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Immediate implantation and peri-implant Natural Bone Regeneration (NBR) in the severely resorbed posterior mandible using Leukocyte- and Platelet-Rich Fibrin (L-PRF): a 4-year follow-up

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ABSTRACT

When following a tooth extraction the residual alveolar ridges and the residual bone height above the inferior alveolar nerve area are not suitable to receive implants, it is necessary to adopt a bone regeneration approach, even if in the posterior mandible this approach is subjected to some limitations due to the low vascularization and the mechanical constraints during mastication function in this area. To overcome these problems, the Authors developed a new form of Guided Bone Regeneration, named Screw-Guided Bone Regeneration (S-GBR). This approach is based on the use of a dental implant as a space maintainer and as a regeneration pillar to reinforce, protect and guide the bone compartment, and of an adequate combination of bone substitute and Leukocyte- and Platelet-Rich Fibrin (L-PRF) membrane. This strategy of combining L-PRF with adequate materials is a form of in vivo tissue engineering and was termed Natural Bone Regeneration (NBR). In this article, the Authors describe the use of L-PRF and simultaneous implantation in a NBR strategy for the treatment of a severely resorbed posterior mandible. A 49 years old female patient needed a fixed implant-supported rehabilitation of her right posterior mandible. It was decided to perform a direct implantation with simultaneous peri-implant bone regeneration. Following the osteotomies preparation, three implants were inserted and the vestibular face of the alveolar ridge was then covered with a mix of L-PRF and collagenated equine bone material (OsteoBiol® *Gen-Os*®, Tecnoss®, Giaveno, Italy) in a 50/50 volume ratio. All the threads of the implants were largely covered with a significant quantity of material to regenerate a broad alveolar ridge around them. Three layers of L-PRF were finally added to cover the surgical site and maintain the bone material. Four years after the treatment, the rehabilitation appeared stable, functional and aesthetic. The radiographic follow-up did not show any significant peri-implant bone loss. The peri-implant tissues remained at the same level around the implant collars, and no dehiscence appeared.

CONCLUSIONS

The concept of the NBR strategy is to promote a complete remodeling of the bone materials and to regenerate in fine a natural bone volume and so the choice of the bone material to associate with the L-PRF is a fundamental element for this technique. Based on their experience, the Authors stated that *"the NBR functions in priority with collagenated bone materials, and the material used in this case is commonly employed in our NBR surgeries"*.

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