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Case Report

Treatment of Excessive Gingival Display Using a Lip Repositioning Technique: A Case Report

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Abstract

Objective: One of the most important goals of dental clinicians is to meet the esthetic expectations of the patients. Excessive gingival display upon smiling is defined as "gummy smiling" and this situation may be a problem for the patients. Orthognathic surgery performed in gummy smile cases resulting from jaw deformites eliminates this problem. However, these procedures are quite invasive and requires hospitalization of the patients. For these reasons, "lip repositioning procedure", which involves retraction of smile elevator muscles, may be an alternative in the treatment of some gummy smile cases.

Materials and Methods: Gummy smile resulting from delayed tooth eruption and lip hyperactivity was diagnosed in a 22-year old female who applied to the ERU University, Dental Faculty, Periodontology Department with the complaint of excessive gingival display upon smiling. Lip repositioning procedure depending on the removal of a strip of mucosa from the maxillary buccal vestibule and suturing the lip mucosa to the mucogingival line was performed.

Results: Clinical success was achieved. The patient complained about tension while talking or smiling, which lasted for one week. At the 1-year follow-up, it was observed that the results were maintained and patient was statisfied with her clinical appearance.

Conclusions: Lip repositioning procedure performed in the true indication may be an alternative in the treatment of gummy smile.

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

Introduction

One objective of the dental clinician is to meet patient expectations [1]. A person's smile is one of the most important factor for the first impression [2]. Patients with excessive gingival display, also known as "gummy smile," usually experience dissatisfaction with their clinical appearance [3].

A gummy smile has four different etiologies. The first is passive eruption where gingiva does not complete its apical migration [4]. In these patients, the problem can be solved through crown lengthening, which is a very simple and effective procedure involving hard and soft tissue resection. The second etiology is a dentoalveolar extrusion [4]. Patients with a dentoalveolar extrusion must be treated by an orthodontist or through orthognathic surgery. The third etiology is a vertical maxillary excess; for these patients [4], orthognathic surgery is the inevitable treatment choice. The fourth etiology is a hyperactive upper lip [4]; these patients have different treatment choices available with variable outcomes reported for each, including a myectomy, botulinum toxin injection, lip elongation (associated with rhinoplasty), detachment of lip muscles, and lip repositioning [5]. Lip repositioning was first defined in plastic surgery literature in 1973 [6]; the topic was recently explored again in periodontology literature [4,5]. The objective of lip repositioning is to partially inhibit gingival display by limiting the retraction of elevator smile muscles (i.e. zygomaticus minor, levator anguli, orbicularis oris, and levator labii superioris). This technique involves removing a strip of maxillary vestibule mucosa and suturing the mucosa to the mucogingival line [6]. Other procedures are invasive, require patient hospitalization, or involve a long treatment period. For these reasons, lip repositioning may be an effective and alternative treatment in particular cases of gummy smile.

The aim of this case report is to present the one-year outcome of gummy smile treatment using lip repositioning.

Case Report

A 22-year-old woman visited the Periodontology Clinic at Erciyes University in Kayseri, Turkey. Her chief complaint was excessive gingival display upon smiling (Figure 1). She desired to minimize the gingival display of while smiling. Her medical history was unremarkable. On clinical examination, it was determined that the etiology of gummy smile was delayed tooth eruption and lip hyperactivity. 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.

Surgical Procedure

Thirty minutes prior to the operation, 100 mg ibuprofen was given to the patient to reduce post-surgery pain. Povidone iyodine (Batidex, Cimedis Cihan, Ankara,Turkey) was used as an extraoral antisepsis

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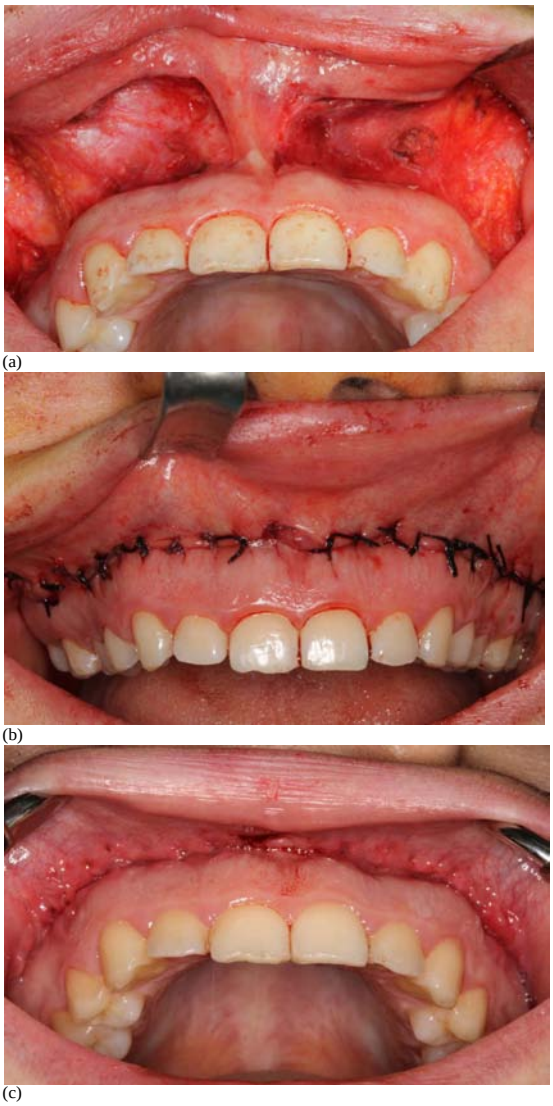
Figure 1: Pre-treatment excessive gingival display upon smiling.



(a)

(b)

(c)

Figure 2: Exposed submucosa after removal of the mucosal strips with labial frenulum kept intact (a), Intra-oral appearance following suturing (b), Post operative 1 week following removal of sutures (c).

and the patient rinsed with 0.12% chlorhexidine for 1 minute. Local infiltration anesthesia was performed from maxillary left first molar to right molar, a sterile pencil was used to mark the border line of incisions on the mucosa. The incision began horizontally on one side of maxilla from the labial frenulum and extended to the first molar.

This incision was approximately 1 mm coronal to the mucogingival line; the second incision was performed 10-12 mm apical to the mucogingival line and was parallel to the first incision. Finally, two parallel incisions were connected by two vertical incisions. Strips of outlined mucosa, as well as minor salivary glands and fat tissue, were removed (Figure 2a). The same procedure was repeated on the other side of maxilla keeping labial frenulum intact at midline. All incisions and mucosal removal were performed using #15c blades (Unaldi Medical,Istanbul, Lawton, Germany). Electrocautery was used to control bleeding and prevent hematoma. The parallel incisions were sutured with 4.0 Silk (Biokan Medical, Dogsan, Kayseri, Turkey) and an extraoral plaster (Hypafix,BSN Medical, Hamburg, Germany) was used to prevent swelling.

Post-Operative Management

Postoperative care included one week of analgesics (100 mg of ibuprofen) taken twice daily and an antimicrobial mouth rinse (0.12% chlorhexidine) used twice daily for one week. Patient was given a soft diet, an ice compress on the day of surgery and was informed to minimize lip movement on smiling and talking or avoiding any mechanical trauma.

Results

Postoperative healing was uneventful and she disclosed minimal discomfort for few days. The patient complained about tension while talking or smiling, which lasted for one week. Sutures were removed at 14 days following surgery. A minor scar formation occurred along the suture lines.

The 1-year follow-up showed a reduction of gingival display with minor scar formation. The patient was satisfied with her clinical appearance (Figure 3).

Discussion

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 [4,5] suggested without any prediction on the amount of reduction in gingival display. Riberio-Junior et al., have already reported that no correlation existed between the amount of tissue removed and reduction of gingival display [7].

In the postoperative period healing of the operation area was uneventful. Our patient experienced little discomfort (tension and swelling) upon smiling and talking which lasted 2 weeks. In literature, similar post-operative symptoms during the first week were also reported by the other clinicians [4-7]. Discomfort following operation showed variance between the case reports depending on the patient's perceptions.

The use of electrocautery was essential during surgery in order to avoid postoperative hematoma resulting from bleeding [8]. Hematoma may jeopardize mucosal healing by serving as a bacterial

Figure 3: Clinical appearance upon smiling at 1 year later.

reservoir for infection and causing sutures to loosen in early healing phase [9].

Previous studies reported that a relapse can occur after lip repositioning surgery [6,7,10,11]. One of the most important predisposing factor for relapse is the presence thin biotype [10,11]. 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 [7].

Various techniques such as myectomy, botulinum toxin injection, lip elongation (associated with rhinoplasty), detachment of lip muscles have been used in the treatment of gummy smile [12,13] Dental clinicians should prefer the least invasive and more simple and predictable treatment choice in such cases. Lip repositioning performed in our patient serves as a good sample in this sense.

Conclusion

The least invasive way of treating gummy smile requires proper diagnosis of the underlying etiology. Lip repositioning surgery may be a good treatment alternative to reduce the amount of gingival display in patients with upper lip hyperactivity as reported in this case. Both the patient and the clinicians were satisfied with the final outcome which was maintained a year.

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