Use of R.T.R. and PRF as filling material in post extraction sockets

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Introduction

Currently, the great majority of the extractions are followed by the immediate use of an implant. In some cases the bone volume is not enough to get the desired primary stability, in that case the clinician will need a first surgery where he would win the bone volume required for that implant, and then a second surgery for the final placement of the implant1. To obtain the best results possible, the use of a material that guides the bone regeneration is necessary and β-tricalcium phosphate has proven a great efficacy in helping and maintaining the space for the bone regeneration2. In addition to this, the use of platelet rich fibrin (PRF), a second generation platelet concentrate, that acts as a bioscaffold and has multiple growth factors, can accelerate the process of regeneration3. The characteristics of R.T.R. are its porosity, that helps in the formation of stronger clots, no systemic toxicity and its resorbability that promotes new bone formation in 3 - 6 months. In synergy with this, PRF thanks to its growth factors promotes the new bone formation and, as an optimized clot, helps to get a faster regeneration of the extraction socket and to have a more predictable outcome4, 5.

Case report

A 59 year-old woman, systemically healthy and under periodontal treatment, requires the extraction of the left central incisor (2.1) and left lateral incisor (2.2) to be rehabilitated with osseointegrated implants in a second surgery after the alveolar preservation surgery. The lateral incisor presents a radiolucent lesion around the root and no presence of vestibular wall in 2.1. The surgery was explained to the patient with the risks and benefits and an informed consent was signed. Local anesthesia was administered to the patient. The teeth were extracted with a forceps taking care to preserve the alveolar walls. After the extraction, a full mucoperiostal flap was elevated which allowed to confirm the great loss of alveolar bone.
Two blood tubes of 9 ml without anticoagulant were obtained from the patient’s ante cubital vein for the production of the PRF. The PRF was produced following Choukroun protocol (3000 rpm by 10 min) and then compressed into two membranes. The exudate of the compression was collected with a syringe to be applied over the bone graft. One of them was cut and mixed with R.T.R. fragments to be used as the bone graft and the other one was used as a membrane.

R.T.R. was fragmented to get a better adaptation to the defects, and once mixed with the PRF membrane, it was placed in the defects. When the graft was ready the exudate was then applied to it. When suturing, the membrane was applied with a pocket technique to ensure its intimate contact with the bone graft. The flap was closed with simple stitches and in first intention.
The use of platelet concentrates has become popular during the last 10 years, but among them, one of the simplest and cheapest forms has raised as one of the best options, the PRF. As a cheap and free access platelet concentrate, its homogenous bibliography supports its good results as an adjuvant in multiple surgeries like sinus lifts, intrabony defect fillings and of course bone grafting\(^6\)\(^-\)\(^7\). Although PRF acts as a bioscaffold, it lacks a good resistance and resorbs in around 28 days, thus the use of a material that sustains bone regeneration is necessary, and that material is R.T.R.

Beta-Tricalcium Phosphate has a proven biocompatibility, osteoconductivity and resorbability. As it resorbs, R.T.R. releases calcium and phosphate ions which help in the neo formation of the bone\(^11\). The combination of two materials with not known local or systemic toxicity and that synergize in the formation of bone should reduce the time needed to place the implants. The bone graft that best suits the PRF characteristics still needs further and deep study, but R.T.R. seems to perfectly fit all the characteristics to maximize the bone regeneration.
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References


