

The Effect of Fluvastatin-loaded Poly (lactic-co-glycolic acid) (PLGA) Membrane on Guided Bone Regeneration

張, 浩淼

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氏 名 : 張 浩淼

論 文 名 : The Effect of Fluvastatin-loaded Poly (lactic-co-glycolic acid)
(PLGA) Membrane on Guided Bone Regeneration
(スタチン含有PLGA膜の骨形成に与える影響)

区 分 : 甲

論 文 内 容 の 要 旨

Background: Poly (lactic-co-glycolic acid) (PLGA) has excellent biodegradability, biocompatibility and flexibility, and is widely used as a medical engineering material such as guided bone regeneration (GBR) membrane. Statin is one of the most commonly prescribed cholesterol lowering drugs, which has been shown to promote bone formation in vivo. We fabricated PLGA-fluvastatin microspheres as a locally-injectable drug delivery system (DDS) and showed new bone formation and gingival soft tissue healing at extraction sites. **Purpose:** The purpose of this study was to evaluate the effects of statin-loaded PLGA membrane on bone regeneration at bone defects in rat calvaria and tibia, possibly utilized as a GBR membrane. **Materials and Methods:** PLGA or fluvastatin-loaded PLGA (FS + PLGA) membrane was prepared and mechanical properties were evaluated. Standardized bony defects were created in rat calvaria or right side of tibia, and covered with PLGA or FS + PLGA membrane. Then, bone regeneration was evaluated using image analysis based on histologic examination. **Results:** There were no statistically significant differences between the tensile strength of membrane with or without fluvastatin. At 4 and 8 weeks after the implantation of membrane, the FS +PLGA groups showed enhanced new bone formation around the edge of the defect than the PLGA groups in calvaria model. At 8 weeks in tibia model, the defect was filled with new bone in all groups. However, in FS + PLGA group, the regenerated bone was thicker and denser than other groups. **Conclusions:** These results suggest that the fluvastatin-loaded PLGA membrane prepared in this study would have a potential to use as a GBR membrane.