INTRODUCTION: PREPARATION OF FIBRIN RICH BLOCKS WITH CGFs

In our case report, concentrated growth factors (CGFs) mixed with bovine spongious bone substitute and autologous fibrin rich blocks, have been used after the extraction of a fractured single root end to ensure the dimensions of the postextractive socket, facilitate new bone formation, reduce healing time. CGFs is a stimulating multifactorial system, different from all other regenerative materials, because all phases and component can be used depending on the specific needs. It is made of a fibrin matrix with a complex tridimensional architecture which makes it a real plastele. Leukocytes and growth factors rich biomaterial. It is prepared according to Sacco's protocol who developed the technique in 2006. 20 to 60 mL of blood is taken from the patient's forearm, divided into 2/8 glass-coated test tubes without anticoagulants, and centrifugated at 2400-2700 using a specific centrifuge with a rotor turning at alternating and controlled speed for 12 minutes. At the end of the process 6-8 pieces of fibrin-rich blocks are obtained characterized by 4 phases: the uppermost platelet poor plasma (PPP) layer (serum); the middle fibrin buffy coat layer; the third liquid layer, containing white stem cells and concentrated growth factors (CGF); the lowest platelet rich coagulation (RBC) layer. Serum can be separated right after centrifugation and used to amalgamate graft materials. Red clot is separated from fibrin gel before the use; it can be used alone or in combination with particulate fibrin coat and autologous or heterologous bone grafts. Fibrin buffy coat is a dense polymerized fibrin network; it contains platelets, leukocytes, growth factors and provides a matrix for fibroblasts and endothelial cells involved in angiogenesis and tissue remodeling. In particular, platelets are important since they release high concentrations of biologically active proteins (PDGF-BB, TGFβ1, IGF-1 and IGF-2) and support recruitment, growth and cell morphogenesis. Fibrin gel blocks can be used as fillers or membrane or fragmented and mixed with other graft materials. We use fibrin buffy coats and blood clots cut into small pieces and mixed with particulate bovine bone. The whole is mechanically homogenized into the Round Up device for about 5 second. The mix results in a dense and adhesive autologous graft, easily to wedge into the postextractive alveolus, capable of release growth factors (e.g. TGFβ1, PDGF, VEGF) slowly, stimulate cell proliferation, matrix remodeling and angiogenesis, during healing process. The remaining fibrin blocks are pressed down with special pliers to obtain membrane, used to cover CGFs/ bone graft, previously inserted into the postextractive alveolus.

CASE PRESENTATION: SURGICAL AND PROSTHETIC PROPERTIES

This is a report of a 28 years old woman presented to our observation with a traumatic fracture of the 11 and the 21. A full thickness crestal flap was elevated a mucoperiosteal flap, extended from the 13 to the 21, without any vertical releasing incision. Root extraction was performed using piezoelectric device in order to minimize surgical trauma. Bone substitute mixed with CGF was grafted into the post-extractive alveolus and the whole is covered with fibrin membrane.

RESULTS

Neither side effect or adverse reactions were reported. The surgical sites healed uneventfully. New bone formation is revealed, after 4 months, from histologic results; Masson's Trichrome stain highlights active osteoblasts and graft material particles included into newly formed bone. This technique provides for an high increase of regenerative capacity of hard and soft tissues, indeed, wound healing period was practically halved.

CONCLUSION

This socket preservation technique, together with CGF's use, allows to prevent the normal bone resorption after tooth extraction. In particular, CGF was reported to have a good regenerative capacity and an high versatility on sinus and alveolar ridge augmentation, used as interesting clinical option to optimize the healing of hard and soft tissue. In our case report CGF has been used successfully in association with bone substitute, taking advantage of its bovine spongious bone substitute osteoconductive property matched with CGF's regenerative potential.

REFERENCES