory oral hygiene. A complete medical history and blood investigation was carried out to rule out any systemic contraindication to this surgery. The treatment plan consisted of using two different surgical techniques on different arches and compare the results.

Fig. 1: Smile before depigmentation procedure

Fig. 2: Preoperative view of both arches before depigmentation

Maxillary gingival depigmentation to be carried out by scraping method by scalpels and mandibular gingival depigmentation by electrosurgical method.

Local infiltration anesthesia was given (2 ml of lignocaine with adrenaline (1:1,00000 by weight) in the maxillary gingiva. After adequate anesthesia, a 15 no. scalpel blade was used to scrape the entire epithelium and a layer of connective tissue till all the visible pigmentation was removed from margin to the mucogingival junction. Hemostasis was obtained by direct pressure by sterile gauze. The surgical wound was protected by a periodontal dressing. The patient was prescribed analgesics, ibuprofen 400 mg for 3 days and chlorhexidine mouthwash for 1 week to aid in plaque control.

After 1 week the dressing was removed and wound was irrigated with an antiseptic solution. Healing appeared good with pink colored gingiva showing complete epithelialization (Fig. 3). The patient was comfortable. Depigmentation on the mandibular gingiva was carried out by electrosurgical method using monoterminal loop electrodes (Fig. 4). The electrode was used with light brushing strokes and the tip was kept in continuous sweeping motion. This was done to avoid heat accumulation and tissue destruction, all the noticeable pigmentation was removed (Fig. 5). The wound was covered with periodontal dressing. The patient was advised analgesics

and chlorhexidine mouthwash postoperatively as before. After 1 week the dressing was removed and the wound was irrigated with an antiseptic solution. At this time, the patient complained of slight pain and discomfort with the mandibular gingiva. The area of gingival epithelium appeared pale in color, (Fig. 6) with slow epithelialization with unhealed ulcerations. The dressing was replaced once again and analgesics were advised.

At the end of 4 weeks, both the maxillary and mandibular gingiva showed epithelialization without any noticeable pigmentation (Fig. 7). The gingiva appeared pink and healthy and the patient was happy with her smile (Fig. 8). The patient was discharged and asked to inform about any reoccurrence of pigmentation.

Postsurgical repigmentation has been documented and is said to be due to activity of adjacent melanocytic cells from

Fig. 3: Postoperative view of maxillary gingiva after 1 week

Fig. 6: Postoperative view after 1 week electrosurgery

Fig. 4: Removal of pigmented mandibular gingiva using electrosurgery unit

Fig. 7: Maxillary and mandibular gingiva after 4 weeks

Fig. 5: Postoperative view of mandibular gingiva immediate to electrosurgery

Fig. 8: Natural smile after depigmentation procedure

Fig. 9: Appearance of repigmentation after 1 year

the surrounding areas. When the patient was recalled for evaluation after 1 year, few isolated areas of mild pigmentation were noticed on the maxillary as well as mandibular gingiva (Fig. 9).

DISCUSSION

The color of the gingiva is determined by its vascularity, thickness of epithelium, degree of keratinization and presence of melanin pigmentation. Gingival hyperpigmentation is an esthetic concern among many patients especially young females. Various procedures have been in use for this purpose with different degrees of success.

In the present case, depigmentation of the maxillary gingiva was carried out by scraping technique utilizing scalpel and the mandibular gingiva was depigmented by electrosurgical method. Both the arches were evaluated postoperatively at the end of 1, 2 and 4 weeks and 1 year respectively.

At the end of first week, scalpel technique showed good results in terms of healing, patient's comfort and color of the gingiva. But in comparison the results of electrosurgical method employed for mandibular gingiva exhibited pale and tender gingiva with areas of minute ulcerations and incomplete epithelialization, this involved necessity of repacking the wound with periodontal dressing for an additional week. At the end of 2 weeks, the patient was comfortable and healing observed was satisfactory with pink color of the gingiva. Further the patient was followed for 4 weeks. The patient was pleased with the improvement in esthetics that created a pleasant and a confident smile.

Recurrence of pigmentation has been documented. There is little information on the behavior of melanocytes after surgical injury. Different studies have shown variation in the timings for early repigmentation. According to Begamashi O et al it takes about 1.5 to 3 years to return to the full clinical baseline of repigmentation, while another study documented recurrence of repigmentation as early as 24 days to 8 years long period.[1]

At the recall visit after 1 year, the patient's maxillary and mandibular gingiva were examined. Maxillary gingiva showed comparatively very few isolated areas of repigmentation in comparison with mandibular gingiva. The patient was still satisfied with the results.

Further research regarding the factors affecting the rate, the length of time required for recurrence of pigmentation, the methods that can be employed to prevent it are needed. Longitudinal as well as comparative studies using different techniques are warranted.

CONCLUSION

Scalpel surgical technique can be performed easily in the routine dental settings with minimal equipment and hence remains the most popular technique. In our case, the patient was more comfortable postoperatively when the procedure was carried out by scalpel technique than with electrocautery. Healing was satisfactory with both the methods at the end of 4 weeks. Postsurgical repigmentation is said to occur with varying periods of time.

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