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Original Research

Comparative evaluation of healing in Kirkland flap with platelet rich fibrin versus demineralized freeze dried bone allograft in treating periodontal infrabony defects

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ABSTRACT:
Background: To evaluate the comparison of healing score in Kirkland flap with platelet rich fibrin versus demineralized freeze dried bone allograft in treating periodontal infrabony defects. **Method:** A total of 30 patients was selected for relative study consisting of Kirkland flap with PRF &Kirkland flap with DFDBA in infrabony defects. Out of them, 15 patients were dealt through Kirkland flap surgery with PRF application thereafter, while the remaining 15 patients underwent Kirkland flap surgery along with DFDBA placement in the infrabony defects. **Result:** On comparison of healing score among the two Groups A&B during given time intervals the mean values were statistically non-significant.
Keywords: PRF: platelet rich fibrin, DFDBA: demineralized freeze dried bone, infrabony defects.

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INTRODUCTION

Periodontitis is an inflammation of the periodontium that is initiated by microbial plaque, which accumulates on the tooth surface at the gingival margin and induces an inflammatory reaction.[1] The inflammatory response in patients with chronic periodontitis results in destruction of the periodontal tissues[2]that extends beyond the gingiva and produces destruction of the alveolar bone and connective tissue attachment of the tooth.[3] The primary goal of periodontal therapy thus, is to arrest the above inflammatory disease process. It is directed at disease prevention, slowing or arresting disease progression, regenerating lost periodontium, and maintaining achieved therapeutic objectives. [4]

Regeneration results in formation of new bone, cementum, and functionally aligned periodontal ligament on a previously diseased root surface[5]. Despite difficulties obtaining complete periodontal regeneration of intrabony defects, studies have shown improved clinical parameters using graft materials alone or combined with other treatment approaches.[6-10]

Several bone graft materials have been used in treatment of infrabony defects. Demineralized freeze-dried bone allograft(DFDBA) has been proven to be the material of choice for regeneration. However, platelet rich fibrin (PRF) has been said to have several properties that aid in healing and regeneration. Hence, this study focuses on regenerative capacity of PRF when compared with DFDBA.

AIM AND OBJECTIVES

AIM OF THE STUDY

Comparative evaluation of healing in Kirkland flap with platelet rich fibrin versus demineralized freeze dried bone allograft in treating periodontal infrabony defects.

OBJECTIVES OF THE STUDY

To compare the healing in between the Kirkland flap with PRF and Kirkland flap with DFDBA in periodontal infrabony defects.

METHOD AND MATERIAL

Group-A: It comprised of 15 individuals to which Kirkland flap procedure was performed with PRF in infrabony defects.

Group-B: It comprised of 15 individuals to which Kirkland flap was performed with DFDBA in infrabony defects.

CRITERIA FOR PATIENT SELECTION

For standardization of sample, patients were selected on the basis of following criteria.

INCLUSION CRITERIA

- Chronic periodontitis patient with probing depth ≥5mm
- Subjects aged between 20 -55 year with periodontal infrabony defects between premolar to molar.
- Systemically healthy patient
- Non smokers

EXCLUSION CRITERIA

- Diabetic patients
- Pregnant or Lactating mothers
- History of periodontal surgery in same area within 6 months
- Patients with poor compliance
- Allergic to local anaesthetic, chlorhexidine, antibiotic & analgesic

OBTAINING PRF

5ml of peripheral venous blood was drawn from antecubital fossa of the right arm and placed in sterilized vacuum evacuated vials without an anticoagulant and centrifuged immediately for 10 mins at 3000 rpm.

After centrifugation the resultant product,

1. Top most layer, consisted of straw colored acellular plasma
2. The middle layer consisted of PRF clot.
3. Third layer formed was red colored lower fraction containing red blood cells.

The middle layer of PRF clot was then removed with sterile tweezer and separated from the underlying RBC layer using scissors and then transferred on a sterile dish. The obtained PRF was then filled in the kirkland flap.

PREPARATION OF GRAFT MATERIAL (DFDBA)

Allograft (DFDBA) was placed in a sterile dappen dish and covered by a saline saturated gauze square to avoid dehydration. The allograft was then rehydrated with sterile saline, blotting off any excess solution. The graft was then next delivered to the bony defect with a (dedicated) spoon excavator or spatula and was added in incremental fashion. Light pressure should be used to maintain space between the graft particles to allow neovascularization of the site. The defect should be filled or slightly overfilled to maximize regeneration while not compromising flap closure or vascular supply[80].

RESULT

Table 1: Comparison of Healing score among the two groups during given time intervals.

Healing		baseline	3months	6months
GROUP A	Mean	1.7	3.7	4.87
	SD	0.53	0.53	0.37
GROUP B	Mean	1.74	3.65	4.9
	SD	0.51	0.49	0.37
F value		0.37	0.02	0.03
p value		0.7	0.93	0.89

On comparison of healing score among the two Groups A&B during given time intervals the mean values were statistically non-significant.

DISCUSSION

Periodontal disease is among the most prevalent diseases worldwide and is characterized by the presence of gingival inflammation, periodontal pocket formation, loss of periodontal attachment and loss of alveolar bone around the affected teeth.[11,12]The goal of periodontal therapy include not only the arrest of periodontal disease progression, but also the regeneration of structure lost due to disease.[13] Regenerative therapy is considered to be very interesting field, which involves the replacement and/or regeneration of oral tissues altered as a result of disease.[14]

Periodontal surgical procedures utilize a variety of regenerative materials and techniques. Many of these include the use of bone grafts, bone replacement materials and more recently use of growth factors. The most extensively evaluated graft material for the treatment of infrabony defect remain demineralized freeze dried bone allograft. DFDBA has both osteoinductive and osteoconductive activity and the ability to creat and maintain the space.[15,16]

A second generation platelet concentrate, platelet rich fibrin was introduced bychoukroun et al. in 2001.PRF is in the form of platelet gel can be used in conjucation with bone grafts, which offer several advantages, including promoting wound healing, bone growth and maturation, wound sealing and improving the handling properties of graft materials.[17] PRF can be used as a membrane. Platelet activation in response to tissue damage release several biologically active proteins including; platelet alpha granules, platelet derived growth factor, transforming growth factors-beta, vascular endothelial growth factor and epidermal growth factor.[18]The biologic activity of the fibrin molecule is enough, in itself, to account for the significant cicatricial capacity of the PRF, and the slow polymerization mode confers to the PRF membrane a particularly favourable physiologic architecture to support the healing process.[19,20] Leukocytes that are concentrated in PRF scaffold play an important role in growth factor release, [21]immune

regulation,[22] anti-infectious activities, [23] and matrix remodelling during wound healing.

This relative study comprised of 30 patients with chronic periodontitis having infrabony defects, with 15 members in each group selected from both the genders. A standard regimen was followed in recording the clinical parameters. Thereafter, scaling and root planing followed by Kirkland flap procedure was carried out for each patient. In the GROUP A, Kirkland flap with PRF was placed to see the efficacy of PRF in healing, as there are various studies supporting its role in healing of surgical wounds, whereas, in other GROUP B, Kirkland flap with DFDBA was performed. The result of present report support the role of DFDBA also PRF with its various growth factors present in it in accelerating the healing process and this result is in accordance to, **Anuj Sharma *et al.***(2011), **Thorat*et al.***(2011)**Bansal *etal.* (2013)**, **KhattarSakshi*et al.***(2014) and **Pradeep et al**, **Lekovic et al**. In this study DFDBA though being osteoinductive in nature provided ascaffold for osteoconduction thus it has repeatedly demonstrated significant improvements in soft and hard tissue clinicalparameters for the treatment of intraosseous (infrabony) periodontal defects.

CONCLUSION

Kirkland flap along with PRF may be clinically useful in periodontal regeneration supporting the healing process in patients with infrabony defects. PRF has thus confirmed itself to be considered as a healing biomaterial.

It is suggested that in future a histological study evaluating the role of PRF in Kirkland flap cases may be carried out to conclusively confirm periodontal regeneration aspects of the same.

While DFDBA is a common alternative because of its osteoinductive potential from bone morphogenic protein exposure during the demineralization process, there is a large body of evidence to support the use of it in intrabony defects to achieve healing.

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