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## Revolutionizing Dental Implants: The Game-Changing Impact of Concentrated Growth Factors

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**Abstract:** Concentrated growth factors (CGF) is an autologous blood-derived biomaterial, the latest generation of platelet derivatives, produced by centrifugation of the whole blood sample. Many studies reported the ability of CGF to induce osteogenic differentiation, indeed it contains growth factors, platelets, white blood cells and stem cells that play an important role in the processes of tissue regeneration and differentiation [1, 2]. During the last decades the need of implant services in edentulous patients has dramatically increased. This study evaluates the effects of CGF on enhancing the osseointegration of dental implants. Using a Round up device, in fact, dental implants were permeated with CGF, resulting in a complex internal structure capable of releasing growth factors (VEGF, TGF- $\beta$ 1, and BMP-2) and matrix metalloproteinases (MMP-2 and MMP-9) over time, which were quantified using ELISA assays. The CGF-permeated implants promoted the osteogenic differentiation of human bone marrow stem cells (hBMSC), evidenced by matrix mineralization and the expression of osteogenic differentiation markers. Additionally, CGF provided a biocompatible and biologically active surface that significantly improved endothelial cell adhesion on CGF-coated implants compared to traditional ones. Finally, surgical intervention data showed that CGF-permeated implants achieved better osseointegration and reduced post-surgical complications. These findings suggest promising new applications of CGF in dental implantology to enhance osseointegration and support the healing process [3].

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