

Coronally Positioned Vestibule for Gummy Smile

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Abstract

Gummy smile represent excessive gingival display in the maxilla upon smiling. This case report aims to explain the alternative surgical method to treat gummy smile by positioning the vestibule more coronally. This method advantageous because the surgical is performed without reduction of vertical dimension of labial mucosa. A 40-year-old female presenting the esthetic problem of excessive gingival display when smiling. The surgical is performed on the vestibule of the left to right second premolar in order to positioning the vestibule more coronally. One month after surgery, excessive gingival display has been significantly reduced.

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Introduction

Periodontal tissue conditions in the maxillary anterior region are generally associated with esthetic factors because they affect the appearance of a patient's smile. Gummy smile constitutes an exaggerated gingival display during spontaneous smiling¹. A smile profile is categorized as being a gummy smile when more than 3 mm of the gingival width of the vertical direction is visible. The smile profile is said to be well-balanced if the cervical crown of the maxillary anterior teeth display is located approximately 1 mm from the attached gingiva^{2,3}.

Rosemarie Mazzuco et al. categorized gummy smile according to the involvement of contracting muscles during the action of smiling: anterior, posterior, combination and asymmetry. Goldstein divided the gummy smile into three grades of severity: low, medium and high⁴. Epidemiological data suggests that gummy smile occurs more commonly in women than men, 10% of whom range in age from 20 to 30 years old. Its incidence decreases with age, the condition being a consequence of decreased muscle

strength surrounding the oral cavity⁵. Gummy smile can be caused by several factors including gingival enlargement, delayed passive eruption, dental-alveolar extrusion, vertical maxillary excess (VME), a short upper lip and a hyperactive upper lip⁵⁻⁷. Treatment for the condition is specific, depending on its cause, and can be either surgical or non-surgical in nature.

Materials and methods

A 40-year-old woman attended the Dental and Oral Hospital Universitas Airlangga complaining chiefly of a disproportionate gingival display when smiling. On preliminary intra-oral examination, the distance between the upper lip edge and the gingival margin in the maxillary anterior region during smiling was around 8 mm, whereas in the left and right maxillary posterior region ranging from the first premolar to the first molar ranges, it amounted to approximately 5 mm. (Figure 1b). On further detailed intra-oral examination, a number of conditions were identified: dental calculus was found in the lingual mandibular anterior and buccal maxillary posterior regions, there was an absence of periodontal pockets. Scaling and root planing were undertaken in all quadrants. A periodontal flap was indicated as being required for mucosal attachment reconstruction on the labial maxillary anterior. The study was conducted according to the Human Research Ethics Committee of Universitas Airlangga Faculty of Dental Medicine,

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and informed consent was obtained from the patient.

Treatment procedures

Premedication three times a day with 500 mg Amoxicillin orally was administered a day before the surgical procedure. Four cc of a local anesthetic consisting of Lidocaine HCl 20mg + Adrenaline 12,5µg was injected into the maxillary anterior labial fold, divided equally between the second left-to-right premolar region by infiltration technique. Coronally positioned vestibule procedure was created by making first horizontal incision on distance 8-mm from the gingival margin, along the second left-to-right premolar region by means of a #15 scalpel (Swann-Morton, Sheffield, England). A second incision was then made on the mucogingival junction, parallel to the first of exactly the same length as the previous incision (Figure 2). Both incisions were connected with each other. The next step consisted of removing gingiva between the two incisions by leaving a layer of gingival fibroblasts attached to the alveolar bone (Figure 3). Interrupted sutures were used to approximate two wound margin with blue nylon non-absorbable 5.0 sized yarn (Ailee Inc., Busan, South Korea) (Figure 4).



Figure 1. Patient profile before surgery: a). Closing the mouth. b). Smiling: the gingiva appears exaggerated.

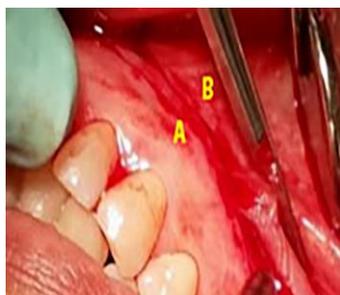


Figure 2. Second incision on the mucogingival junction parallel to the first incision. Details: a. The first incision. b. The second incision.



Figure 3. Remaining gingival fibroblasts.



Figure 4. Coronally positioned vestibule with interrupted sutures that connects the two incisions.



Figure 5. Intraoral conditions two weeks post-operative and patient profile one-month post-operative during smiling.

Patients were administered certain post-procedure medication, such as 500 mg of Amoxicillin, three times a day for five days, 500 mg Mefenamic Acid, three times daily for three days, 50 mg Diclofenac sodium, twice a day for three days, and Chlorhexidine gluconate oral rinse 0,1% every eight hours for seven days.

Results

On the first post-operative day, the patient experienced slight stiffness of the upper lip, accompanied by minimal pain. The extraoral examination revealed a slight swelling of normal color on the front lip. Intraoral examination revealed signs of inflammation in the surgical

wound site (with a limited degree of swelling) in the second left-to-right premolar region. By post-operative Day 7, stiffness of the upper lip had started to reduce in severity, pain was minimal and no swelling of the extraoral was visible. Intraoral examination confirmed the surgical wound site as continuing to be reddish with minimal swelling, while the stitches continued to close the surgical wound effectively. Patients were given Vitamin C 500 mg once a day for ten days and Vitamin E 100 IU twice a day over the same period. On post-operative Day 14, the patient reported no discomfort and both extraoral and intraoral examinations revealed no abnormalities. At the same time, the stitches were opened and the wound irrigated with NaCl solution (Figure 5).

Discussion

The common treatment for gummy smile involving periodontal tissue is that of a gingivectomy, usually undertaken when an area of the clinical crown remains covered by gingiva.^{8,9} One of the causes of this condition is delayed passive eruption.¹⁰ However, if the height-width ratio of the crown is already equal, then a gingivectomy procedure will result in the impression of longer teeth. This condition will detract from dental esthetics. Hence, alternative procedure are required to treat gummy smile if gingivectomy procedure will no longer performed for this reason. Alternative procedure can be done by positioning the vestibule more coronally.

Gummy smile can also treated by lip repositioning procedure. This procedure involves mucosa superiorly of mucogingival junction causing the reduction of vertical dimension of labial mucosa.¹¹⁻¹³ Coronally positioned vestibule is not involves the vertical dimension of labial mucosa. So that, the length of lip mucosa area is not reduced. It is anticipated that this change will decrease the length of lip mucosa, so that when the patient is smiling, the upper lip properly covers the gingiva.

The coronally positioned vestibule constitutes a form of vestibule reconstruction that relocates the vestibule to a more coronal position. In this case, vestibule reconstruction is performed by relocating the attachment between the mucosa and attached gingiva closer to the coronal. This method is performed without reducing the mucosa superiorly of mucogingival junction on

the vestibule area, but reducing the vertical dimension of attached gingiva. Patients with minimally attached gingiva contraindication for this method due to difficulties in relocating the vestibule.

In this case, the patient's upper lip curve formed a concave when smiling (creating a curved, downward line). Therefore, it proved necessary to remove a section of the mucosa as wide as that from the second left to right premolar. In particular cases, the removal of the mucosa merely requires a narrower area, i.e. from the left to right canine. This action can be completed if the upper lip curve forms a convex curve (curves upward) when the patient is smiling. If the gummy smile is mild, coronally positioned vestibule can maybe performed only in the frenulum area from the left to right maxillary incisor.

In this case report, the patient suffered from advanced gummy smile. The possible cause of gummy smile in this case is excessive strain on the maxillary elevator muscle when the patient is smiling. The muscles that play a role include the levator labii superioris, levator labii superioris alaeque nasii, zygomaticus major, zygomaticus minor and depressor septii¹⁴. This specific muscular hyperfunction causes the upper lip to be drawn up to a higher than normal position. Certain cases can be treated by Botox injection therapy, whose aim is that of weakening muscle pull.¹⁵ However, the systemic effects of this procedure, such as nausea, tenderness, and swelling must be taken into account. A number of contraindications need to be considered, including: pregnancy, allergy reaction, and whether the patient is taking calcium channel blocker medicine^{16,17}. Therefore, in order to minimize the systemic risk resulting from Botox injections, an alternative range of coronally positioned vestibule is selected. This technique aims to reduce the height of the upper lip position during smiling, thereby reducing the degree of exposed gingiva.

Another possible cause of gummy smile present in this case was that of mild vertical maxillary excess (VME). Its presence was supported by the results of observation of the exposed upper incisor when the patient was at rest. In severe case that accompanied by skeletal deformities, gummy smile should ideally be treated with orthognathic surgery.

Conclusions

In this case, gummy smile is probably associated with VME provide promising results regarding the maintenance of coronally positioned vestibule. Coronally positioned vestibule constitutes an alternative treatment for gummy smile.

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