

Lip Repositioning to Improve the Harmony of the Smile: A Surgical Case Report

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Abstract

A beautiful smile boosts a person's confidence. Gummy smile is a term used for excessive gingival display (EGD), its etiology is multifactorial, can be treated by several surgical and non-surgical techniques due to etiology factors. Factors that contribute to the gummy smile include exaggerated lip length and lip hypermobility. Lip repositioning surgery can be used to treat EGD, mild to moderate degree of gingival display (4-8 mm) caused by hypermobile upper lip. The lip repositioning procedure is a surgical treatment option that involves removing a partial thickness strip from the maxillary buccal vestibular mucosa and suturing the lip mucosa back to the mucogingival line. This technique is less invasive than orthognathic surgery, with minor complications and patient satisfaction.

Keywords: *Lip Repositioning; Gingival display; Esthetic crown lengthening; Smile*

Introduction

A perfect smile is determined by the balance among three parameters: the white (teeth), the pink (gum), and the lips. Excessive gingival display while smiling has caused aesthetic embarrassment for many patients, affecting their psychosocial behavior⁴. The aesthetics of a smile are influenced by the position and curvature of the upper lip, the parallelism of the anterior incisal curve with the lower lip, the relationship between the maxillary anterior teeth and the lower lip, and the number of teeth displayed in a smile. An excessive gingiva to lip distance of 4 mm or more is classified unattractive as Koh. Ich. et. Al., have shown. Gummy Smile is an esthetic issue which causes a person to show a larger than average amount of gum tissue when smiling³. Excessive gingival display ≥ 4 mm is commonly referred to as a "gummy smile", which is caused by several different etiologies and can be corrected using various techniques⁶. Excessive gingival display (EGD), commonly referred to as "gummy smile", is one of the several developmental or acquired deformities and conditions that manifest in periodontium. The causes of EGD include vertical maxillary excess, anterior dento-alveolar extrusion, altered passive eruption, short or hyperactive upper lip, or combination thereof. In recent years there are various treatment options recommended in dental literature available for correcting gummy smile, like, esthetic crown lengthening, orthodontic therapy, orthodontic surgery and lip repositioning. Smile is expressed by muscular action around the lips in the inferior third of the face. The three most important elevating muscles are: 1-Zygomaticus Minor 2-Levator Labi Superioris Alaeque Nasi 3-Levator Labi Superioris⁵.

The current case report presents a patient diagnosed with an excessive gingival display, managed by lip repositioning surgery. This procedure is suggested to be a conservative solution, which requires a less invasive approach than orthognathic surgery. The lip repositioning procedure is performed by removing a partial thickness ribbon of vestibular mucosa and then suturing the mucosa to the periosteum of the muco-gingival line. The aim of this article is to present a successful lip repositioning treatment where the objective of the technique was to decrease the gingival appearance with minimum of recurrence. This surgical technique resulted in improved smile aesthetics and high patient satisfaction. Proper case selection and diagnosis is critical for success.

Case Report

Patient profiles and consent

In June 2021, a female patient, A.R, 24 years old, was presented in our clinic with the chief complaint of a “gummy smile” (Fig.1). Cephalometric and clinical diagnosis excluded an anterior dento-alveolar extrusion and the ANS-PNS base was in normal parameters. The hyperactive upper lip was determined to be the cause of the gummy smile. Written informed consent was obtained after discussing the risks, benefits, and treatment alternatives. Intraoral and extraoral photos were taken for planning and records.



Figure 1: Patient's smile.

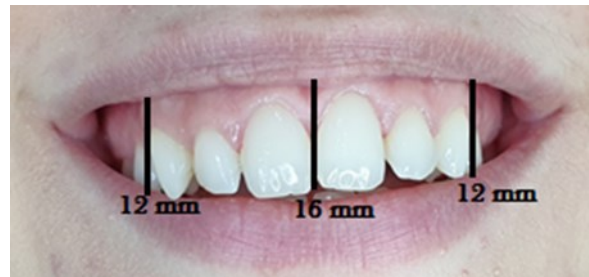


Figure 2: Measurements made during smile.

Examination: The lip length was measured according to Peck et al. (1992).

Surgical procedure

As local anesthesia was injected (lidocaine HCl 4% with 1:100.000 epinephrine) an outline (Fig.3) by a marking pencil was done to the borders of incision.

The technique consists in removal of a single band of mucosa, elevated as a partial-thickness flap. It was outlined by a coronal incision at the MGJ (mucogingival-junction), and an apical incision parallel to the coronal one. The apical incision was positioned at the depth of the vestibule. The incisions were connected bilaterally at the level of projection of the labial commissures while smiling, usually to the second premolar (Fig.4). It has been suggested that the distance between the superior and inferior borders must be twice the length of repositioning desired on the smile.



Figure 3: Incision outline.



Figure 4: Incision, epithelium removed, and connective tissue exposed followed by the dissection of three muscular fibers.

The removal of single mucosal band was done, followed by the dissection of three muscular fibers; Zygomaticus Minor, Levator Labi Superioris Alaeque Nasi and Levator Labi Superioris. The periosteal, simple running suturing was done on both sides; by a polyamide, non-absorbable, size 4/0 suture (Fig.5). Suturing to the mucogingival line would result in a narrower vestibule and a restricted muscle pull.



Figure 5: Suture for stabilization of the new mucosa margin.

Postoperative instructions

It was prescribed analgesics (ibuprofen 600mg every 6 - 8 hours as needed), antibiotics (augmenting 1gr. twice daily for 1 week), and chlorhexidine gluconate 0.12% twice daily for two weeks.

The patient was instructed to apply ice packs at 20-minute intervals for 24 hours. It was given the printed letter of all surgical advice, including soft food diet of first week and restriction of lip movement during smiling or talking in the first two weeks.

Follow-up

The sutures were removed after ten days of postoperative healing. It was formed a minor scar line on the suture placement, that remained invisible while smiling. Patient was satisfied with the new smile.



Figure 6: Post-operative check-up one month after the intervention.

Discussion

Worldwide literature shows us the success of this surgical treatment.

In twelve patients, 10 females and 2 males, one month postoperatively, the gingival display in all patients was recorded to be between 2 and 4 mm with a mean of (2.6 mm).⁷

The initial database search yielded 368 studies; the random effects model exhibited an EGD reduction of 2.87 mm (95% CI: 1.91-3.82) after 3 months of Lip Repositioning Surgery (LRS). These results decreased after 6 months (2.71 mm; 95% CI: 1.95-3.47) and 12 months (2.10 mm; 95% CI: 1.48-2.72). Meta-analysis comparing the performance of myotomy showed greater EGD reduction at 6 months than without myotomy ($P < 0.02$).⁸

The electronic research retrieved from 783 studies, an overall EGD reduction of -3.06 mm (95%CI: -3.71-2.40), -2.91 mm; (95%CI: -3.66-2.15) and -2.76 mm; (95%CI: -3.83--1.70) was achieved after 6, 12, and 36 months, respectively, compared to baseline ($P < 0.01$). Meta-analysis revealed that the use of LRT with periosteal suturing showed the greatest decrease in EGD with 5.22 mm (95% CI: 4.23-6.21; $P < 0.01$) at 6 months and 4.94 mm (95% CI: 3.86-6.02; $P < 0.01$) at 12 months.⁹

Conclusion

Lip Repositioning is the preferred solution to treat excessive gingival display (EGD) caused by hypermobile upper lip.

Lip repositioning surgery is less invasive than orthognathic surgery, with minor complications and great results.

This technique has great feedback from patients, who can tell the post-op comfort and a big satisfaction within its result.

Conflicts of Interest

The author confirm there is no conflict of interest to disclose.

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