



Zuchelli's Modified Coronally Advanced Flap for Root Coverage –A Case Series

Authors

Dr Divya Soman^{1*}, Dr S Santhosh Kumar²

Government Dental College, Trivandrum

*Corresponding Author

Dr Divya Soman

Abstract

Gingival recession often leads to esthetic complaints, dental hypersensitivity, cervical caries and non-carious cervical lesions. The ultimate goal of a root coverage procedure is complete coverage of the recession defect with a good appearance related to the adjacent soft tissues and minimal probing depth following healing. The coronally advanced flap (Zucchelli & De Sanctis 2000), without releasing incisions is a very safe and reliable approach in periodontal plastic surgery and allows excellent blending between the surgical area and the adjacent tissues. It is also known as coronal envelope flap for multiple recession defects which ensures a harmonious gingival margin, minimal scarring, and keratinized tissue gain. This case series highlights the Zucchelli's technique for root coverage in multiple recession defects

Keywords: *Gingival recession, root coverage, zuchelli's technique.*

Introduction

Mucogingival deformities are congenital, developmental, or acquired defects that may occur around natural teeth or implants and in edentulous ridges. The presence of mucogingival deformities often have an impact on patients in terms of aesthetics and function¹. Among the mucogingival deformities, lack of keratinized tissue and gingival recession are the highly prevalent problems affecting individuals of all ages worldwide. Gingival recession is an apical shift of the gingival margin from cemento-enamel junction, causing pathologic exposure of the root surface². Gingival recession is found in populations with good and poor oral hygiene. It is most commonly located at the buccal surfaces and may be associated with

wedge-shaped defects in the cervical area of one or more teeth³

Multiple gingival recessions are usually more challenging defects than single recession defects because the surgical field is larger with higher anatomical variability that may include prominent roots, shallow vestibules, enamel-root abrasions and unevenness in residual keratinized tissue⁴. There are several surgical approaches for covering exposed root surfaces, including laterally repositioned flap (Grupe, 1956), free gingival graft (Miller 1982), coronally advanced flap (Harris et al., 1995), subepithelial connective tissue graft (Langer & Langer 1985), pedicle grafts (Harris, 1995), pedicle flap (Cohen, 1968), oblique rotated flap (Pennel, 1965), and modified coronally advanced flap (Zucchelli 2000)⁵.

The coronally advanced flap (Zucchelli & De Sanctis 2000), without releasing incisions is a very safe and reliable approach in periodontal plastic surgery and allows excellent blending between the surgical area and the adjacent tissues. It is also known as coronal envelope flap for multiple recession defects which ensures a harmonious gingival margin, minimal scarring, and keratinized tissue gain.² Evaluating the predictability of achieving complete root coverage in Miller Class I and II multiple adjacent recession type defects by various surgical techniques, it has been indicated that modified coronally advanced flap with and without soft tissue grafting is one of the most predictable methods to obtain complete root coverage.⁶ The aim of this case series was to clinically evaluate the effectiveness and the predictability of root coverage using Zucchelli's modified coronally advanced flap with envelope technique for the treatment of multiple recession in patients with esthetic demands

Case Report I

A 42 year old female patient reported to the Department of Periodontics with the chief complaint of sensitivity and elongated appearance of maxillary teeth since 5 months. Patient used to brush in horizontal scrub technique which is one of the cause of gingival recession. Clinical examination revealed Millers's class I multiple gingival recession defect of maxillary teeth from 11 to 16 with recession depth ranging from 1 to 4mm on the facial aspect. The periodontium was healthy with no signs of inflammation. At first visit scaling and root planning was performed after recording case history. Routine blood investigations were done. After 1month root coverage by Zucchelli's coronally advanced flap was planned. Informed consent was obtained from the patient.

Case 1



Fig 1 Preoperative Presentation



Fig 2 Preoperative assessment of recession depth



Fig-3: Oblique horizontal incision

Case Report 2

A 36 year female reported to the Department of Periodontology and Oral Implantology.

Chief Complaint: Patient complained of sensitivity in the maxillary front region (22, 23, 24) since; 7 months. Patient use to brush once daily with horizontal scrub technique. Clinical examination revealed miller's class I gingival recession on mesiofacial aspect of 22, 23, 24 teeth. The periodontium was healthy with no signs of inflammation. At first visit scaling and root planning was performed after recording case history. Routine blood investigations were done.



Fig 4 Split -full -split thickness flap raised



Fig 2 Preoperative recession depth



Fig 5: Suturing



Fig-3: Oblique horizontal incision



Fig 6: 5 months postoperative view



Fig 4 Split-full-split flapraised

After 1 month root coverage by Zucchelli's coronally advanced flap was planned. Informed consent was obtained from the patient

Case 2



Fig 1 Preoperative Presentation



Fig 5: Suturing



Fig 6: 5 month's postoperative view

Procedure

Baseline values of clinical parameters were recorded before surgery. After administering LA, exposed root surfaces were planed using gracey curettes. The flap design consisted of a horizontal incision extended to include one tooth on each side of the teeth to be treated in order to facilitate the planned coronal repositioning of the flap tissue over the root surfaces. When advancing an envelope flap, the surgical papilla also rotate towards the ends of the flap. In particular, the surgical papilla located mesial to the midline of the flap rotate in a mesialcoronal direction, while the papilla distal to the flap midline rotate in a distal-coronal direction. If the entire interdental soft tissue is comprised in the surgical papilla (i.e., if an intrasulcular incision is made interproximally), at the end of the coronal displacement, a portion will be displaced over the crown of the adjacent tooth instead of in the middle of the interproximal area and thus has to be cut away, causing a loss of interdental keratinized tissue. To avoid this, horizontal incision of the envelope flap consisted of oblique submarginal incisions in the interdental areas, which continued with the intra sulcular incision at the recession defects.

Each surgical papilla (SP) is dislocated with respect to the anatomic papilla (AP) by the oblique submarginal interdental incisions; in particular, the surgical papilla mesial to the flap midline are dislocated more apically and distally, while the papilla distal to the midline are shifted in a more apical and mesial position. The envelope flap is then raised with a split-full-split approach in the coronal-apical direction. The oblique interdental incisions are carried out keeping the blade parallel to the long axis of the teeth in order to dissect the surgical papilla in a split-thickness manner. Gingival tissue apical to the root exposures is raised in a full-thickness manner to provide that portion of the flap critical for root coverage with more thickness. Finally, the most apical portion of the flap is elevated in a split thickness manner to facilitate the coronal displacement of the flap. The remaining tissue of the anatomic interdental papilla is deepithelialized to create connective tissue beds to

which the surgical papilla were sutured. A sharp dissection into the vestibular lining mucosa is then carried out to eliminate muscle tension. It must be considered that the “adequate” coronal displacement of the flap results from the elimination of lip and muscle tensions in the apical portion of the flap. During coronal advancement, each surgical papilla is rotated towards the ends of the flap and finally resided at the center of the interproximal area. Flap mobilization is considered “adequate” when the marginal portion of the flap is able to passively reach a level coronal to the CEJ at each single tooth in the surgical site. The flap, in fact, should be stable in its final position even without the sutures. Flaps were repositioned coronally to CEJ, on enamel by means of sutures around the contact point. Stabilization of blood clot was achieved by application of gentle pressure for 3 minutes in both groups. After flap closure, periodontal dressing was placed over surgical area and postoperative instructions were given.

Post Operative Care

The patient was instructed to not disturb the surgical site in any way till the sutures were removed. Other post operative instructions were given. Patient was advised to take antibiotics (Amoxicillin 500mg tds) for 5 days postoperatively. Two weeks post operatively the periodontal dressing and the sutures were removed. Adequate root coverage was obtained and healing was satisfactory.

Discussion

The ultimate goal of a root coverage procedure is complete coverage of the recession defect with a good appearance related to the adjacent soft tissues and minimal probing depth following healing³. Coronally advanced flap is one of the most widely used surgical technique indicated for the treatment of Miller's class I and class II gingival recession defects. In 1926, Norberg outlined aspects of the procedure. Bernimoulin et al in the mid- 1970s, described a technique to treat multiple gingival recessions, which included a free gingival graft for gingival augmentation that was followed 3 months

later, by a coronal positioning of the gingival margin⁷. Zucchelli et al made a significant modification of the original coronally advanced flap designed by Bernimoulin et al by introducing the envelope coronally advanced flap, which eliminated the vertical release incisions.

The two cases presented here employed Zucchelli's modification of the coronally advanced flap. De Sanctis and Zucchelli suggested that the split-thickness elevation at the level of the surgical papilla guarantees anchorage and blood supply in the interproximal areas mesial and distal to the root exposure. The full-thickness portion, by including the periosteum, confers more thickness and thus better opportunity to achieve root coverage⁸. Increased keratinised gingiva height was observed in these cases which might be explained by several events taking place during the healing and maturation of the marginal tissue. First, the tendency of the mucogingival line to regain its "genetically" defined position following coronal dislocation during the flap procedure⁹. Second, it cannot be excluded that granulation tissue derived from the periodontal ligament tissue might have contributed to the increased gingival dimension¹⁰. In present study using this flap technique adequate root coverage with stable results for over 5 months was achieved. No scar formation was observed and the colour match of the tissue was excellent. The hypersensitivity was also resolved completely following the surgery.

Conclusion

The results of the present case series demonstrated that this new approach to the coronally advanced flap technique was very effective for the treatment of multiple gingival recessions in patients with aesthetic demands both in terms of root coverage and increase in keratinized tissue.

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