Currently dental implant treatment is predictable and number of patient demanding this treatment is increasing; however, enough bone is required at the place of implant installation. Although autologous bone transplant is gold standard for bone augmentation, inflammation of the donor site and the limitation of the harvestable bone are the problems. Bone substitutes of calcium phosphate materials are used and they are effective as scaffolds for bone regeneration. However, they are less effective than autologous bone because of the lack of signal molecules and cells for bone regeneration. As a bone substitute for implant installation site, material, which can exchange to bone, is ideal. However, the bone substitutes, which are available, are hydroxyapatite and beta-TCP and they are stable in the body for a long time without exchanging to bone. Thus, we are developing bone substitute, which stimulates bone formation and exchange to bone. Since statins, drugs for hypercholesterolemia, enhance BMP2 expression in osteoblasts, it is possible that local application of a statin promotes bone formation. We observed that local release of simvastatin, one of the statins, from the bone defects stimulated bone formation in rats, rabbits and dogs. Furthermore, we demonstrated that alpha-TCP smoothly exchanged to bone compared to other bone substitute, such as hydroxyapatite and beta-TCP. In addition, we confirmed that alpha-TCP was a superior carrier releasing simvastatin slowly and that the bone substitute, which consists of alpha-TCP and simvastatin, stimulated bone formation exchanging to bone in animal experiments. Based on these results, we started clinical study of this new bone substitute after the approval of Ethical Committee in Dental Hospital. The clinical outcome of this new bone substitute is excellent.

2. Publications in the year 2006

3. Abstracts in the year 2006
2) Samee M, Kuroda S, Kondo H, Kasugai S. An in vitro gene transfer to rabbit periosteal cells induced osteoblast differentiation whereas an ex vivo gene transfer failed ectopic bone formation in mice within 8 weeks, using human BMP-2 and VEGF. 53rd The Annual Meeting of Orthopaedic Research Society 2007.2.11-14 Convention Center, San Diego, USA


4) Oda M, Kondo H, Kuroda S, Kasugai S. α-TCP with BMP-2 gene and CaP induces ectopic bone formation. General Session (84th ) and Exhibition of International Association for Dental Research 2006.6.28-7.1. Brisbane, Australia

5) Iino G, Nishimura K, Sato D, Kasugai S, Omura K. Effects of PGE1 application on the rat incisal sockets. General Session (84th ) and Exhibition of International Association for Dental Research 2006.6.28-7.1. Brisbane, Australia


8) Maruo K, Sato D, Machida T, Kasugai S. Effects of simvastatin and alpha-tricalcium phosphate on alveolar ridge augmentation. General Session (84th ) and Exhibition of International Association for Dental Research 2006.6.28-7.1. Brisbane, Australia

9) Samee M, Kuroda S, Kondo H, Kasugai S. An in vitro gene transfer of BMP2 and VEGF to rabbit periosteal cells induce osteoblastic differentiation. 52nd The Annual Meeting of Orthopaedic Research Society, 2006.2.11-14, Convention Center, Chicago, Illinois, USA