



ISSN Print: 2394-7489
ISSN Online: 2394-7497
IJADS 2022; 8(1): 539-542
© 2022 IJADS
www.oraljournal.com
Received: 14-11-2021
Accepted: 17-12-2021

Dr. Samjotha Dharma
Postgraduate, Department of
Periodontics and Implantology,
AJ Institute of Dental Sciences,
Mangalore, Karnataka, India

Dr. Shivaprasad
Postgraduate, Department of
Periodontics and Implantology,
AJ Institute of Dental Sciences,
Mangalore, Karnataka, India

Dr. Sahana Purushotham
Reader, Department of
Periodontics and Implantology,
A J Institute of Dental Sciences,
Mangalore, Karnataka, India

Evaluating the efficacy of a minimally invasive root coverage procedure with platelet rich fibrin using the gum drop technique

Dr. Samjotha Dharma, Dr. Shivaprasad and Dr. Sahana Purushotham

DOI: <https://doi.org/10.22271/oral.2022.v8.i1h.1475>

Abstract

Gingival recession is manifested as an apical displacement of the gingival tissues, leading to root surface exposure. They may cause root hypersensitivity, root caries, and pose esthetic concerns to patients when left untreated. Various surgical treatment modalities are being practised to treat these mucogingival defects. The innovations and the advances in the surgical techniques has led to the development of surgeries that could be done with minimal tissue manipulation and trauma improving the healing and overall clinical parameters. In the current study a novel, minimally invasive surgical approach called the Gum Drop Technique, which utilises both A-PRF membrane and i-PRF as the regenerative biomaterials for recession defects in the maxillary anterior region has been described.

Keywords: Gingival recession, gum drop technique, minimally invasive surgery, PRF

Introduction

Gingival recession is one among the common aesthetic and functional problems affecting the periodontium, and is also one of the most complex in regard to the etiology and the treatment modalities. It is characterized by the displacement of the gingival margin apically from the cemento-enamel junction (CEJ) or from the former location of the CEJ in which restorations have distorted the location or appearance of the CEJ. Gingival recession can be localized or generalized and be associated with one or more surfaces [1]. The key factors which determine the successful management of gingival recessions are the identification of its etiologic agents and their elimination, the assessment of the degree of tissue involvement and last but not least, the selection and the careful implementation of the appropriate surgical procedure in order to achieve optimal root coverage, improved soft tissue aesthetics and reduced sensitivity. The selection of the surgical technique is influenced by various anatomical factors like the defect size, the width of the keratinized gingiva apical to the recession, the thickness of the flap, the level of the interdental papilla and the alveolar bone, the vestibular depth and the position of the labial frenulum [2]. In 1995, minimally invasive surgery (MIS) was first introduced in periodontology literature by Harrel and Rees. The method involves surgical access that minimizes tissue trauma due to reflection and manipulation that results in better stabilization of the blood clot with reduced surgical morbidity [3]. "The Gum Drop Technique" (GDT), is a soft-tissue grafting technique combining minimally invasive incisions with patient blood derivatives to achieve a stable root coverage. Biological factors derived from the patients' blood have been introduced as solo or combination agents to increase wound healing and success rates [4]. The purpose of this study was to assess the efficacy of this minimally invasive root coverage procedure.

Materials and Methods

The study was approved by the Ethical committee of A J Institute of Medical Sciences, Mangalore. All the clinical procedures was conducted in the department of Periodontics, A J Institute of Dental sciences Mangalore. A total of 20 subjects were included in the study. Individuals belonging to age group of 20-45years with Class I and Class II gingival recession

Corresponding Author:
Dr. Samjotha Dharma
Postgraduate, Department of
Periodontics and Implantology,
AJ Institute of Dental Sciences,
Mangalore, Karnataka, India

in the maxillary incisors and premolars with sufficient width of attached gingiva $\geq 2\text{mm}$, were included in the study (Fig 1). Individuals with habits like smoking and tobacco chewing, severely abraded tooth surface, insufficient width of attached gingiva $<2\text{mm}$, tooth with root caries were excluded from the study. Gingival recession width (RW), recession height (RH) and Keratinized Tissue Width (KTW) were assessed prior to surgery using UNC 15 probe. All subjects received full-mouth scaling and root planing, polishing and individualized oral hygiene instructions prior to scheduled surgery. Surgical protocols and safety guidelines were followed prior to the surgery.

Preparation of i-PRF and A-PRF: Adequate amount of blood from the patient's antecubital fossa was drawn for the preparation of i-PRF and A-PRF and processed in the centrifuge machine at 700rpm for 3min for i-PRF and 2300rpm for 12min for A-PRF preparation.

Surgical Technique: Patients were anesthetized by injecting local anaesthetic containing 2% lignocaine with 1:2,00,000 adrenaline. Root biomodification was done with 17% EDTA gel, applied on the root surface for 3 minutes and thoroughly irrigated with saline. The procedure was initiated by giving an intrasulcular incisions on the buccal aspect of the teeth. VISTA instruments were used to elevate the keratinized tissue upto the mucogingival junction in full thickness. The interdental papilla was preserved as these incision lines were not connected across the interproximal tissues. Small incision of 2-3mm in length was made 1-2mm apical to the mucogingival junction on either sides, involving the recession site (Fig 2) VISTA tunnelling instrument was used to create a full thickness tunnel between the entrance holes and extended to the cementoenamel junction (CEJ) of each tooth sparing the tip of the papilla to allow a tension free flap to be repositioned in a more coronal direction to cover the root

recession being treated.

i-PRF was injected in the tunnel. The A-PRF membranes prepared prior, were introduced through the entrance holes under the elevated soft tissue over the roots and under the papillae (Fig 3). After membrane placement, the gingiva was advanced coronally towards the CEJ with 6-0 nylon non-degradable suture using Composite bonding, placed on the labial surfaces which acts as stabilization points for the sutures. The pin holes created were sutured using simple interrupted suture (Fig 4). The surgical site was protected using periodontal dressing. Post operatively, analgesics was prescribed along with 0.12% CHX mouthwash, and patients were instructed to avoid flossing for 2-3 weeks and brushing for a week at the surgically treated site. The patients were scheduled for recall visits at 1 week and 3 month for clinical assessment of gingival recession width (RW), recession height (RH) and Keratinized Tissue Width (KTW).

Results

The clinical outcomes obtained from the study are enumerated in Table 1. The Recession Width having a Median value of 3mm among the 20 patients, showed clinically improved results at 1week and an average of 0.50mm at 3months having a statistically significant p value of 0.001. The Recession depth having a median value of 2mm at baseline, showed complete root coverage at 1 week and 3 months post-operative. Similarly, the keratinized tissue which had a median value of 3mm at baseline improved to 4mm at 1week and 3months (Fig 5).

The Mean difference of Recession depth, recession width and keratinized tissue width was found to be statistically significant from pre to 1 week and between pre to 3 months whereas the mean recession difference changes from 1 week to 3 months was not statistically significant (Recession depth p value = 0.564, recession width p value=0.739, keratinized tissue width p value=0.317). (Table 2).



Fig 1: Preoperative



Fig 2: Vertical incisions 1-2mm apical to mucogingival junction



Fig 3: A-PRF membrane passed into the entrance holes



Fig 4: Suturing using composite bonding



Fig 5: 3 month Post-operative

Table 1: Comparison of the recession width, recession depth and keratinised tissue width within the group using friedman test

		N	Minimum	Maximum	Median	IQR	p value
Recession Width	Baseline	20	2	4	3	1	0.001*
	1 week	20	0	2	0	1	
	3 months	20	0	1	0.50	1	
Recession Depth	Baseline	20	1	3	2	0	0.001*
	1 week	20	0	1	0	1	
	3 months	20	0	1	0	1	
Keratinized tissue Width	Baseline	20	3	4	3	0	0.001*
	1 week	20	3	4	4	1	
	3 months	20	3	4	4	1	

*significant, IQR-Interquartile range

Table 2: Comparison of the clinical parameters between time intervals using Wilcoxon sign test

		Pre V/s 1 week	Pre V/s 3 months	1 week V/s 3 months
Recession Depth	Z value	-3.97	-3.99	-0.57
	p value	.001*	.001*	.564
Recession Width	Z value	-4.008	-3.83	-0.333
	p value	.001*	.001*	.739
Keratinised tissue width	Z value	-3.606	-3.46	-1.0
	p value	.000*	.001*	.317

*p value set significant at 0.05/3=0.016

Discussion

The goal of any periodontal plastic surgical procedure, like gingival recessions is to obtain complete root coverage and optimal aesthetic appearance. Gum drop technique, a minimally invasive surgical procedure using autologous platelet concentrate as a biomaterial, has shown successful and predictable outcomes in treating gingival recession.

Various grafts like free gingival autografts, Sub epithelial connective tissue grafts (CTG), acellular dermal matrix have been used for recession defects. CTG, although considered the current gold standard, presents with a number of disadvantages, including the need for harvesting at a distant donor site, limited tissue availability, and increased potential for post harvesting morbidity [5]. The use of autologous platelets concentrates like PRF (Platelet rich fibrin) membrane and i-PRF have gained increased interest, as an adjunct biomaterial for the treatment of gingival recession. A-PRF membrane, belonging to the second-generation platelet concentrate has a favorable physiologic architecture to support the healing process, due to its slow polymerization mode [6]. PRF play a role in hemostasis and clot formation and release platelet granules contain growth factors, including platelet-derived growth factor (PDGF), transforming growth factor b (TGFb), IGF-1, involved in cell proliferation and differentiation [7]. A Recent study by Miron *et al.* [8] showed that i-PRF was capable of inducing higher cell migration and mRNA expression of TGF-β, PDGF, osteocalcin and significant increase in type I collagen gene expression when compared to PRP. Ucak *et al.* [9] reported that, the addition of i-PRF to the

CAF+CTG treatment showed further development in terms of increasing the KTH (Keratinized Tissue Height) and decreased recession depth.

In the present GDT technique, the usage of both A-PRF membrane and i-PRF serves the purpose of root coverage and reduces the inflammation, stimulating the healing process thus providing a long-term stability of the repositioned gingival margin. In the GDT by Tuttle [4], a small gum piercing instrument was used to create of holes in the mucogingival line. The author reported three successful cases where a stable and complete root coverage was seen upto 9months [4]. In the present study, we attained successful and stable results of root coverage upto 3months with improvement in recession width, recession depth and Keratinised Tissue width. In a case report by Midhun [10], the Gum Drop technique was used for the management of Miller's Class III gingival recession where they achieved 90 percentage of defect coverage at 6 months.

The combination of A-PRF-membrane and i-PRF is a predictable and inexpensive approach for the treatment of Class I as well as Class II gingival recession defects. The cases treated with this novel GDT technique proposed by Tuttle D [4], has shown to improve the gingival phenotype and provide long-term stability in term of reduction of recession depth and significant gain in CAL.

Conclusion

The probable role of A-PRF membrane and i-PRF in the improvement of the gingival parameters and the mechanisms involved are still poorly understood. This minimally invasive

technique has advantages of preservation of papilla, reduction of bleeding, rapid healing, without the need for a donor site and has shown to have a high patient acceptance. However, studies with large sample size and longer follow-up period are necessary to confirm a promising outcome.

References

1. Kassab MM, Cohen RE. The etiology and prevalence of gingival recession. *The Journal of the American Dental Association*. 2003;134:220-5.
2. Shkreta M, Atanasovska-Stojanovska A, Dollaku B, Belazelkoska Z. Exploring the gingival recession surgical treatment modalities: A literature review. *Open access Macedonian journal of medical sciences*. 2018;6:698-708.
3. Sultan N, Jafri Z, Sawai M, Bhardwaj A. Minimally invasive periodontal therapy. *Journal of Oral Biology and Craniofacial Research*. 2020;10:161-5.
4. Tuttle D, Kurtzman GM, Froum SH. Platelet-rich fibrin minimally invasive root recession soft-tissue grafting. *International Journal of Growth Factors and Stem Cells in Dentistry*. 2018;1:32-7.
5. Zadeh HH. Minimally invasive treatment of maxillary anterior gingival recession defects by vestibular incision subperiosteal tunnel access and platelet-derived growth factor BB. *International Journal of Periodontics and Restorative Dentistry*. 2011;31:653-60.
6. Dohan DM, Choukroun J, Diss A, Dohan SL, Dohan AJ, Mouhyi J, Gogly B. Platelet-rich fibrin (PRF): a second-generation platelet concentrate. Part I: technological concepts and evolution. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology*. 2006;101:37-44.
7. Passaretti F, Tia M, D'esposito V, Pascale MD, Corso MD, Sepulveres R, *et al*. Growth-promoting action and growth factor release by different platelet derivatives. *Platelets*. 2014;25:252-6.
8. Miron RJ, Fujioka-Kobayashi M, Hernandez M, Kandalam U, Zhang Y, Ghanaati S, *et al*. Injectable platelet rich fibrin (i-PRF): opportunities in regenerative dentistry?. *Clinical oral investigations*. 2017;21:2619-27.
9. Ucak Turer O, Ozcan M, Alkaya B, Surmeli S, Seydaoglu G, Haytac MC. Clinical evaluation of injectable platelet-rich fibrin with connective tissue graft for the treatment of deep gingival recession defects: A controlled randomized clinical trial. *Journal of clinical periodontology*. 2020;47:72-80.
10. Midhun Kishor S1, Seema G. Management of Miller's Class III Gingival Recession by Gum Drop Technique: A Case Report. *CRDS*. 2021;2:38-41.