

Improving Smile Aesthetics: The Periodontal Way!!

Lipika Gopal¹ Nipun Dhalla^{2*} Shetal Rani³ Pooja Palwankar⁴ Ruchi Pandey⁵

¹Senior Lecturer, Department of Periodontology, Manav Rachna Dental College, Faridabad, Haryana, India.

²Reader, Department of Periodontology, Manav Rachna Dental College, Faridabad, Haryana, India.

³PG Student, Department of Periodontology, Manav Rachna Dental College, Faridabad, Haryana, India.

⁴Professor and Head, Department of Periodontology, Manav Rachna Dental College, Faridabad, Haryana, India.

⁵Reader, Department of Periodontology, Manav Rachna Dental College, Faridabad, Haryana, India.

ABSTRACT

Background: A beautiful smile is considered to set everything straight and uplift one's personality. The smile is a harmonious relationship of our teeth, lips and gingiva. A charming smile and facial aesthetics are strongly related to each other. Individuals predominately emphasize on another person's eyes and mouth during interaction and the smile ranks second to eyes, as the most important feature in facial attractiveness (Goldstein RE, 1969). Therefore, an attractive, well-balanced smile is a highly regarded treatment objective, along with creating a functional occlusion.

Keywords: Smile design, aesthetics, periodontology.

INTRODUCTION

"Beauty is a power and a smile is the sword" is one of the popular phrases given by John Ray. A beautiful smile is considered to set everything straight and uplift one's personality. The smile is a harmonious relationship of our teeth, lips and gingiva. A charming smile and facial aesthetics are strongly related to each other. Individuals predominately emphasize on another person's eyes and mouth during interaction and the smile ranks second to eyes, as the most important feature in facial attractiveness (Goldstein RE, 1969). Therefore, an attractive, well-balanced smile is a highly regarded treatment objective, along with creating a functional occlusion. The lips form the frame of a smile and as such define the aesthetic zone as incisors and canines are positioned at vermilion border of maxillary lip (Chu SJ et al, 2009). The gingival margin of lateral incisor is usually located at 1 to 2mm more incisally or at the same height as of central incisor and canines. The height of contour of the gingival margin is at distal line angle of maxillary central incisor and canines

and in centre, mesiodistally to lateral incisor (Chu SJ, 2009).

Gummy smile contributes a major portion of an attractive smile. Excessive gingival display (EGD) or gummy smile is the term used when there is an overexposure of maxillary gingiva during smile. It is multifactorial that can be hereditary, acquired and skeletal in nature. Excessive anterior maxillary height, hyperfunction of labial elevator muscles, and excessive gingiva caused by delayed passive eruption are 3 major reasons for gummy smile. A classification based on combining the various dental, skeletal, and soft tissue etiologic factors resulting in excessive gingival display (EGD) (Bhola et al, 2015) is as follows:-

1. EGD(A) Altered passive eruption
2. EGD(B) Bony maxillary excess
3. EGD(C) Conditions causing gingival enlargement
4. EGD(D) Deficient maxillary lip length
5. EGD(E) Excessive mobility of maxillary lip

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*Correspondence Dr. Nipun Dhalla.

Department of Periodontology, Manav Rachna Dental College, Faridabad, Haryana, India.

Email: Not Disclosed

The various treatment modalities to correct the gummy smile are dependent on the etiology. The techniques documented are by contracting by injecting botulinum toxin (Polo M, 2008), crown lengthening with or without osseous resection (Mostafa D, 2018), by means of myotomy ie sectioning the upper lip elevator muscles and the labial frenulum further causing less lip mobility during smile (Ishida LH et al, 2010), by orthodontic therapy with or without orthognathic surgery (Izraelewicz-Djebali E et al, 2015), lip repositioning (Grover HS et al, 2014).

Lip repositioning procedure was first described in 1973 by Rubinstein and Kostianovsky in medical plastic surgery. Later, it was introduced in dentistry, after being modified in 2006 by Rosenblatt and Simon. It is a conservative surgical technique that offers a less invasive approach to EGD. The surgery limits smile muscle pull (zygomaticus minor, levator anguli, orbicularis oris, and levator labii superioris) by decreasing the depth of the upper vestibule.

The aim of this article is to describe the lip repositioning technique followed by crown lengthening to decrease excessive gingival display.

CASE REPORT

A 38-year-old woman with no significant medical history reported to the Department of Periodontology, Manav Rachna Dental College, Faridabad with a chief complaint of excessive display of gums while smiling. Extraoral clinical examination revealed symmetric facial thirds as well as a normal upper lip length of 20 mm. On intraoral examination, periodontal tissues were found to be healthy with an adequate width of attached gingiva on the facial aspect. High smile line and 7 mm of gingival display during smile was detected (Fig 1). Due to the aberration in the normal steps of eruption termed Altered Passive Eruption, 2 to 3 mm of the anterior crowns were submerged by excess gingiva, revealing short clinical crown (disproportionate crown height/ width ratio) (Fig. 2). Probing depth and clinical attachment level were 3 mm in relationship to maxillary anteriors. The preoperative radiograph (orthopantomograph) was assessed and it did not show any abnormalities in any form. During extravagant smiling, an over exuberant lip raising was observed, which confirmed the presence of hyperactive upper lip.

Fig 1: Pre-op Smile line



Fig. 2 - Intra oral depicting short clinical crown



Fig 3: Bleeding points for crown lengthening



Fig 4: Post crown lengthening.



Fig 5: Marking of incision line for lip repositioning.



Fig 6: Partial thickness incision.



Fig 7: Band of tissue excised.



Fig 8: Sutures placed.



Fig 9 Post operative:



The patient was diagnosed with EGD associated with APE Type 1A (Bhola et al, 2015). The treatment plan was formulated as crown lengthening procedure by scalpel gingivectomy and if further required lip repositioning would be performed. Patient was explained with all the post op complications regarding surgical technique and a written consent was taken from her.

Adequate local anesthesia was administered, transgingival probing was done around the tooth and found that 3 mm of soft tissue present above the alveolar crest. Krane Kaplan Pocket Marker was placed to mark the bleeding points and no. 15 Bard-Parker blade was used to give the initial internal bevel incision 3 mm above the gingival margin so as to achieve the ideal contour both on labial and palatal aspect (Fig. 3). Note that biologic width (BW) is maintained. Chlorhexidine rinse 0.2% bid was prescribed for 2 weeks, and the patient was given appropriate postoperative instructions. Patient was recalled after 1 week to check for healing followed by 1 month follow up for the surgical procedure (Fig. 4) and Pre-operative measurements for lip repositioning surgery were made to check the smile line (which was measuring around 15 mm). According to the decision plan framed, Local anaesthetic was administered in the vestibular mucosa and lip from maxillary right to left first pre molar. A marking pen was used to outline the incisions on the dried tissues (Fig. 5). A partial-thickness incision was made at the mucogingival junction from the right first premolar to the left first premolar, second partial thickness incision was made parallel to the first incision in the labial mucosa, 8-10 mm apical to the mucogingival junction (Fig. 6) . The epithelial band was removed, leaving the underlying connective tissue exposed (Fig. 7) . Care was taken to avoid damaging minor

salivary glands in the submucosa. The parallel incision lines were approximated with interrupted sutures (vicryl 4-0) at the midline and other locations along the borders of the incision to ensure proper alignment of lip midline with the midline of the teeth. Then interrupted sutures were continued on the either sides to approximate both flap ends (Fig. 8).

The sutures were removed 10 days post operatively and satisfactory healing was observed intra-orally (Fig. 8).

DISCUSSION

Proper case selection and diagnosis are considered to play a critical role. The etiology should be identified first and then treatment plan to be formulated. The prevalence of Excessive gingival display includes Age range of 20-30 years with rate of 7 % in men and 14% in women (Ramesh A et al, 2019). Relevance Of Genetics In Excessive Gingival Display(EGD) shows 65% of the patients have at least one family member who show the same condition, and 15% of the subjects have the whole family group with altered passive eruption (Rossi R et al, 2014). It is indicated only in patients who refuse to undergo orthognathic surgery. Devang et al. in 2019 reported treatment which comprised removal of two strips of mucosa, bilaterally to the maxillary labial frenum, and coronal repositioning of the new mucosal margin and deduced that lip repositioning can be considered a promising treatment in esthetic rehabilitation (Devang DT et al, 2019).

In accordance to a report by Sanchez IM et al, they concluded that with proper diagnosis and sequence of therapy, modified lip repositioning surgery combined with esthetic crown lengthening can be used unvariedly to treat EGD and enhance smile esthetics (Sánchez IM et al, 2017) as described in the present case.

The complications with the surgical procedure includes formation of a mucocele because of severing of minor salivary glands in the upper lip, feeling of discomfort, numbness, and difficulty in some movements of upper lip. Paresthesia may be experienced by a minority of patients postoperatively. Contraindications for lip repositioning surgery include inadequate width of

attached gingiva in maxillary anterior sextant. The surgeon experiences difficulty in flap reflection, stabilization and suturing. Patients with severe vertical maxillary excess cases are also not considered ideal candidates for lip repositioning and therefore, should be treated with orthognathic surgery (Dayakar MM et al, 2014).

This technique have shown favourable results with a 75–80% improvement in the more severe and complicated cases and up to 100% with stable results in relatively simple cases (Humayun N et al, 2010). The recurrence rate has shown to be 6-8 weeks in literature which includes various reasons such as high muscle pull, not incising enough tissue. The recurrence can be rectified by second surgical entry and excising enough tissue or the use of Botox injections (Bhola R et al, 2015).

CONCLUSION

The various periodontal plastic procedures favours esthetics improvements thereby increasing self-esteem of the individual. Lip repositioning surgery is considered to be a successful therapeutic procedure for excessive gingival display and further esthetic rehabilitation. It is considered a plastic surgical procedure. Therefore, the above case can be termed as unique as it combines a plastic surgical procedure along with dental periodontal procedure of crown lengthening. However, stability needs to be evaluated by various literature reviews to enhance this treatment modality.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

REFERENCES

1. Bhola R, Kinsella E, Giffin N, Lipscombe S, Ahmed F, Weatherall M, et al. Single-pulse transcranial magnetic stimulation (sTMS) for the acute treatment of migraine: evaluation of outcome data for the UK post market pilot program. *J Headache Pain*. 2015;16:535.
2. Bhola, Monish & Fairbairn, Peter & Kolhatkar, Shilpa & Chu, Stephen & Morris, Tamaara & Campos, Marinele. LipStaT: The Lip Stabilization Technique- Indications and Guidelines for Case Selection and Classification of Excessive Gingival Display. The

International journal of periodontics & restorative dentistry. 2015;35:549-59.

3. Chu SJ, Tan JH, Stappert CF, Tarnow DP. Gingival zenith positions and levels of the maxillary anterior dentition. *J Esthet Restor Dent*. 2009;21(2):113-20.

4. Chu SJ, Tarnow DP, Tan JH, Stappert CF. Papilla proportions in the maxillary anterior dentition. *Int J Periodontics Restorative Dent*. 2009;29(4):385-93.

5. Dayakar MM, Gupta S, Shivananda H. Lip repositioning: An alternative cosmetic treatment for gummy smile. *J Indian Soc Periodontol*. 2014;18(4):520-3.

6. Devang DT, Shilpi S, Saptak RS, Archita K. An Integrated modified lip repositioning using bioresorbable collagen membrane: A long-lasting auxiliary treatment approach for gummy smile. *J ICDRO*. 2019;11(1):43-48.

7. Goldstein RE. Study of need for esthetics in dentistry. *J Prosthet Dent*. 1969;21(6):589-98.

8. Grover HS, Gupta A, Luthra S. Lip repositioning: A pioneering technique for perio-esthetics. *Contemp Clin Dent* 2014;5:142-5.

9. Humayun N, Kolhatkar S, Souiyas J, Bhola 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;81:1858-1863.

10. Ishida LH, Ishida LC, Ishida J, Grynglas J, Alonso N, Ferreira MC. Myotomy of the levator labii superioris muscle and lip repositioning: A combined approach for the correction of gummy smile. *Plast Reconstr Surg*. 2010;126:1014-9.

11. Izraelewicz-Djebali E, Chabre C. Gummy smile: orthodontic or surgical treatment? *J Dentofacial Anom Orthod* 2015;18:102.

12. Mostafa D. A successful management of severe gummy smile using gingivectomy and botulinum toxin injection: A case report. *Int J Surg Case Rep*. 2018;42:169-174.

13. Polo M. Botulinum toxin type A (Botox) for the neuromuscular correction of excessive gingival display on smiling (gummy smile). *Am J Orthod Dentofacial Orthop* 2008;133:195-203.

14. Ramesh A, Vellayappan R, Ravi S, Gurumoorthy K. Esthetic lip repositioning: A cosmetic approach for correction of gummy smile – A case series. 2019;23(3):290-294.

15. Rossi R, Brunelli G, Piras V, Pilloni A. Altered Passive Eruption and Familial Trait: A Preliminary Investigation. *Int J Dent*. 2014;2014:1-5.

16. Sánchez IM, Gaud-Quintana S, Stern JK. Modified Lip Repositioning with Esthetic Crown Lengthening: A Combined Approach to Treating Excessive Gingival Display. *Int J Periodontics Restorative Dent*. 2017;37(1):e130-e134.