



Research Article

Volume 15 Issue 5 - November 2022  
DOI: 10.19080/ADOH.2022.15.555921

Adv Dent & Oral Health

Copyright © All rights are reserved by NedaSadat Hashemi

# Comparing and Examining the Treatment of Intraosseous Defects, Bone Grafting in Periodontal Surgery



Hamed Nabahat<sup>1\*</sup>, NedaSadat Hashemi<sup>1</sup>, Alireza Rajabi<sup>2</sup>, Melika Tahan<sup>1</sup>, Sogol Poursamad<sup>2</sup> and Sahar Haghghat<sup>2</sup>

<sup>1</sup>Yevdokimov Moscow State University of Medicine and Dentistry (Semashko), Moscow, Russia

<sup>2</sup>I.M. Sechenov First Moscow State Medical University (MSMU), Moscow, Russia

**Submission:** November 14, 2022; **Published:** November 28, 2022

**\*Corresponding author:** NedaSadat Hashemi, A.I. Yevdokimov Moscow State University of Medicine and Dentistry, Moscow, Russia

## Abstract

Treatment of periodontal osseous defects; however, the clinical benefits of this therapeutic practice require further clarification through a systematic review of randomized controlled studies. The purpose of this systematic review is to access the efficacy of bone replacement grafts in proving demonstrable clinical improvements in periodontal osseous defects compared to surgical debridement alone. Several bone graft materials have been used in the treatment of infrasonic defects. Demineralized freeze-dried bone allograft (DFDBA) has been histologically proven 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 the regenerative capacity of PRF when compared with DFDBA. This study was conducted as a case study in Russia (2021-2022) and was presented at the Japan Dental Conference 2022.

**Keywords:** Bone grafting; Dentistry; Case study; Freeze-dried bone

**Abbreviations:** DFDBA: Demineralized freeze-dried bone allograft; GTR: Guided Tissue Regeneration; OFD: open flap debridement; PD: Probing depth; RAL: Relative Attachment Level; GML: Gingival Marginal Level

## Introduction

Adult dentition permanent tooth absence can be brought on by congenital absence, dental disease, trauma, iatrogenic errors, or dental disease [1]. Additionally, pathologic abnormalities like cancer may cause them to be lost after maxillofacial surgery [2,3]. The alveolar bone that surrounds a missing tooth is typically very thin; this lack of bone may be the result of atrophy, trauma, a failure to form, or surgical resection [4]. Osseous flaws that are connected to periradicular lesions can show similar phenomena. Dental implants can only be used to replace lost teeth if there is enough bone to support them sufficiently [5]. As a result, bone augmentation may substantially help implant treatment, which would otherwise not be a therapeutic option [6].

Regenerating periodontal tissues damaged by periodontitis is the ultimate goal of periodontal therapy. Bone transplants, guided tissue regeneration (GTR), or their mixtures have both been employed for this purpose [7]. Histological evidence shows that OFD causes periodontal repair that is predominantly characterized by the creation of a lengthy junctional epithelial attachment, whereas DFDBA favors the formation of a new attachment apparatus in infrabony defects. Studies have revealed

striking variations in DFDBA's osteoinductive properties. Some donor bone had absolutely little activity and had only served as a Type I collagen supply [8]. Due to DFDBA's shortcomings, researchers are now looking for a regenerative material that has a comparable capacity for regenerating periodontal tissues with the least amount of antigenicity and expense drawbacks [9].

## Materials and Methods

A total of 60 intrabony defect sites were chosen, divided into the test group (20 open flap debridement [OFD] and PRF sites) and the control group (20 open flap debridement [OFD] + DFDBA sites). After debridement of the site and suturing the flap into place at the test sites, two PRF plugs were inserted into the intrabony defect. Probing depth (PD), relative attachment level (RAL) [10], and gingival marginal level were the variables that were measured (GML). Just prior to surgery (baseline) and six months after surgery, these parameters were measured. A paired t-test was used to compare changes in PD, RAL, and GML within each group and between the two groups at baseline and six months following surgery [11]. 60 sites participated in this investigation. Prior to surgery, defects were randomly assigned

by flipping a coin to receive either a PRF plug or DFDBA after an OFD. The randomization procedure was unknown to the study's investigator. Participants who maintained good dental hygiene and provided consent were chosen for the study after initial periodontal therapy, which included oral hygiene instructions, scaling, and root planning [12].

The subject was scheduled for surgery after the specified flaws were evaluated clinically and radiographically to ensure they met the inclusion criteria. Each site was given a unique acrylic stent, ensuring that the typical periodontal probe always returns to the same location for subsequent measurements. Using a UNC-15 probe, clinical parameters including PD, relative attachment level (RAL), and gingival marginal level (GML) were evaluated [8]. Each participant underwent surgery with the same periodontal surgeon. To treat each site, a full-thickness mucoperiosteal flap was reflected, striving to keep as much soft tissue as possible [13]. With the aid of hand and ultrasonic tools, the exposed roots and osseous deformities were removed. The participant's own blood was used to create a PRF plug for the faults at the test location. DFDBA was positioned at the control locations. After that, the flap was raised to its original level and stitched with a 4-0 silk suture. With interrupted loop sutures, a primary closure was achieved. After 14 days, participants were brought back for suture removal

[14].

### Results and Discussion

Using directed bone regeneration, a comparable study (historical trial) explored the potential for fresh bone regrowth surrounding implants (GBR) [15]. It demonstrated that the patient would benefit from and need bone augmentation. In another study, the requirement for autogenous bone grafting during implant implantation in freshly extracted maxillary incisor and premolar sockets was assessed. The reported differences were substantial [10]. A carefully planned study examined the use of iliac crest bone grafting, short implants, and trans-mandibular implants among other implant placement methods in edentulous patients. It demonstrated that bone grafting techniques were superior to short and trans-mandibular implants (Figure1). In the test PRF group, the mean reduction in PD at six months was 4.67 1.48 mm, compared to 4.70 1.78 mm in the control DFDBA group. Gain in RAL is 2.59 1.26 mm in the test PRF group compared to 2.59 1.26 mm in the control DFDBA group. In comparison to the control DFDBA group, the gingival margin moved apically by 0.72 2.3 mm in the test PRF group but only by 0.43 1.31 mm. The differences in terms of PD ( $P = 0.96$ ), RAL ( $P = 1.00$ ), and GML ( $P = 0.62$ ) were observed to be non-significant.



Figure 1: Hard tissue deficiency at 12 and 16.

### Conclusion

In terms of clinical metrics, platelet-rich fibrin has demonstrated significant results after six months that are comparable to DFDBA for periodontal regeneration. As a result, it can be utilized to correct intrabony deficiencies.

**Acknowledgment:** This study was conducted as a case study in Russia (2021-2022) and was presented at the Japan Dental Conference 2022.

### References

1. Agarwal A, Gupta ND, Jain A (2016) Platelet rich fibrin combined with decalcified freeze-dried bone allograft for the treatment of human intrabony periodontal defects: a randomized split mouth clinical trial. *Acta Odontologica Scandinavica* 74(1): 36-43.
2. Chadwick JK, Mills MP, Mealey BL (2016) Clinical and radiographic evaluation of demineralized freeze-dried bone allograft versus platelet-rich fibrin for the treatment of periodontal Intrabony defects in humans. *Journal of periodontology* 87(11): 1253-1260.

3. Sharma A, Pradeep AR (2011) Autologous platelet-rich fibrin in the treatment of mandibular degree II furcation defects: A randomized clinical trial. *Journal of periodontology* 82(10): 1396-1403.
4. Del Fabbro M, Bortolin M, Taschieri S, Weinstein R (2011) Is platelet concentrate advantageous for the surgical treatment of periodontal diseases? A systematic review and meta-analysis. *Journal of Periodontology* 82(8): 1100-1111.
5. Espitia-Quiroz LC, Fernández-Orjuela AL, Anaya-Sampayo LM, Acosta-Gómez AP, Sequeda-Castañeda LG, et al. (2022) Viability and Adhesion of Periodontal Ligament Fibroblasts on a Hydroxyapatite Scaffold Combined with Collagen, Polylactic Acid–Polyglycolic Acid Copolymer and Platelet-Rich Fibrin: A Preclinical Pilot Study. *Dentistry Journal* 10(9): 167.
6. Maknojia M (2022) Comparative evaluation of autologous platelet-rich fibrin versus platelet-rich fibrin combined with demineralized freeze-dried bone allograft in the treatment of periodontal intrabony defects: A clinical & radiographic study. *Journal of International Oral Health* 14(1): 34.
7. Bhombe KR, Bajaj P, Mundada B, Dhadse P, Subhadarsanee C, et al. (2022) Combined Effect of Platelet-Rich Fibrin Matrix (PRFM) and Demineralized Freeze-Dried Bone Allograft (DFDBA) in Immediate Implant Placement: A Single-Arm Clinical Trial. *Cureus* 14(9): e29728.
8. Feng M (2022) Preparation, characterization and biological properties of a novel bone block composed of platelet rich fibrin and a deproteinized bovine bone mineral. *Fundamental Research* 2(2): 321-328.
9. Verhulst MJ, Loos BG, Gerdes VE, Teeuw WJ (2019) Evaluating all potential oral complications of diabetes mellitus. *Frontiers in endocrinology* 10: 56.
10. Kang F, Sah M, Fei G (2020) Determining the risk relationship associated with inferior alveolar nerve injury following removal of mandibular third molar teeth: A systematic review. *Journal of stomatology oral and maxillofacial surgery* 121(1): 63-69.
11. Dayashankara R J K, Bhatnagar A, Pandey R, Arora G, Kumar J, et al. (2021) A comparative evaluation of iliac crest bone graft with and without injectable and advanced platelet rich fibrin in secondary alveolar bone grafting for cleft alveolus in unilateral cleft lip and palate patients: A randomized prospective study. *Journal of Stomatology Oral and Maxillofacial Surgery* 122(3): 241-247.
12. Nabahat H, Tahan M, Davoudabadi FA, Sergeevich L, Kolomeitsev, et al. (2021) Regeneration of Permanent Tooth Enamel (Alternative Solution of Nano-hydroxyapatite) after Exposure to Beer (Laboratory Study at the Dental Center, Moscow, Russia). *Adv Dent & Oral Health* 14(4): 555-891.
13. Francisco I, Fernandes MH, Vale F (2020) Platelet-rich fibrin in bone regenerative strategies in Orthodontics: A systematic review. *Materials* 13(8): 1866.
14. Faridnejad H, Biostat Biom (2022) Open Access J Design and Simulation of the Source (Wiggler) and Medical Beamline of Iranian Light Source Facility (ILSF) for Medical Applications. *JP Journal of Biostatistics*.
15. Arafat Y and Azra (2020) An analysis of energy supply and oil price shocks on agricultural productivity of Pakistan. *Sarhad Journal of Agriculture* 36(4): 1120-1126.



This work is licensed under Creative Commons Attribution 4.0 License  
DOI: [10.19080/ADOH.2022.15.555921](https://doi.org/10.19080/ADOH.2022.15.555921)

### Your next submission with Juniper Publishers will reach you the below assets

- Quality Editorial service
- Swift Peer Review
- Reprints availability
- E-prints Service
- Manuscript Podcast for convenient understanding
- Global attainment for your research
- Manuscript accessibility in different formats  
( Pdf, E-pub, Full Text, Audio)
- Unceasing customer service

Track the below URL for one-step submission  
<https://juniperpublishers.com/online-submission.php>