

Modified lip repositioning for management excessive gingival display: A case report

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Abstract

Introduction: Excessive Gingival Display (EGD), commonly known as “gummy smile” is a condition in which the maxillary gingiva looks excessive (>2 mm) than normal when someone is smiling. This condition is considered aesthetically disturbing, affecting the patient's self-confidence and psychological state. The objective of this case report is to describe the stages of gingivectomy and modified lip repositioning for EGD reconstruction and attachment of the labial mucosa of the maxillary anterior region.

Case Report: A 21-year-old male came with the main complaint of wanting to improve his smile which showed less attractive gums. The results of the examination obtained the presence of EGD and hypermobile upper lip so a combined surgical action was planned with gingivectomy and modified lip repositioning for EGD reconstruction and attachment of the labial mucosa of the maxillary anterior region.

Case management: The first surgical procedure performed was gingivectomy. One month later, modified lip repositioning was performed. The patient was satisfied with the treatment results and at follow-up after 7 months there was no EGD when the patient smiled.

Conclusion: Combined gingivectomy and modified lip repositioning surgery can be an alternative treatment to correct Excessive Gingival Display and provide satisfactory aesthetic results for patients

Keywords: Excessive gingival display; Altered passive eruption; Hypermobile upper lip; Modified lip repositioning; Gingivectomy

1. Introduction

Excessive Gingival Display (EGD), commonly known as a “gummy smile” is a condition where the maxillary gingiva is excessive (>2 mm) from normal when a person is smiling.(1) This condition can affect the patient's aesthetic and psychological status because it decreases self-confidence which will be hidden or controlling the smile.(2)(3) When smiling, the gingiva is considered normal if it is 1-2 mm visible.(1)(2)(4) Excessive Gingival Display is considered to be aesthetically disturbing, affecting the patient's self-confidence and psychological well-being.(1) Accurate identification of the etiologic factors causing the EGD condition is important, as treatment options are determined by the etiologic factors. (1)(5) The etiology of EGD is multifactorial and may co-occur including short maxillary lip length, hypermobile upper lip, Altered Passive Eruption (APE), gingival hyperplasia, Vertical Maxillary Excess (VME), dentoalveolar extrusion.(1)(5)(6)(7)

Clinical diagnosis of EGD includes clinical crown length (gingival margin to incisal), anatomical crown length (gingival margin to base of gingival sulcus), keratinized gingival width (attached gingival margin to mucogingival junction),

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frenulum attachment, overjet and overbite, vertical border of smile. (2) (7) Treatment options for EGD include esthetic crown lengthening without or with osseous resection (gingivectomy), hyaluronic acid, botulin toxin, lip repositioning, orthodontic treatment, and orthognathic surgery. (1) (2) (5) (7) (3) In some cases of EGD caused by more than 1 factor, a combination of several techniques will be used in the treatment. (1) (5) The therapeutic approach should therefore be centered on the main etiology or the combination of etiologies found in each case. (7) The objective of this case report to describe the stages of modified lip repositioning for EGD reconstruction and attachment of the labial mucosa of the maxillary anterior region.

2. Case report

A 21-year-old male came to the Periodontics Specialist Clinic in Dental Hospital Universitas Airlangga with the main complaint of wanting to improve his smile that exposes the gums making it less attractive (Figure 1). The patient was not taking any medications, had no systemic diseases, and had no drug or food allergies.

On intra-oral examination, several conditions were found, namely the presence of plaque, calculus, Bleeding on Probing, fixed orthodontic devices in the maxilla and mandible; the gingival display is 5 mm; hypermobile upper lip (upper lip mobility 9 mm). The diagnosis of this case was Chronic gingivitis of tooth region 13,12,22,23,32,43 with soft tissue condition Mucogingival deformity (Excessive gingival display). Before the treatment began, the patient was explained about all the procedures that would be carried out including the risks and complications that might occur, and the patient gave consent to the treatment plan that he would receive.



Figure 1 Smile profile photo before modified lip repositioning action

Based on the clinical findings from the intraoral examination, the patient was planned for phase 1 therapy in the form of Dental Health Education (DHE) and scaling and root planing. Phase 1 therapy was evaluated and phase 2 therapy was continued, namely combined surgery with gingivectomy in regions 13,12,11,21,22,23 and modified lip repositioning indicated for reconstruction of excessive gingival display and attachment of the labial mucosa of the maxillary anterior region.

2.1. Case management

At the first visit the patient was carried out phase 1 therapy, namely scaling and root planing, then after phase 1 was completed, which was known from the results of the treatment evaluation, continued phase 2 therapy using the modified lip repositioning method. This method includes 2 surgical procedures starting with gingivectomy on tooth regions 13,12,11,21,22,23 and the next visit followed by modified lip repositioning therapy.

The gingivectomy started with Excessive gingival Display examination and crown proportion measurement with Chu's guide on teeth 11,12,13,21,22,23. From the results of the examination, it was found that the maxillary gingiva visible when smiling was 5 mm, and the crown proportion was disproportionate for teeth 13,12,11,21,22,23.

The gingivectomy procedure began with extraoral and intraoral asepsis with povidone iodine 10% (Figure 2A & 2B). Local anesthesia using lidocaine HCl 2% on the mucobuccal fold of the tooth region 13,12,11,21,22,23 (Figure 2C). Furthermore, bleeding points were made using Pocket Marker Forcep (PMF) in the mesiolabial, fascial, distolabial parts of teeth 13,12,11,21,22,23 (Figure 2D). Gingival excision 1-2 mm apical to the bleeding point using a 15C blade with a blade position of 450 was performed with discontinue excision technique (Figure 2E). Kirkland knife and orband knife were used during gingivoplasty to contour the anatomy of the gingival and interdental margins (Figures 2F & 2G). Irrigation of 0.9% NaCl saline solution and final result after gingivectomy (Figure 2H-2I). The surgical area was covered with periodontal pack (Figure 2J). On the seventh day after surgery, the periodontal pack was removed and there was good healing (Figure 2K). The patient's smile profile still showed excessive gingival display (Figure 2L).



Figure 2 Gingivectomy procedure for teeth 13,12,11,21,22,23. (A) Extraoral aseptics with povidone iodine 10%. (B) Intraoral aseptics with povidone iodine 10%. (C) Local anesthesia with lidocaine HCl. (D) Creating bleeding point with PMF. (E) Apical bevel external incision of bleeding point. (F) Contouring the gingival margin with a Kirkland knife. (G) Contouring the interdental gingiva with an Orban knife. (H) Irrigation with saline solution. (I) Final result. (J) Periodontal pack placement (K) 7 days postoperative. (L) Smile profile after gingivectomy

One month after gingivectomy, modified lip repositioning was performed on the maxillary anterior region. The procedure began with extra oral and intraoral aseptics with povidone iodine 10% (Figure 3A & 3B). This was followed by lip repositioning design with a sterile pencil (Figure 3C). Local anesthesia with infiltration technique using lidocaine HCl 2% on the mucobuccal fold of the frenulum area (Figure 3D). Then the maxillary labial frenulum was clamped using a hemostat to the extent of the design that had been made followed by a frenulum incision followed by a partial thickness incision in the frenulum area following the design that had been made so that the partial thickness incision results appeared according to the initial design (Figure 3E-3H). Suturing on the connective tissue and on the mucosa with blue Nylon 5.0 with interrupted technique (Figures 3I & 3J). The patient was asked to control in 7 days and the sutures were removed in 21 days after surgery. Profile of the patient smiling after simple lip repositioning on Day 30 (Figure 3K).



Figure 3 Simple lip repositioning procedure. (A & B) Extraoral and intraoral aseptics. (C) modified lip repositioning design. (D) Local anesthesia. (E) Clamp the frenulum with haemostat and frenulum incision. (F & G) Partial thickness incision as per design. (H) Result of partial thickness incision (I) Suturing (J) After suturing. (K) Smile profile on day 30 after modified lip repositioning

Follow-up 7 months after gingivectomy and modified lip repositioning did not show excessive gingival display on the patient's smile profile (Figure 4).

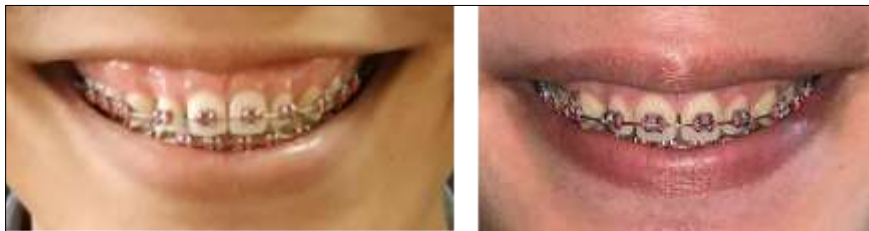


Figure 4 (i) Smile profile before gingivectomy and modified lip repositioning. (ii) Smile profile follow-up 7 months after gingivectomy and modified lip repositioning

3. Discussion

In the case report from the intraoral examination, altered passive eruption (APE) was found in the maxillary anterior teeth, namely teeth 13, 12, 11, 21, 22, and 23. APE has been defined as the condition in which "the gingival margins fail to recede during tooth eruption to a level apical to the cervical convexity of the tooth crown". Shape (width/length ratio) of the maxillary anterior teeth, that is, when teeth were short or quadratic in appearance (width/length ratio ≥ 0.85). (3) In these cases where multiple etiologies are present, the treatments provided should be carried out in the correct sequence when both APE and hypermobile upper lip are present, it is important to first treat the APE and then re-evaluate the patient's smile and satisfaction with their appearance before addressing the hypermobile upper lip with a lip repositioning surgery or another suitable procedure.(3)(8)

Lip repositioning for the treatment of EGD in mild to moderate cases is a less invasive procedure, with fewer post-operative complications, and provides faster recovery compared to orthognathic surgery.(9) Lip repositioning surgery is a cosmetic operation that reduces the elevator pull muscles, which lift the upper lip, to remedy a gummy smile.(10) The surgery limits how high the upper lip can rise when the patient smiles to maintain the top lip near the teeth and reduce the amount of exposed gum.(4)(11) The contraindications of the technique include cases with severe vertical maxillary excess (>8 mm).(9)(12)(13) The chances of relapse are high as time progresses after lip repositioning. According to the literature, this is a normal relapse post-lip repositioning, as the upper lip muscle attachment will tend

to go back to its original place with continuous dynamic movement of lips after surgical detachment. (10)(14) Lip repositioning surgery with a modified method was stable even after a year of follow-up. 6

4. Conclusion

This case report concludes that combined gingivectomy and lip repositioning surgery can be an alternative treatment to correct Excessive Gingival Display and provide satisfactory aesthetic results for patients.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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