

## Case Report

## Surgical Smile Makeover with an Unique Combination of the Lip Repositioning and Laser Depigmentation Techniques

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### ABSTRACT

An attractive smile is essential for a long-lasting impression. Excessive Gingival Display (EGD) during smiling and gingival pigmentation is a cause for concern to many individuals. Various treatment modalities are available to manage the “gummy smile”. Among all, Lip Repositioning Surgery (LRS) is a promising technique that provides satisfactory results. Esthetic periodontal plastic surgery is a boon to patients having "dark gums". This case report describes the combination of the lip repositioning technique followed by laser depigmentation in two phases to achieve a cosmetically superior smile. Both the chair-side procedures are predictable with significant and stable outcomes.

**Keywords:** *Depigmentation, Gummy smile, Laser, Lip repositioning*

Gingival health and appearance are essential components of an attractive smile and are becoming an integral component of periodontal treatment. Excessive gingival display (EGD) is also known as “gummy smile” as gingiva becomes the dominant visual feature compared to the lips and teeth. EGD is associated with the altered passive eruption, anterior dento-alveolar extrusion, vertical maxillary excess, short and hyperactive upper lip, or a combination of these [1,2]. Identification of the etiology is essential for the establishment of a correct treatment plan. If the upper lip length is within normal range and the lower facial third is not disproportionate, a hyperactive upper lip is considered the main cause of gummy smile [3]. In literature, different techniques were reported for the treatment of the hyperactive upper lip. They are: botulinum toxin injections, lip elongation associated with rhinoplasty, detachment of lip muscles, myotomy and partial removal, and lip repositioning [4-7].

One of those techniques is Lip repositioning surgery (LRS), which consists of the removal of a strip of mucosa from the maxillary vestibule and suturing the lip mucosa to

the mucogingival line. The color of healthy gingiva varies from pale pink to deep bluish purple hue. Most times, the pigmentation is caused by primary pigments like melanin, melanoid, oxyhemoglobin, reduced hemoglobin, carotene, bilirubin, and iron [8,9]. Hyperpigmentation is caused by an excessive melanin deposition by melanocytes located in the basal and suprabasal cell layers of the epithelium. High levels of oral melanin pigmentation are observed in the African, East Asian or Hispanic individuals [10]. Gingival depigmentation is a technique of removal or reduction of the hyperpigmentation by techniques like bur abrasion, scalpel method, cryotherapy, electrosurgery and laser [11]. The present case report describes the treatment of an unesthetic smile with the combination of lip repositioning and gingival laser depigmentation surgeries.

### CASE REPORT

A 26-year-old male patient reported to the department with the chief complaint of dark gums that were excessively visible on smiling. Patient desired an attractive pink smile with minimal gum exposure and limited procedure time.

Patient's history was unremarkable. On examination, there was diffuse black pigmentation [Figure 1], and a hyperactive upper lip. During exaggerated smile, the second premolar to second premolar was visible. The patient was educated about the condition, available treatment options and their side effects. LRS was planned in the first visit followed by the laser depigmentation after two weeks.

Local anesthetic was administered and the incision line was marked on the dried tissue [Figure 3]. A partial-thickness incision was made at the mucogingival junction following the marking. A second partial thickness incision that ran parallel to the first incision and 10 mm apical of the mucogingival junction was made in the labial mucosa [3]. Incisions were connected at each second premolar, creating an elliptical outline and the mucosa was removed within this outline carefully, leaving the underlying connective tissue exposed [Figure 4].

Continuous resorbable sutures were given to stabilize the new mucosal margin to the gingiva. Patient was prescribed analgesics and antibiotics and instructed to rinse twice daily for 1 week with 0.2% chlorhexidine mouthwash. Instructions were given to the patient regarding ice pack application, soft diet and minimal lip movement. The patient was recalled after 2 weeks.

After 2 weeks, post-operative healing occurred with minimal discomfort. Topical anaesthesia was applied and diode laser (810 nm) was used for depigmentation method [Figure 5]. The gingival epithelium and part of connective tissue were removed. The tip was used with brush strokes and intermittent saline irrigation to prevent heating of the underlying tissue. The periodontal dressing was placed. On recall after 10 days, complete healing and satisfactory depigmentation with minimal scarring at suture line of LRS was noted [Figure 6]. The patient was happy with the result [Figure 2]. The patient was reviewed periodically for 6 months.



**Figure 1 and 2 - Pre-operative and post-operative photographs showing lip position and visibility of melanin pigmentation on gums. Figure 3 - Marking made for tissue removal**



**Figure 4 - Tissue removal done, Figure 5 - Post-laser depigmentation, Figure 6 - Post-laser healing**

## DISCUSSION

Esthetic dentistry strives to merge function and beauty according to the values and individual needs of every patient. Perception of the right esthetics varies among individuals depending upon their social environment, personal experience and culture. Advances now allow the clinician to achieve a periodontal environment that complements and enhances the creation of optimal dental esthetics. Patient was conscious about his gingival display hence, was motivated and determined to undergo the surgeries to enhance his smile.

The lip repositioning technique was first described 1973 by Rubenstein and Kostianovsky [12]. as a part of medical plastic surgery and introduced in dentistry, after being modified in 2006 by Rosenblatt and Simon [7]. LRS is a valid alternative to treat EGD caused by a hyperactive or short upper lip as the results of this technique are stable, has low morbidity and well accepted by patients. Silva et al [3] reported high patient satisfaction 2.5 years after surgery, with 70% of patients considering the postoperative amount of gingival display to be “about right” and 90% willing to undergo the procedure again.

According to Cicek (2003), [8]. melanin pigmentation is caused by melanin deposition by active melanocytes located in the basal layer of oral epithelium [11]. An effective treatment modality is the use of diode laser for depigmentation where energy is transformed into ablation energy, resulting in cellular rupture and vaporization with minimal heating of the surrounding tissue [13]. According to Atsawasuwan and Greethong (1999), [14]. laser beam produces a bloodless field for surgery, causes minimum damage to the periosteum and underlying bone, and the treated gingiva and mucosa do not need any dressing. This has the advantages of easy handling, short treatment time, hemostasis, and sterilization effects. The occurrence of re-pigmentation may be spontaneous and is attributed to the activity and migration of melanocytes from surrounding areas. Since laser beam destroys the epithelial cells including those at the basal layer, it reduces the chances of re-pigmentation [15].

After surgery, re-pigmentation of the gingiva should be monitored by a routine follow-up of the patient. In the present case, there was no evident re-pigmentation at the end of six months follow-up and the patient was satisfied. However, the case is being followed up to evaluate the

long-term stability of the results. There are some contraindications of this surgical technique like patients with inadequate attached gingiva, severe skeletal deformities and severe vertical maxillary excess. The possibility of recurrence is high and decrease in the vestibular depth following surgery is present. These all points make it an inferior technique as compared to others and contribute to its limitations. Since literature shows few clinical case reports and studies on LRS, more studies with a greater number of patients and long-term follow-up are necessary to increase the level of scientific evidence.

## CONCLUSION

This case report describes the successful management of a gummy smile via coronal lip repositioning surgery in conjunction with laser gingival depigmentation. The treatment resulted in reduced gingival display and an aesthetically pleasing smile ensuring a high level of patient satisfaction.

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