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Lip Repositioning Technique: A Simple Surgical Procedure to Improve the Smile Harmony

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Abstract: ***Excessive gingival display is an esthetic concern for patients. It is a condition in which an overexposure of the maxillary gingiva (>3mm) is present during smiling. There are different etiologies of a gummy smile, such as vertical maxillary excess, short and hyperactive upper lip, altered passive eruption, anterior dentoalveolar extrusion, or a combination of these causes. The correct diagnosis of all etiologic factors is imperative for its appropriate management. Many techniques have been used to restore the dentogingival relation for the management of gummy smile. Lip repositioning is a conservative surgical technique used to treat excess gingival display. It is a largely unknown treatment modality. This limits lip elevation on smiling and increases lip fullness. This technique was designed to be shorter, less aggressive and to have fewer postoperative complications compared to orthognathic surgery. In the current case series presents three patients who were successfully managed with lip repositioning. The aim of this article is to describe the lip repositioning technique to decrease gummy smile by a simple surgical procedure.***

Keywords: Lip repositioning, Aesthetic Smile, Excessive gingival display, maxillary gingiva, anterior dentoalveolar extrusion

1. Introduction

For many years, dentists mainly focused on teeth without paying much attention to the gingiva, when treating esthetic issues of the oral cavity. However, today to be attractive, the lips, teeth, and gums are required to be in harmony. The gingival display is measured from the gingival margin to the lower border of the upper lip during smiling [1]. A beautiful smile is one with a 2mm gingival display [2] and when this exceeds 3mm it is considered to be unappealing and is known as a “gummy smile [3]. The worldwide prevalence of excessive gingival display is 10.5%–29% and it is less common in men than women, with a 2: 1 female tendency.

Excessive gingival display (EGD), commonly termed gummy smile, is a condition characterized by an overexposure of the maxillary gingiva while smiling (4). EGD may result from a single discrepancy, but is more commonly the result of an interplay of multiple factors. Proper diagnosis of etiological factors is essential to select the right treatment protocol. The aetiology of EGD is variable: related to bony maxillary excess, related to conditions causing gingival enlargement, related to deficient maxillary lip length or related to excessive mobility of maxillary lip (5). Many techniques have been used to restore the dentogingival relation for the management of gummy smile. Such techniques include crown lengthening procedures, orthodontic leveling of the gingival margins of maxillary teeth, maxillary teeth intrusion, lip repositioning, orthognatic surgery and nonsurgical procedures like the use of the botulinum toxin (6).

Lip repositioning procedure was first described in 1973 by Rubinstein and Kostianovsky as part of medical plastic surgery. Later on, it was introduced in dentistry, after being modified in 2006 by Rosenblatt and Simon. . (7).

This surgical technique of lip repositioning procedure to treat gummy smiles is suggested to be a conservative permanent solution that requires a less invasive approach than orthognathic surgery. Its purpose is to limit the traction of muscles involved in smiling (zygomaticus minor, levatoranguli, orbicularis oris, and levatorlabiisuperioris), by decreasing the depth of the upper vestibule [8].

The objective of the lip repositioning technique described in this case report is to minimize the gingival appearance by limiting the retraction of elevator muscles. The procedure can be performed in esthetically aware patients with lips in coronal position during smiling. However, adequate width of the attached gingiva is a prerequisite to accomplishing a satisfactory outcome.

2. Case Report

A 22 - year - old female patient, presented with the chief complaint of a “gummy smile”. They had previously been treated with orthodontics. Written informed consent was obtained following a discussion of risks, benefits, and treatment alternatives. Intra– and extraoral photographs were taken for planning and records.

On extra - oral examination, the face was found to be bilaterally symmetrical with incompetent lips. Intra - orally, the gingival display was 8 mm, during smiling, which extended from the right second premolar to the left second premolar.

Surgical procedure
First, adequate local anesthesia was achieved. The technique consists in doing an elliptical incision in the depth of the vestibule. A marking pencil was used to outline the borders of the elliptical incision. The inferior border of the incision was placed at the mucogingival junction and was extended from the mesial aspect of the first premolars bilaterally. As a general rule, it has been suggested that the distance between the superior and inferior borders must be twice the length of repositioning desired in the smile. Partial - thickness incisions were made using a scalpel across the superior and then the inferior border. The outlined mucosa is removed by partial thickness dissection, exposing the underlying connective tissue. The area of frenectomy was approximated with a simple interrupted suture to ensure symmetry and proper midline placement. The remaining closure bilaterally was completed with interrupted sutures to) stabilize the new mucosal margin to the gingiva. absorbable sutures were used (5 - 0 vicryl).

Postoperative instruction
Prescriptions for analgesics (ibuprofen 600 mg every 8 hours as needed) and chlorhexidine gluconate 0.12% (gentle bathing of the surgical area twice daily for 2 weeks) were given. Patient was instructed to apply ice packs at 20 minute intervals for 24 hours and soft diet during the first postoperative week. Oral hygiene can be reinstated after 48 hours. Additional instructions include avoiding any manipulation or mechanical trauma to the surgery and minimizing lip movements when smiling or talking the first 2 weeks postoperatively. Sutures were removed at the 1 - week postoperative visit. The extraoral final situation can be observed in Figures.

3. Discussion

Facial attractiveness is directly related to smile esthetics. The act of smiling involves a complex arrangement of muscle contractions that, in combination with the lip position, oral tissue characteristics, gingiva, and teeth, results in overall smile expression [9, 10].

The aim of this article is to describe the lip repositioning technique to decrease gummy smile by a simple surgical procedure. This technique was designed to be shorter, less aggressive and to have fewer postoperative complications compared to orthognathic surgery (11).

Proper diagnosis of the etiological factors is the first step to select the right treatment protocol. The aetiology of EGD is variable. It may include extraoral or introaoralcomponents. The contraindications for this technique include the presence of a minimal zone of attached gingiva, which can create difficulties in flap design, stabilization and suturing. Another contraindication is several vertical maxillary excess (VME). Degree II VME has gingival and mucosal display of 4 to 8 mm. In the other hand, in degree III VME more than 8 mm of soft tissue are seen. In both cases, an interdisciplinary approach is required (11).

The results showed that the employed surgical procedure successfully reduced the gingival display with low morbidity. The procedure is safe and has minimum side effects. [12] Reports in the literature have shown minimal post operative bruising, discomfort and swelling. Mucocele formation has been the most severe reported complication. [13, 14]

Lip repositioning procedure began as a plastic surgical treatment and ever since variations have been reported. [13] The original technique did not include severing the muscle attachment after flap reflection. [12,] However, some authors suggested performing myectomies to detach smile muscle attachment to prevent relapse. [15] Another method to prevent reattachment of smile elevator muscles is the placement of spacer between elevator muscles of lip and anterior nasal spine thereby preventing superior displacement of repositioned lip.

Silva et al. in 2012 reported successful management of excessive gingival display in a study wherein thirteen patients with excessive gingival display were treated with a modified lip repositioning technique. Treatment consisted of the removal of two strips of mucosa, bilaterally to the maxillary labial frenum and coronal repositioning of the new mucosal margin. The baseline gingival display of 5.8 ± 2.1 mm significantly decreased to 1.4 ± 1.0 mm at 3 months and was maintained until 6 months (1.3 ± 1.6 mm). Subjects were satisfied with their smile after surgery and would likely choose to undergo the procedure again (92%). [16]

Similar results were obtained in other case reports by Rosenbaltt, [13] Simon, [14] and Humayun et al. [17] who achieved approximately 4 mm of reduction in gummy smile.

Jacobs et al. in 2013 reported a case series where seven patients were successfully managed with trial, and then definitive, lip repositioning wherein a mean reduction in gingival display of 6.4 ± 1.5 mm was achieved. [18]

Vital et al. in 2013 presented case report of two patients treated with modified lip repositioning technique and obtained significant improvement in the amount of gingival exposure and esthetic satisfaction after a 6 month follow up. [19]

This case report shows that although the results of lip repositioning surgery appear stable for up to 6 months postoperatively, its utility as a long term treatment option remains questionable. More studies with larger sample size

and long term follow - up are necessary to establish the level of scientific evidence of this procedure.

Contraindications for lip repositioning surgery include inadequate width of attached gingiva in maxillary anterior sextent. Insufficient amount of tissue poses difficulty in flap reflection, stabilization and suturing. Patients with severe vertical maxillary excess cases are also not the ideal candidates for lip repositioning and should be treated with orthognathic surgery. [13]

4. Conclusion

Lip repositioning procedure is an effective way of reducing the EGD. However, long - term stability of the results needs to be seen. None the less, this procedure appears to be a promising alternative treatment option for excessive gingival display.

Source of support - Nil

Conflict of interest - Nil

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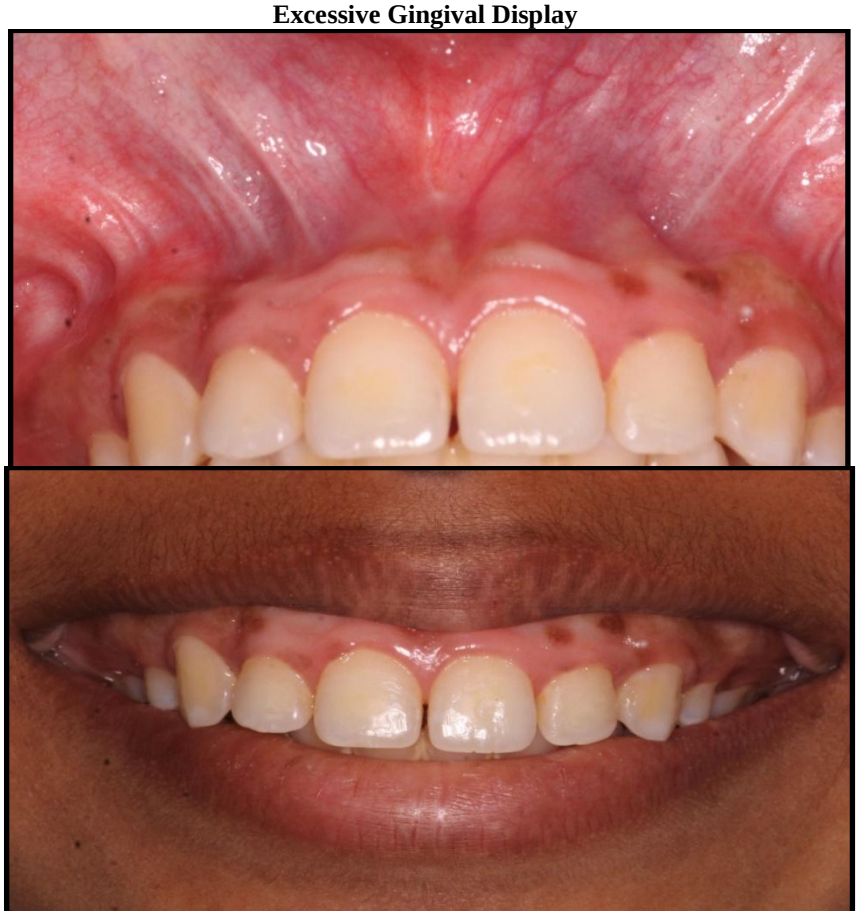
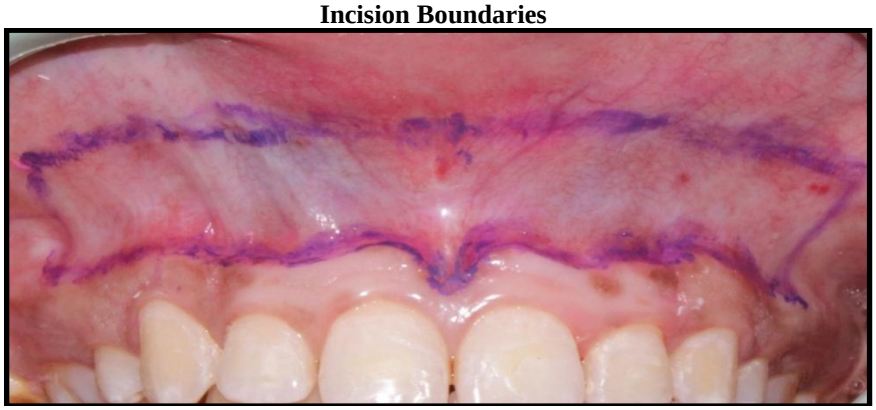
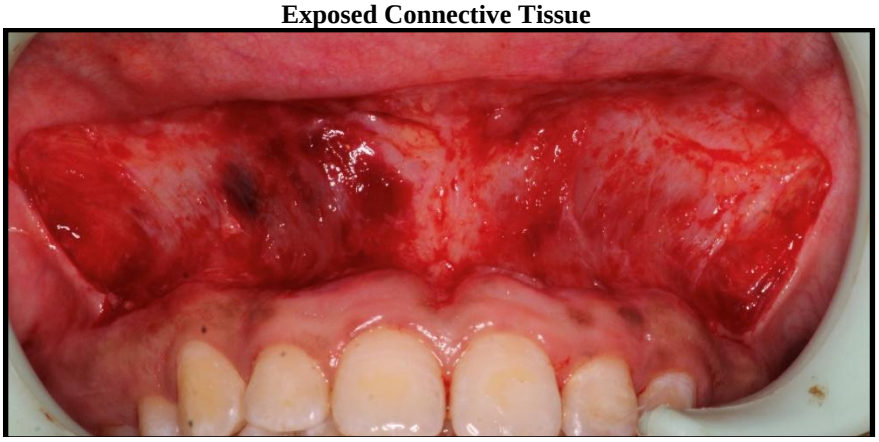
Excessive Gingival Display

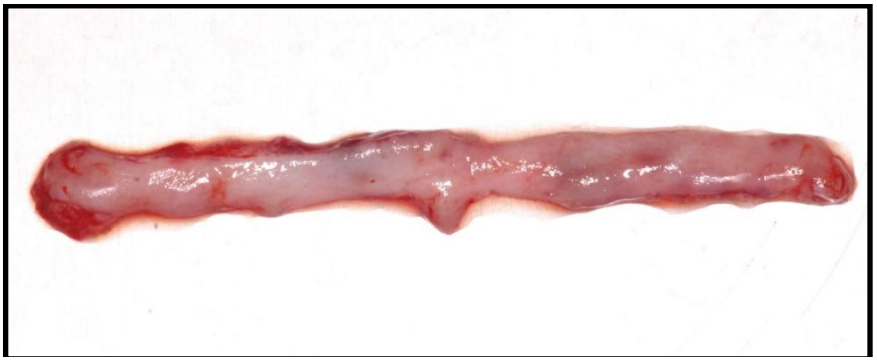


Incision Boundaries

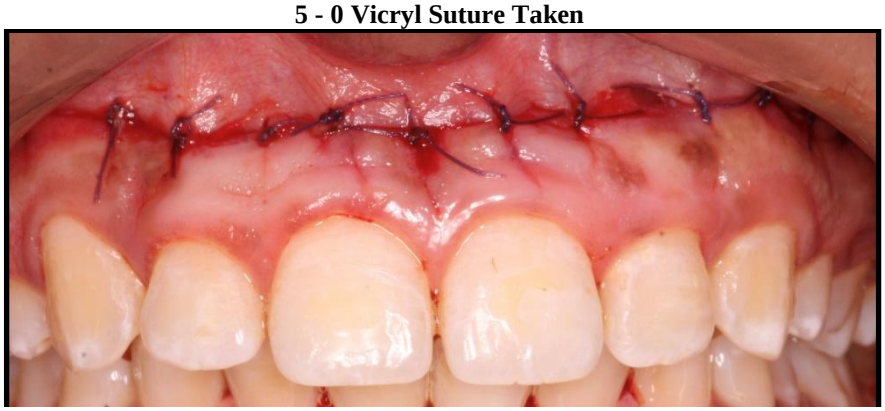


Exposed Connective Tissue

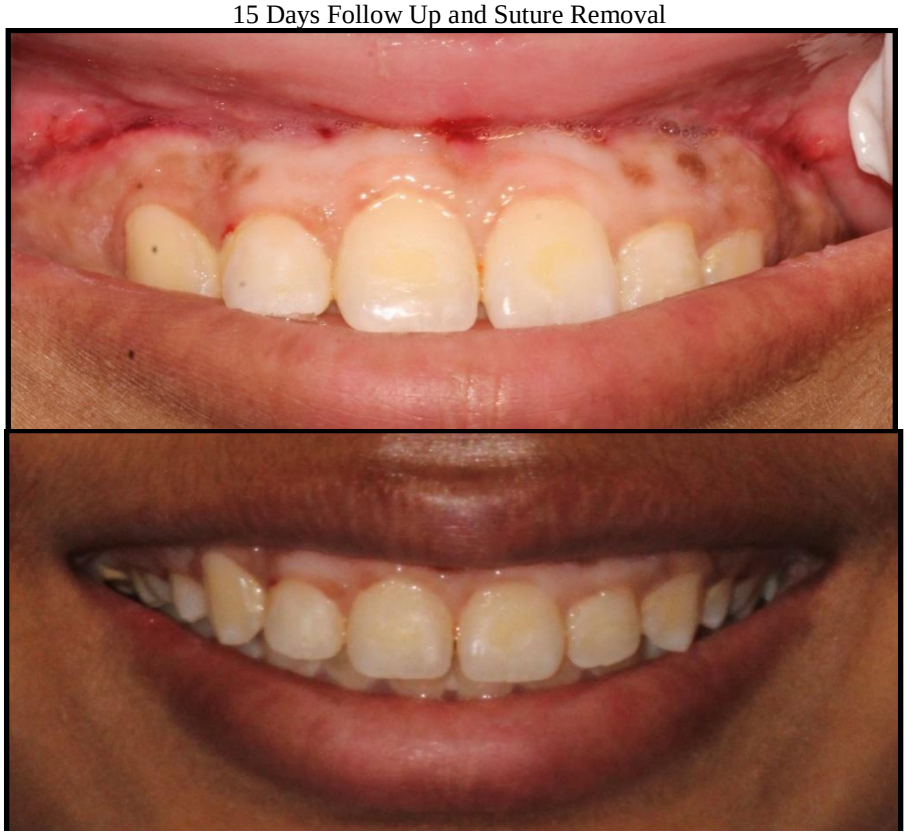




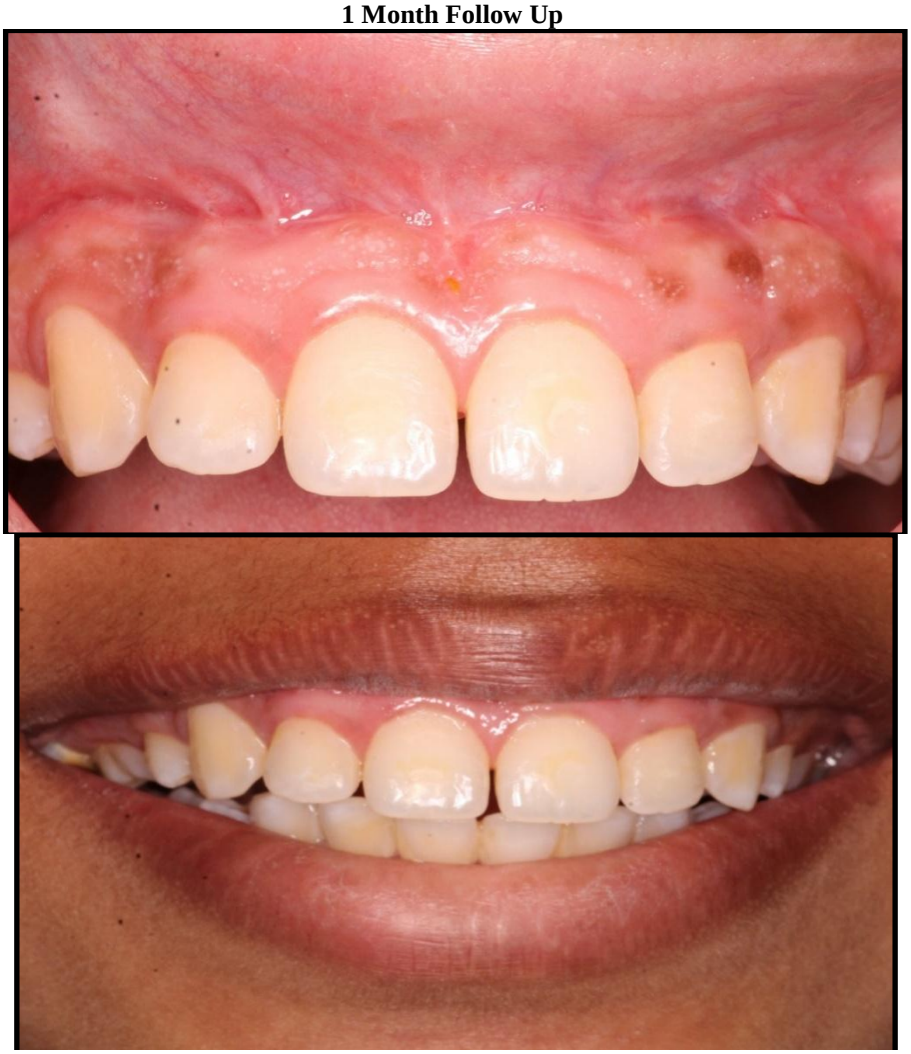
5 - 0 Vicryl Suture Taken



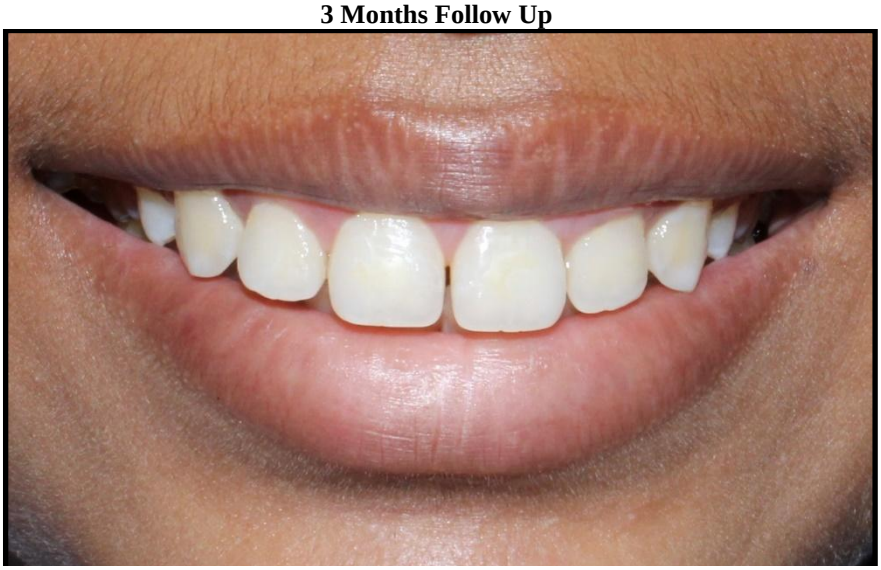
15 Days Follow Up and Suture Removal



1 Month Follow Up



3 Months Follow Up



6 Months Follow Up