

Comparing of the patient related esthetic outcome Using Platelet rich fibrin (PRF) membrane with Coronally Advanced Flap With and Without Vertical Releasing Incisions (the envelope-type flap and the flap with VRIs) in Miller Class I and II Gingival recession defects: A Study Protocol

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Abstract: Aim: *To compare the patient related esthetic outcome Using Platelet rich fibrin (PRF) membrane with Coronally Advanced Flap With and Without Vertical Releasing Incisions (the envelope-type flap and the flap with VRIs) in Miller Class I and II Gingival recession defects*

Material and Methods- *14 defects will be randomly divided into test and control group consisting of 7 defects in each. Test group will be treated by PRF + CAF without VRI group and control group will be treated by PRF +CAF with VRI. Primary outcome will be gain in root coverage and secondary outcome will be Plaque index (PI), Papillary bleeding index (PBI), probing pocket depth (PPD), relative attachment level (RAL), relative gingival margin level (RGML), recession depth (RD), gingival thickness (GT) and width of keratinized gingiva (WKG). Clinical evaluation will be performed at 3 & 6 months of therapy.*

Result-*Student's paired t-test will be utilized to analyze data from the day of surgery to six months. A comparison of both groups at baseline and six months will be achieved by student's unpaired t-test. Comparison of the PI and PBI at baseline & six months will be performed by student's paired t-test. When all the parameters will be compared at 6 months post-operatively to baseline data, both the treatment group (test and control) will show significant gain in root coverage, RAL gain, PPD reduction, decrease in recession depth,*

increase in GT and WKG.No significant difference will be found in the two groups for reduction of recession and CAL and satisfaction of patient with regards to esthetics. Higher chances of complete root coverage and increase WKG will be seen in control group.

Conclusion- The combination of PRF and CAF without VRI will be effective in the treatment of gingival recession. PRF in combination with CAF without VRI will have significant clinical outcome as compared to GTR membrane and CAF with VRI.

Key words:-*Coronally advanced flap, gingival recession, Vertical releasing incisions.*

INTRODUCTION:

“Gingival recession is exposure of the root surface due to apical migration of the gingival margin”. Recession has become a common esthetic problem due to which most of the people are trying to get treated (Amarante et al 2000)¹. Mucogingival surgeries are done to correct esthetic problems, avoid recession formation, help in controlling plaque, and decrease dentin hyper-sensitivity. People today around the world are conscious about their appearance and recession is under focused as it gives unaesthetic appearance during smiling (Zucchelli et al 2000)².

Past 30 years, many surgeries are developed for the gingival recession prevent recession. This surgeries are “subepithelial connective tissue graft” (SCTG), free gingival graft, coronally advanced flap (CAF), “laterally positioned flap”, and “guided tissue regeneration with membranes”, platelet-rich plasma (PRP), “acellular dermal matrix (ADM)”, and “platelet-rich fibrin (PRF)” along with CAF (Needleman et al 2005, Miller et al 1998, Cario et al 2009)³⁻⁵.

PRF is a platelet concentrate of 2nd generation made by centrifugation of blood. It is an alteration of PRP with some benefits, like 1st its preparation is easy 2nd ease of application 3rd it is less expensive, and 4th no need of bovine thrombin or anticoagulant for its preparation. PRF has fibrin framework properties and growth factors which help in stimulation of cell migration, faster healing of wound and tissue regeneration.

SCTG and CAF have given better results in gaining complete root coverage and thus are considered as gold standard for the same. Though, there are some disadvantages of SCTG technique such as it takes longer time for surgery, higher chances of morbidity, need for 2nd surgery, and causes postoperative pain and bleeding, and donor tissue supply is limited (Needleman et al 2005)³.

CAF is a safe and liable method for the management of root coverage that do not need donor site from palatal. Individual who has greater esthetic hopes, CAF will be the treatment of choice if there is enough keratinized tissue present below to the root exposed. In CAF, the tissue which covers the root recession have same color, thickness, and texture to that present surrounding the recession defect thus, it gives more esthetic results.

Envelope type of CAF is done for the management of gingival recessions in the anterior region of the mouth². The benefit of the envelope type of flap is that it does not require vertical releasing incisions (VRIs), which damages supply of blood to the flap and can cause un-esthetic white scars (keloids).

Aim

Therefore, the current study will be undertaken to “compare the patient related esthetic outcome Using Platelet rich fibrin (PRF) membrane with Coronally Advanced Flap With and

Without Vertical Releasing Incisions (the envelope-type flap and the flap with VRIs) in Miller Class I and II Gingival recession defects” with the following objectives:

Objectives:

1. To assess the efficacy of PRF membrane in along with CAF with VRIs for root coverage, gains in CAL (clinical attachment level), to improve the WKG (width of the keratinized gingiva).
2. To assess the efficacy of PRF membrane along with a coronally advanced flap without VRIs (envelope-type flap) in regard to root coverage, gains in CAL, to improve the WKG.
3. Evaluation of patient centered outcomes following root coverage with PRF membrane and CAF With and Without VRI.

MATERIAL AND METHODS:

14 systemically healthy individual with recession of gingiva present on the buccal or labial surface of the teeth will be taken from the OPD of “department of Periodontics, Sharad Pawar Dental College, Sawangi (Meghe), Wardha” using following inclusion and exclusion criteria:

Inclusion Criteria:

1. Existence of Miller’s Class I /II gingival recession on the buccal/labial surfaces of the maxillary teeth .
2. ≥ 2 mm gingival recession depth present.
3. Adequate interdental bone seen radiographically.
4. Adequate WKG present apical to recession.

Exclusion Criteria:

1. Patients using tobacco products and smokers.
2. Non cooperative individual.
3. Individual with poor oral hygiene after phase I therapy and showing plaque score ≥ 1 .
4. History of periodontal surgical treatment in quadrant selected for the study.
5. Pregnant lady or lactating mother.
6. Presence of badly caries teeth
7. Presence of mobile teeth.

Study Design:

14 patients, each with recession defects will be selected for the study. Prior to surgery selected patients will be randomly assigned to either PRF + CAF with VRI group or PRF + CAF without VRI group (envelope-type flap), each group will be consisting 7 patients respectively. Before surgery, the defects will be randomly allotted either to test or control group by flipping a coin, each group will consist of 7 defects, according to randomized parallel design.

Initial Therapy:

Every patient will receive initial therapy consisting of oral hygiene instructions, scaling and root planing, professional polishing with the use of rubber cup and a low abrasive polishing paste. Coronoplasty will be performed, if needed. A Modified Stillman’s brushing technique will be prescribed for teeth with recession-type defects in order to minimize brushing trauma. Plaque control instructions will be repeated until patients achieved a plaque score of ≤ 1 . The patient’s plaque control and tissue response will be re-evaluated 6 weeks later.

CLINICAL MEASUREMENTS:

Clinical records like Papillary Bleeding Index , Plaque Index , relative attachment level (RAL), probing pocket depth (PPD) , relative gingival margin level (RGML), recession depth (RD), WKG and GT will be noted on the surgery day, 3 and 6 months after surgery. Primary outcome will be gain in root coverage and secondary outcome will be PI, PBI, PPD, RAL, RGML, RD, GT and WKG.

A) Indices:

Patient's gingival status and oral hygiene will be evaluated at the day of surgical procedure 3 and 6 months.

1. **Plaque Index** will be measured using "Turesky - Gilmore - Glickman Modification of Quigley-Hein" 1970⁶

2. **Papillary Bleeding Index** will be measured using Muhlemann H.R 1977⁷

B) Probing Measurements:

The clinical parameters will be measured for evaluation of the results are the PPD, RAL, RGML, RD, WKG and GT which will be recorded using a UNC-15 probe. To assimilate the measurements clinically, acrylic stents will be made on patient's casts. Stent covering the occlusal surfaces of the test tooth will be used as reference point. To extend periodontal probe to the deepest area of defect, it inserted at an angle. With the help of burs, longitudinal grooves will be made on the stent which will be used as guide for periodontal probe. GT will be calculated 3 mm below the margin of gingiva, under topical anesthesia with the help of endodontic reamer and rubber stopper. RD will be calculated from cement-enamel junction to the margin of gingiva. WKG will be achieved by calculating the sulcular depth plus the attached gingiva by UNC-15 Probe. These clinical measurements will be noted on the treated areas at the day of surgery, 3 and 6 months.

PRF Preparation

10ml of blood will be withdrawn from antecubital vein and samples will be taken in sterile test tubes and for 12 minutes will be centrifuged at 3000 rpm. In middle part fibrin clot formed which will be segregated from underlying RBCs

Surgical Procedure for control group:

Before the surgery, blood investigations will be carried out and the patients will be directed to gargle with 0.2 % Chlorhexidine gluconate for 1 minute. Asepsis and infection control will be maintained throughout the surgical procedure. The surgical will be carried out following complete sterilization procedures. After giving local Anaesthesia^{8,9}, root planing will be done of uncovered root surfaces with ultra-sonic scalers followed by curettes.

Two diagonal, beveled incisions will be given one at distal and other at mesial line angle of the two teeth surrounded with gingival recessions. These incisions, along with the intrasulcular incisions end to end to the distal and mesial margins of recession, designed the two external papillae. Split thickness dissection of surgical papillae will be done till the sulcular area, as the blade will be placed parallel to the root surface. Full thickness flap of soft tissue below the exposed root will be elevated by put in a small periosteum elevator into the sulcus and going in the apical direction so that 3 to 4 mm of bone is exposed below the bone dehiscence. The split thickness elevation will be done of VRIs. This split thickness elevation will continue apical to bone exposure until the elevated flap moves coronally passively. PRF will placed on the root surfaces. The flap should cover the PRF placed on the root surface and be stable in position coronally, even without the sutures.

Two interrupted sutures will be placed at the most apical part of the VRI, which will proceed in coronal direction, each suture will be directed apical–coronal from the flap to soft tissue.

Surgical procedure for test group

For test site surgical procedure will be same as that for control site except oblique incisions or VRI will not be placed i.e envelope flap will be raised in the control group and PRF membrane will be positioned on the surface of the root exposed. The flap should cover the PRF placed on the root surface and be stable in position coronally, even without the sutures.

We will start placing the suture from the peripheral areas of the flap. Last sutures will be placed at the central area. These sling sutures permits adequate placement of the flap on the curves of the crown and maintain the position of the papilla on the interdental connective tissue bed. The flap margin held above to the CEJ to compensate for soft tissue shrinkage after surgery.

Post-operative care:

Post-operatively, periodontal pack will be set on the recipient site. Non-steriodal anti-inflammatory Tab. Ibugesic Plus, t.i.d and antibiotic Cap. Mox, t.i.d will be given for 5 days after surgical period. Subjects will be advised to avoid brushing over treated side and rinse with 0.2% chlorhexidinegluconate for 2 weeks. They will be advised not to interrupt pack and prevent unnecessary injury to surgical site.

Periodontal pack will be taken off 1 week post-operatively. Healing is noticed and if necessary second pack will be given. Following 14 days the sutures will be removed. Patients will be instructed to wipe the surgical site with cotton ball soaked in 0.2% chlorhexidinegluconate for a week in an apico-coronal course and adopt Charter's brushing technique with soft toothbrush. Subjects will be recalled at 1, 3 and 6 months following surgery.

Statistical Analysis:

The mean and standard deviations (Mean \pm SD) values will be measured for all records. Mean data is examined using standard statistical method for the statistical significance. Students paired t-test will be used to correlate the data from the baseline to 3 and 6 months for per group. Treatment groups comparisons will be done using student's unpaired t-test. If probability value [p] is > 0.05 , the difference observed will be regarded as non-significant and if less < 0.05 , it will be significant.

Expected results:

Time required for the surgery will be less in the control group. No significant difference will be found in the two groups for reduction of recession and CAL and satisfaction of patient with regards to esthetics. Higher chances of complete root coverage and increase WKG will be seen in control group.

Discussion:

PRF has increased amount of Leukocytes helps in release of growth factor, regulation of immunity, anti-infectious properties, and remodelling of matrix during wound healing. PRF membrane helps in stabilization of flap as it has adhesive properties and biologic functions such as fibrin glue; this also helps in angiogenesis enhancement (McGuire et al 2003)¹⁰. PRF

can be produced easily and is less expensive, it takes less time for the preparation of PRF (Jankovic et al 2012)¹¹.

Jankovic et al (2012)¹¹ compared the outcomes gained by the using “PRF membrane and connective tissue graft (CTG)” in the management of gingival recession and assessed the clinical effect of PRF on subjective patient discomfort and early healing of wound. Using PRF membrane for the management of gingival recession shows acceptable clinical results, along with improved wound healing and reduced patient discomfort compared to CTG treated gingival recession defects. The authors concluded that increase in KTW in was seen in CTG group and improved wound healing was obtained with the PRF group.

G. Zucchelli et al (2009)¹² associated esthetic and root coverage results of the CAF with and without VRI for the management of multiple recessions defects. It was found that both techniques were useful for reduction of recession depth. The CAF without VRI shows higher chances of attaining 100 percent root coverage and reduces post-operative discomfort. Time required for the surgical was less for CAF without VRI group. There was possibility of keloid formation in CAF with VRI group thus giving patients an un-esthetic appearance. Few articles on Gingival surgeries related to recession are available¹³⁻¹⁵. Dambhare et al reported a study of autologous Platelet Rich Fibrin in combination with HA and Beta-TCP or HA and Beta-TCP alone for treatment of furcation defects¹⁶. Thombre et al conducted evaluation of the effectiveness of coronally positioned flap with or without acellular dermal matrix allograft in the treatment of multiple marginal gingival recession defects¹⁷. Chavan et al reported about open flap debridement in combination with acellular dermal matrix allograft for the prevention of postsurgical gingival recession¹⁸. Deshpande et al conducted a comparative evaluation of RhPDGF-BB plus Beta-TCP and subepithelial connective tissue graft for the treatment of multiple gingival recession defects¹⁹. Another related 2study on treatment of periodontitis was reported by Kathariya et al²⁰ and Abualhaija²¹.

Conclusion:

The combination of PRF and CAF without VRI will be effective in the treatment of gingival recession. PRF in combination with CAF without VRI will have significant clinical outcome as compared to GTR membrane and CAF with VRI.

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