

Original Research

COMPARATIVE EVALUATION OF MANAGEMENT OF GINGIVAL RECESSION DEFECTS USING CORONALLY ADVANCED FLAP WITH PLATELET RICH FIBRIN MEMBRANE WITH AND WITHOUT MAGNIFYING LOUPES - A CLINICAL STUDY

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ABSTRACT:

Background: Gingival recession and root exposure represent a therapeutic problem to the clinician. Increasing interest in esthetics and the related problems such as hypersensitivity and root caries have favoured the development of many root coverage procedures. Recession coverage upto a certain extent has solved these problems, but these procedures need good maintenance after the surgery for long term benefits. With increasing advances in the field of recession coverage, microsurgery had added another dimension in undertaking the surgical procedure. **Objectives:** The aim of the study was to compare the clinical efficacy of coronally advanced flap combined with PRF membrane using the microsurgical technique with magnifying loupes and conventional surgical technique in the treatment of localized gingival recession. **Materials & Methods:** A split mouth study was carried out in ten patients with bilateral almost comparable isolated miller's class I or II facial recession defects ≥ 2 mm in anterior or premolar teeth. One site designated as group I underwent coronally advanced flap with platelet rich fibrin membrane using magnifying loupes and Group II underwent coronally advanced flap with platelet rich fibrin membrane using conventional technique. The clinical parameters were evaluated at baseline, 3 months, 6 months postoperatively using clinical recession depth, probing depth, clinical attachment levels and width of keratinized gingiva. **Results:** Both groups showed significant clinical improvement in all the parameters. Although, the results were slightly better in group I but, on comparing both the groups, these parameters did not reach statistical significance. **Conclusion:** The microsurgical and conventional techniques provided a statistically significant reduction in gingival recession height. After 6 months, there was no statistically significant difference between the techniques regarding root coverage.

Key words: Flap, PRF

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INTRODUCTION

The main goal of periodontal therapy is to improve periodontal health and thereby to maintain patient's functional dentition throughout the life. However, aesthetics represents an inseparable part of today's periodontal therapy and several procedures have been

proposed to preserve or enhance patient's esthetics (Roccuzzo et al. 2002). Gingival recession is one of the commonly encountered problems in clinical practice. It is the term used to characterize the apical shift of the marginal gingiva from its normal position on the crown of the tooth to levels on the root surface beyond the

cemento-enamel junction (Loe, Ånerud and Boysen 1992). Miller (1985) described a useful classification of recession defects taking into consideration the anticipated root coverage that is possible to attain. Plaque induced periodontal inflammation, tooth brushing trauma, tooth malposition, alveolar bone dehiscence, high frenum attachment, iatrogenic factors related to restorative and periodontal procedures, as well as orthodontic tooth movement have been associated with the development of gingival recession. Esthetics, dentin hypersensitivity, root caries and cervical abrasions are the indications for root coverage (Pandey and Mehta 2013). The treatment of choice for recession coverage should address the biological as well as the patient's esthetic demands. Various surgical techniques have been suggested to treat gingival recession defects. These include laterally positioned flap, free gingival graft, the coronally advanced flap, subepithelial connective tissue graft and guided tissue regeneration with membranes, enamel matrix derivative or the application of an acellular dermal matrix and platelet-rich plasma and platelet rich fibrin in combination with Coronally advanced flap. Subepithelial Connective Tissue Graft technique is accepted as the gold standard and shows greater degree of predictability for obtaining complete root coverage. However, Subepithelial Connective Tissue Graft Technique is time consuming requiring a second surgical procedure and is associated with patient discomfort, post-surgical pain, bleeding and limited supply of donor tissue. In contrast, the Coronally Advanced Flap is easier to perform and effective root coverage may be obtained without the potential clinical complications associated with the donor site surgery (Andrade et al. 2010).

A recent innovation in dentistry is the use of second-generation platelet concentrate which is an autologous platelet rich fibrin gel with growth factors and cicatricial properties for root coverage procedures (Padma et al. 2013). Platelet Rich Fibrin is defined as an autologous platelet and leukocyte enriched fibrin biomaterial. Without an anticoagulant, Platelet Rich Fibrin is polymerized naturally and has the characteristic of slowly composed dense fibrin matrix, which makes Platelet Rich Fibrin a manipulative material. It can be used as membranes, when squeezed between two hard surfaces. The Platelet Rich Fibrin consists of platelets, leukocytes, growth factors and presence of circulating stem cells. The natural polymerized fibrin architecture of Platelet Rich Fibrin seems responsible for releasing high amounts of growth factors and other matrix glycoproteins for approximately 7 days. These biochemical components and fibrin formation of Platelet Rich Fibrin support cell migration, wound healing and tissue regeneration (Eren and Atilla 2013). A clinical advantage of Platelet Rich

Fibrin as a graft material is related to avoidance of a donor site and a major decrease in patient discomfort after operation. Due to these features, it can be concluded that Coronally Advanced Flap with Platelet Rich Fibrin technique may represent an alternative to the traditional Coronally Advanced Flap + Subepithelial Connective Tissue Graft technique.

The current pendulum of clinical opinion in some areas of periodontal education and research has swung away from traditional mechanical and surgical therapy towards advanced treatment applications. The application of magnification to periodontics has tremendously refined the periodontal surgical care. As recent developments in medicine have shown, magnification and microsurgery can greatly impact clinical practice (Perumal et al. 2015). Modern periodontology is closely linked to both plastic surgery and esthetic dentistry. As a treatment philosophy, microsurgery incorporates three different principles (Tibbetts and Shanelec 2009)1. Improvement of motor skills thereby enhancing surgical ability.2. An emphasis on passive wound closure with exact primary apposition of the wound edge.3. The application of microsurgical instrumentation and suturing to reduce tissue trauma. Since only a few studies are available in the literature comparing the conventional and microsurgical techniques in periodontal plastic surgery, the aim of the present study is to compare the clinical efficacy of coronally advanced flap with Platelet Rich Fibrin membrane with and without magnifying loupes in treatment of localized gingival recession.

MATERIALS AND METHODS

This comparative clinical study was carried out in the Department of Periodontics, Punjab government dental college and hospital, Amritsar, India. The study protocol was explained to each potential patient and written informed consent was obtained before the commencement of any treatment. This study was done under the ethical guidelines of the Institutional Research and Ethical Committee. This was a split-mouth study which included a total of twenty sites (ten in each group), which were selected in total of ten patients of age ranging from 25 to 55 years, who met the inclusion criteria of the study, were planned to be examined at baseline, and postsurgically at 3 months and at 6 months.

A general assessment of the selected subjects was made through their history, clinical examination and routine laboratory investigations. All the selected subjects received phase-I therapy, which included oral hygiene instructions, scaling and root planing. Following phase I therapy, the subjects were re-evaluated after 6 weeks. The patients still fulfilling our selection criteria were finally selected for the study. Immediately prior to surgery, following clinical parameters were recorded:

CLINICAL PARAMETERS:

A clinical proforma was designed to have a systematic and methodical recording of all the information and parameters made during the study. Following parameters were recorded:

- i. Probing depth
- ii. Width of keratinized gingiva
- iii. Clinical Recession depth
- iv. Clinical attachment level

All the parameters were taken at baseline and subsequently at the end of 3 months and 6 months after surgery. The measurements for determination of recession depth, probing depth, and clinical attachment level were standardized using UNC-15 graduated periodontal probe and customized acrylic occlusal stents with grooves which were prepared on the study model of the patients. The occlusal stent was made using self cured acrylic covering the occlusal as well as coronal 1/3rd of the buccal and the lingual surfaces of the tooth involved and one tooth mesial and distal of the involved tooth. Vertical grooves were made to guide the periodontal probe vertically in the same plane everytime. The flat bottom edge of the vertical grooves was used as the fixed reference point. The stent was stored on the cast to minimize distortion. The same procedure was followed to prepare all the stents in this study. Vertical measurements for determination of recession depth, probing pocket depth and clinical attachment level were measured from:

1. Fixed reference point to gingival margin
2. Fixed reference point to the cemento-enamel junction
3. Fixed reference point to the base of the pocket.

Using above measurements, following clinical parameters were calculated as:

- (I) Probing Depth (PD): The probing depth was calculated by subtracting the distance of fixed reference point to the gingival margin from distance of fixed reference point to the base of the pocket.
- (II) Width of Keratinized Gingiva (WKG): The width of keratinized gingiva was measured from the most apical part of gingival margin to the mucogingival junction.
- (III) Clinical Recession depth (RD): Recession depth was calculated by subtracting the distance of fixed reference point to the cemento-enamel junction from distance of fixed reference point to the gingival margin.
- (IV) Clinical attachment level (CAL): Clinical attachment level was calculated by subtracting the distance of fixed reference point to the cemento-enamel junction from distance of fixed reference point to the base of the pocket. All measurements were performed at the buccal surface of the teeth.

Study design: The selected teeth in each patient will be randomly divided into 2 groups using a split mouth study design:

Test group (Group I) Coronally Advanced Flap with Platelet Rich Fibrin membrane using microsurgical technique under magnifying loupes.

Control group (Group II) Coronally Advanced Flap with Platelet Rich Fibrin membrane using macrosurgical technique with unaided eye.

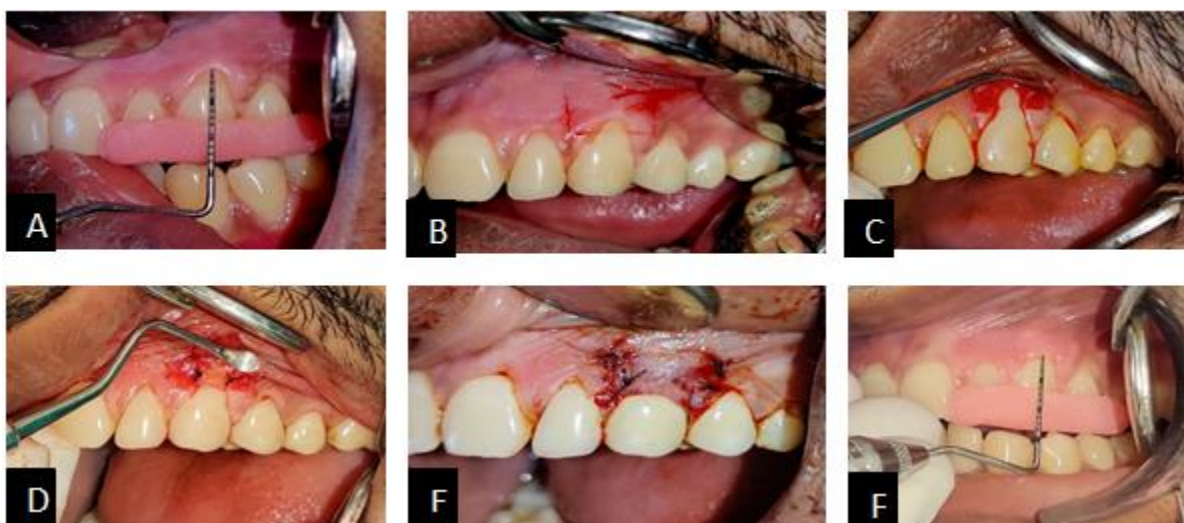


Figure 1: (A) Preoperative recession depth measurement of test site (B) incision, (C) flap reflection and (D & E) suture placement done under compound loupes, (F) recession depth measurement at 6 months, well found gingival tissue coverage was seen at the test site.

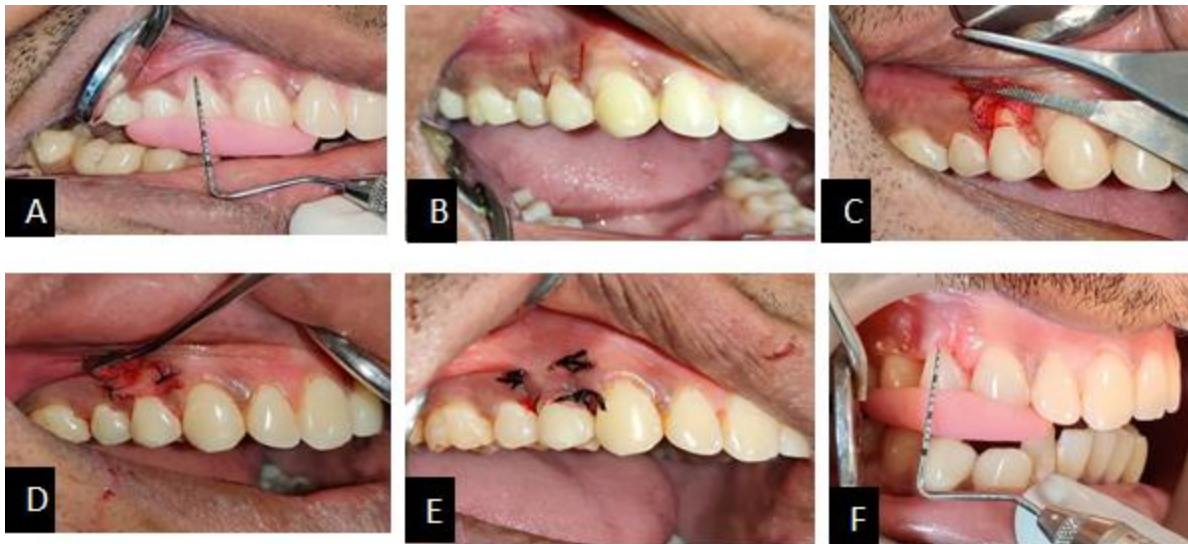


Figure 2: (A) Preoperative recession depth measurement of test site, (B) incision, (C) flap reflection and (D & E) suture placement done in conventional manner without use of any magnification, (F) recession depth measurement at 6 months, well found gingival tissue coverage was seen at the control site.

Surgical Management:

Prior to surgery, the consent form was signed by the subjects. All instruments used in surgery were sterilized by autoclaving (temperature 121°C at 15 psi pressure for 15 minutes). The facial skin all around oral cavity was scrubbed with povidone iodine (5% w/v) solution and subjects were asked to rinse with 0.2% chlorhexidine. All cases were operated under local anaesthesia with a solution of 2% Lignocaine with 1:200000 adrenaline. Anaesthetic solution was administered by nerve block to adequately anesthetize the surgical site. Both sites (Group I and Group II) underwent an identical coronally positioned flap procedure. An intrasulcular incision was made using 15 no. blade on the buccal aspect of the involved tooth. This incision was horizontally extended mesiodistally to dissect the buccal aspect of the adjacent papillae, avoiding the gingival margin of the adjacent teeth. Two oblique releasing incisions were carried out from the mesial and distal extremities of the horizontal incisions beyond the mucogingival junction. A trapezoidal full thickness flap was raised with a periosteal elevator towards the mucogingival junction. A full thickness flap was limited to 3 to 4 mm beyond the marginal bone crest and the continuous partial thickness flap was extended apically until the flap could be passively repositioned coronally from the cemento-enamel junction. Adjacent papillae were then de-epithelized to provide a connective tissue bed for coronally positioned flap. After that, platelet rich fibrin membrane was positioned and sutured. In Group I, all the above procedure was carried out with microsurgical miniblades under compound loupes with 3.5X magnification. The flap was coronally positioned and sutured using 6-0 black braided silk suture.

NonEugenol periodontal dressing (Coe – Pak™) was placed over the surgical site. In Group II, all the above procedure was carried out with conventional blades and under direct vision. The flap was coronally positioned and sutured using 3-0 black braided silk suture. Non-Eugenol periodontal dressing (Coe – Pak™) was placed over the surgical site. Postsurgical Management: All patients were prescribed Amoxycillin 500 mg thrice a day and Ibuprofen 400 mg thrice a day for 5 days. During the recovery phase of the wound, the subjects were instructed not to brush the operated area for two weeks. They were also instructed to rinse the oral cavity with chlorhexidine (0.2%) mouthwash twice daily. The subjects were recalled one week after the surgery for the removal of periodontal dressing and sutures, the teeth were polished and the patient were instructed to maintain good oral hygiene. Then, the subjects were recalled at the end of 3 months and 6 months after surgery and all the clinical parameters were again recorded. The data thus collected was compiled and put to statistical analysis.

RESULTS

The present study was conducted to clinically evaluate and compare the clinical efficacy of coronally advanced flap combined with PRF membrane using the microsurgical technique with surgical loupes and conventional surgical technique in treatment of localized gingival recession. Ten patients in the age group of 25-55 years (both male and female) visiting the Department of Periodontology, Punjab Govt. Dental College and Hospital, Amritsar, with bilateral almost comparable isolated gingival recession defects ≥ 2 mm in anterior and/or premolars were included in the

present study. Immediately prior to the surgery, the selected teeth in each subject were divided into 2 groups randomly. Recession in Group I was treated by Coronally Advanced Flap with Platelet Rich Fibrin membrane using microsurgical technique with surgical loupes whereas that in Group II was treated by Coronally Advanced Flap with Platelet Rich Fibrin membrane using conventional technique.

Following clinical parameters were recorded for the selected teeth at baseline and subsequently, at 3 months and 6 months after surgery.

1. Recession depth – (using UNC-15 and customized acrylic stent)
2. Probing pocket depth (using UNC-15 and customized acrylic stent)
3. Clinical attachment level (using UNC-15 and customized acrylic stent)
4. Width of the keratinized gingiva – measured from the most apical part of gingival margin to the mucogingival junction.

The data thus obtained was compiled, tabulated and statistically analyzed. The results thus obtained are shown in tables I to XIII.

CLINICAL PARAMETERS:

- I. Recession depth: Table II shows mean change in recession depth at different time intervals in both groups. In Group I, the mean reduction in recession depth was 2.40 ± 0.64 mm between baseline and 3 months (significant, $p < 0.05$). In Group II, the mean reduction in recession depth was 2.10 ± 0.56 mm between baseline and 3 months (significant, $p < 0.05$). Table III shows intergroup comparison of mean change in recession depth of Group I and Group II at different time intervals. The difference of mean change in recession depth between baseline and 3 months was 0.30 ± 0.82 (nonsignificant, $p > 0.05$), between baseline and 6 months was 0.50 ± 0.84 (nonsignificant, $p > 0.05$); between 3 and 6 months was 0.20 ± 0.63 (non-significant, $p > 0.05$). Table IV shows percentage of mean root coverage of Group I and Group II at different time intervals. The mean root coverage percentage obtained was 72.720% for Group I and 64.51% for Group II between baseline and 3 months. 50 Mean root coverage percentage obtained was 69.69% for Group I and 54.83% for Group II between baseline and 6 months.
- II. Probing depth: Table VI shows mean change in probing depth at different time intervals in both groups. In Group I, the decrease in probing depth between baseline and 3 months was 0.30 ± 0.48 mm

(non-significant, $p > 0.05$), between baseline and 6 months was 0.40 ± 0.51 mm (significant, $p < 0.05$). In Group II, the decrease in probing depth between baseline and 3 months was 0.20 ± 1.03 mm, between baseline and 6 months was 0.50 ± 0.70 mm and between 3 months and 6 months was 0.30 ± 0.67 mm. The change was statistically non-significant ($p > 0.05$) at all time intervals. Table VII shows intergroup comparison of mean change in probing depth between Group I and Group II at different time intervals. The difference of mean change in probing depth between baseline and 3 months was 0.10 ± 0.994 (nonsignificant, $p > 0.05$), between baseline and 6 months was 0.10 ± 0.738 (nonsignificant, $p > 0.05$); between 3 and 6 months was 0.20 ± 0.789 (non-significant, $p > 0.05$).

- III. Clinical attachment level: Table IX shows mean change in clinical attachment level at different time intervals in both groups. In Group I, gain in the mean clinical attachment level between baseline and 3 months was 2.60 ± 0.84 mm (significant, $p < 0.05$). In Group II, gain in the mean clinical attachment level between baseline and 3 months was 2.20 ± 0.13 mm (significant, $p < 0.05$). Table X shows intergroup comparison of mean change in clinical attachment level between Group I and Group II at different time intervals. The difference of mean change in clinical attachment level between baseline and 3 months was 0.40 ± 1.07 (non-significant, $p > 0.05$), between baseline and 6 months was 0.50 ± 1.08 (non-significant, $p > 0.05$); between 3 and 6 months was 0.10 ± 0.73 (non-significant, $p > 0.05$).
- IV. Width of keratinized gingiva: Table XII shows mean gain in width of keratinized gingiva at different time intervals in both groups. In Group I, gain in the width of keratinized gingiva between baseline and 3 months was 0.20 ± 0.42 mm (nonsignificant, $p > 0.05$). In Group II, gain in the width of keratinized gingiva between baseline and 3 months was 0.20 ± 0.42 mm (non-significant, $p > 0.05$), between baseline and 6 months was 0.50 ± 0.52 mm (significant, $p < 0.05$). Table XIII shows intergroup comparison of mean gain in width of the keratinized gingival between Group I and Group II at different time intervals. The difference of mean change in clinical attachment level between baseline and 3 months was 0.00 ± 0.66 (non-significant, $p > 0.05$), between baseline and 6 months was 0.10 ± 0.94 (non-significant, $p > 0.05$); between 3 and 6 months was 0.10 ± 0.87 (non-significant, $p > 0.05$).

RESULTS**MEAN CHANGE IN RECESSON DEPTH SCORE IN GROUP I AND II AT DIFFERENT TIME INTERVALS**

Time interval	Group	No.	Mean change	'Z'	'p'	's'
Baseline and 3 months	I	10	2.40±0.64	2.859	0.004	S
	II	10	2.10±0.56	2.913	0.004	S
Baseline and 6 months	I	10	2.30±0.67	2.859	0.004	S
	II	10	1.80±0.91	2.719	0.007	S
3 months and 6 months	I	10	0.01±0.31	1.000	0.317	NS
	II	10	0.30±0.48	1.732	0.083	NS

MEAN CHANGE IN PROBING DEPTH SCORE IN GROUP I AND II AT DIFFERENT TIME INTERVALS

Time interval	Group	No.	Mean change	'Z'	'p'	's'
Baseline and 3 months	I	10	0.30±0.48	1.732	0.083	NS
	II	10	0.20±1.03	0.632	0.527	NS
Baseline and 6 months	I	10	0.40±0.51	2.000	0.046	S
	II	10	0.50±0.70	1.890	0.059	NS
3 months and 6 months	I	10	0.10±0.56	0.577	0.564	NS
	II	10	0.30±0.67	1.342	0.180	NS

MEAN CHANGE IN CLINICAL ATTACHMENT SCORE IN GROUP I AND II AT DIFFERENT TIME INTERVALS

Time interval	Group	No.	Mean change	'Z'	'p'	's'
Baseline and 3 months	I	10	2.60±0.84	2.848	0.004	S
	II	10	2.20±0.13	2.830	0.005	S
Baseline and 6 months	I	10	2.70±1.05	2.831	0.005	S
	II	10	2.20±1.52	2.691	0.007	S
3 months and 6 months	I	10	0.10±0.73	0.447	0.655	NS
	II	10	0.00±0.60	0.000	1.000	NS

MEAN CHANGE IN KERATINIZED GINGIVA SCORE IN GROUP I AND II AT DIFFERENT TIME INTERVALS

Time interval	Group	No.	Mean change	'Z'	'p'	's'
Baseline and 3 months	I	10	0.20±0.42	1.414	0.157	NS
	II	10	0.20±0.42	1.414	0.157	NS
Baseline and 6 months	I	10	0.60±0.51	2.449	0.014	S
	II	10	0.50±0.52	2.336	0.025	S
3 months and 6 months	I	10	0.40±0.51	2.00	0.046	S
	II	10	0.30±0.48	1.732	0.083	NS

DISCUSSION

Gingival recession is a common clinical entity observed in patient population regardless of their age and ethnicity. Its global prevalence varies significantly among different study populations. Some common consequences of gingival recession, such as tooth hypersensitivity, pain, root caries and esthetic concerns, adversely affect patients overall well-being (Wang, Modarressi and Fu 2012). Treatment of gingival recession is a common requirement due to aesthetic concern or root sensitivity in patients with high standards of oral hygiene. The coronally advanced flap procedure is a very common approach for root coverage. This approach may be used alone or in combination with soft tissue grafts (Wennstrom and Zucchelli 1996), barrier membrane (Pini prato et al. 1992), enamel matrix derivative (Rasperini et al. 2000), acellular dermal matrix (Harris 1998), platelet rich plasma (Marx et al. 1998) and living tissue engineered

human fibroblast derived dermal substitute (Wilson et al. 2005) (Cairo, Pagliaro, Nieri 2008). Jankovic et al. (2012) in a 6 month randomized controlled trial found that Platelet rich fibrin membrane provided clinically acceptable results and enhanced wound healing when compared to connective tissue graft treated gingival recession sites. Similarly, Reddy et al. (2013) also reported two cases where PRF membrane was used in addition to modified coronally advanced flap technique and in that it showed enhanced root coverage with an increase in thickness of gingiva. In the present study, the coronally positioned flap surgical approach described by Rocuzzo et al. (1996) was performed. Combined full thickness and partial thickness flap was raised. The continuous partial thickness portion extending apically into the vestibule facilitated in the passive coronal displacement of flap and the flap was advanced as coronally as possible towards the cemento-enamel junction, as in accordance with the study conducted by Pini Prato et al. (2005).

Ten patients in the age group of 25 – 55 years with bilateral almost comparable isolated Miller’s class I and II facial recession defects ≥ 2 mm in anterior or premolar teeth were selected and operated upon as per the previously established criteria. The recession defects in ten patients were randomly assigned into two groups. In Group I, coronally advanced flap with platelet rich fibrin membrane using microsurgical technique under magnification loupes was done. In Group II, coronally advanced flap with platelet rich fibrin membrane using macrosurgical technique with unaided eye was done. The clinical parameters i.e. the probing depth, clinical recession, width of keratinized gingiva, clinical attachment level were evaluated clinically in both the groups at baseline, at 3 months and 6 months post-operatively. The data thus recorded was compiled, tabulated and statistically analysed to arrive at the results which were as follows:

- I. **RECESSION DEPTH:** In the present study, the mean recession depth in Group I was 3.30 ± 0.94 mm at baseline, 0.90 ± 0.70 mm at 3 months and 1.00 ± 0.63 mm at 6 months. Mean reduction of recession depth was 2.40 ± 0.64 mm (mean root coverage of 72.72%) at 3 months and 2.30 ± 0.67 mm at 6 months (mean root coverage of 69.69%) from baseline and both were statistically significant. 68 The mean recession depth in Group II was 3.10 ± 0.99 mm at baseline, 1.00 ± 0.17 mm at 3 months and 1.30 ± 0.90 mm at 6 months. Mean reduction of recession depth was 2.10 ± 0.56 mm (mean root coverage of 64.51%) at 3 months and 1.80 ± 0.91 mm at 6 months (mean root coverage of 54.83%) from baseline and 6 months and both were statistically significant. The results are in accordance with the studies conducted by Latha et al. (2009) and Francetti et al. (2005). In both Group I and Group II, the mean recession depth coverage at the end of 6 months was slightly less than that achieved at the end of 3 months but this change was statistically non-significant. On intergroup comparison, although mean reduction in recession depth was more in Group I, but results were statistically non-significant at different time intervals. Similar results were recorded by Francetti et al. (2005) who treated cases of gingival recession by different mucogingival surgical techniques, with and without the aid of a surgical microscope. Also, similar results were recorded by Patel et al. (2018) who compared the macro- and microsurgery techniques for root coverage using a coronally positioned flap (CPF) associated with platelet rich fibrin membrane.
- II. **PROBING DEPTH:** In the present study, the mean probing depth in Group I was 1.30 ± 0.45 mm at baseline, 1.00 ± 0.44 mm at 3 months and 0.90 ± 0.53 mm at 6 months. Mean decrease in

probing depth was 0.30 ± 0.48 mm at 3 months, 0.40 ± 0.51 mm at 6 months compared to baseline and 0.10 ± 0.56 mm between 3 months and 6 months.. The mean probing depth in Group II was 1.50 ± 0.67 mm at baseline, 1.30 ± 0.78 mm at 3 months and 1.00 ± 0.63 mm at 6 months. Mean decrease in probing depth was 0.20 ± 1.03 mm at 3 months, 0.50 ± 0.70 mm at 6 months 69 compared to baseline and 0.30 ± 0.67 mm between 3 months and 6 months. The results were statistically non-significant at different time intervals. Similar results were recorded by Aroca et al. (2009) who compared the management of gingival recession by coronally advanced flap alone or in combination with a platelet rich fibrin membrane. On comparison, the mean decrease in probing depth was slightly more in Group I, but intergroup differences were statistically non-significant at different time intervals. Similar results were recorded by Andrade et al. (2010).

- III. **CLINICAL ATTACHMENT LEVEL:** In the present study, the mean clinical attachment level in Group I was 4.60 ± 1.11 mm at baseline, 2.00 ± 1.09 mm at 3 months and 1.90 ± 0.83 mm at 6 months. Mean gain of clinical attachment level was 2.60 ± 0.84 mm at 3 months and 2.70 ± 1.05 mm at 6 months from baseline, which were statistically significant. The mean clinical attachment level in Group II was 4.40 ± 1.56 mm at baseline, 2.20 ± 1.16 mm at 3 months and 2.20 ± 1.24 mm at 6 months. Mean gain of clinical attachment level was 2.20 ± 0.13 mm at 3 months and 2.20 ± 1.52 mm at 6 months from baseline, which were statistically significant. Similar results were recorded by Tinti et al. (1992), Huang and Wang (2007), Aroca et al. (2009), Andrade et al. (2010) and Padma et al. (2013). The gain in mean clinical attachment from 3 months to 6 months was 0.10 ± 0.73 mm in Group I (non-significant, $p > 0.05$) and 0.00 ± 0.66 mm in Group II (non-significant, $p > 0.05$). This is in accordance with the study conducted by Padma et al. (2018). On intergroup comparison, the mean gain in clinical attachment was slightly more in Group I, but intergroup differences were statistically nonsignificant at different time intervals. Similar results were recorded by Francetti et al. (2005) and Andrade et al. (2010).
- IV. **WIDTH OF KERATINIZED GINGIVA:** In the present study, mean gain in width of keratinized gingiva was 0.20 ± 0.42 mm at 3 months from baseline (significant, $p < 0.05$). The mean width of keratinized gingiva in Group II was 2.10 ± 0.83 mm at baseline, 2.30 ± 0.90 mm at 3 months and 2.60 ± 0.80 mm at 6 months. Mean gain in width of keratinized gingiva was 0.20 ± 0.42 mm at 3

months from baseline and 0.30 ± 0.48 mm between 3 months and 6 months, which were statistically non-significant. Similar results were recorded by Eren and Atilla (2013). The mean gain of 0.60 ± 0.51 mm and 0.50 ± 0.52 mm in width of keratinized gingiva between baseline and 6 months was statistically significant in both Group I and Group II, respectively. The results are in accordance with the studies made by Andrade et al. (2010), Eren and Atilla (2013), Padma et al. (2013) and Thamaraiselvan et al. (2015). The width of the keratinized gingival epithelium is probably influenced by inductive stimuli from the underlying connective tissue as well as by the genetically determined phenotype of the epithelial cells (Leknes et al. 2005). Since coronally positioned flap was used in both the groups, the tendency of the coronally displaced mucogingival junction to regain its original “genetically determined position” [Pini Prato et al. (1999), Leknes et al. (2005)], may be the cause in producing increased amount of width of keratinized gingiva. On comparison, the mean gain in width of keratinized gingiva was slightly more in Group II, but intergroup results were statistically non-significant at different time intervals. Similar results were recorded by Francetti et al. (2005) who treated cases of gingival recession by different mucogingival surgical techniques, with and without the aid of a surgical microscope.

During the course of the study it was observed that the surgical microscope leads to the magnification of the structures together with proper illumination, thereby, improving recognition of tissue elements and thus, facilitating extremely fine and accurate incisions, meticulous suturing and precise closure of wound margins to achieve an excellent result in terms of esthetics. Moreover, one clinical report also demonstrated the advantages of the microsurgical approach in treating root coverage (Burkhardt and Lang 2005). That study found faster healing and vascularization in microsurgically treated sites compared to those receiving conventional (macrosurgical) care. Furthermore, It was observed that inspite of the longer duration of surgery in Group I (microsurgical technique), the procedure was comfortable to the patients. In the present study, considerable root coverage was achieved in all the subjects with gain in clinical attachment level in both Group I and Group II. Though, more coverage (69%) was obtained in Group I (treated by coronally advanced flap with platelet rich fibrin membrane using magnifying loupes) than (54%) in Group II (treated by coronally advanced flap with platelet rich fibrin membrane using conventional technique), but this was

statistically nonsignificant. Hence, within the confines of the study it seems that the relative outcomes observed with microsurgery are promising but, the relatively small sample size of the present study may be the limiting factor for the power of the statistical analysis. Further prospective investigations with a larger database are needed to confirm the results of the present study.

CONCLUSION

The purpose of the present study was to compare the clinical efficacy of coronally advanced flap combined with platelet rich fibrin membrane using the microsurgical technique with magnifying loupes and macrosurgical technique with naked eyes in the treatment of localized gingival recession. The selected teeth in each patient were divided into two groups randomly. In Group I, the gingival recession was treated by coronally advanced flap with platelet rich fibrin membrane using microsurgical technique with surgical loupes and in Group II, the gingival recession was treated by coronally advanced flap with platelet rich fibrin membrane using conventional technique. All the clinical parameters – recession depth, probing depth, clinical attachment level and width of keratinized gingiva were recorded for the selected teeth at baseline and subsequently, at the end of 3 months and 6 months after surgery. The data thus recorded was compiled, tabulated and statistically analysed to arrive at the results.

Following conclusions were drawn from the results:

1. In both groups, reduction in recession depth and gain in clinical attachment level was seen at 3 months and 6 months from baseline which was found to be statistically significant. However, on intergroup comparison, the difference in reduction of mean recession depth and gain in mean clinical attachment between Group I and Group II was statistically non-significant at all time intervals.
2. There was reduction in Probing depth in Group I and Group II at all time intervals which was non-significant except in Group I where the reduction between baseline and 6 months was statistically significant. However, on intergroup comparison, the difference in reduction of mean probing depth between Group I and Group II was statistically non-significant at all time intervals.
3. There was statistically significant gain in width of keratinized gingiva from baseline to 6 months in both groups. However, on intergroup comparison, the difference in gain of mean width of keratinized gingiva between Group I and Group II was statistically non-significant at all time intervals. So, within the limitation of the study, it can be concluded that considerable root coverage was achieved in all the subjects with gain in clinical attachment level in both Group I and Group II.

Though, more coverage was obtained in Group I (microsurgical technique) than in Group II (conventional technique), but this was statistically non-significant. Hence, within the confines of the study it seems that the relative outcomes observed with microsurgery are promising but, the relatively small sample size of the present study may be the limiting factor for the power of the statistical analysis. Further prospective investigations with a larger database are needed to confirm the results of the present study.

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