Chronicles of
Dental Research

Case Report

Modified Lip Repositioning Surgery: An Alternative Approach For The Correction Of Excessive Gingival Display

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Abstract

One of the main concerns of many people who visit the dentist is "gummy smiles." Nowadays, aesthetics plays a crucial role in the treatment of periodontal disease. A radiant and beautiful smile may transform anyone's demeanour. However, the white and pink are well balanced in a gorgeous smile. Depending on a proper diagnosis, there are several therapy techniques available to address the imbalance of excessive gingival display (EGD). This case report shows how a lip-repositioning surgery can successfully manage EGD in a patient with an inadequate short upper lip. This was accomplished by suturing the lip mucosa to the mucogingival line after cutting two partial thickness strips of mucosa from the maxillary buccal vestibule on each side of the upper labial frenum. As a result, there was less gingival show and competent lips while smiling due to a smaller vestibule and limited muscular pull.

Key words: Gummy smile, excessive gingival display, lip repositioning.

INTRODUCTION

An increase in the amount of gum exposure during both voluntary and involuntary smiling have a negative impact on the beauty of the smile for the patients.[1,2] The term excessive gingival display or gummy smile should only be used in the case of a 4-mm gingival display during involuntary smiling, which is measured from the free gingival margin of the central incisors to the inferior border of the upper lip.[2] There are lots of etiological factors that contribute to a gummy smile, which include vertical maxillary excess, altered passive eruption, short upper lip, hyperactivity in the elevator muscles of the lip, and dento alveolar extrusion, especially in the anterior area.[3,4]

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One of the techniques advocated for treating gummy smile is lip repositioning surgery, which aims at removing part of the mucosa and suturing this area into another level, thus limiting the muscle pull of the elevator muscles of the lip.[5,6] One of the major drawbacks of this surgery is the relapse that occurs with almost full regain in the preoperative amount of gum exposure.[7–9] That is why several authors proposed many modifications for the original technique to overcome this drawback.[5,6,10]

Another complication that might happen is the midline shift during suturing due to the removal of the labial frenum, which is why modified lip repositioning surgery was proposed, as it aims at preserving the frenum, thus preventing this complication.

CASE REPORT

A 25-year-old female patient was referred to the Department of Periodontology from the orthodontics department for the correction of excessive gingival display, before the commencement of orthodontic treatment. The patient also complained of excessive gum display on smiling and incompetent lips, since teenage. The patient was apparently asymptomatic except the embarrassment of going in public due to gummy smile. On examination, she had an excessive gingival display of around 8-10 mm extending from maxillary right second premolar (#15) to maxillary left second premolar (#25).(FIGURE:1)

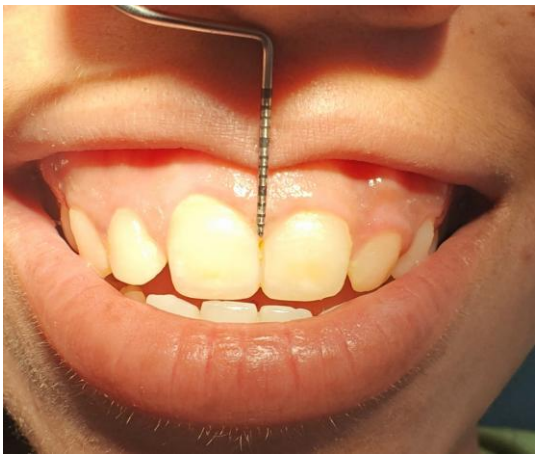

FIGURE 1: excessive gingival display of around 8-10 mm extending from maxillary right second premolar (#15) to maxillary left second premolar (#25).

Furthermore, marginal gingival discrepancy was reported in relation to tooth #12,#13,#14,#23 and #24 along with short clinical crowns.

Two treatment options were presented to the patient: Maxillary orthognathic surgery or lip repositioning surgery (LRS). After careful discussion, the patient opted for the LRS as it was minimally invasive, less aggressive and had the potential for fewer postoperative complications.

The patient's medical history was non-contributory and there was no contraindication to surgical treatment.

The treatment suggested and performed were:

• Surgical crown lengthening in relation to #12,#13,#14,#23 and #24

• Surgical lip repositioning procedure for correction of gummy smile.

Surgical procedure for lip repositioning

Surgical technique was performed after following complete aseptic precautions. Standard skin preparation was carried out by 10% povidone-iodine solution and temporary draping was done. Local infiltration was done using local anesthetic solution (2% Lignocaine with 1:200,000 Adrenaline) in the vestibular mucosa and lip extending from right first molar to left first molar. The surgical area was outlined using an indelible pencil (FIGURE: 2). The procedure was initiated with a 11 no Bard-Parker blade by giving a partial-thickness incision following the mucogingival junction extending from right first premolar (#14) to left first premolar (#24).

FIGURE 2: Outline of the surgical area

FIGURE 3: Partial thickness incision on both the sides of the frenulum

Followed by the first incision, another second horizontal incision parallel to first was made in the labial mucosa 10-12 mm apical to mucogingival junction. These two incisions were connected at each end by creating an elliptical pattern. The partial-thickness flap was excised leaving the underlying connective tissue exposed to the oral cavity(FIGURE:3). It is noteworthy that the amount of partial-thickness flap excised should be either double the amount of gingival display that needs to be reduced or a maximum of 10-12 mm tissue excision in order to prevent the involvement of labial minor salivary glands severing of which may lead to the formation of mucocele. This is a modified technique in which the maxillary labial frenulum is maintained and two mucosal strips, one at each side of the frenulum, are removed [11]. Leaving the frenulum intact helps maintaining the position of the labial midline, prevents changes in lip symmetry and decreases the morbidity associated with the procedure, but limits the possibility of correcting EGD in the region of the maxillary central incisors.

Complete hemostasis should be attained by pressure pack. Henceforth, parallel incised margins were approximated with multiple interrupted sutures at a distance of 1 mm on either side of the midline to approximate the flap margins (FIGURE:4)

FIGURE 4: Suturing done with multiple interrupted sutures

Over the surgical site, a non-eugenol periodontal dressing (Coe-pack, GC) was applied.(FIGURE :5) Non-steroidal anti-inflammatory along with oral antibiotics were prescribed post-operatively for 5 days. Patient was instructed to use ice packs immediate post-operatively for few hours with intermittent application on the upper lip and to minimize lip movement while smiling and talking. Patient was recalled for follow-up after a week. Sutures were removed after 2 weeks.

This esthetic procedure is safe and has minimal side-effects. The patient was recalled every 3 months for follow-up.

FIGURE 5: Over the surgical site, a non-eugenol periodontal dressing (Coe-pack, GC)

RESULT

At the 1-week postoperative visit, the patient reported very slight discomfort, with no postoperative bruising or extraoral swelling. At the 2-week postoperative visit, the gingival display on smiling reduced to 3 mm (FIGURE 6). The site healed uneventfully. The patient was highly pleased and satisfied with the esthetic outcome. The one year follow up also showed very little relapse of around 1 mm only. (FIGURE 7)

FIGURE 6: Reduction of gingival display after 2 weeks, post operation

FIGURE 7 : 1 year post operative picture

DISCUSSION

This report documents the use of Lip repositioning surgery for the management of EGD. The original technique for the procedure was described as cosmetic surgery by Rubinstein and Kostianovsky[12] for correction of a gummy smile caused by hypermobile lip. This surgical procedure was designed to have fewer postoperative complications when compared to orthognathic surgery besides being shorter and less aggressive. This procedure was re-advocated by Litton and Fournier[13] for the correction of EGD in a case of SUL by separating the muscles from the basal bony structures to coronally place the upper lip. This surgical procedure reported no complications but there were reports of relapse. Thus this technique was further improvised by Miskinyar[14] to correct the relapse. The trial treatment group consisted of seven patients who had relapse. Miskinyar however did not report when or how much relapse had occurred in his patient group. These patients were reoperated using a more aggressive approach which included myectomy and a partial resection of the muscle- levator labii superioris along with nerve repositioning before muscle resection. This was thought to eliminate muscle regeneration thus making the

results more permanent. The only post-operative complication reported by the author was a postoperative paraesthesia that lasted 2.5 months for one patient. Case reports by Rosenblatt and Simon[15] and Simon *et al.*[3] used an elliptical-shaped incision at the mucogingival junction and the alveolar mucosa, to reflect a partial-thickness flap, and an arbitrary excision of 10 to 12 mm of epithelium. They reported good results in one case of 8-month follow-up.

Similar surgical procedure has been reported by Humayun *et al.*[16] with one year follow-up providing good results. This case report demonstrates that LRS may be used effectively for treatment of excessive GD by positioning the upper lip in a more coronal location. Proper diagnosis evaluation of the severity of VME, HUL, or a short lip and an appropriate case selection are critical for the success of any surgical procedure. It is a less invasive, viable substitute for patients, has fewer post-operative complications and provides a faster recovery compared to orthognathic surgery. Long-term follow-up studies are needed to evaluate the stability and effectiveness of this treatment modality, but it holds promise as an alternative treatment modality in perio-esthetics.

CONCLUSION

This case report demonstrates that Lip Repositioing Surgery may be used effectively for treatment of excessive gingival display, by positioning the upper lip in a more coronal location. Proper diagnosis evaluation of the severity of vertical maxillary excess, hypermobile upper lip, or a short lip and an appropriate case selection is critical for the success of any surgical procedure. It is a less invasive, viable substitute for patients, has fewer post-operative complications, and provides a faster recovery as compared to orthognathic surgery. Long-term follow-up studies are needed to evaluate the stability and effectiveness of this treatment modality, but it holds promise as an alternative treatment modality in perio-esthetics.

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