

Case Report

Lip Repositioning with Crown Lengthening & Gingival Depigmentation: A Case Report

Krishna Kumar Gupta^{1*} • Amitabh Srivastava² • Chetan Chandra³ • Vivek Tripathi⁴

¹Professor, Sardar Patel Post Graduate Institute of Dental & Medical Sciences, Lucknow, India

²Reader, Sardar Patel Post Graduate Institute of Dental & Medical Sciences, Lucknow, India

³Senior lecturer, Sardar Patel Post Graduate Institute of Dental & Medical Sciences, Lucknow, India

⁴Post graduate student-IIYr, Sardar Patel Post Graduate Institute of Dental & Medical Sciences, Lucknow, India

*Corresponding Author; E-mail: drkkgupta26@rediffmail.com

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Abstract

This clinical report describes the successful use of lip repositioning technique for the reduction of excessive gingival display. A 34-year-old female patient reported with a chief complaint of gummy smile. The lip repositioning technique was performed under local anesthesia with the main objective of reducing gummy smile by limiting the retraction of elevator muscles (e.g. zygomaticus minor, levator anguli, orbicularis oris and levator labii superioris). The technique is fulfilled by removing a strip of mucosa from the maxillary buccal vestibule, creating a partial-thickness flap between mucogingival junction and upper lip musculature, and suturing the lip mucosa with mucogingival junction, resulting in a narrow vestibule and restricted muscle pull, thereby reducing gingival display. A scalpel surgery was planned for depigmentation. The entire procedure was explained to the patient and written consent was obtained. A Bard Parker handle with a No.15 blade was used to remove the pigmented layer. When a crown lengthening procedure is planned to increase the length of the available tooth, the biological width needs to be considered and not encroached upon, as this may lead to periodontal breakdown.

Key words: Crown lengthening, gingival depigmentation, gummy smile, lip repositioning.

Introduction

A smile expresses a feeling of joy, success, sensuality, affection and courtesy, and reveals self-confidence and kindness. The harmony of the smile is determined not only by the shape, the position and the color of the teeth but also by the gingival tissues.¹

Gingival health and appearance are essential components of an attractive smile. Gingival pigmentation results from melanin granules, which are produced by

melanoblasts. The degree of pigmentation depends on melanoblastic activity. Although melanin pigmentation of the gingiva is completely benign and does not present a medical problem, complaints of 'black gums' are common particularly in patients having a very high smile line (gummy smile).

Gummy smile, due to excessive gingival display, always makes a normal person conscious while smiling, especially in females who are more esthetically conscious than males. Gummy smile is attributed to

improper relation between gingival tissue and the tooth, with the gingival tissue in excess and a paucity of tooth portion.

Case report

A 34-year-old female patient reported to the Department of Periodontology and Implantology at Sardar Patel Post-graduate Institute of Dental and Medical Sciences, Lucknow, India, with the chief complaint of excessive display of gums and black gingiva. There was no significant medical or family history and the patient was medically sound and fit for the surgical procedure. On clinical examination extraorally, the face was bilaterally symmetrical with incompetent lips. Intraorally, a severe gingival display was seen during smiling which extended from the maxillary right first premolar to the maxillary left first premolar (Figure 1A).

Technique

Aim of the technique

Lip repositioning is a surgical technique to correct the gummy smile by limiting the retraction of the elevator smile muscles (e.g. zygomaticus minor, levator anguli, orbicularis oris and levator labii superioris). For depigmentation in the present case a partial-thickness flap (epithelial excision) was used, which was simple and effective and yielded good results, along with good patient satisfaction.

Surgical technique

Complete extraoral and intraoral mouth disinfection was carried out with 2% Betadine, followed by infiltration of local anaesthesia, (2% Lignocaine hydrochloride with 1:80,000 epinephrine). Thereafter the surgical area was demarcated with the help of an indelible pencil. The surgical area started at the mucogingival junction and extended 10-12 mm superiorly in the vestibule. Incisions were made in the above-mentioned surgical area and both superior and inferior partial-thickness flaps were raised from the maxillary right first molar to the maxillary left first molar (Figure 1B).

The incisions were then connected with each other on the distal end in an elliptical outline. The epithelium was then removed within the outline of the incision, leaving the underlying connective tissue exposed (Figure 1C). The parallel incision lines were approximated with interrupted stabilization sutures at the midline and other locations along the borders of the

incision to ensure proper alignment of the lip midline with the midline of the teeth; then continuous interlocking sutures were used to approximate both flaps (Figure 1D). The sutures were resorbable in nature.

A scalpel surgery was planned for depigmentation. The entire procedure was explained to the patient and written consent was obtained. A Bard Parker handle with a No.15 blade was used to remove the pigmented layer. After removing the entire pigmented epithelium along with a thin layer of connective tissue with the scalpel, the surgical area was covered with a periodontal dressing.

When a crown lengthening procedure is planned to increase the length of the available tooth, the biological width needs to be considered and not encroached upon, as this may lead to periodontal breakdown.

The proportions of crown length are also very important. This technique is generally used to improve aesthetics and takes the form of a gingivectomy procedure to excise the soft tissue.

Normally, the gingival margin is 1 mm coronal to the CEJ. If it is greater, then the clinical crown is shorter than the anatomical crown and a crown lengthening procedure is required.

First of all we measured the clinical crown length with the help of a UNC-15 Probe (Figures 1E-J).

The gingival tissue was of thick biotype 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.

The thick, fibrous gingival tissue was excised with an inverse bevel incision (internal bevel gingivectomy), following a scalloped pattern around the gingival margin. A No. 15 blade was used to make 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 (Figures 1K-M) and periodontal Coe-pak was applied (Figure 1N).

The patient was recalled at one-week, two-week and four-week intervals (Figures 1O-Q).

Precautions while surgery

1. Caution must be exercised to avoid damage to minor salivary glands in the submucosa. Some rare complications reported in the literature are paresthesia² and transient paralysis.³
2. Clinicians must look for adequate width of the attached gingiva.



Figure 1. Severe gingival display (A). Partial-thickness flaps raised (B). Incisions connected and the epithelium removed (C). Parallel incision lines approximated with interrupted stabilization sutures at the midline (D). Measurement of clinical crown length with UNC-15 probe (E-J). Internal inverse bevel gingivectomy; inverse bevel incision to remove pocket lining; a second incision into the intracrevicular sulcus (K-M). Periodontal Coe-pak applied (N). One-week, two-week and four-week recalls (O-Q).

3. The procedure should not be carried out in patients with severe vertical maxillary excess. Orthognathic surgeries are treatment of choice in such patients.

Discussion

In most patients, the lower edge of the upper lip assumes a “gumwing” profile, which limits the amount of gingiva that is exposed when a person smiles. Patients who have a high lip line expose a broad zone of gingival tissue and may often express concern about their “gummy smile.” The above case presents the successful clinical outcome of a lip repositioning technique. In the present case the crown length was not appropriate and required crown lengthening. Lip repositioning is most commonly used in plastic surgical procedures and is rarely used as a dental procedure. The technique to prevent reattachment of the smile muscles is to use an alloplastic or autogenous separator.⁴ This spacer is placed with a nasal approach between the elevator muscles of the lip and the anterior nasal spine, thus preventing the superior displacement of the repositioned lip.

Crown lengthening procedure is carried out for various restorative and esthetics reasons,⁵ such as short teeth, excessive gingival display (gummy smile), and uneven gingival contour. An evaluation of clinical and anatomic crown lengths in patients with a high lip line is important because incomplete anatomical crown exposure may be the principle factor in the esthetics of a case.⁶

Ideally the smile should expose minimal gingiva, the gingival contour should be symmetrical and in harmony with the upper lip, the anterior and posterior segments should be in harmony and the teeth should be of normal length. To obtain optimum esthetic results, the gingival form, tooth anatomy and the relationship of the underlying bone to the CEJ must be completely understood.

Several procedures have been proposed for crown lengthening procedure. In this case internal bevel gingivectomy was considered the treatment of choice in order to maintain the periodontal health and post-operative esthetics of the patient. The amount of attached gingiva needs to be measured as a part of the assessment. It has been shown that there should be 2-3 mm of attached gingiva to maintain periodontal health.⁷

In this case adequate attached gingiva was present. Ideally, the gingival margin is 2 mm coronal to the CEJ; however, in this case it was 4 mm from the CEJ and bone level was adequate. Therefore, in order to eliminate the existing pocket depth, i.e. 4 mm, the procedure was accomplished with an inverse bevel

incision in order to excise 2-3 mm of thick fibrous gingival tissue in a scalloped pattern. When full exposure of the anatomic crown was achieved surgically, there was a dramatic improvement in esthetics by the concomitant lengthening of the teeth and reduction of the gingival exposure, which significantly altered the ratio of crown to marginal tissue in favor of the teeth.

Oral pigmentation occurs in all races of man. There are no significant differences in oral pigmentation between males and females. The intensity and distribution of pigmentation of the oral mucosa is variable, not only between races, but also between different individuals of the same race and within different areas of the same mouth.(no reference)

Melanin pigmentation is frequently caused by melanin deposition by active melanocytes located mainly in the basal layer of the oral epithelium. Pigmentations might be removed for aesthetic reasons. Different treatment modalities have been used to this end.⁸ The selection of a technique for depigmentation of the gingiva should be based on clinical experience, patient's financial status and individual preferences.

Electrosurgery requires more expertise than scalpel surgery. Prolonged or repeated application of an electric current to tissue induces heat accumulation and undesired tissue destruction. Contact with periosteum or alveolar bone and vital teeth should be avoided.⁹

Cryosurgery is followed by considerable swelling, and it is also accompanied by increased soft tissue destruction. Depth control is difficult, and optimal duration of freezing is not known, but prolonged freezing increases tissue destruction.¹⁰ Depigmentation with lasers achieves good results, but they require sophisticated and expensive equipment, which occupies a large space. A free gingival graft can also be used to eliminate the pigmented areas. However, it requires an additional surgical site (donor site) and color matching.¹¹

These treatment modalities, however, are not widely accepted or popularly used. Scalpel surgical technique is highly recommended in consideration of the equipment constraints that may not be frequently available in clinics.¹⁰ It is known that the healing period for scalpel wounds is faster than other techniques. However, scalpel surgery may cause unpleasant bleeding during and after the operation, and it is necessary to cover the exposed lamina propria with periodontal dressing for 7 to 10 days.¹¹

Post-surgical repigmentation of gingiva has been previously reported. Repigmentation is described as spontaneous and has been attributed to the activity and migration of melanocytes from surrounding areas. In the present case at the end of 6 months, no further

repigmentation was seen. The case is being followed up to further estimate the extent and rate of repigmentation.

Conclusion

Lip repositioning is an innovative and effective way to improve the gummy smile of the patient. This technique is an easy, time-consuming and cost-effective technique to produce a satisfactory result for the patient.

Excessive gingival display is associated with different etiologies, which must be identified before treatment. Internal bevel gingivectomy to remove the excess gingival tissue can be a treatment of choice to move the gingival margin apically, and to restore normal tooth dimensions and dentogingival relationships.

The depigmentation procedure was successful and the patient was satisfied with the result. Thus, we conclude that depigmentation of hyperpigmented gingiva by scalpel surgery with bur abrasion is simple, easy to perform, cost-effective and above all it causes less discomfort and is aesthetically acceptable to the patient.

References

1. Liébart ME, Fouque-Deruelle C, Santini A, Dillier FL, Monnet-Corti V, Glise JM, et al. Smile line and periodontium visibility. *Perio* 2004;1:17-25.
2. Miskinyar SAC. A new method for correcting a gummy smile. *Plast Reconstr Surg* 1983;72:397-400.
3. Kamer FM. "How I do it"—plastic surgery. Practical suggestions on facial plastic surgery. Smile surgery. *Laryngoscope* 1979;89:1528-32.
4. Ellenbogen R, Swara N. The improvement of the gummy smile using the implant spacer technique. *Ann Plast Surg* 1984;12:16-24.
5. Naini FB, Gill DS. Facial aesthetics: 1. Concepts and clinical assessment. 2. Clinical assessment. *Dent Update* 2008;35:102-4, 106-7, 159-62, 164-6, 169-70.
6. Tjan AHL, Miller GD, The JGP. Some aesthetic factors in a smile. *J Prosthet Dent* 1984;51:24-8.
7. Maynard JG Jr, Wilson RDK. Physiological dimensions of the periodontium significant to the restorative dentist. *J Periodontol* 1979;50:170-7.
8. Pontes AE, Pontes CC, Souza SL, Novaes AB Jr, Grisi MF, Taba M Jr. Evaluation of the efficacy of the acellular dermal matrix allograft with partial thickness flap in the elimination of gingival melanin pigmentation. A comparative clinical study with 12 months of follow-up. *J Esthet Restor Dent* 2006;18:135-43; discussion 143.
9. Ozbayrak S, Dumlu A, Ercalik-Yalcinkaya S. Treatment of melanin-pigmented gingiva and oral mucosa by CO2 laser. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2000; 90:14-5.
10. Almas K, Sadiq W. Surgical treatment of melanin-pigmented gingiva; an esthetic approach. *Indian J Dent Res* 2002;13:70-3.
11. Mokeem SA. Management of gingival hyperpigmentation by surgical abrasion: report of three cases. *Saudi Dent J* 2006; 18:162-6.