

Injectable Porous Bioresorbable Composite Containing Fluvastatin for Bone Augmentation

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氏 名 : 周 天 任

論 文 名 : Injectable Porous Bioresorbable Composite Containing Fluvastatin for Bone Augmentation (注射可能なFluvastatin含有多孔性生体吸収性複合材料の骨増生への効果について)

区 分 : 甲

論 文 内 容 の 要 旨

The purpose of this study was to evaluate the effects of an injectable composite made up of calcium sulfate (CAS), fluvastatin (FS) and atelocollagen on bone augmentation in rats. Porous structures and the compressive strength of composites were evaluated. The cumulative release kinetics of FS were determined in vitro by a spectrophotometer. To observe bone regeneration in vivo, five different materials (normal saline; atelocollagen gel only; composite of CAS and atelocollagen; composite containing 0.5% FS; and composite containing 1.0% FS) were injected in extraction sockets and on the crania of rats. Micro-computed tomography (micro-CT) and histological evaluation were performed after 2, 4, and 8 weeks of healing time. The composites had high porosity (greater than 55%). FS kept a slow and stable release for >30 days. In vivo results demonstrated that, more new bone was formed in the FS groups compared with other groups, both bone mass and bone density had prominent increased in maxillae and crania. Resorption of the composite was also observed for cranial tissues. In conclusion, this composite can be applied percutaneously, without any incision. It has excellent properties with replaceability into bone and anabolic effects for bone formation, as well as a drug delivery system for bone formation.