Journal of Periodontal Medicine & Clinical Practice

Vol-4, Issue - II, May-Aug 2017

www.jpmcp.com

Short Communication

Platelet Rich Fibrin : A panacea in periodontal regeneration and repair

Chouan H, Bhandari V

Chouhan H, Bhandari V. **Platelet Rich Fibrin : A panacea in periodontal regeneration and repair**
J Periodontal Med Clin Pract 2017;02: 10-12

Affiliation

1. **Dr. Harmesh Chouhan** PG Student (Deptt. Of Periodontology & Oral implantology, Swami Devi Dyal Hospital & Dental College, Barwala, Panchkula)
Contact No: 9417974695
Email Id: harmeshchouhan@gmail.com

2. **Dr. Varun Bhandari** (PG Student (Deptt. Of Periodontology & Oral implantology, Swami Devi Dyal Hospital & Dental College, Barwala, Panchkula)
Contact No: 8054228389
E-mail: drvarunbhandari@gmail.com

Over the past 20 years, an increasing trend has been observed in periodontology whereby the regeneration of intrabony and furcation defects has been accomplished by means of biological agents and growth factors.The periodontium is a complex functional unit derived from several tissues responsible for the connection of teeth with their surrounding bone. This is accomplished by collagen Sharpey's fibers that span from the root cementum through the periodontal ligament and attach to bundle alveolar bone.[1,2] It has been well described in the literature that failure to prevent infection by periodontal pathogens may cause gingivitis and without treatment may lead to the development of periodontitis and the eventual loss of periodontal structures .[1] Since true periodontal regeneration comprises not only the regeneration of the periodontal ligament, but also the surrounding alveolar bone, cementum, and also the overlying soft tissues including new connective and epithelial tissues, complete periodontal regeneration remains but a desired end goal, with much future research still necessary to fulfill these criteria predictably.

Platelet concentrates are described with a large focus on the number of randomized clinical trials that now support the use of platelet rich fibrin (PRF) for the repair/regeneration of intrabony and furcation defects.[3] Different types of platelet concentrates have been described, including but not limited to platelet rich plasma (PRP), pure platelet rich plasma (P-PRP), leukocyte- and platelet rich plasma (L-PRP), and platelet rich fibrin (PRF). The potential of this substances as a biologic agent in periodontology relies on the growth factors stored within platelet alpha granules including platelet-derived growth factor (PDGF), vascular endothelial growth factor (VEGF), insulin-like growth factor (IGF), platelet-derived angiogenic factor, and transforming growth factor-beta (TGFB)[4].PRP was first utilized extensively by many clinicians in the periodontal fields and has since been extensively utilized for intrabony defect regeneration mainly in combination with bone

grafts[5].Following the regenerative outcomes with PRP, several authors began to hypothesize whether PRF, a natural platelet concentrate without the use of anti-coagulants, could further improve the outcomes observed with PRP.First, PRF contains a fibrin network that facilitates blood clot formation and tissue repair[6]. Secondly, its growth factor release kinetics have been shown to occur more slowly when compared to PRP, and therefore regeneration may take place over a more extended period of time.

Moreover, PRF contains leukocytes and macrophages, known cell types implicated in immunity and host defense.[7] Since periodontal defects are the result of invading bacterial pathogens, the inclusion of white blood cells contained within PRF is hypothesized to further act as a bacterial resistant matrix capable of fighting bacterial pathogens. While a number of studies investigating intrabony defect regeneration have compared PRF to common regenerative modalities including bone grafts, barrier membranes or bioactive factors, no study to date exists for furcation defect regeneration.The biological advantages of PRF have been shown to act locally by quickly stimulating a large number of cell types by influencing their recruitment, proliferation, and/or differentiation. These include endothelial cells, gingival fibroblasts, chondrocytes, and osteoblasts, thereby having a potential effect on either soft- or hard-tissue repair.[8]

Conclusion: Despite the fact that PRF is not commonly utilized in routine clinical practice by many clinicians for the regeneration of intrabony defects it remains interesting to note that it is far evaluated for its potential for periodontal regeneration either for intrabony or furcation defects. While periodontal regeneration remains complex due to the number of tissues needed to be regenerated (new cementum, periodontal ligament and alveolar bone), as well as the fact Sharpey's fibers need to be oriented functionally to support the tooth apparatus, it remains difficult to assess PRF for periodontal regeneration without histological evidence.

REFERENCES:

1. Bosshardt DD, Sculean A. Does periodontal tissue regeneration really work? Periodontol 2000. 2009;51:208–19.
2. Bosshardt DD, Stadlinger B, Terheyden H. Cell-to-cell communication–periodontal regeneration. Clinical oral implants research. 2015;26(3):229–39.
3. Dohan DM, Choukroun J, Diss A, et al. Platelet-rich fibrin (PRF): A second-generation platelet concentrate. Part I: Technological concepts and evolution. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2006;101:37–44.
4. BoyapatiL,Wang H-L. The role of platelet-rich plasma in sinus augmentation: a critical review. Implant dentistry. 2006;15(2):160–70.
5. Hanna R, Trejo PM,Weltman RL. Treatment of intrabony defects with bovine-derived xenograft alone and in combination with platelet-rich plasma: a randomized clinical trial. Journal of Periodontol. 2004;75(12):1668–77.
6. Toffler M, Toscano N, Holtzclaw D, Corso M, Dohan D. Introducing Choukroun's

platelet rich fibrin (PRF) to the reconstructive surgery milieu. J Implant Adv Clin Dent. 2009;1:22–31.

7. Clark RA. Fibrin and wound healing. Annals of the New York Academy of Sciences. 2001;936:355–67.
8. Roy S, Driggs J, Elgharably H, Biswas S, Findley M, Khanna S, et al. Platelet-rich fibrin matrix improves wound angiogenesis via inducing endothelial cell proliferation. Wound repair and regeneration: official publication of the Wound Healing Society [and] the European Tissue Repair Society. 2011; 19(6):753–66.

Competing interest / Conflict of interest The author(s) have no competing interests for financial support, publication of this research, patents and royalties through this collaborative research. All authors were equally involved in discussed research work. There is no financial conflict with the subject matter discussed in the manuscript.
Source of support: NIL