

## SECOND GENERATION PLATELET CONCENTRATE (PLATELET-RICH FIBRIN) IN ITS APPLICATION IN ORAL SURGERY

**Biljana Evrosimovska<sup>1\*</sup>, Daniela Veleska-Stevkovska<sup>2</sup>, Cena Dimova<sup>3</sup>, Zaklina Menceva<sup>1</sup>**

<sup>1</sup>Department of Oral surgery and Implantology, University Dental Clinical Centre St. Pantelejmon, Mother Tereza 17, 1000 Skopje, Macedonia

<sup>2</sup>Faculty of Dentistry, University Ss. Cyril and Methodius, Mother Tereza 17, 1000 Skopje, Macedonia

<sup>3</sup>Faculty of Medical Sciences, Dental medicine, University Goce Delcev, Krste Misirkov 10-a, 2000 Stip, Macedonia

\*e-mail:bevrosimovska@gmail.com

### Abstract

The development of bioactive surgical additives, which are being used to regulate the inflammation and increase the speed of healing process, is one of the great challenges in oral surgery. Platelet-rich fibrin (PRF) is a second-generation platelet concentrate who was defined as an autologous leukocyte and PRF biomaterial, in which, platelets and leukocytes are collected with high efficiency such that the growth factors will be able to release gradually during at least 1 week. The biologic effect of this fibrin matrix is: angiogenesis, immune control, harnessing the circulating stem cells, and wound protection by epithelial cover. The following article attempts to summarize our clinical cases regarding the technique of using PRF, focusing on its preparation, advantages of using it in oral surgery.

Three cases with different clinical diagnoses were taken for this study in order to show the possible ways of application of PRF in the surgical field. In the first case, it is a 53 year-old female patient who has been diagnosed with osteonecrosis of the alveolar ridge during the examination in the projection of the first lower right molar. In the second case, PRF application was administered to a 41 year-old female patient diagnosed with radicular cyst on the upper left second incisor. The third case involved a 47 year-old male patient with diagnosed gangrenous roots in the upper right first and second premolars and the second molar in which the PRF application was intended to achieve alveolar bridge augmentation. PRF was prepared with blood drawn from individuals using technique due to PRF protocol. Both types of PRF (I and A-PRF) were applied independently in the first case, and in the second and third cases a bone graft was placed together with PRF.

The soft and bone tissue management in all our cases show process of neovascularization through the PRF clot and the epithelial covering development. In spite of the infectious and inflammatory statement of such sockets, rapid healing of the wound was observed without pain, dryness, or purulent complications. The results of the observed cases showed that biologic effect of PRF was revealed through achieved angiogenesis, immune control, harnessing the circulating stem cells, and wound protection by epithelial cover.

PRF alone or in combination with other biomaterials seems to have several advantages and indications in oral surgery, due it is a minimally invasive technique with low risks and satisfactory results.

**Key words:** *Platelet-rich fibrin, Blood platelet, Bone regeneration, Soft tissue regeneration.*