

DECISION MAKING FOR MANAGEMENT OF EXCESSIVE GINGIVAL DISPLAY & SURGICAL TECHNIQUE OF LIP REPOSITIONING: A CASE REPORT

Dr.Sachin D. Funde^{*1}, Dr. Mala Dixit Baburaj², Dr. Sandeep K. Pimpale³ and Dr. Manish Ashtankar⁴

^{*1}Final Year Post Graduate Student, Dept. Of Periodontics, Nair Hospital & Dental College, Maharashtra University of Health Sciences, Mumbai, India.

²Professor and Head, Dept. of Periodontics, Nair Hospital & Dental College, Mumbai

³Assistant Professor , , Dept. of Periodontics, Nair Hospital & Dental College, Mumbai

⁴First Year Post Graduate Student, Dept. Of Periodontics, Nair Hospital & Dental College, Mumbai

Abstract

In the era of aesthetic dentistry a high smile line is a challenge well known to any aesthetically minded dentist. The exposure of more than three mm of the gum during the smile is known as gingival or gummy smile. This condition is known as excessive gingival display (EGD). EGD can be due to altered passive eruption, Hypermobility upper lip, Short upper lip, Vertical maxillary excess.

Keywords:

Lip Repositioning Surgery,
Excessive Gingival
Display, Aesthetic
Dentistry.

Lip repositioning surgery (LRS) is a new aesthetic surgical procedure for managing excessive gingival display. It involves precise resection of maxillary mucosal tissues with suturing of the lip in a more coronal position. With the help of reversible surgical trial patient and doctor can preview final results. Thus LRS turns out to be new conservative approach for managing EGD. This case report presents decision making for management of excessive gingival display and surgical technique of Lip Repositioning Surgery for Management of Excessive Gingival Display.

INTRODUCTION

In the era of aesthetic dentistry, people are not only concern about their teeth but also regarding their smile and appearance. The smile itself and the aesthetics of the smile are influenced by three components teeth, gums and lip. An attractive smile depends on the proper proportion and arrangement of these three elements. Any imbalance in one of these three factors may affect aesthetic appearance of the smile. An estimated 50% of patients show some amount of gingiva above the central incisors when smiling^[1]. Gingival display of one to three mm during smiling is accepted to be normal. The exposure of more than three mm of the gum during the smile is known as gingival or gummy smile. This condition is known as excessive gingival display (EGD). There are different aetiologies for EGD and the decision making for treatment planning is mentioned in (Table 1)^[2] and (Fig 1)^[2] given below.

A number of authors have written in detail on the diagnostic approach to this situation, and generally, the diagnoses considered are a hypermobile upper lip, short upper lip, and/or vertical maxillary excess.^[4,5] In many patients, the aetiology is likely a combination of one or more diagnoses.^[6]

The case report presented here discusses decision making in treatment planning of EGD and the surgical technique of lip repositioning procedure with fully reversible trial for managing EGD. The patient was given chance to preview the surgical result. Once the patient was fully satisfied with the reversible surgical trial, permanent surgery was performed.

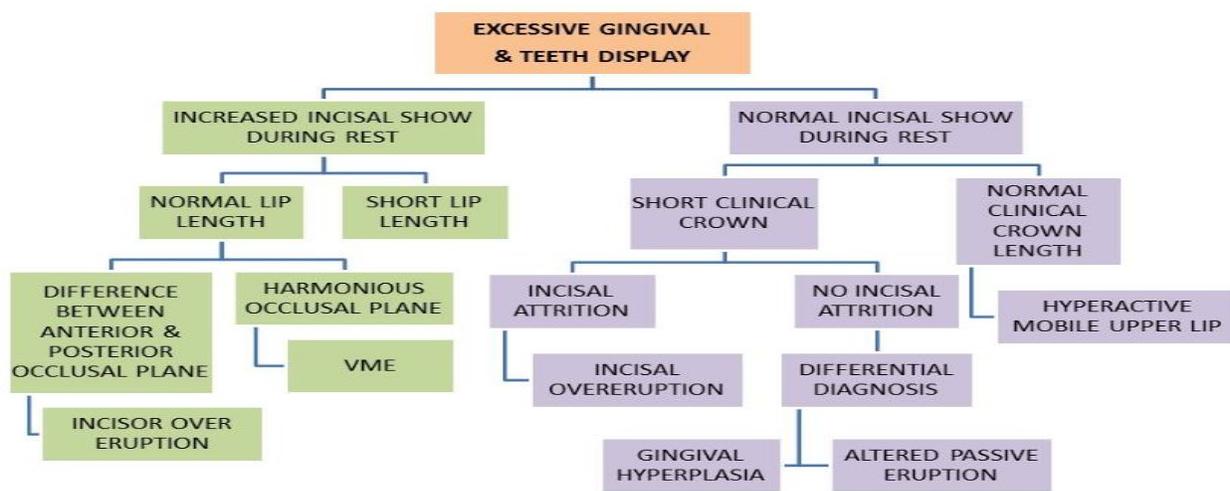


Fig. 1- Diagnosis of aetiology for Excessive Gingival Display

Table- 1 Various aetiologies, diagnosis and treatment for excessive gingival display.

Sr .No	Etiology of EGD	Diagnosis	Treatment
1	Short Lip (measured from the subnasale to the lower border of the upper lip)	Increased gingival exposure during rest, lip length less than 20 to 24 mm in young Adults.	Lip Repositioning Surgery
2	Gingival Enlargement Plaque-/drug-induced gingival Enlargement	Clinical examination H/o of Drug intake Normal incisor exposure at rest, short clinical crown, No attrition,	SRP, Drug substitution, Plaque control Gingivectomy - less than 6 teeth, sufficient keratinised gingiva, no attachment loss, absence intrabony defect Flap surgery -more than 6 teeth, less keratinised gingiva, underlying bony defect [3]
3	Altered/Delayed passive Eruption	Normal incisor exposure at rest, short clinical crown, No attrition,	Gingivectomy/ crown lengthening, with/without osseous reduction upon trans gingival probing

4	Anterior dentoalveolar extrusion	Tooth wear at the anterior region (compensatory incisor over eruption) or with anterior deep bite. In cases with deep bite, there is usually a discrepancy in the occlusal plane between the anterior and posterior segments	orthodontic intrusion of the involved teeth moving the gingival margin apically, surgical periodontal correction with or without adjunctive restorative therapy, or an interdisciplinary comprehensive treatment plan
5	Vertical maxillary excess (VME)	Increased gingival exposure during rest, Normal lip length, Harmonious occlusal plane, Increased lower facial height on Cephalometric analysis measured between the palatal plane and the incisal edge of the maxillary incisors.	Degree I:-2–4mm EGD Orthodontic intrusion Orthodontics and periodontics. Periodontal and restorative therapy Degree II:-4 to 8 mm EGD Periodontal and restorative therapy. Orthognathic surgery (Le Fort I osteotomy) Degree III:-≥ 8 mm EGD, Orthognathic surgery with or without adjunctive periodontal andrestorative therapy
6	Hyperactive upper lip	Normal incisor exposure during rest,Normal clinical crown length	Levator myectomy and partial removal technique. implant spacer technique, Botulinum toxoid injection

CASE REPORT

A female patient, aged 21 was reported to Department of Periodontics, Nair Hospital Dental College, Mumbai on 5th January 2014, with a chief complaint of excessive display of gums upon smiling. Patient had forwardly placed premaxilla with angle's class II malocclusion. Patient had vertical maxillary excess. Patient had five to seven mm of gingival display upon smiling above the CEJ of maxillary anterior teeth. (Fig. 2) Risks, benefits, and treatment alternatives were discussed with patient and written consent was obtained. Patient was agree to undergo the lip repositioning surgery with a reversible trial. Intra- and extra oral photographs were taken for planning and records.



Fig. 2- Preoperative clinical picture of Patient with 5 to 7 mm of gingival display upon smiling above the CEJ of maxillary anterior teeth.

SURGICAL PROCEDURE

The treatment was planned in the sequence of reversible lip repositioning, patient evaluation and approval, and definitive surgical repositioning. Topical lignocaine jelly was applied for reversible suture trial. For reversible trial superior and inferior borders were marked with bleeding points. The inferior border of this is defined by the mucogingival junction from the mesial aspect of the first molars bilaterally. The superior border is best described as moustache-shaped—slightly inferior in the area of the labial fraenum, cresting in the area of the canine, and tapering toward the posterior.

As a general rule, it has been suggested that the distance between the superior and inferior borders be twice the length of repositioning desired in the smile.^[7] Nine to ten, 3-0 silk sutures were placed approximately at the labial fraenum, above both canines and premolars, as needed (Fig 3). This allowed the upper border to be drawn down to the mucogingival junction thus inverting and tucking behind the tissue proposed for excision. At this point, photographs were taken and the patient was able to evaluate the potential result (Fig. 4). Patient was given a chance to view the photographs and use a mirror. Patient was allowed to go to the home overnight prior to the definitive surgery.



Fig. 3- Presurgical Trial with silk sutures placed approximately at the labial fraenum, above both canines and premolars.



Fig. 4- Reversible surgical trial showing preview of final lip position in patient.

Once the patient was satisfied with final lip position via reversible trial, next the temporary sutures were removed. A partial-thickness incision was made first across the superior border, then the inferior, connecting in the posterior bilaterally. The epithelium bounded by these incisions was then removed. (Fig 5a, 5b).



Fig. (5a) and (5b) - De-epithelisation of left labial mucosa and right labial mucosa respectively.

The tissue thickness was approximately one mm. The remaining closure was completed with interrupted sutures using 3-0 silk (Fig 6). Postoperative instructions were then given. A soft diet was recommended for 24 hours. Patients were asked to avoid high smiling for 1 week, to avoid pulling on the lip to examine or display the wound, and to avoid brushing in the area for three days. Nonsteroidal anti-inflammatory drugs and antibiotic were recommended for pain control, and cold packs were given to patients to be used in the first 24 hours following surgery.



Fig. 6- Final suturing of upper incision border to lower incision border using silk with simple interrupted suture technique.

RESULTS

Patient was seen the day after surgery for follow-up. Periodic follow-up occurred for suture removal after seven days, when necessary and for photographs (Fig 7a and 7b). The mean preoperative gingival display on smiling was five to seven mm. The corresponding mean postoperative measurement was 1.5 to 2 mm below the gingival zenith. The patient was fully satisfied and was happy with new appearance. Follow up after three months showed two to three mm of relapse (Fig 8).



Fig. (7a) and (7b) - 7 day postoperative picture after suture removal. Fig. 7a- Healing after 7days. Fig 7b- Final corrected lip position after 7 days following surgery.



Fig. 8- Clinical picture of follow up after 3 months showing 2-3 mm of relapse in final corrected lip position.

DISCUSSION

This case report presents the conservative management of EGD with LRS, including a novel reversible trial repositioning prior to definitive treatment. Successful treatments with variations of LRS were first described in the medical literature in 1973 by Rubinstein and Kostianovsky.^[8] In 1979, Litton and Fournier described gummy smile correction with LRS, including elevator muscle detachment in cases with a short upper lip.^[9] Miskinyar, in 1983, reported little success with LRS, but saw no relapse in 27 patients treated with myectomy and partial resection of either one or both of the levator labii superioris muscles bilaterally.^[10] Ellenbogen and Swara reported success in limiting lip elevation on smiling (maximum correction, 6 mm) by partially transecting the lip elevator muscles and implanting a silicone spacer.^[11] In the dental literature, multiple authors have presented case reports of single patients successfully treated with LRS.^[5,7]

Patient had mild discomfort for 24 to 48 hours, with no serious side effect. Possible complication includes unilateral paraesthesia, and mucocele. Relapse over the long term cannot be ruled out, and future research should aim to evaluate stability of the result. Here, the authors demonstrate positioning of the lip slightly below the zenith, in anticipation of some small amount of relapse following complete healing.^[12]

CONCLUSION

Lip repositioning can be seen as excellent alternative to the more costly and time-consuming treatment available for excessive gingival display. The main advantage of the LRS that it consist of reversible surgical trial whereby patient can preview the result. Thus LRS comes out to be innovative, minimally invasive aesthetic surgical procedure for managing EGD and should be preferred over more invasive surgeries.

REFERENCES

1. Crispin BJ, Watson JF. Margin placement of esthetic veneer crowns. Part I: Anterior tooth visibility. *J Prosthet Dent* 1981;45:278–82.
2. Silberberg N, Goldstein M, Smidt A. Excessive gingival display--etiology, diagnosis, and treatment modalities. *Quintessence Int* 1985;40:809–18.
3. Paulo M. Camrigo, Fermin A. Carranza, Henry H. Takie. Treatment of gingival enlargement. In: David L. Cochran, E.Barrie Kenney, William V., Giannobile MJN, editor. *Clinical Periodontology*, 10th ed. Noida: Elsevier; 2007.p.918-925.
4. Ezquerria F, Berrazueta MJ, Ruiz-Capillas A, Arregui JS. New approach to the gummy smile. *Plast Reconstr Surg* 1999;104:1143–50.
5. Humayun N, Kolhatkar S, Souiyas J, Bholia M. Mucosal coronally positioned flap for the management of excessive gingival display in the presence of hypermobility of the upper lip and vertical maxillary excess: a case report. *J Periodontol* 2010;81:1858–63.
6. Robbins JW. Differential diagnosis and treatment of excess gingival display. *Pract Periodontics Aesthet Dent* 1999;11:265–72.
7. Simon Z, Rosenblatt A, Dorfman W. Eliminating a gummy smile with surgical Lip repositioning. *J Cosmetic Dent* 2007;23:100–108.
8. Rubinstein A, Kostianovsky A. Cirugiaestetica de la malformacion de la sonrisa. *Pren. Med Argent* 1973;60:952-4.
9. Litton C, Fournier P. Simple surgical correction of the gummy smile. *Plast Reconstr Surg* 1979;63:372–3.
10. Miskinyar SA. A new method for correcting a gummy smile. *Plast Reconstr Surg* 1983;72:397–400.
11. Ellenbogen R, Swara N. The improvement of the gummy smile using the implant spacer technique. *Ann Plast Surg* 1984;12:16–24.
12. Jacobs PJ, Jacobs BP. Lip repositioning with reversible trial for the management of excessive gingival display: a case series. *Int J Periodontics Restorative Dent* 2013;33:169–75.

AUTHOR BIBLIOGRAPHY



Dr.Sachin D. Funde

Final Year Post Graduate Student

Dept. Of Periodontics, Nair Hospital & Dental College , Mumbai

Correspondence Address – Plot 86, Sec 2, Indrayani Nagar,

Bhosari, Near Water tank ,Pune 400026

Email- sachindfunde@gmail.com



Dr. Mala Dixit Baburaj
Professor and Head , Dept. of Periodontics
Nair Hospital & Dental College , Mumbai
Email- maladixit25@gmai.com



Dr. Sandeep K. Pimpale
Assistant Professor , , Dept. of Periodontics
Nair Hospital & Dental College , Mumbai
Email-sandeppimple@gmail.com



Dr. Manish Ashtankar
First Year Post Graduate Student
Dept. Of Periodontics, Nair Hospital & Dental College , Mumbai
Email-manishashtankar@gmail.com