

Orthobiology and bone regeneration, from R&D to clinical performance

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There are numerous clinical indications for bone grafts. The ideal graft material should favor bone apposition and growth while simultaneously being degraded by body fluids and cells. Ultimately, the material should be replaced by mature physiological bone tissue within a healing period of weeks. Because autologous and allogenic bone grafts fulfill some of these requirements, clinicians in spite of intrinsic limitations routinely use these biological materials. In addition these bone grafts are not the best templates for the new technologies developed for Tissue Engineering and Delivery Scaffolds for osteoinductive bioactive factors. For these reasons during the last 10 years, researchers and clinicians have developed synthetic solutions to support the challenge of bone regeneration particularly for patient at risk (aging population, bone pathology, low trophic bone situation, revision surgical complications etc.). The present lecture will present the evolution from the "generic" CaP bioceramics, to "smart " bioceramics bone graft, and how these recent concepts of synthetic bone graft, (granules, blocks, putties) support Orthobiology research and development, and clinical applications both in Orthopedic and in maxillofacial indications. Several examples of recent clinical evidence will be presented.