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Original Research Article

Comparative evaluation of modified triangular coronally advanced Flap alone or in combination with platelet rich fibrin or type I collagen membrane for treatment of Miller's Class I and Class II gingival recession

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ABSTRACT

Background: The study aimed to clinically evaluate the outcome of modified triangular coronally advanced flap (mtCAF) alone or in combination with platelet rich fibrin or type I collagen membrane in Miller's Class I and Class II gingival recession.

Materials and Methods: 45 sites with Millers Class I or II gingival recession were recruited and allocated into 3 groups with 15 sites each. Group 1: mtCAF alone, Group II: mtCAF with PRF and Group III: mtCAF with bioresorbable collagen membrane (Bio-Gide®). Standardized Clinical Parameters such as Plaque Index (PI), Gingival Index (GI), Pocket Probing Depth (PPD), Clinical attachment level (CAL), Gingival Recession Depth (GRD) and Keratinized Tissue Height (KTH) were measured at baseline and 6 months.

Result: All the three groups showed improvement in clinical parameters but it was not statistically significant. However, a significant increase in keratinized tissue height was seen in Group III as compared to Group I and Group II.

Conclusion: Modified triangular coronally advanced flap (mtCAF) alone or in combination with PRF and collagen membrane showed good clinical outcomes but better results were obtained in terms of keratinized tissue when collagen membrane was used.

1. Introduction

Gingival recession (GR) is defined as the exposure of the root surface as a result of apical migration of the gingival margin to the cemento-enamel junction (CEJ).[1] GR is induced by a variety of etiological factors some of which includes plaque, calculus, fenestration, dehiscence, tooth malpositioning, toothbrush trauma, resorption of alveolar bone at the site, occlusal injury and various iatrogenic or idiopathic reasons.[2,3] Clinically it results in sensitivity, unesthetic appearance and if left unchecked may result in extrusion of the tooth, mobility and finally tooth loss.

Sub-epithelial connective tissue grafts (SCTG) along with a coronally advanced flap (CAF) is considered as a gold standard for treatment of recession defects.[4] Excellent root coverage is achieved with a good thickness of the augmented gingiva. However, it requires a 2nd surgical site.

The CAF is considered one of the most suitable surgical procedures in cases where there is adequate keratinized tissue apical to the defect. It shows optimal root coverage, great colour blending with adjacent soft tissues, and good re-establishment of former soft tissue morphology.[5] However, CAF when used alone may not provide with complete root coverage (CRC).[6] Hence platelet rich fibrin

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(PRF) membranes or collagen membranes have been used as an adjunct to CAF to achieve better post-surgical outcomes as they do not require a second surgical site.[7]

PRF is composed of a fibrin matrix polymerized in a tetra molecular structure and it involves the joining of platelets, leukocytes, cytokines, and circulating stem cells.[4] Various benefits of PRF comprises wound healing, sealing of wound and haemostasis, bone maturation and growth and provide better handling of the graft materials.[8]

Earlier, various non-resorbable as well as bioresorbable membranes have been used for root coverage procedures. The major problem with the non-resorbable membrane is that it requires an additional surgical procedure to retrieve the membrane which may interfere with healing and clinical outcome. To overcome this, equally efficient bioresorbable membranes were developed. Among absorbable membranes, type I collagen has been widely studied in the root coverage procedure and proven to be highly efficacious in the treatment of gingival recession.[9]

2. Measurement of Clinical Parameters

Clinical parameters were recorded at baseline (just prior to the surgery) as well as at 6- month follow-up for Group I, Group II and Group III using a UNC-15 probe. Custom-made self-cured acrylic stents grooved in an occluso-apical direction corresponding to the mid-buccal area as a fixed reference point were fabricated to provide reproducible alignments of the probe for each patient. The clinical parameters assessed were as follows: Plaque Index (PI), Gingival Index (GI), Gingival Recession Depth (GRD) (measured as the distance between the most apical point of the CEJ and the gingival margin), Pocket Probing Depth (PPD) (measured from the free gingival margin to the base of the sulcus/pocket), Keratinized Tissue Height (KTH) (measured as the distance from mucogingival junction (MGJ) to the gingival margin, with MGJ determined using a visual method), and Clinical Attachment Level (CAL) (measured from the cemento-enamel junction to the base of the sulcus/pocket).

2.1. Surgical procedure

The surgical area was anaesthetized using local anaesthesia (2% lignocaine with adrenaline 1:80000). In all the three groups (Group I, Group II, and Group III), the preparation of the recipient site was common using modified triangular coronally advanced flap technique given by Zuchelli et al.[10] in 2016. First the length of a curved line parallel to the CEJ connecting the papilla tips and passing through a midpoint

located 1mm coronal to the CEJ was measured with an orthodontic wire, which represented the extension of the flap's marginal perimeter after coronal advancement. The wire was then shifted to the most apical extension of the recession defect and each half of it was bent along

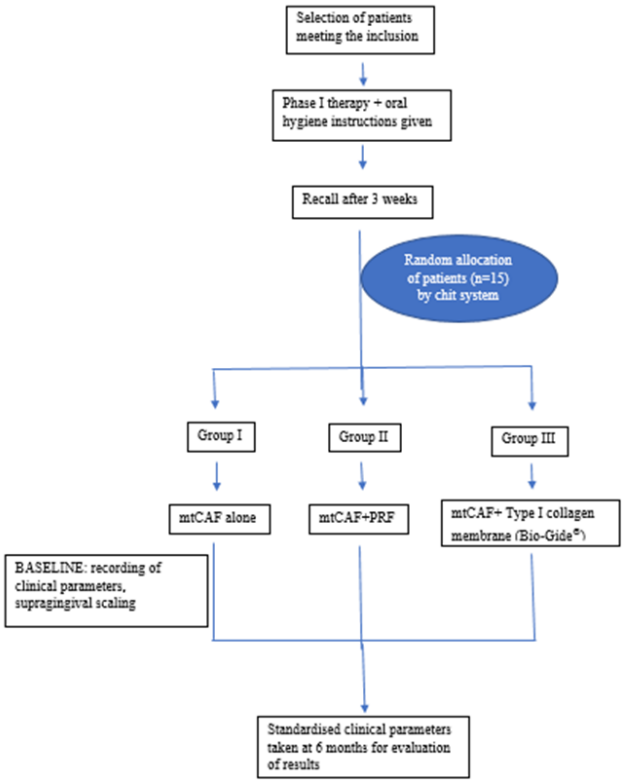

Fig. 1: Study design

the gingival margin of the recession. Two oblique vertical incisions of the triangular flap were given at the ends of the orthodontic wire and extended parallel to the soft tissue margin of the adjacent healthy teeth beyond the mucogingival line. Flap was then elevated following a split-full-split-thickness approach in the coronal to apical direction and was sufficiently mobilized to advance it coronally to cover gingival recession. De-epithelisation of the interdental papilla was done to adapt to the anatomical papilla. Flap was then secured using interrupted suturing technique in Group I (Figure 2). For Group II (Figure 3) the same surgical procedure was followed except platelet rich fibrin (PRF) was adapted over the recession area and interrupted sutures were given. In case of Group III (Figure 4), same surgical technique as in Group I was performed, except Type I collagen membrane (Bio-Gide®) was adapted over the recession area and the flap was secured with the help of interrupted sutures. The subjects were then given post-operative instructions and recalled after 10 days for suture removal.

2.2. PRF preparation protocol

Around 5 ml of whole venous blood was collected in two sterile vacutainer tubes without anticoagulant and were centrifuged at 3000 revolutions per minute (rpm) for 10

minutes. Following this, the centrifuged blood settled into the following layers: red lower fraction containing red blood cells, upper straw-colored cellular plasma and the middle fraction containing the fibrin clot. The upper straw-coloured layer was removed and middle fraction was collected, 2 mm below lower dividing line, which was the PRF. Membrane was then prepared from it by squeezing it between two pieces of moist gauze. PRF membrane was placed over the recession defect just apical to CEJ.

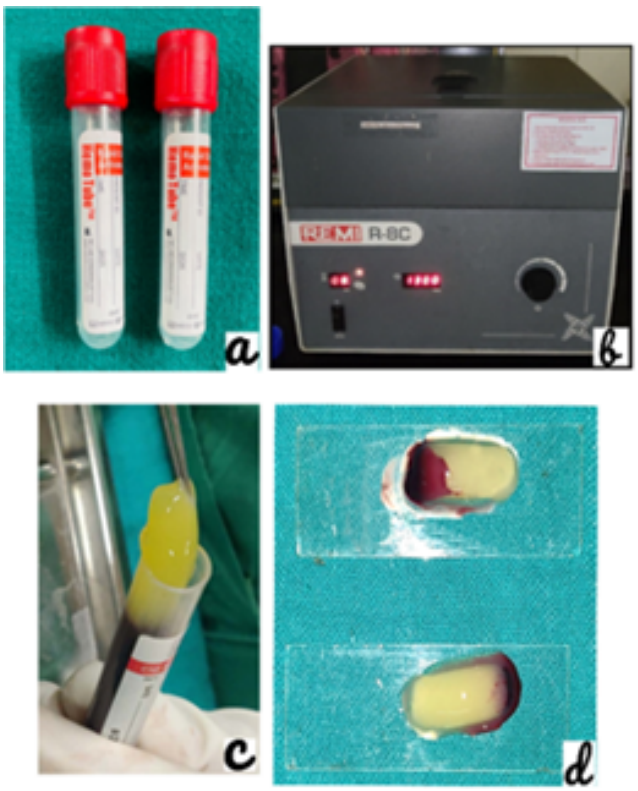

Fig. 2: PRF Preparation (a) Vacutainer tubes (b) Centrifugation machine (c) & (d) Preparation of platelet rich fibrin membrane.

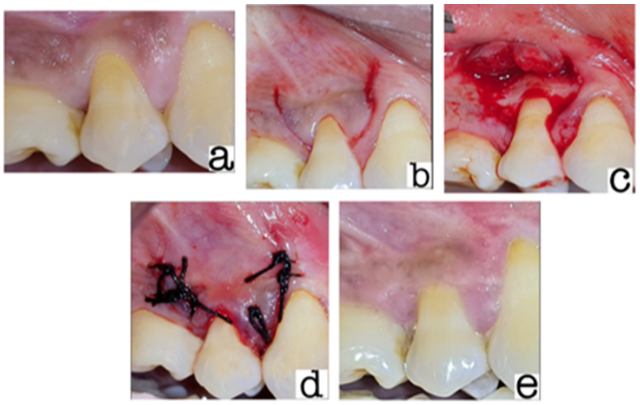

Fig. 3: "Group I" (a) Baseline view, (b) Incision, (c) Flap reflection, (d) Suturing, (e) 6-month follow-up view

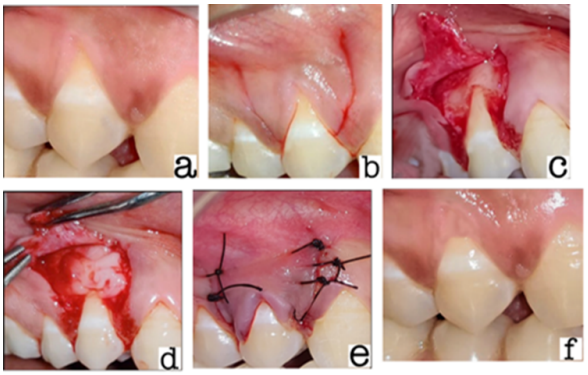

Fig. 4: "Group II" (a) Baseline view, (b) Incision, (c) Flap reflection, (d)PRF membrane placed, (e) Suturing, (f) 6-month follow-up view

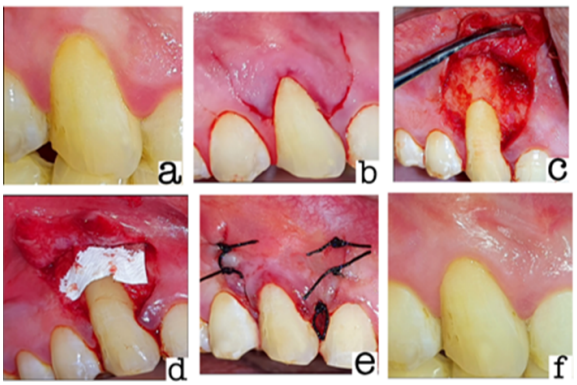

Fig. 5: "Group III" (a) Baseline view, (b) Incision, (c) Flap reflection, (d) Collagen membrane (bio-gide) placed, (e) Suturing, (f) 6-month follow-up view

3. Results

No statistically significant difference in PPD was found between and within Group I, Group II, and Group III ($p>0.05$) at baseline and 6 months (Table 1 andTable 5). While comparing CAL within Group I, Group II and Group III, statistically significant difference ($p<0.05$) was found from baseline to 6 months (Table 5). However, while comparing between the three groups no statistical significance ($p>0.05$) was seen from baseline to 6 months (Table 2). In case of GRD, there was a significant decrease from baseline to 6 months within Group I, Group II and Group III (Table 5). But intergroup comparison did not show any significant values from baseline to 6 months (Table 3). When comparing within and between the groups, a significant increase ($p<0.05$) in KTH was seen in Group I, Group II, and Group III (Table 4 and Table 5). The mean difference in Keratinized Tissue Height at baseline and 6 months was significantly more among Group III as compared to Group I and Group II.

Table 1: Inter-group comparison of pocket probing depth between the three groups at various time intervals.

Pocket Probing Depth		Mean	Std. Deviation	Mean Difference	p-value
Baseline	Group 1 (mtCAF alone)	1.33	0.49	0.20	0.576
	Group 2 (mtCAF+ PRF)	1.13	0.35		
	Group 1 (mtCAF alone)	1.33	0.49	0.13	0.950
	Group 3 (mtCAF+ Collagen membrane)	1.20	0.41		
	Group 2 (mtCAF+ PRF)	1.13	0.35	-0.07	0.984
	Group 3 (mtCAF+ Collagen membrane)	1.20	0.41		
3 months	Group 1 (mtCAF alone)	1.20	0.41	0.13	0.950
	Group 2 (mtCAF+ PRF)	1.07	0.26		
	Group 1 (mtCAF alone)	1.20	0.41	0.07	0.984
	Group 3 (mtCAF+ Collagen membrane)	1.13	0.35		
	Group 2 (mtCAF+ PRF)	1.07	0.26	0.06	0.990
	Group 3 (mtCAF+ Collagen membrane)	1.13	0.35		
Baseline-3 months	Group 1 (mtCAF alone)	0.13	0.35	0.06	0.990
	Group 2 (mtCAF+ PRF)	0.07	0.26		
	Group 1 (mtCAF alone)	0.13	0.35	0.06	0.990
	Group 3 (mtCAF+ Collagen membrane)	0.07	0.26		
	Group 2 (mtCAF+ PRF)	0.07	0.26	0.00	1.000
	Group 3 (mtCAF+ Collagen membrane)	0.07	0.26		

Table 2: Inter-group comparison of clinical attachment level between the three groupsat various time intervals.

Clinical Attachment Level		Mean	Std. Deviation	Mean difference	p-value
Baseline	Group 1 (mtCAF alone)	3.33	0.98	0.60	0.105
	Group 2 (mtCAF+ PRF)	2.73	0.59		
	Group 1 (mtCAF alone)	3.33	0.98	0.07	0.984
	Group 3 (mtCAF+ Collagen membrane)	3.27	0.59		
	Group 2 (mtCAF+ PRF)	2.73	0.59	-0.53	0.199
	Group 3 (mtCAF+ Collagen membrane)	3.27	0.59		
3 months	Group 1 (mtCAF alone)	1.73	1.16	0.53	0.607
	Group 2 (mtCAF+ PRF)	1.20	1.01		
	Group 1 (mtCAF alone)	1.73	1.16	0.20	0.870
	Group 3 (mtCAF+ Collagen membrane)	1.53	1.06		
	Group 2 (mtCAF+ PRF)	1.20	1.01	-0.33	0.709
	Group 3 (mtCAF+ Collagen membrane)	1.53	1.06		
Baseline-3 months	Group 1 (mtCAF alone)	1.60	1.30	0.07	0.984
	Group 2 (mtCAF+ PRF)	1.53	0.83		
	Group 1 (mtCAF alone)	1.60	1.30	-0.13	0.902
	Group 3 (mtCAF+ Collagen membrane)	1.73	1.03		
	Group 2 (mtCAF+ PRF)	1.53	0.83	-0.20	0.843
	Group 3 (mtCAF+ Collagen membrane)	1.73	1.03		

Table 3: Inter-group comparison of gingival recession depth between the three groupsat various time intervals

Gingival Recession Depth		Mean	Std. Deviation	Mean difference	p-value
Baseline	Group 1 (mtCAF alone)	1.73	0.59	0.13	0.925
	Group 2 (mtCAF+ PRF)	1.60	0.63		
	Group 1 (mtCAF alone)	1.73	0.59	-0.33	0.602
	Group 3 (mtCAF+ Collagen membrane)	2.07	0.80		
	Group 2 (mtCAF+ PRF)	1.60	0.63	-0.47	0.245
	Group 3 (mtCAF+ Collagen membrane)	2.07	0.80		
3 months	Group 1 (mtCAF alone)	0.73	0.46	0.13	1.000
	Group 2 (mtCAF+ PRF)	0.60	0.51		
	Group 1 (mtCAF alone)	0.73	0.46	0.07	0.984
	Group 3 (mtCAF+ Collagen membrane)	0.67	0.49		
	Group 2 (mtCAF+ PRF)	0.60	0.51	-0.07	0.984
	Group 3 (mtCAF+ Collagen membrane)	0.67	0.49		
Baseline-3 months	Group 1 (mtCAF alone)	1.00	0.53	0.00	1.000
	Group 2 (mtCAF+ PRF)	1.00	0.38		
	Group 1 (mtCAF alone)	1.00	0.53	-0.40	0.178
	Group 3 (mtCAF+ Collagen membrane)	1.40	0.63		
	Group 2 (mtCAF+ PRF)	1.00	0.38	0.40	0.178
	Group 3 (mtCAF+ Collagen membrane)	1.40	0.63		

Table 4: Inter-group comparison of keratinised tissue height between the three groupsat various time intervals

Keratinised Tissue Height		Mean	Std. Deviation	Mean difference	p-value
Baseline	Group 1 (mtCAF alone)	5.33	1.23	-0.40	0.895
	Group 2 (mtCAF+ PRF)	5.73	0.96		
	Group 1 (mtCAF alone)	5.33	1.23	0.47	0.689
	Group 3 (mtCAF+ Collagen membrane)	4.87	0.83		
	Group 2 (mtCAF+ PRF)	5.73	0.96	0.87	0.097
	Group 3 (mtCAF+ Collagen membrane)	4.87	0.83		
3 months	Group 1 (mtCAF alone)	5.93	0.96	-0.40	0.709
	Group 2 (mtCAF+ PRF)	6.33	0.98		
	Group 1 (mtCAF alone)	5.93	0.96	-0.07	0.984
	Group 3 (mtCAF+ Collagen membrane)	6.00	0.76		
	Group 2 (mtCAF+ PRF)	6.33	0.98	0.33	0.954
	Group 3 (mtCAF+ Collagen membrane)	6.00	0.76		
Baseline-3 months	Group 1 (mtCAF alone)	0.60	0.51	0.00	1.000
	Group 2 (mtCAF+ PRF)	0.60	0.63		
	Group 1 (mtCAF alone)	0.60	0.51	-0.53	0.038*
	Group 3 (mtCAF+ Collagen membrane)	1.13	0.52		
	Group 2 (mtCAF+ PRF)	0.60	0.63	-0.53	0.038*
	Group 3 (mtCAF+ Collagen membrane)	1.13	0.52		

*Significant difference

Table 5: Intra group comparison of PPD, CAL, GRD and KTH between the three groupsat various time intervals.

Groups	Pocket Probing Depth (PPD)			Clinical Attachment Level (CAL)			Gingival Recession Depth (GRD)			Keratinised Tissue Height (KTH)		
	Mean ± SD		P -value	Mean ± SD		P - value	Mean ± SD		P - value	Mean ± SD		P -value
Group 1 (mtCAF alone)	Baseline	6 months		Baseline	6 months	<0.001*	Baseline	6 months	<0.001*	Baseline	6 months	<0.001*
	1.33±0.49	1.20±0.41	0.089	3.33±0.98	1.73±1.16		1.73±0.59	0.73±0.46		5.33±1.23	5.93±0.96	
Group 2 (mtCAF +PRF)	1.13±0.35	1.07±0.26	0.118	2.73±0.59	1.20±1.01	<0.001*	1.60±0.63	0.60±0.51	<0.001*	5.73±0.96	6.33±0.94	0.003*
Group 3 (mtCAF + Collagen membrane)	1.20±0.41	1.13±0.35	0.101	3.27±0.59	1.53±1.06	<0.001*	2.07±0.80	0.67±0.49	<0.001*	4.87±0.83	6.00±0.76	<0.001*

*Significant difference

4. Discussion

Periodontal plastic surgical procedures are aimed at treatment of marginal tissue recession leading to complete regeneration of the periodontium, resulting in coverage of the exposed root surfaces esthetically as well as in a functional manner.

Zucchelli et al. in 2016[10] compared the triangular design with the trapezoidal design in CAF procedures and found comparable results. While root coverage showed no difference between the CAF groups, the colour match and contiguity showed better score for the triangular CAF.

In the triangular CAF the shape of the surgical papillae is the same as the anatomical papillae, thus a precise soft tissue adaptation in the interdental area aided in camouflaging of the treated site with respect to the adjacent teeth after surgery. Also, the risk of scarring is considerably lower in triangular CAF as at the end of the surgical procedure the releasing incisions are inside the de-epithelized recipient bed and are covered by the flap making it aesthetically more pleasing as compared to the trapezoidal CAF procedure.

While comparing the PPD within Group I, Group II and Group III, slight reduction in values were seen at 6 months from baseline, however the results were not statistically significant. This is in accordance with a study by *Trombelli et al. 1994*[11] who stated that no significant difference in probing depth reduction was noted between membrane treated group and non-membrane groups. A study by *Tunali et al. 2015*[12] showed non-significant reduction in probing depth at 6 months in PRF and CAF treated group as compared to CAF group alone. On intergroup comparison between the three groups, no significant difference were seen at baseline and 6 months. This was found in accordance with a study done by *Shalaby et al. 2019*[13]

On comparing the *CAL and GRD* between the three groups no statistically significant difference was observed from baseline to 6 months. It is in accordance to a study by *Raval et al. 2022*[14] which showed statistically no significant p-value while comparing the effect of PRF and Xenogenic collegen member in the treatment of gingival rcession using coronally advanced flap. On intragroup comparison of *CAL* and *GRD* within Group I, Group II and Group III, a statistically significant reduction was seen in all the three groups from baseline which is also in accordance to the study by *Raval et al. 2022*[14]

Upon comparing the KTH, statistically significant difference was found between Group I, Group II and Group III at baseline and 6 months. It was significantly more among Group III compared to Group I and Group II. This increase in KT has been suggested to occur due to formation of new connective tissue which is in accordance to a study by *Jepsen et al. 2013*[15] which showed better keratinised tissue gain in CAF+CM when compared to CAF alone. The use of a xenogeneic collagen matrix as an adjunct to the CAF procedure may be helpful because the CAF surgical procedure has demonstrated very good results in the treatment of localized gingival recessions, in terms root coverage and aesthetic outcomes *(PiniPrato et al. 1995*[16]).

Geislich Bio-Gide® due to its cross-linked structure slows the degradation rate therefore the membrane stays for an adequate period of time beneath the flap which prevents the apical migration of epithelial cells during healing hence discouraging the formation of long junctional epithelial attachment and favouring development of connective tissue attachment.[17] Due to its bilayered structure, the membrane prevents ingrowth of soft tissue into the augmented site and also acts as a guide for bone, soft tissue as well as blood vessel development. Also, collagen membrane provides a collagenous scaffold for tissue repair as well as augmenting the gingival tissue thickness. Also, the membrane being semi-permeable, allows exchange of gases and nutrient passage thus ensuring better flap healing. It is easy to manipulate and well tolerated by the patients with no negative response in post-operative healing. These findings were also supported in a study by *Wang et al. 1994*[8]

The results of the present study suggested that both PRF and bioresorbable collagen membrane (Bio-Gide®) can produce predictable root coverage with modified triangular coronally advanced flap technique in the treatment of gingival recession. Although the use of collagen membrane offered greater advantage in terms of increase in keratinised tissue height, use of PRF also showed comparable improvement in clinical parameters when compared to baseline. The variation in the results suggest that root coverage procedures are technique sensitive, and success of root coverage may be influenced by the condition of surgical sites, such as soft-tissue thickness.[18]

5. Conclusion

This randomized controlled clinical trial suggests that all the three groups showed improvement in the clinical parameters from baseline, however the use of collagen membrane showed an additional benefit of enhanced keratinized tissue width as compared to PRF group or mtCAF alone group. Thus, we can conclude that modified triangular coronally advanced flap technique can be used for the treatment of Miller's Class I and Class II gingival recession either alone or in combination with PRF and type I collagen membrane. However, we are in further need of similar longitudinal studies to evaluate the long-term effects of this surgical procedure.

6. Limitations

Certain limitations of our study were short follow-up period, and absence of histological analysis. Moreover, the soft tissue thickness and gingival biotype was not evaluated in this study. Hence, the ability to directly compare the amount of root coverage between this study and previous

human clinical trials is limited. Within the limitations of the present study, it can be concluded that all the three treatment modalities are feasible options for predictable aesthetic root coverage in Miller's Class I and Class II recession defects. However, the use of type I collagen membrane along with mtCAF provided an additional benefit of enhanced keratinized tissue width as compared to mtCAF with or without PRF.

7. Future Consideration

The use of collagen membrane as well as platelet rich fibrin has high potential for use as an adjunct in periodontal plastic surgeries without any side effects. PRF can be a cost-effective alternative to collagen membrane since it is prepared using patient's own blood without any anticoagulant, which minimises the risk of cross contamination.

8. Source of Funding

None.

9. Conflict of Interest

None.

References

1. Aljehani YA. Risk factors of periodontal disease: review of the literature. *Int J Dent*. 2014;p. 1–9. doi:10.1155/2014/182513.
2. Mythri S, Arunkumar SM, Hegde S, Rajesh SK, Munaz M, Ashwin D. Etiology and occurrence of gingival recession - An epidemiological study. *J Indian Soc Periodontol*. 2015;19(6):671–5.
3. Kassab MM, Cohen RE. The etiology and prevalence of gingival recession. *J Am Dent Assoc*. 2003;134(2):220–5.
4. Tunali M, Özdemir H, Arabacı T, Gürbüzer B, Pikdöken L, Firatli E. Platelet-Rich Fibrin In The Treatment Of Gingival Recession Defects. *Int J Periodontics Restor Dent*. 2010;13:43–56.
5. Bherwani C, Kulloli A, Kathariya R, Shetty S, Agrawal P, Gujar D. Zucchelli's technique or tunnel technique with subepithelial connective tissue graft for treatment of multiple gingival recessions. *J Int Acad Periodontol*. 2014;16(2):34–42.
6. Dixit N, Lamba AK, Faraz F, Tandon S, Aggarwal K, Ahad A. Root coverage by modified coronally advanced flap with and without platelet-rich fibrin: A clinical study. *Indian J Dent Res*. 2018;29(5):600–4.
7. Kumar AP, Fernandes B, Surya C. Platelet rich fibrin: A promising approach for root coverage. *J Interdiscip Dent*. 2011;1(2):115–23.
8. Saluja H, Dehane V, Mahindra U. Platelet-Rich fibrin: A second generation platelet concentrate and a new friend of oral and maxillofacial surgeons. *Ann Maxillofac Surg*. 2011;1(1):53–60.
9. Mahajan R, Khinda P, Shewale A, Ghotra K, Bhasin MT, Bhasin P. Comparative efficacy of placental membrane and Healiguide^{TM} in treatment of gingival recession using guided tissue regeneration. *J Indian Soc Periodontol*. 2018;22(6):513–35.
10. Zucchelli G, Stefanini M, Ganz S, Mazzotti C, Mounssif I, Marzadori M. Coronally Advanced Flap with Different Designs in the Treatment of Gingival Recession: A Comparative Controlled Randomized Clinical Trial. *Int J Period Restor Dent*. 2016;36(3):319–27.
11. Trombelli L, Schincaglia G, Checchi L, Calura G. Combined guided tissue regeneration, root conditioning, and fibrin-fibronectin system application in the treatment of gingival recession. A 15-case report. *J Periodontol*. 1994;65(8):796–803.
12. Tunali M, Özdemir H, Arabacı T, Gürbüzer B, Pikdöken L, Firatli E. Clinical Evaluation of Autologous Platelet-Rich Fibrin in the Treatment of Multiple Adjacent Gingival Recession Defects: A 12-Month Study. *Int J Periodontics Restor Dent*. 2015;35(1):105–14.
13. Shalaby, Morsy SM. Comparative evaluation of coronally advanced flap using platelet-rich fibrin membrane and fresh amniotic membrane in gingival recession. *Egypt Dent J*. 2019;65:1279–90.
14. Raval YH, Shah MA, Bora NP. Comparative evaluation of the efficacy of xenogeneic collagen matrix and platelet ;rich fibrin in the treatment of gingival recession. *J Indian Soc Periodontol*. 2022;26(5):465–70.
15. Jepsen K, Jepsen S, Zucchelli G, Stefanini M, Sanctis D, Baldini M, et al. Treatment of gingival recession defects with a coronally advanced flap and a xenogeneic collagen matrix: A multicenter randomized clinical trial. *J Clin Periodontol*. 2013;40(1):82–9.
16. Prato GP, Clauser C, Cortellini P. Periodontal plastic and mucogingival surgery. *Periodontol*. 1995;9:90–105. doi:10.1111/j.1600-0757.1995.tb00058.x.
17. Soni N, Sikri P, Kapoor D, Soni BW, Jain R. Evaluation of the efficacy of 100% Type-I collagen membrane of bovine origin in the treatment of human gingival recession: A clinical study. *Indian J Dent*. 2014;5(3):132–40.
18. Shieh AT, Wang HL, Neal O, Glickman R, Macneil GN. Development and clinical evaluation of a root coverage procedure using a collagen barrier membrane. *J Periodontol*. 1997;68(8):770–8.

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