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Recession width evaluation after the use of Advanced PRF (A-PRF) versus subepithelial connective tissue graft (SCTG) in combination with coronally advanced flap in treatment of gingival recession: A randomized clinical trial

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Abstract---Objective: To evaluate the amount of recession width following the use CAF and advanced platelet rich fibrin (A-PRF) compared to CAF with SCTG in the treatment of single gingival recession. Materials and Methods: Twenty gingival recession defects were randomly assigned to receive either CAF+SCTG (n=10) or CAF+A-PRF (n=10). Recession width in mm was assessed at 3, 6 and 9 months post-operatively. Results: Patients in test group (CAF+A-PRF) reported 2.13 ± 0.35 recession width at 3 months, 2.00 ± 0 after 6 months. While, finally decreased to 1.25 ± 1.04 after 9 months. In the control group (CAF+SCTG), the amount of recession width recorded 1.00 ± 1.07 at 3 months, while, after 6 and 9 months decreased to 0.5 ± 0.93 . Conclusion and recommendation: There was no statistically significant difference between the two studied groups after 9 months. While, A significant difference reported at 3 and 6 months. Further studies with larger sample size and longer follow-up is needed.

Keywords---Gingival recession, Miller class II, Miller class II, platelet rich fibrin.

Introduction

Gingival recession (GR) defined as the apical shift of the marginal gingiva beyond the cemento-enamel junction (CEJ) with subsequent exposure of the root to the oral environment. Deteriorated esthetics and dentine hypersensitivity constituted the main associated problems (*Rajapakse et al., 2007*).

Single recession have been successfully treated by various periodontal plastic surgical procedures. Among these techniques the combination of coronally advanced flap (CAF) and connective tissue graft (SCTG) well documented to be considered as the gold standard for the management of Miller class I and II isolated recession defects with higher amount of root coverage that reached about 83% (*Roccuzzo et al., 2002; Zucchelli et al., 2014*).

Additionally, CAF+SCTG offered numerous advantages such as improved esthetics, stability of the gingival margin and creeping attachment. However, Several limitations have been reported mainly due to the inclusion of a second surgical site that attributed to increase postoperative discomfort with or without pain, morbidity and bleeding (*Zucchelli and Mounssif, 2015; Chambrone et al., 2018*).

Accordingly, researches for SCTG substitutes have been proposed to overcome these drawbacks and the adjunctive use of autologous platelets concentrates has been highlighted. It presented an accelerated and uncompromised course of wound healing speculated by the optimized and sustained release of multiple immune compatible growth factors as vascular endothelial growth factor (VEGF), platelet-derived growth factor (PDGF) and insulin-like growth factor (I-LGF) in addition to enhanced angiogenesis (*Choukroun et al., 2006; Tavelli et al., 2020*).

Furthermore, the evolution of different generations of platelets concentrate included PRP and PRF have been evaluated for its efficacy in the treatment of gingival recession. Nowadays, modern generation called advanced platelet rich fibrin (A-PRF) considered as modification to PRF based on low speed centrifugation concept (LSCC) has been introduced. It assumed that lowering the centrifugation force (G-force), resulted in increase in total amount of released leukocytes and growth factors within the fibrin membrane thus potentiate to more pronounced effect. However, A-PRF is not assessed sufficiently to ensure its clinical success and predictability in the treatment of root coverage (*Ghanaati et al., 2014; Kobayashi et al., 2017*).

Aim of the study

The aim of this clinical trial was to evaluate the amount of recession width in millimeter following the use of advanced platelet rich fibrin (A-PRF) compared to subepithelial connective tissue graft (SCTG) in combination with coronally

advanced flap (CAF) in the treatment of Miller class I and II single gingival recession.

Materials and Methods

Settings: The protocol of the current randomized clinical trial received ethical approval. The detailed surgical procedures and follow up periods were clearly described for all participants. Informed consent was obtained from all patients.

Participants: The current RCT included 20 patients with single gingival recession defects of Miller classes I, II; root coverage surgical interventions were performed.

Exclusion criteria: included patients having systemic disorders or taking medications that contraindicate surgical intervention, current smokers and cases with infection or inflammation in the surgical site.

Interventions: Detailed explanation of the study was provided to each eligible patient. Participants were then randomly allocated to either the test group (CAF+A-PRF) or the control group (CAF+SCTG). Random sequencing was generated.

Study steps: Professional periodontal treatment was performed to eligible patients. Oral hygiene instructions, patients' education and motivation were applied. Then, follow-up till inflammation subsided and patients could maintain their oral hygiene properly was performed.

Surgical procedures: After local anesthesia administration, both groups received CAF with split- full- split flap elevation with trapezoidal design. Then a) for test group A-PRF was prepared after withdrawal of patient blood and centrifugation at 1500 rpm for 14 minutes.

While, b) in control group SCTG graft was obtained through single incision technique. Fixation in place was performed with interrupted sutures. Followed by final sling suture to the flap to achieve coronal advancement.

Postsurgical instructions: Tooth brushing in the surgical treated area was stopped for 2 weeks. Suture removal was after 14 days. 0.12% Chlorhexidine mouth wash was prescribed twice per day for 1 minute to maintain adequate plaque control for additional 2 weeks. 600 mg ibuprofen tablet was also prescribed after the surgery and repeated twice daily for the following days as needed.

Outcome: Patients were followed up for a period of 9 months after the root coverage surgical procedures for evaluation of recession width in mm.

Statistical analysis: For comparing two groups, the independent samples t-test was applied.

Results

In the test group (A-PRF), the amount of recession width was 2.13 ± 0.35 at 3 months, and reported 2.00 ± 0 after 6 months. While, finally decreased to 1.25 ± 1.04 after 9 months. For control group (SCTG), the amount of recession width recorded 1.00 ± 1.07 at 3 months, while, after 6 and 9 months decreased to 0.5 ± 0.93 .

Mean, standard deviation and P-value for recession width in mm (RW) at T0, T3, T6, and T9 in both groups are shown in table (1) and figure (1).

Table (1)
Mean, standard deviation and P-value for recession

	SCTG (n=10)		A-PRF (n=10)		P-VALUE**
	MEAN	SD	MEAN	SD	
T0	2.63	0.52	3.00	0	0.059
T3	1.00	1.07	2.13	0.35	0.013
T6	0.50	0.93	2.00	0	0.00043
T9	0.50	0.93	1.25	1.04	0.148

* Significant at $P < 0.05$

** Tested by Independent sample t test

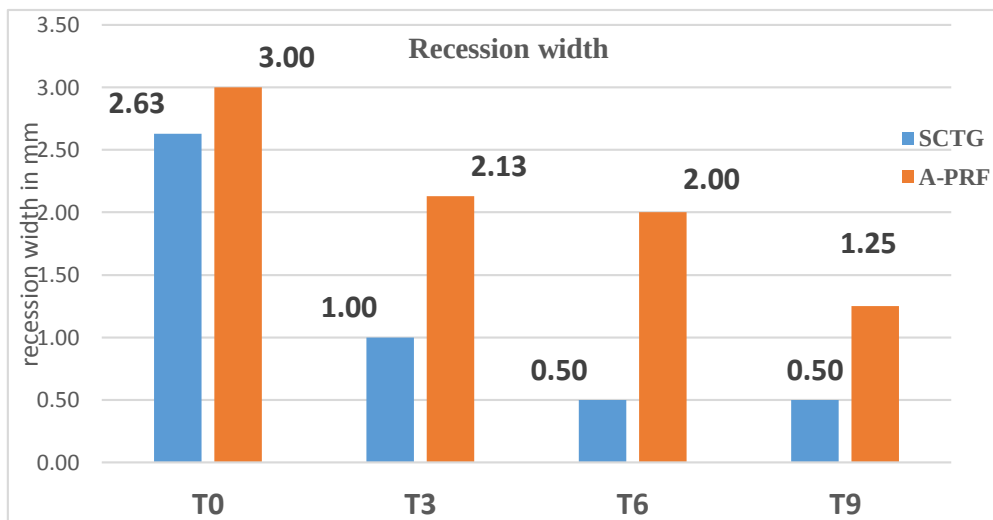


Fig. (1): Bar chart showing mean recession width at T3, T6 and T9 in both groups

Discussion

Gingival recession is documented as a common clinical condition, if left untreated, an increase in the risk of progression has been proved to occur even in patients with proper oral hygiene (Chambrone and Tatakis, 2015; Seong et al., 2018). Many problems have been encountered, however, esthetics and psychological problems constitutes the most common. As recently, it represented

an integral part of oral health and therapy (Eli et al., 2001; Chrysanthakopoulos, 2014).

Accordingly, numerous surgical techniques have been proposed and investigated. The combination of coronally advanced flap and connective tissue graft considered as the gold standard with the highest probability to achieve complete root coverage (Chambrone et al. 2018, 2019). However, some limitations have been reported such as increased patient morbidity due to involvement of the second donor surgical site and insufficient amount of graft tissue needed for larger defects. Additionally, the anatomical variation that may hinder the harvesting procedure (Tonetti et al., 2014; Cairo et al., 2016). Yet, the current trail aimed to assess the efficiency of an alternative technique based on autologous platelets concentrates (A-PRF) in management of recession defects.

The outcome of the present study was the amount of recession width in mm (RW) measured at 3, 6 and 9 months post-operatively. The recession width recorded by A-PRF group was significantly reduced from 3.00 ± 0.0 mm to 1.25 ± 1.04 mm from baseline to 9 months. This was in accordance to (Thamariselvan et al., 2015). The sites treated with CAF and SCTG, demonstrated significant reduction in recession width (RW) from 2.63 ± 0.52 mm at baseline to 0.50 ± 0.93 mm after 6 and 9 months. Similar findings was documented by Eren and Atilla (2014). There was no statistically significant difference reported between the 2 studied groups after 9 months. However, at 3 and 6 months significant reduction observed in favor to CAF+SCTG. These results pointed out that after 9 months follow-up comparable results were achieved. Therefore, further studies with larger sample size and longer follow-up are recommended to confirm such results.

Conclusion

A-PRF showed a promising and close results to SCTG in the term of recession width 9 months after the treatment.

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