The Use of Platelet Rich Fibrin in Pulpal and Periodontal Regeneration

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Abstract
Purpose: Platelet rich fibrin (PRF) has been postulated to aid in regeneration. Therefore, the purpose of this study is to evaluate the inflammatory response of PRF in vitro, and analyze clinically and histologically the effectiveness of PRF on pulpal regeneration after reimplantation.

Materials and Methods: The in vivo experiment included 18 patients (69 teeth). Teeth were extracted and apicoectomy performed. The tooth was reimplanted and splinted after PRF was condensed into the apex. Control teeth received the same treatment with the exception of the PRF. After 3-11 months, vitality was checked, teeth were extracted and analyzed histologically. For the in vitro, PRF was fabricated from two donors. A periodontal ligament (PDL) cell line was divided into four groups: A: PDL cells and PRF, B: PDL cells, PRF, and Lipopolysaccharide (LPS), C: PDL cells and LPS, and D: PDL cells only. After 24 h LPS was added to groups B and C. Supernatants were collected at 24, 48 and 72 h and an enzyme-linked immunosorbent assay was used to measure the concentration of IL-6.

Results: PRF had no effect on diagnostic tests or histological outcome. Out of mouth time lead to more post-operative non-vital responses. For the cell cultures, PRF synergized with LPS inducing higher IL-6 release.

Conclusions: PRF does not improve vitality responses in vivo and results in higher expression of IL-6 from PDLs.

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Platelet rich fibrin is a second-generation platelet concentrate widely used to accelerate soft and hard tissue healing and is a strictly autologous fibrin matrix containing a large quantity of platelet and leukocyte cytokines. Ross et al. were amongst the pioneers who first described growth factor from platelets. In this article we discuss about various uses of platelet rich fibrin in the field of dentistry. The relationship between pulpal and periodontal disease was first described by Simring and Goldberg in 1964.5 The regenerative potential of platelets has been deliberated. The platelets release growth factors that are trapped inside the fibrin matrix following activation. The osteoconductive and osteoinductive properties of platelet-rich fibrin were used to stimulate pulp and periodontal regeneration. Results: During follow-up, no clinical signs and symptoms were present. After the initial 6 months, no further bone loss and attachment loss were observed. The tooth remained functional and was aesthetically acceptable. Conclusions: When a tooth is avulsed, attachment damage and pulp necrosis occur. Viable periodontal ligament cells are often left on most of the root surface. If the periodontal ligament that is left attached to the root surface does not dry out,