

Pursuit of Esthetics- Three techniques unified- A case report

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Abstract

Introduction

In today's world of esthetic driven dentistry everyone desires of a pleasing smile. Generally the most pleasing smile, is considered to be a smile line having minimal gingival display along with visibly clean and spotless teeth.

Excessive gingival display or referred commonly as 'gummy smile' are source of embarrassment and may lead to loss of self-esteem and confidence in many patients. Periodontium manifests many kind of developmental or acquired deformities out of which "gummy smile, is a common deformity¹.

While numerous factors may be responsible for excessive gingival display, most common is short lip length and its hyper activity, short clinical crown length, vertical maxillary excess and dentoalveolar extrusion.

A prevalence between 10.5%² and 29%³ has been recorded for Gummy smile. It is more prevalent and considered more unaesthetic in females^{4,5,6} than in males.

At rest the average length of lip, measured from the subnasale to the most inferior portion of the upper lip at the midline is about 22-24 millimeters in males and 20-22 millimeters in females⁷. If the upper lip length is within normal range and the lower facial third is not disproportionate, a hyperactive upper lip is considered to be the main cause of gummy smile. In such cases, various treatment approaches have been used, with highly variable outcomes; botulinum toxin^{8,9}, lip elongation associated with rhinoplasty¹⁰, lip muscles detachment¹¹, myotomy and partial removal^{12,13} and lip repositioning^{14,15,16} are the reported treatment approaches. In the case discussed below lip repositioning along with crown lengthening and bleaching was performed to achieve a wholesome aesthetic result.

Aim of the technique

Lip repositioning is performed with an objective to minimize the gingival display by limiting the hyperactivity or retraction of the elevator smile muscles (like zygomaticus minor, orbicularis oris, and levator anguli and levator labi superioris). For a better result, in

the presence of inappropriate crown length to width ratio, crown lengthening is needed to perform though only crown lengthening would not suffice the purpose because only a limited amount of gingiva can be removed with an aim of not hindering the biological width. And finally bleaching was done to do away with intrinsic band of stain present on anterior tooth.

Case Report

A 23-year-old female patient visited to the department of Periodontics, Sardar Patel Post Graduate Institute of dental and medical sciences, Lucknow, Uttar Pradesh(India) with a chief complaint of gummy smile along with an unaesthetic anterior tooth due to staining(Fig. 1). In this case the goal of the treatment was to minimize the gingival display in her smile along with correction of stained tooth. The patient had an inappropriate crown length to width ratio. A diagnosis of moderate vertical maxillary excess was established. The patient preferred a comparatively less invasive procedure to address her chief complaint when she was discussed for an alternate treatment option of orthognathic surgery by an oral and maxillofacial surgeon.



Fig. 1: Pre-Op

Procedure

After complete extraoral and intraoral mouth disinfection was performed out, an infiltration local

anesthesia was administered. After this, with the help of an indelible pencil the surgical area was demarcated (Fig. 2), which started at the mucogingival junction and terminated 10-14 millimeters superiorly into the vestibule. Once the site was demarcated, Incisions were made for the surgical site and both superior and inferior partial-thickness flaps were raised from the first molar to the first molar involving both the quadrants in upper arch. The incisions were then connected with each other on the distal end in an elliptical fashion. The epithelium was then removed (Fig. 3 & 4) within the borders of the incision, and leaving behind the underlying exposed connective tissue. To ensure proper alignment of the lip midline with the midline of the teeth the parallel incision lines were approximated with interrupted stabilization sutures at the midline and other locations along the borders of the incision; followed by continuous interlocking sutures to approximate both the flaps (Fig. 5).



Fig. 2: Marking with indelible pencil



Fig. 3: Incision given & tissue tag removal

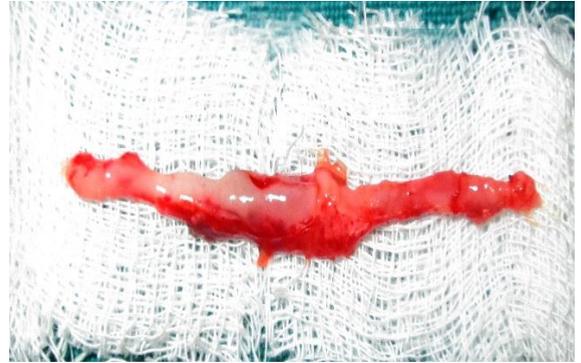


Fig. 4: Removed tissue



Fig. 5: Site after tissue removal

Non-steroidal anti-inflammatory drugs (ibuprofen 600 mg four times daily for 2 days) and oral antibiotics (amoxicillin 500mg along with clavulenic acid 125 mg twice a day for 5 days) were given after surgery. The patient was given instructions for the application of ice packs and was told to restrict to minimal lip movement when smiling and talking for 1 week. Postoperative healing occurred with a minimum of ecchymosis and discomfort. Follow-up examinations revealed reduced gingival display (Fig. 6).



Fig. 6: Suture placed

It is of utmost importance to consider the biological width and it should not be encroached upon before planning a crown lengthening procedure to increase the length of the available tooth, as this may lead to periodontal breakdown. Normally, the gingival margin lies one millimeter coronal to the Cemento

enamel junction. If this distance is greater, then the clinical crown is shorter than the anatomical crown and a crown lengthening procedure is required in such cases.

First of all with the help of a UNC-15 Probe we measured the clinical crown length. The biotype of gingival tissue was thick and had adequate attached gingiva. Therefore, we simplified our surgical procedure by excising 2-3 mm of gingival tissue from the gingival margin in order to maintain sufficient esthetics in the anterior region and avoid the appearance of a long clinical crown post-operatively.

An inverse bevel incision was given to excise the thick, fibrous gingival tissue, following a scalloped pattern around the gingival margin (Fig. 7). A No. 15 blade was used to perform an inverse bevel incision in order to remove the pocket lining and further maintain the periodontal health. This was followed by a second incision into the intracrevicular sulcus. After one month bleaching was performed in three sittings and an acceptable result was achieved (Fig. 8). Patient was happy with the results.



Fig. 7: Post-operative



Fig. 8: Post bleaching



Fig. 9: Esthetic crown lengthening performed

Discussion

The lower edge of upper lip presents a “gum wing” profile. In many patients, this profile limits the gingival display when a person smiles. Patient who have a high lip line exposes a broad zone of gingival tissue and may often express concern about their “gummy smile. It’s not easy to change the form and position of the lips during speech and smile, but if necessary, the dentist may, modify/ control the form of the teeth and interdental papillae as well as the position of the gingival margins and the incisal edges of the teeth along with repositioning of the lip.¹⁷ The hyper function of the lip elevator muscles is thought to contribute to the production of a gummy smile. Therefore, several soft tissue surgical procedures have been reported to correct a gummy smile caused by hyper function. This procedure was originally described as cosmetic surgery by Rubinstein and Kostianovsky for correction of a gummy smile caused by a hyper mobile lip.¹⁸

Along with lip repositioning other factor like clinical crown height, gingival pigmentation or color of the tooth also play an equally important role in determining the esthetic of the smile.

In the particular case along with lip repositioning, crown lengthening and bleaching was also performed to obtain optimum esthetic smile. Crown lengthening involves the surgical removal of hard and soft periodontal tissues to gain supracrestal tooth length, allowing longer clinical crowns¹⁹ and re-establishment of the biologic width^{19,20}. Tooth whitening or bleaching has been very effective for giving fast, non-invasive cosmetic changes that can have a huge impact on an individual’s personal perception of their well-being and self-esteem. The latest generation of vital bleaching products is effective, safe and also relatively long lasting. Bleaching can be maintained through the use of whitening toothpastes and bleaching toothpastes with yearly touch-up bleaching using a peroxide bleaching agent.

Conclusion

In conclusion, the completion of the surgery performed resulted in clinical crown increase and

reduction of excessive gingival display in the patients. Along with this bleaching enhanced the esthetic value. The long-term stability of the results remains to be seen, but it holds promise as an alternative treatment modality in esthetic rehabilitation.

19. Gargiulo AW, Wentz FM, Orban B. Dimensions and relations of the dentogingival junction in humans. *J Periodontol.* 1961;32:261-7.

References

1. Armitage, G. C. (1999) Development of a classification system for periodontal disease and conditions. *Annals of Periodontology* 4, 1–6.
2. Tjan, A. H., Miller, G. D. & The, J. G. (1984) Some esthetic factors in a smile. *The Journal of Prosthetic Dentistry* 51,24–28.
3. Dong, J. K., Jin, T. H., Cho, H. W. & Oh, S. C. (1999) The esthetics of the smile: a review of some recent studies. *International Journal of Prosthodontics* 12,9–19.
4. Peck, S., Peck, L. & Kataja, M. (1992) The gingival smile line. *The Angle Orthodontist* 62,91–100.
5. Ackerman, M. B. & Ackerman, J. L. (2002) Smile analysis and design in the digital era. *Journal of Clinical Orthodontics* 36,221–236.
6. Geron, S. & Atalia, W. (2005) Influence of sex on the perception of oral and smile esthetics with different gingival display and incisal plane inclination. *Angle Orthodontist* 75,778–784.
7. Peck S, Peck L, Kataja M. The gingival smile line. *Angle Orthod* 1992;62:91-100; discussion 101-102.
8. Polo, M. (2005) Botulinum toxin type A in the treatment of excessive gingival display. *American Journal of Orthodontics and Dentofacial Orthopedics* 127,214–218.
9. Mazzuco, R. & Hexsel, D. (2010) Gummy smile and botulinum toxin: a new approach based on the gingival exposure area. *Journal of the American Academy of Dermatology* 63,1042–1051.
10. Ezquerro, F., Berrazueta, M. J., Ruiz-Capillas, A. & Arregui, J. S. (1999) New approach to the gummy smile. *Plastic and Reconstructive Surgery* 104,1143–1150.
11. Miskinyar, S. A. (1983) A new method for correcting a gummy smile. *Plastic and Reconstructive Surgery* 72,397–400.
12. Ishida, L. H., Ishida, L. C., Ishida, J., Grynglas, J., Alonso, N. & Ferreira, M. C. (2010) Myotomy of the levator labii superioris muscle and lip repositioning: a combined approach for the correction of gummy smile. *Plastic and Reconstructive Surgery* 126,1014–1019.
13. Rosenblatt, A. & Simon, Z. (2006) Lip repositioning for reduction of excessive gingival display: a clinical report. *International Journal of Periodontics and Restorative Dentistry* 26,433–437.
14. Simon, Z., Roseblatt, A. & Dorfmann, W. (2007) Eliminating a gummy smile with surgical lip repositioning. *Journal of Cosmetic Dentistry* 23,100–108.
15. Gupta K.K., Srivastava A., Chandra C., Tripathi V. (2011) Lip Repositioning with crown lengthening & Gingival depigmentation: A Case Report. *Journal of Periodontology & Implant Dentistry* 3(1):38-42(2011e2).
16. Gupta K.K., Srivastava A., Singhal R., Srivastava S. (2010) An innovative cosmetic technique called lip repositioning. *Journal of Indian Society of Periodontology - Vol 14, Issue 4, Oct-Dec.*
17. Rubinstein AM, Kostianovsky AS. Cosmetic surgery for the malformation of the laugh: Original technique (in Spanish). *Prensa Med Argent* 1973;60:952.
18. Ingber FJS, Rose LF, Coslet JG. The “biologic width”: a concept in periodontics and restorative dentistry. *Alpha Omegan.* 1977;70:62-5.