

Effect of a Single Injection of Benidipine- Impregnated Biodegradable Microcarriers on Bone and Gingival Healing at the Tooth Extraction Socket

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<https://hdl.handle.net/2324/2236139>

出版情報 : Kyushu University, 2018, 博士 (歯学) , 課程博士
バージョン :
権利関係 :

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論 文 名	Effect of a Single Injection of Benidipine-Impregnated Biodegradable Microcarriers on Bone and Gingival Healing at the Tooth Extraction Socket (ベニジピン含有マイクロスフィア単回投与が抜歯窩の骨および歯肉の治癒に及ぼす影響)		
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論 文 審 査 の 結 果 の 要 旨

A dihydropyridine-type calcium channel blocker, benidipine (BD), is extensively used in hypertension therapy, and has been reported to promote bone metabolism *in vitro*. We evaluated effects of sustained-release of BD-loaded poly (lactic-co-glycolic acid) (PLGA) microcarriers on the promotion of bone and gingival healing at an extraction socket *in vivo*. Additionally, effects of BD on osteoblasts, osteocytes, fibroblasts, and epithelial cells were evaluated *in vitro*. The maxillary first molars of rats were extracted. Next, PLGA microcarriers containing BD were directly injected into the gingivobuccal folds as a single dose. After the injection, bone and soft tissue healing was histologically evaluated. Effects of BD on proliferation, migration, and gene expression of gingival and bone cells were also examined *in vitro*. Following the tooth extraction, BD significantly augmented bone volume and density, as well as epithelial wound healing. *In vitro* studies revealed that BD promoted significant proliferation and migration of fibroblasts and epithelial cells. Real-time polymerase chain reaction revealed that BD up-regulated mRNA expression of Ahsg and Csf-2 in osteoblasts. Taken together, a single topical administration of BD-loaded PLGA microcarriers promoted bone and soft tissue healing at the extraction site of tooth. This study first reported the effects of BD on extraction socket healing.

The paper has already been published in *Advances in Wound Care*. Therefore, the present work could be recommended for a doctor of philosophy (Dental Science) in Kyushu University.