FORTOSS® VITAL

Intelligent Biomaterials for Bone Growth

Bone augmentation materials play a vital role if producing optimum solution for the patient is the desired outcome. They are routinely used in post extraction ridge preservation (socket filling), enhancing ridge volume around implants as well as in sinus graft and indirect sinus lift procedures.

Autogenous bone, because it provides the components required for healing, is recognised as the gold standard. These basic components include osteoinductive growth factors, osteoconductive matrix and osteogenetic stem cells. Attempts using allograft and xenograft derived products have gone some way to bridging the gap between the amount of bone that can be harvested from a patient and that which is needed to give the desired outcome. However, the risk of immunologic rejection, potential disease transmission[1,2] and biologic inferiority when compared to autogenous bone are reported to be producing a movement in favour of synthetic materials[3].

Xenograft materials (often called "natural") may also contain some non-resorbable element and hence the "feel" of the de novo bone in the short term is generally harder than when either allograft or synthetic materials are used. This slow resorption rate however has been reported to have an impact on the quality of the newly formed bone and ultimately its clinical relevance[4]. Optimal augmentation materials should preferably be fully biodegradable: the material must be remodelled and integrated into the newly formed bone.

Because of the above concerns, high expectations have been placed on synthetic materials. Recent research has shown the osteogenic capacity of some synthetic calcium phosphate materials [5,6]. This benefit is often attributed to the multiporous nature of these materials[7] that allows quick vasularisation and cell attachment. A further development of synthetic materials is the introduction of a surface charge. This charge is known to harness key proteins (eg osteocalcin, osteopontin) necessary for osteoblast formation[6,8]. **This represents a major and important step in the development of synthetic bone augmentation materials. A material that has this attribute mimics the natural healing process and facilitates faster bone formation.**

This research is being pioneered by Biocomposites Ltd, Keele, UK and is a feature of **VITAL.**

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