



## CASE REPORT

### Lip Repositioning as an Alternative Treatment of Gummy Smile

Büşra KARACA,DDS, Hüseyin Alican TEZERİŞENER,DDS, Öznur ÖZALP,DDS,  
Mehmet Ali ATAY,DDS,PhD, Alper SİNDEL,DDS,PhD

Department of Oral and Maxillofacial Surgery, School of Dentistry, Akdeniz University, Antalya, Turkey

#### Abstract

##### Objective

Excessive gingival display (EGD) may compromise esthetics during smile. As the etiology is multi-factorial, various treatment options have been described for the management of EGD. The aim of this report was to present the management of four patients with EGD by lip repositioning technique as a minimally invasive treatment modality.

##### Case

Four female patients referred to our department with a chief complaint of unaesthetic appearance during smiling. Clinical examination revealed EGD as a result of vertical maxillary excess and hypermobile upper lip. Lip repositioning surgery was performed in order to restrict the pull of the elevator lip muscles. No complications or recurrence were observed at 6-month follow-up and all patients were satisfied with the outcomes of the procedure.

##### Conclusion

As a safe and relatively simple procedure, lip repositioning may provide satisfactory outcomes for patients with excessive gingival display.

**Keywords:** excessive gingival display, gummy smile, hypermobile lip, lip repositioning, smile esthetics

#### Introduction

Excessive gingival display (EGD), commonly termed gummy smile, is a condition characterized by overexposure of the maxillary gingiva during smiling. According to Tijan et.al; smile line has been graded depending on the exposure of tooth and gingiva<sup>1</sup>. A display of marginal gingiva more than 3 mm is defined as a very high smile line which is also called as gummy smile<sup>2</sup>.

Etiology of gummy smile may vary including vertical excess of the maxilla, delayed tooth eruption, compensatory eruption of the maxillary teeth, incompetent lips or hyperfunctionality of upper lip muscles<sup>3</sup>. Genetic factors have also been reported to play a role in gummy smile<sup>4</sup>. As a result of multifactorial etiology, correction of gummy smile may be performed using various techniques including orthognathic surgery, orthodontic intrusion, surgical crown lengthening, detachment of lip elevator muscles, botulinum toxin injections and surgical lip repositioning<sup>5,6</sup>.

Lip repositioning was first described in 1973 for the correction of gummy smile cases caused by the hypermobility of the upper lip<sup>7</sup>. It was performed by removing a band of mucosa including the frenulum of the upper lip from the buccal vestibule to apical to the mucogingival junction as a partial thickness flap. Since the introduction, several modifications of the technique

have been developed including preservation of the frenulum to decrease the morbidity.

Indications of lip repositioning surgery include gummy smile, thin upper lip and smile line asymmetry while it is contraindicated in case of an attached gingiva less than 3 mm in the anterior maxilla due to the difficulties in the flap design and stabilization or a gingival display more than 6 mm caused by skeletal factors<sup>8</sup>.

Lip repositioning surgery is gaining popularity among patients and surgeons. The purpose of this study to present the management of four patients with excessive gingival display by lip repositioning technique as a minimally invasive treatment modality.

#### Case Presentation

Four female patients referred to our department with a chief complaint of unaesthetic appearance during smiling. The patients' medical history were insignificant with no contraindication for surgery. Clinical examination revealed 3 to 6 mm of maxillary gingival display during full smile and normal height and width-to-height ratio of maxillary anterior teeth therefore diagnosis of moderate vertical maxillary excess was made (Figure 1). All patients refused the orthognathic surgery

**Corresponding Author:** Büşra KARACA

DDS Research Assistant

**Address:** Faculty of Dentistry, Akdeniz University, Oral and Maxillofacial Surgery, Konyaalti, Antalya, Türkiye

**Mobile:** +90(538) 6908673

**e-mail:** busra-karac@hotmail.com

and preferred lip repositioning as a less invasive procedure. Informed consents were obtained prior to the procedure.



**Figure 1.** Preoperative view of one of the patients: A very high smile line with the display of marginal gingiva more than 3 mm was observed.

### Surgical Technique

Local anesthetic was administered in the vestibular mucosa and lip between the maxillary first molars. The incision outlines were marked with a sterile surgical marking pen on the dried mucosa.

Following a partial thickness incision at the mucogingival junction from the right first molar to the left first molar, a second parallel incision was made at approximately 6 to 10 mm distance from the first incision. The incisions were connected at each first molar creating an elliptical outline of the incisions. The epithelial layer was removed, leaving the underlying connective tissue exposed [Figure 2]. The amount of tissue to be removed was decided approximately two times of gingival exposure in length. Electrocoagulation was used to control bleeding.



**Figure 2.** A 6 to 10 mm width elliptical epithelial layer was removed and the underlying connective tissue was exposed.

Prior to surgery, images were obtained with patients in active smile, and the amount of gingival display in active smile was

evaluated six months after the surgery. No intra- or post-operative complications were observed and all patients were satisfied with the outcomes of the treatment (Figure 3).



**Figure 3.** A remarkable decrease in gingival exposure was observed at 6-months follow-up of the patient.

### Discussion

Lip repositioning surgery is an innovative technique to correct excessive gingival display creating an attractive smile which will hopefully improve quality of life for gummy smile patients. Investigations have shown that the amount of gingival display in an attractive smile varies from 1 mm to 3 mm<sup>9</sup>. The specific etiologies of gummy smile require different treatments which may include botulinum toxin injections, orthodontic treatment, crown lengthening, and so forth<sup>2</sup>. The current literature consists of many case reports suggesting different treatment modalities for correction of gummy smile according to their etiology.

In the presented cases, lip repositioning were preferred since the underlying etiology for gummy smile were hypermobility of the upper lip elevator muscle. The procedure has been reported to be related with minimal postoperative side effects including bruising, discomfort, swelling of the upper lip, mucocele formation<sup>10</sup>. Similarly, our patients did not experience any severe symptoms following the procedure.

### Conclusion

As a safe and relatively simple procedure, lip repositioning may provide satisfactory outcomes for patients with excessive gingival display. However, careful examination of the patient and etiology of EGD is mandatory for proper indication and achieving successful results.

### Acknowledgement

There was no grant support for this study. All authors declare that there is no conflict of interest related to this work. This report was presented as an oral presentation at the ACBID 13<sup>th</sup> International Congress with EACMFS Endorsement held in Antalya, Turkey, in 2019.

### Source of Finance

### Conflict of Interest

All authors disclose any financial and personal relationships

with other people or organizations that could inappropriately influence (bias) their work.

## References

1. Tjan AH, Miller GD, The JG. Some esthetic factors in a smile. *J Prosthet Dent.* 1984;51(1):24-8.
2. Robbins JW. Differential diagnosis and treatment of excess gingival display. *Pract Periodontics Aesthet Dent.* 1999;11(2):265-272.
3. Martins AT, Sakakura CE, Correcirc BE, Pontes AEF. A modified technique that decreases the height of the upper lip in the treatment of gummy smile patients: a case series study. *J. Dent. Oral Hyg.* 2012; 4(3):21-28.
4. Livada R, Shiloah J. Gummy smile: could it be genetic? Hereditary gingival fibromatosis. *J Tennessee Dental Association.* 2012;92(1):23.
5. Monaco A, Streni O, Chiara Marci M, Marzo G, Gatto R, Giannoni M. Gummy smile: clinical parameters useful for diagnosis and therapeutical approach. *J Clin Pediatr Dentistry.* 2005;29(1):19-25.
6. Rubinstein AM, Kostianovsky AS. Cosmetic Surgery malformation of Smiles. *Prep Med Argent* 1973;60:952.
7. Roy BM. Lip Repositioning: Patient Outcome Assessments [master thesis]. Columbus, OH: The Ohio State University; 2016:1-28.
8. Alammar AM, Heshmeh OA. Lip repositioning with a myotomy of the elevator muscles for the management of a gummy smile. *Dent Med Probl.* 2018 Jul-Sep;55(3):241-246.
9. Silva CO, Ribeiro-Júnior NV, Campos TV, Rodrigues JG, Tatakis DN. Excessive gingival display: treatment by a modified lip repositioning technique. *J Clin Periodontol.* 2013;40(3):260-265.
10. Rosenblatt A, Simon Z. Lip repositioning for reduction of excessive gingival display: A clinical report. *Int J Periodontics Restorative Dent.* 2006;26:433-7.