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Use of Synthetic Bone Blocks as an Alternative to Autologous Bone Block Grafts

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In modern implantology, correct three-dimensional positioning of implants, as well as sufficient bone material are of great importance in order to reach satisfactory and predictable results. Resorption processes, traumatic tooth losses or chronic inflammatory processes such as chronic periodontal diseases, however, often result in severe reduction of bone material. If affected areas are intended to serve as implant beds, augmentation will often be required during the same or in a previous intervention. While autologous bone is still considered to be the gold standard, bone substitute materials have proven successful particularly in cases of rather small defects. Their use may decrease patient's morbidity, shorten treatment duration and reduce treatment costs. However, if the defect exceeds a certain size, autologous bone grafts will have to be used, usually in the form of blocks. Intraoral bone removal poses the problem of limited availability. Extraoral donor sites, however, require treatment under general anesthesia or under in-patient conditions, which is why patients frequently reject this type of surgery. In particular in cases of edentulism in the molar and premolar region, patients tend to prefer fixed dental prostheses, however, the problem of a significantly narrowed alveolar ridge often occurs in the molar area of the mandible.

The use of the NanoBone® | block (Artoss, Germany) constitutes a possible alternative to autologous bone blocks. The nanocrystalline material, that has already proven reliable in many trials in a particulate form, has been available on the market in the form of blocks for a short time. Preclinical trials using animal models have shown high rates of bone formation within a relatively short period of time. The following follow-up observation was initiated to find out whether the bone substitute material used in the form of blocks proves successful as a possible alternative to autologous bone.

The nanocrystalline blocks used constitute a possible alternative to autologous bone blocks. The block provides a sufficient primary stability to be used safely for augmentation. The clinical procedure, however, differs from the use of e.g. autologous blocks removed from the retromolar space. The special structure of the block provides for the complete osseointegration of the augmentation material and thus for a sufficient gain in volume for safe implantation