

Periodontal Plastic Surgery: Treating Gingival Recession with Coronally Displaced Flaps

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Abstract

Desire for improved esthetics has increased tremendously in recent times making perio-esthetic procedures an integral part of periodontal treatment. Various surgical procedures have been developed over time that give acceptable results as regards recession coverage and pleasing esthetic appearance to the patient. The surgical procedure of choice for recession coverage should take into consideration both the biological aspects as well as the patient's esthetic demands. Coronally advanced flaps for root coverage are the most commonly used technique for multiple teeth recessions. This case report describes treatment of generalized gingival recession using three different techniques of coronally advanced flaps for root coverage giving an esthetic appearance to the patient. With the use of just different techniques of coronally advanced flaps; it was possible to achieve significant improvement in the patient's smile by achieving recession coverage and increase in width of attached gingiva.

Keywords: Recession; Root Coverage; Coronally Displaced Flap; Width of Attached Gingiva; Plastic Surgery

Introduction

One of the most common esthetic concerns associated with the periodontal tissues is gingival recession. Gingival recession is defined as the displacement of gingival margin apical to cemento-enamel junction [1]. The common causes of gingival recession include: traumatic tooth brushing technique, high muscle attachment and frenal pull, tooth position, alveolar bone dehiscence, iatrogenic factors and post-surgical gingival recession [2]. Marginal tissue recession is associated with thermal and tactile sensitivity, esthetic complaints and a tendency towards root caries. Over the years, numerous surgical techniques have been introduced to correct labial, gingival recession defects to achieve an esthetic outcome.

In the following case report, a patient who presented with generalized gingival recession on the labial aspect was treated with three different types of coronally advanced flaps namely, the conventional coronally advanced flap, the Zucchelli modification of coronally advanced flaps and the bridge flap technique resulting in improved esthetics and increased width of keratinized gingiva.

Case Report

A 37 year old male patient reported to the Department of Periodontology with a chief complaint of displacement of his gums making his teeth appear longer. The patient wanted some correction of the same in order to improve his smile. The patient had no relevant medical history. He had visited a dentist earlier for routine scaling and polishing 2 years back. On clinical examination the periodontium was healthy and no signs of inflammation were observed. However, Millers Class 1 recession was seen between teeth number 15 to 11 and 21 to 25 in the maxillary arch and between 32 to 42 in the mandibular anteriors. Millers Class 2 recession was seen in 33 and 43. The frenal attachments were also evaluated and were found to be non-interfering with the marginal gingiva. There was no mobility in any of the teeth. The presence of multiple recession was thus attributed to faulty brushing habit of the patient. Scaling and root planing was done for the patient and he was taught the proper brushing technique with use of soft bristle toothbrush. As maintenance of good oral hygiene is imperative for better prognosis of such procedures, the patient was monitored for a month to evaluate his brushing habits and maintenance of proper hygiene.

As oral hygiene maintenance was found to be satisfactory, recession coverage procedures were planned. The multiple areas with class 1 recession were treated using non- invasive coronally advanced flaps. For areas with higher degree of recession the free gingival grafts were planned at a later stage. The three treatment protocols were carried out in a span of 14 days with a gap of one week between each procedure keeping the patient’s comfort in mind.

On day 1 the recession between 21 to 25 (Figure 1a) was treated using conventional coronally advanced flap. The surgical sites were anesthetized using 2% lignocaine hydrochloride with adrenaline. The exposed root surfaces were conditioned with 24% EDTA preparation for 2 minutes to eliminate the smear layer. The area was then rinsed with a copious amount of sterile saline solution for 1 minute. An intra-sulcular incision at the facial aspect of the involved teeth was performed followed by two horizontal incisions at right angles to the adjacent interdental papillae at the CEJ level without interfering with the gingival margin of the neighboring teeth. To mobilize the flap, two oblique vertical releasing incisions were extended about 3 mm beyond the mucogingival junction (MGJ). A full thickness trapezoidal mucoperiosteal flap was then elevated up to the MGJ, and following penetration of the periosteum, a partial thickness flap was dissected further apically to ensure a passive coronal advancement at the level slightly beyond the CEJ. The facial parts of the interdental papillae were carefully de-epithelized (Figure 1b). The flap was then sutured into place with sling sutures so that the flap margin is slightly coronal to the CEJ (Figure 1c). After surgery, the patient was given Amoxicillin 500 mg every 8 hours for 5 days, Enzoflam every 8 hours for 3 days and 0.12% chlorhexidine gluconate rinse every 12 hours for 15 days.



Figure 1a: Pre-operative View (Tooth No. 21-25).



Figure 1b: Split Thickness Flap reflected (Tooth No. 21-25).



Figure 1c: Simple Interrupted Sutures placed.



Figure 1d: Post-operative 6 months view.

On day 7, the recession between tooth number 11 to 15 was treated using the Zucchelli modification of the coronally advanced flap. Root conditioning was done as described earlier. After anaesthetizing the area, oblique horizontal incisions were given connecting the CEJ of one tooth to the gingival margin of the adjacent tooth after taking into consideration the tooth with the maximum recession as the center (Figure 2a). A split thickness flap was reflected till the root exposure and further apically a full thickness flap was raised. Beyond muco-gingival junction again a split thickness flap was reflected to ensure adequate coronal displacement. Anatomic interdental papilla

was completely de-epithelialized to expose the underlying connective tissue and to eliminate the epithelium that might interfere with healing (Figure 2b). After flap reflection the root surface was examined for remnant calculus and thorough scaling and root planing was done. The flap was then advanced coronally and secured in place using sling sutures (Figure 2c). As the patient was already given antibiotics during the previous treatment, only analgesics were prescribed after this procedure.



Figure 2a: Zucchelli's Technique (Tooth No. 11-15).



Figure 2b: Split Thickness Flap reflected (Tooth No. 11-15).



Figure 2c: Flap coronally advanced and sling sutures placed.



Figure 2d: Post-operative 6 months view.

On day 14 the recession between 32 to 42 was treated using the Bridge Flap technique. Although recession was present in 33 and 43, it wasn't included in this flap design as the recession was of a higher grade and it was not possible to achieve coverage with just coronally advanced flap. For the treatment of these areas subsequent treatment with free gingival grafts was planned at a later stage. The surgical site was anesthetized using 2% lignocaine hydrochloride with adrenaline. An arch shaped incision was made in the vestibule at approximately two times the depth of gingival recession (2 GR +2 mm) from the gingival margin (Figure 3a and 3b). An incision into the periosteum was placed at its base and bone was exposed so that scar formation could occur. A split -thickness flap was then elevated in the apico-coronal direction following sulcular incisions. This was then connected to the first incision so that the whole bridge flap could be elevated and repositioned coronally to cover the denuded root surfaces (Figure 3c). Digital pressure was then applied on the repositioned flap for 3 minutes and independent sling sutures were placed (Figure 3d). The patient was given analgesics post-surgery.



Figure 3a: Marking done for Bridge Flap (Tooth No. 33-43).



Figure 3b: Semilunar incision given for Bridge Flap (Tooth No. 33-43).



Figure 3c: Semilunar and sulcular incision joined (Tooth No. 33-43).



Figure 3d: Interrupted Sutures placed.



Figure 3e: Increased width of attached gingiva with respect to 33-43.

The sutures were removed 14 days after each surgery respectively. The patient was clinically evaluated at 1 month, 3 months and 6 months post-surgery (Figure 1d, 2d, 3e). At the end of six months a significant coverage was achieved in almost all the treated areas, improving the patient's esthetic appearance (Figure 4b)



Figure 4a: Pre-operative view.



Figure 4b: Post-operative view 6 months.

Discussion

Treatment of gingival recession is becoming an important therapeutic issue due to an increasing demand for cosmetic treatment and the complete root coverage is the goal to be achieved when the patient complains about unesthetic appearance of teeth. The ultimate goal of any therapeutic intervention aimed at root coverage should be to restore the tissue margin at the cemento-enamel junction and to achieve an attachment of the tissues to the root surface so that a normal healthy gingival sulcus with no bleeding on probing and a minimal probing depth is present [3]. The success of surgical procedures for root coverage depends on several factors such as elimination of etiologic factors, the presence of interproximal bone and the choice of the most appropriate surgical technique. Control of prognostic factors affecting the patient, namely oral hygiene, tobacco smoking cessation and systemic disease control are the key elements to be considered before deciding for any surgical procedure. In some clinical situations non-surgical treatment targeted at the etiology may be

used. However, surgical treatment must be considered in cases of objectionable esthetic alterations, progressive recessions or increased hypersensitivity [4]. In the operative phase, the principles of flap design, mobilization, advancement, adaptation and stabilization are important factors that eventually affect the treatment outcome [5].

The most commonly employed technique used in the treatment of multiple areas of gingival recession is the 'coronally repositioned flap' introduced by Bruiestein in 1970 and modified by Allen and Miller in 1989 [6]. When adequate adjacent gingiva exists, repositioning it over the denuded root surface provides the most esthetic result. The coronally advanced flap (CAF) was shown to be a predictable method for recession coverage with satisfactory esthetic results, in single or multiple sites, and a relatively easy procedure for the patient and clinician. The mean percentage of root coverage obtained with this technique ranges from 55% to 99%. In addition there is no need for a second surgical site, as is the case with a free gingival or connective tissue graft [7]. Thus the conventional coronally advanced flap was chosen to be performed in 23 - 25 region and a considerable recession coverage was obtained on follow-up visits.

Though the coronally advanced flap gives considerable results, it has its own disadvantages like scar formation and compromised blood supply. Due to this Zucchelli and Sanctis modified this technique further in 2000. The flap design is an envelope type of flap without vertical releasing incisions. Hence the blood supply is not compromised and there are no unesthetic scars along the incision line. Since it is also a split - full - split thickness flap, it guarantees adequate coronal advancement, good anchorage and ample blood supply to the surgical interdental papillae [8]. Keeping in mind the advantages of this technique, this procedure was done in the 13 - 15 region.

In the lower anterior region the attached gingiva was not adequate therefore the bridge flap technique was used. The bridge flap technique, allows the clinician not only to cover the previously denuded root surfaces but also to increase the zone of attached gingiva at a single step. In this procedure, a coronally advanced flap along with a vestibular deepening incision is used as root coverage procedure for the treatment of multiple recession-type defect. The vestibular deepening incision helps in increasing the width of the attached gingiva [9]. The flap which covers the denuded root surface is supplied by plasmatic circulation from capillaries in the adjacent portion of the gingiva, allowing excellent healing. The bridge flap technique is indicated when a single surgical procedure is desired to predictably cover the denuded root surfaces and increase the width of attached gingiva with vestibular deepening in one step.

In this case report at a 6 month follow up it was observed, that the Zucchelli's technique resulted in the better recession coverage as compared to the conventional coronally advanced flap and the Bridge flap showed increase in the width of the attached gingival along with a considerable amount of recession coverage.

Conclusion

Recession coverage by soft tissue; in millimeters and mean percentages have so far been the main outcome variables for evaluating the treatment outcome. However, root coverage for esthetic improvement, should be evaluated not only by millimeter gain in gingival width but also patient's own evaluation as well as professional evaluation of the overall esthetic outcome should be taken into consideration. Success criteria should not only be based upon the amount of root coverage but also upon the cosmetic integration of the operated zone within the mouth. Thus in this patient, with the use of just different techniques of coronally advanced flaps; we were able to achieve a significant improvement in his smile by achieving recession coverage. With the width of attached gingiva visibly improved in the lower arch there is further scope for treatment of 33 and 43 area with higher degree of recession with free gingival or connective tissue grafting procedures in future.

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