

Case Report

Treatment of gingival display using a Lip Repositioning Technique: A literature review with case report

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Abstract: The objective of this prospective study was to investigate outcomes of a lip repositioning technique for the treatment of excessive gingival display by limiting the retraction of the elevator smile muscles. One of the most important goals of clinicians is to meet the esthetic expectations of the patients. Excessive gingival display during smiling is defined as gummy smile; and lip repositioning procedure may be an alternative in the treatment of some gummy smile cases. This article reports a healthy 32-year old female with complaint of excessive gingival display upon smiling. The lip repositioning technique was performed under local anesthesia with the main objective of reducing gummy smile. The technique is fulfilled by removing a strip of mucosa from the maxillary buccal vestibule, creating a partial-thickness flap between mucogingival junction and upper lip musculature junction. This case report demonstrates the successful management of a lip-repositioning procedure in a patient with incompetent short upper lip. This was accomplished by resulting in a narrow vestibule, thereby reducing gingival display and suturing the lip mucosa to the mucogingival line. This clinical report describes the successful use of lip repositioning technique. At the 1-year follow-up, it was observed that the results were maintained and patient was satisfied with her clinical appearance. Lip repositioning procedure performed in the accurate indication may be an alternative in the treatment of gummy smile.

Keywords: Gummy smile; Excessive gingival display; Lip repositioning; Periodontal plastic surgery.

INTRODUCTION

Smile is considered as an important aesthetic reference; therefore, the study and technique of this changes lead to its disharmony have played a rather more relevant role within dentistry. Gingiva excessive exposure during smile is referred to as “gummy smile”, being diagnosed in cases where, during smile, gingival display measures more than 3 mm from its margin up to the upper lip line [1, 2, 3]. Good appearance is not considered a pride sign, but precisely is a needed, and the dentistry has a fundamental role to obtain it, since the face is the exposed area and the mouth a prominent line of the body [4, 5]. A smile expresses a feeling of joy, success, sensuality, liking and good manners, and reveals self-assurance and sympathy [6]. Gummy smile in severe cases, the overexposure is present in repositioning of the mouth and lips. The hyperactivity of the elevator muscle of the upper lip is one of the main causes of a gummy smile, and several techniques have been proposed for its treatment [7].

The etiology of the extreme high lip line is often multi-factorial, a combination of the four main causes. Skeletal deformity often leads to the most difficult cases and they are often associated with

another of the main causes, muscular hyper-activity, which can result in an unsatisfactory outcome even after orthognathic surgery. Another factor is over-eruption which can with difficulty be treated with orthodontic intrusion and finally merely a short upper lip which is rare [8- 11]. The lip repositioning technique was first described 1973 by Rubenstein and Kostianovsky as part of medical plastic surgery [9]. Later on, it was introduced in dentistry, after being modified in year 2006 by Rosenblatt and Simon [10].

The Benefits of Lip Repositioning

- Lip repositioning exposes a consistent, proportional amount of teeth and gums.
- Recovery is very fast. Only local anesthesia is used and because the repositioning takes place inside the mouth, there is no external scarring. After lip repositioning, we often see our patients smile confidently for the first time. Our patients claim to have improvements in confidence not only in their appearance, but also in their relationships and communication.

Pre-procedural assessment

Prior to developing a suitable treatment plan, it is essential to establish a complete and accurate assessments of the conditions with which the patient presents. Reasons for seeking treatment:

- a. Assessment of systemic health and habits;
- b. Height and symmetry of face;
- c. Thickness, length, and profile of lips;
- d. Smile line;
- e. Condition and dimensions of teeth;
- f. Width of keratinized gingiva;
- g. Gingival biotype; and
- h. Facial and lingual bone levels, thickness of alveolar.

CASE REPORT

Patients profile, pre-surgical evaluation, and consent

This clinical report presents a case of a young female patient with an EGD larger than 10 mm during smiling caused by a combined etiology of a hyperactive upper lip and altered passive eruption of the frontal maxillary teeth. The treatment plan consisted of a modified lip repositioning technique with a reversible clinical trial.

A systematically healthy 32-year-old woman came to private clinic in Qazvin, Iran. Her chief complaint was excessive gingival display during smiling. There was no significant medical or family history and the patient was medically sound fit; no tobacco habit and not take any medication reported for the surgical procedure. Prior to surgery, the patient was submitted to basic periodontal therapy, and the sites operated did not present, bleeding on probing, or probing depth higher than 3 mm, her chief complaints were reported displeasure with the amount of gingiva exposed while smiling and her treatment goal was to minimize the gingival display during smiling.

On clinical examination extra orally, the face was bilaterally symmetrical with incompetent lips. Intraorally, a severe gingival display was seen during smiling which extended from the maxillary right first premolar to the maxillary left first premolar. Treatment options mentioned above were then explained to the patient. In accordance with the patient choice of therapy, a lip repositioning surgery was scheduled. Before surgery, the patient signed the informed consent. A written informed consent was taken and the patient was educated about post-surgical complications such as possible scar formation, mucocele formation, post-operative bruising and extra oral swelling.

Surgical Procedure

Two hours before surgery Dexamethasone amp were injected; Local anesthetic (Xylocaine with 1:200,000 adrenalin: Daro-Pakhsh, Tehran, Iran) was administered. A marking pen was used to outline the apical, coronal and lateral boundaries of the elliptical incision which was 1.5 the length of the repositioning desired in the patient's smile. Eight4.0 nylon (Supaniy®

SUPA.Co. Theran, Iran) sutures (2 in the frontal part, 1 above the canine area, and 1 between the second premolar and the first molar bilaterally) were placed. Suture design involved a vertical tissue bite taken at the superior border in the movable mucosa, a horizontal tissue bite at the mucogingival junction, and inverting and tucking behind the tissue proposed for excision. The treatment plan consisted of reversible lip repositioning and definitive surgical repositioning.

Patient was discharged with all post-surgical instructions and medications for five days which included analgesic (Tedaphen® 400 mg Tehran Darou Co, Iran) QID daily for five days, antibiotic (Amoxicillin 500 mg TDS for five days), along with cold packs extra orally to decrease post-surgical swelling. Extra oral and intraoral antisepsis was performed with 2.0% chlorhexidine solution (Share Drau, Tehran, Iran) rinse for 1 minute. Initial anesthesia consisted of bilateral infraorbital blocks (2% Lidocaine with 1:200,000 Epinephrine). No periodontal dressing was placed.

Post-operative management

The patient was visited for follow-up the day after surgery. Post-operative instructions included soft diet, limited facial movements, no brushing around the surgical site for 14 days and placing ice packs over the upper lip. The patient was instructed to rinse gently with 0.2% Chlorhexidine Gluconate twice daily for 2 weeks. Post-operative Amoxicillin 500 mg T.D.S and Tedaphen® 400 mg (Tehran Darou Co, Iran) B.D for 5 days were prescribed. She complained of tension while talking or smiling, it was lasted for a week. Sutures were removed at 14 days.

Post-operative healing was uneventful and she revealed minimal discomfort for few days. A minor scar formation appeared along the suture lines. The 1-year follow-up displayed a reduction of gingival display with minor scar formation. The patient was satisfied with her clinical appearance.



Fig-1: Pre-treatment clinical view with excessive gingival display upon smiling.



Fig-2: Exposed submucosa after removal of the mucosal strips



Fig-3: Intra-oral appearance following suturing using nylon with interrupted sutures for stabilization of the new mucosal margin to the gingiva.



Fig-4: Post-operative two week following removal of sutures.



Fig-5: Clinical appearance after 6 months



Fig- 6: Clinical appearance upon smiling at 1 year later.

DISCUSSION

This report documents the use of Lip Repositioning Surgery (LRS) for the management of Excessive Gingival Display (EGD) seen with a SUL. The original technique for the procedure was described as cosmetic surgery [14]. The lip repositioning technique is an excellent alternative to more costly procedures with higher morbidity rates [19, 20]. The lip repositioning surgery was originally described in the medical literature in 1973 [8]. This surgical procedure reported no complications but there were reports of relapse.

Previous studies reported that a relapse can occur after lip repositioning surgery [12-14]. One of the most important predisposing factors for relapse is the presence thin biotype [15, 16]. In our case, no relapse occurred through 1 year of follow-up. Thick biotype in our patient probably played the key role in this outcome. Although having not occurred in our case, asymmetry upon smiling could have been encountered as another important complication. This complication was avoided by keeping labial frenulum intact at midline during the surgical procedure. Same amounts of vertical incisions i.e., 12 mm on both sides of maxilla allowed removal of equal amounts of mucosa on right and left operation regions [5]. Various techniques have been used in the treatment of gummy smile such as myectomy, botulinum toxin injection, lip elongation (associated with rhinoplasty), detachment of lip muscles [17, 18]. Dental clinicians would select the least invasive and more simple and predictable treatment choice in such cases. Lip repositioning performed in our patient serves as a good sample.

This case presentation aimed to present the one-year outcome for a gummy smile treated with lip repositioning surgery which demonstrated hyperactive upper lip. In this case, 12 mm of mucosa was removed as the other investigators [21, 22] suggested without any prediction on the amount of reduction in gingival display. Accurate diagnosis and a pertinent case selection are critical for the success of any LR procedure. Contraindications to LR surgery include the presence of a minimal zone of attached gingiva, which can create difficulties in flap design, stabilization, and

suturing, and severe VME (>8 mm of gingival display) [14, 15].

There are some contraindications for lip repositioning surgery including inadequate width of attached gingiva in maxillary anterior sextant. Insufficient amount of tissue poses difficulty in flap reflection, stabilization and suturing. Patients with severe vertical maxillary excess cases are also not the ideal candidates for lip repositioning and would be treated with orthognathic surgery [9].

In a study by Jacobs and co-worker reported in a case series study of seven patients which were successfully managed with trial, and then definitive, lip repositioning wherein a mean reduction in gingival display of 6.4 ± 1.5 mm were achieved [22]. Riberio-Junior and colleagues have already reported that no correlation existed between the amount of tissue removed and reduction of gingival display [7].

Precautions while surgery

- a) Care must be taken to avoid damage to minor salivary glands in sub mucosa.
- b) Some cases with rare complication reported in the literature are paresthesia [23] and transient paralysis [24].
- c) Clinicians must look for adequate width of attached gingiva.
- d) Do not perform the procedure with patients having vertical maxillary excess, in such cases orthognathic surgeries is the solution.

CONCLUSION

Lip repositioning procedure is an effective way of reducing the excessive gingival display (EGD) and it appears to be a promising alternative treatment option for excessive gingival display. However, long-term stability of the results needs to be seen. Both the patient and the clinicians were satisfied with the final outcome. Treatment of excessive gingival display by means of a modified lip repositioning technique results in high level of patient satisfaction and predictable outcomes that are stable in the short term [20].

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