

Zucchelli's Technique Of Coronally Advanced Flap With PRF Membrane – A Novel Technique For The Treatment Of Multiple Gingival Recessions

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Abstracts: **Background:** Gingival recession is both unpleasant and unaesthetic. Gingival recession associated with dentinal hypersensitivity is one of the commonest issues addressed by the periodontist. The treatment of choice for such cases should address biological as well as patient chief complaint. Meeting the esthetic and functional demands of patients with multiple gingival recessions remains a major therapeutic challenge. Coronally advanced flaps for root coverage are the most commonly used technique for multiple teeth recessions. This case report describes a case of Class I gingival recession due to faulty brushing technique associate with dentinal hyper sensitivity treated with Zucchelli's modification of conventional coronally advanced flap with PRF membrane. [Agrawal I NJIRM 2016; 7(3): 55 - 59]

Key Words: Gingival recession, Multiple gingival recessions, PRF, hypersensitivity, Growth factors.

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Introduction: Gingival recession is defined as the apical displacement of the gingival margin in relation to the cemento-enamel junction.¹ A number of etiological and predisposing factors have been listed in the literature. It is caused by traumatic injuries (overzealous teeth brushing) and by destructive periodontal disease.² Other predisposing factors like tooth malpositioning, alveolar bone dehiscence, thin and delicate marginal tissue covering a non vascularized root surface, high muscle attachment and frenal pull, occlusal trauma, lip piercing and other iatrogenic factors.³ It is a common occurrence in individuals with poor oral hygiene as well as those with good oral hygiene, and it usually affects multiple teeth simultaneously. Occurrence in the anterior regions of the mouth leads to compromised esthetics. Therefore, many patients request cosmetic correction⁴ and meeting their esthetic and functional demands remains a major therapeutic challenge.⁵

Several surgical approaches for covering exposed root surfaces, including free gingival graft placement (FGG)⁶, the coronally advanced flap (CAF)⁷, sub epithelial connective tissue graft (SECTG) placement⁸ and guided tissue regeneration (GTR)⁹ and platelet rich fibrin (PRF)¹⁰ have been proposed in the last few decades.

The CAF is the most commonly used for the treatment of gingival recession. The treatment out comes vary between 9-95%.³ However, data also reveals unstable long term results using CAF alone.¹¹ Another limitation is the limited gain in the apico-coronal dimension of keratinized tissue, which is an important parameter in preventing the recurrence of gingival recession.¹²

Therefore, it appears that CAF alone is a less than optimal technique to achieve root coverage despite its advantage of low morbidity. The predictability can be increased by combining CAF with other regenerative techniques such as a connective tissue graft, enamel-matrix derivative, synthetic allograft; autologous platelet concentrates including platelet-rich fibrin (PRF) etc. In conventional technique; it necessitates vertical incisions on the buccal gingiva, which hampers blood supply and early esthetic recovery.⁷ To avoid this, Zucchelli's modification of coronally advanced flap (CAF) is used.¹³

Platelet-rich fibrin (PRF) is a second generation platelet concentrate and is defined as an autologous leukocyte and platelet-rich fibrin biomaterial. It was first developed by Choukroun et al.¹⁴ The PRF membrane consists of a fibrin-3-D polymerized matrix in a specific structure, with the incorporation of platelets, leukocytes, growth factors and presence of circulating stem cells, and does not require donor site preparation, which is necessary in gold standard SECTG.¹⁴

This case represents Zucchelli's technique of coronally advanced flap with PRF membrane for the treatment of multiple gingival recessions.

Case report: A 34 years old male patient came to the department of periodontology with complains of sensitivity in right maxillary posterior region since 3 months. Sensitivity occurs on intake of cold water. On clinical examination, class I Miller's recession was seen in right maxillary first and second premolar and first molar which were because of faulty tooth brushing

habit.(Fig 1 a,b,c) Scaling and Rootplaning was done for the patient and he was advised proper brushing technique.

Figure 1 (a), (b), (c): Millers class I Gingival Recession



Surgical procedure: Disinfection of the surgical site was done with 2% betadine. The procedure was carried out under local anesthesia (Lignocaine HCl with 2 % epinephrine 1: 200,000). The incision outline was first marked with a sterile eosin pencil(Fig 2).

Figure 2: Incision outline with eosin pencil



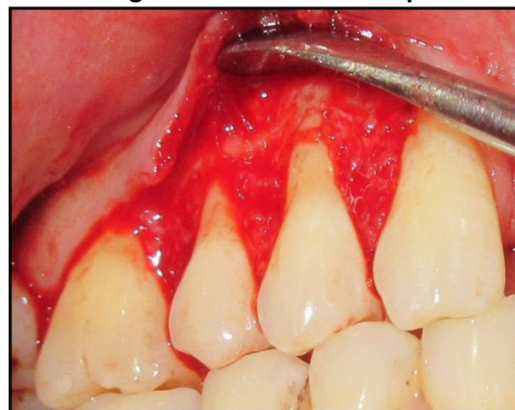
Oblique horizontal incisions were given connecting the CEJ of one tooth to the gingival margin of the adjacent tooth (Fig 3).

Figure 3: Incision Placement



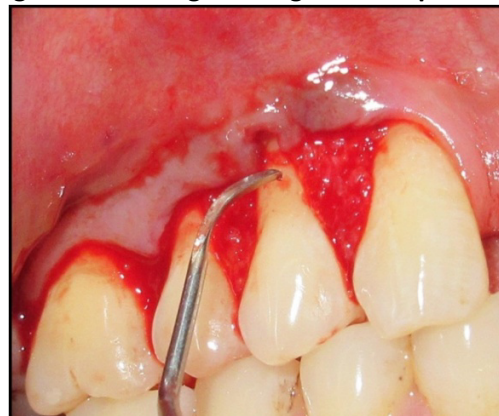
A split thickness flap was reflected till the root exposure and further apically a full thickness flap was raised. Beyond mucogingival junction again a split thickness flap was reflected to ensure adequate coronal displacement(Fig 4).

Figure 4: Reflection of flap



Anatomic interdental papilla was completely deepithelialised to expose the underlying connective tissue and to eliminate the epithelium that might interfere with healing. After flap reflection, thorough scaling and root planing was done. (Fig 5)

Figure 5: Thorough scaling and root planning



Following this, a root biomodification was done using 0.5% tetracycline solution. (Fig 6)

Figure 6: Root biomodification using 0.5% tetracycline



Preparation of PRF membrane:

After the recipient site preparation was completed, the required quantity of blood was drawn in 10 ml test tubes without an anticoagulant and centrifuged immediately. It was centrifuged using a tabletop centrifuge for 10 minutes at 3,000 rpm. The resultant product consists of the following three layers:

- Top most layer consisting of acellular PPP (Platelet poor plasma)
- PRF clot in the middle
- RBCs at the bottom

After centrifugation, the PRF clot was removed from the tube using sterile tweezers, separated from the RBC base using scissors, and PRF membrane was obtained. (Fig 7)

Figure 7: PRF membrane



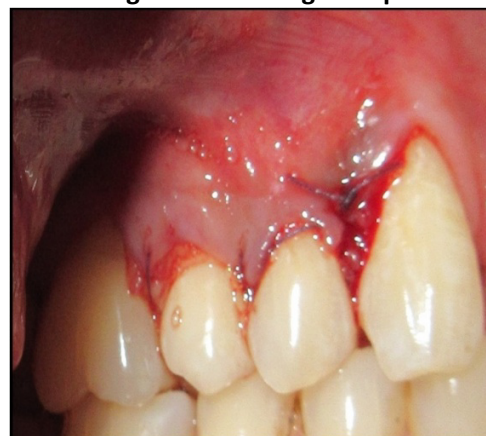
PRF membrane was placed covering the recession defect. (Fig 8)

Figure 8: Placement of PRF membrane



The flap is advanced coronally. While advancing the flap coronally, surgical papillae were rotated towards the ends of the flap and were displaced on the prepared connective tissue beds of the anatomical papillae. The flap was secured in place with sling sutures. (Fig 9)

Figure 9: Suturing of flap



This ensured precise adaptation of the flap. The surgical site was then covered with periodontal dressing.

Post operative care:

The patient was instructed not to remove the pack or 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 500 mg tds) for 3 days postoperatively. Use of 0.12% chlorhexidine rinse was also advised. Two weeks post operatively the periodontal dressing and the sutures were removed. Healing was satisfactory.

Results: The postoperative 3 months shows complete root coverage in maxillary right first and second premolars (Fig 10).

Figure 10: Root coverage after 3 months



There is no scar formation at operative site and the color match was excellent, which is the advantage of Zucchelli's technique over conventional coronally advanced flap.

Discussion: The treatment of gingival recession is becoming an important therapeutic issue from the viewpoint of esthetics. Improving esthetics during smiling or function is becoming the main aim of root coverage procedures. Gingival recession frequently affects groups of adjacent teeth. In order to minimize the number of surgeries and optimize the esthetic results, all the defects should be simultaneously treated.¹³ Multiple adjacent recession defects are a therapeutic challenge considering that several defects must be treated in a single surgical session to minimize patient discomfort. The premolars and molars are the most common sites of involvement.¹⁵ All root surfaces in our case report was conditioned with tetracycline HCL in accordance with a report by Isiket *al.* indicating that a 50-150 mg/ml tetracycline HCL solution resulted in a statistically significant opening of dentinal tubules.¹⁶

Coronally repositioned flap introduced by Bruiestein in 1970 and modified by Allen & Miller in 1989.¹⁷ The coronally advanced procedure resulted in an increased apicocoronal gingival height may be explained by several events taking place during healing and maturation of the marginal tissue. First, there is a tendency of the mucogingival line to regain its genetically defined position following coronal dislocation during the flap procedure, and second, it cannot be excluded that granulation tissue derived from the periodontal ligament tissue may have contributed to the increased gingival dimensions.¹⁸

Zucchelli & Sanctis modified this conventional technique. This new technique has few clinical and

biological advantages over the conventional technique. It is an envelope type of flap without vertical releasing incisions and hence the blood supply is not compromised and there are no unaesthetic scars along 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.¹³

The scientific rationale behind the use of platelet preparations lies in the fact that the platelet α -granules are a reservoir of many growth factors that are known to play a crucial role in hard and soft tissue repair mechanism.^{19, 20} PRF does not use bovine thrombin or other exogenous activators in the preparation process. It forms a gel-like matrix that contains high concentrations of non-activated, functional, intact platelets, contained within a fibrin matrix, that release a relatively constant concentration of growth factors over a period of 7 days.²¹

PRF membrane maintains the flap in a high and stable position, enhances neoangiogenesis, reduces necrosis and shrinkage of the flap, and, thus, guarantees maximal root coverage.²² In this case report, combination of Zucchelli's modification of coronally advanced flap with PRF membrane is used, which showed stable, full root coverage, increased keratinized gingiva width, good color match and no scar formation.

Conclusion: Soft tissue maintenance is the primary line of defense in protecting the tissue from bacterial infection. The application and preparation of PRF membrane is easy and does not require donor site preparation. Combination of Zucchelli's modification of coronally advanced flap with PRF membrane is very effective for treatment of multiple gingival recessions. Good stable results were observed in terms of root coverage, increased thickness of attached gingiva and resolution of dentinal hypersensitivity associated with gingival recession.

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