Case Report

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Modified Lip Repositioning: A Conservative Approach to Treat the Gummy Smile: A Case Report

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ABSTRACT

Background: Unesthetic gummy smile or "Excessive Gingival Display" is a frequent finding among the population that can occur because of various intraoral or extraoral etiologies. This clinical report describes a successful surgical coverage obtained by modified lip repositioning, thus surgically treating gummy smile. The procedure restricts the muscle pull of the elevator lip muscles by shortening the vestibule, thus reducing the gingival display while smiling. The technique is performed by removing two strips of mucosa from maxillary buccal vestibule on both the sides leaving the frenum untouched and creating a partial thickness flap between mucogingival junction and upper lip musculature, and suturing the lip mucosa with mucogingival junction, thereby reducing gingival display. This technique is different from the conventional surgical lip repositioning as labial frenum is left untouched over here as it helps in maintaining the lip symmetry therefore reduces postoperative morbidity.

Keywords: Gummy smile, excessive gingival display, vertical maxillary excess and modified lip repositioning surgery.

INTRODUCTION

With the advances in dentistry, cosmetic dentistry is playing a big role in delivering aesthetic smiles to people. One of the common problems that people visit their dentist is- "How to fix a gummy smile?". A smile is an expression denoting pleasure, joy, happiness, or amusement. Smiling is something that is understood by everyone irrespective of one's culture, race, or religion. A smile is an important gestural method of communication and is an interaction between the teeth, the lip framework, and the gingival scaffold.[1] Esthetics judgment is made by viewing the patient from the front in dynamic states like conversation, facial expressions, and smiling.[2]

A number of people are embarrassed due to their excessive gingival display during smiling and it is a matter of great concern for them as it affects their social life. Gummy smile is seen due to improper relation between the gingival tissue and the tooth, with gingival tissue in excess and tooth portion in a small amount. At least 50% of the patients exhibits some form of gingival display in a normal smile.[3] However, exaggerated or forced smile patterns display gingiva in up to 76% of all patients.[4] In absolute numbers, a normal gingival display between the inferior border of the upper lip and the gingival margin of the maxillary central incisors during a normal smile is 1–2 mm. In contrast, an excessive gingiva-to-lip distance of 4 mm or more is

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classified as "unattractive" by lay people and general dentists.[5] Gummy smile may not present with any pathologic difficulties, but definitely affects the patient's psychosocial behaviour.[6]

The various causes of gummy smile include vertical maxillary excess, anterior dentoalveolar extrusion, altered passive eruption, short or hyperactive upper lip, or combinations thereof.[7,8] Dentoalveolar extrusion can be treated successfully by orthodontic therapy.[9] Excessive gingival display, due to vertical maxillary excess, can be successfully treated by orthognathic surgery.[10] Moderate gingival display that is not skeletal in origin and vertical maxillary excess that ranges between 4 and 8 mm can effectively be treated by surgical repositioning of upper lip limiting the retraction muscles such as zygomaticus minor, orbicularis oris, levator anguli oris and levator labi oris.

The contraindications for this technique include the presence of a minimal zone of attached gingiva, which can create difficulties in flap design, stabilization and suturing. Another contraindication is several vertical maxillary excesses (VME). Degree II VME has gingival and mucosal display of 4 to 8 mm. In the other hand, in degree III VME more than 8 mm of soft tissue are seen. In both cases, an interdisciplinary approach is required [11]

Conventional lip repositioning has been described in many case reports recently for the designing the gummy smile. However, only few have described the modified lip repositioning procedure. This case report describes the surgical technique and outcome of modified lip repositioning in the treatment of excessive gingival display.

CASE REPORT

A 23-year-old female patient reported to the Department of Periodontics and Oral Implantology, with the chief complaint of excessive display of gums while smiling. There were no significant medical or family history and the patient presented with no medical conditions that could contradict the surgical procedure.

On extra oral examination, the facial symmetry was seen to be well maintained. However, the high lip line was noted during smiling.

Intraorally, with full smile, patient's teeth were visible from maxillary right first molar to maxillary left first molar with 5-6 mm of gingival display, a moderate gingival display was seen during smiling which gave an unesthetic appearance [FIGURE 1]. Maxillary anterior teeth had normal crown height and width ratio. A diagnosis of moderate vertical maxillary excess was made. Informed consent was obtained after discussion of the benefits, possible complications, and alternatives to lip repositioning.

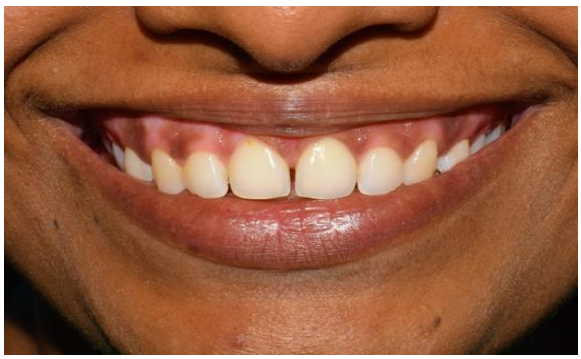

Fig 1: Patient's teeth were visible from maxillary right first molar to maxillary left first molar with 5-6 mm of gingival display.

Aim of the technique

Modified lip repositioning is a surgical way to correct gummy smile by limiting the retraction of the elevator smile muscles (e.g., zygomaticus minor, levator anguli oris, orbicularis oris, and levator labi superioris) and yet preserve the labial frenum.

Modified lip repositioning surgery:-

Local anesthetic (lignocaine 2% with epinephrine 1:100,000) was administered in vestibular mucosa and lip from maxillary right first molar to maxillary left first molar. The surgical site was marked with an indelible pencil [FIGURE 2].

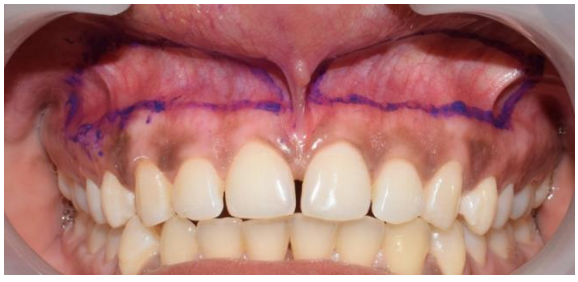

Fig 2: The surgical site was marked with an indelible pencil.

A partial thickness incision was made at the mucogingival junction from the mesial line angle of the right central incisor to the mesial line angle of the right first molar and a second partial thickness incision that ran parallel to the first incision and 10–12 mm apical of the mucogingival junction was made in the labial mucosa. The incisions were connected at the central incisor region without involving the maxillary labial frenum and at the right first molar region creating a quadrilateral outline.

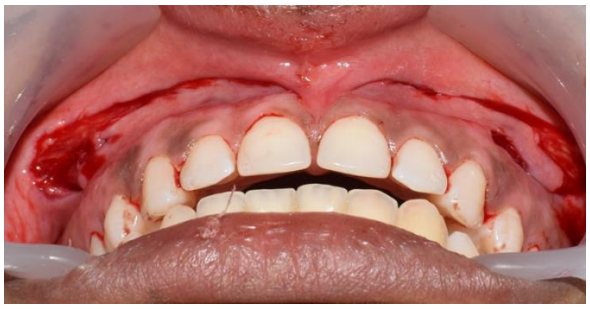

Fig 3: Incisions made leaving the maxillary labial frenum untouched.

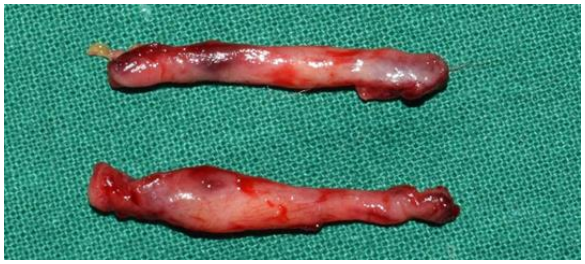

Fig 4: Both the strips of epithelium were removed.

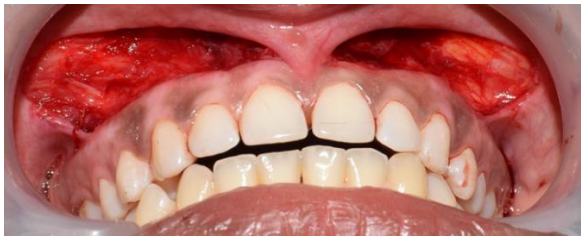

Fig 5: Exposed underlying connective tissue.

The same procedure was carried out on the left side at the mucogingival junction by making an incision from mesial outline of left central incisor to the mesial outline of left first molar. The next partial thickness incision was the one parallel to the first incision and 10–12 mm apical to the mucogingival junction. The incisions were then joined without touching the maxillary labial frenum in the center [FIGURE 3]. Both the strips of epithelium were then removed [FIGURE 4] by careful dissection leaving the underlying connective tissue exposed [FIGURE 5]. Care was taken to avoid damage to any minor salivary glands in the submucosa. The parallel incision lines were approximated with interrupted stabilization sutures (Silk 5-0) [FIGURE 6].

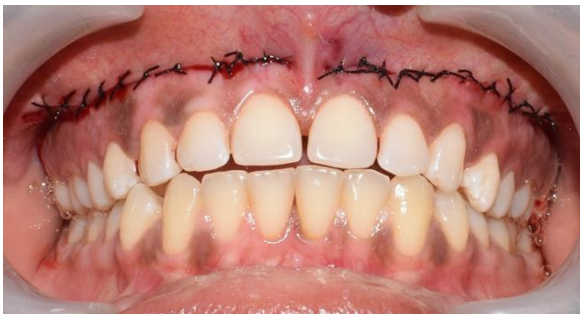

Fig 6: The parallel incision lines were approximated with interrupted stabilization sutures (Silk 5-0).

Patient was discharged with all postsurgical instructions and was prescribed nonsteroidal anti-inflammatory drugs (diclofenac sodium 50 mg three times daily for 3 days) and oral antibiotics (amoxicillin 500 mg and 125mg clavulanic acid two times daily for 5 days). Patient was instructed to apply ice pack post operatively and minimize lip movement for 1 week. Patient was recalled after 1-week for a follow-up. Patient reported mild pain and tension while smiling during the first week after surgery. Sutures were removed 2 weeks post operatively.

It was seen later that the suture area healed in the form of a scar [FIGURE 7], which was not apparent when the patient smiled because it was concealed in the upper lip. Patient was highly satisfied with the treatment carried out. The gingival display noted after 1-month was 1 mm while smiling. The gingival display measured after 1-week were constant even after 1-month, 3-months, 6-months and 1-year period. Patient was very comfortable and presented with no complications.

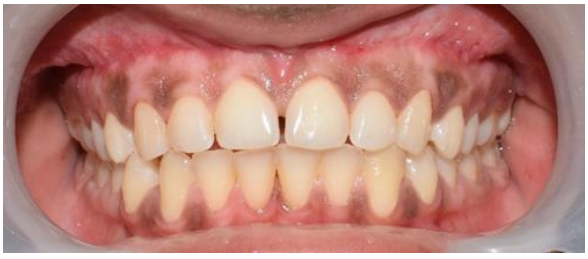

Fig 7: Suture area healed in the form of a scar.

RESULTS

Gingival display at baseline was 5-6 mm while smiling which changed drastically to 1mm while smiling upto a follow up of 1 year postoperatively [FIGURE 8].

Fig 8: One year postoperatively.

DISCUSSION

Dentistry has long been a part of the quest to enhance the esthetics of the teeth and mouth. What constitutes a pleasing dentogingival appearance depends on the extent of gingival exposure. This case report describes an innovative surgical procedure to treat the excessive gingival display during smiling. This procedure is different from the conventional lip repositioning surgery which was first reported in the medical literature in 1973 by Rubinstein and Kostianovsky.[12] Lip repositioning surgery has undergone many modifications since then. In 1979, Litton and Fournier described gummy smile correction with lip repositioning surgery, including elevator muscle detachment in cases with a short upper lip. Miskinyar, in 1983, found no relapses for the 27 patients treated with myectomy and partial resection of either one or both of the levator labii superioris muscles bilaterally in lip repositioning surgery.[13] In 2010, Ishida et al.[14] reported a significant reduction in gingival exposure in 14 patients treated with levator labii superioris myotomy, subperiosteal dissection, and frenectomy. In the modification employed here, the maxillary labial frenum was maintained and two strips of mucosa, one at either sides of the maxillary labial frenum were removed. This modification was introduced for cases where excessive gingival display at the maxillary labial frenum region were minimal and this modification also aids in maintaining the labial midline and prevents changes in lip symmetry therefore reduces postoperative morbidity. Despite, the limited availability of the studies focused on the outcome of lip repositioning, the systematic review published by Tawfik et al. showed that lip repositioning successfully improved EGD by 3.4 mm.[15] This suggests that lip repositioning is a successful approach for the treatment of EGD, especially for patients with minor discrepancies desiring a less invasive alternative to orthognathic surgery and a more immediate and enduring result when compared with orthodontics and Botox treatment, respectively. The current study indicates that after 1-year follow-up, this technique can produce stable results.

CONCLUSION

In conclusion, lip repositioning technique is a simple procedure that holds promise as an alternative treatment modality in esthetic rehabilitation to other procedures with higher morbidity rates. In the present case, the functional and aesthetic parameters required by the patient were achieved and the patient was satisfied with the outcome of the procedure.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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