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[\[PDF \(528K\)\]](#) [\[References\]](#)**Bone formation in β -tricalcium phosphate-filled bone defects of the rat femur: Morphometric analysis and expression of bone related protein mRNA**Kiyoto SHIRATORI¹⁾, Kenichi MATSUZAKA²⁾, Yoshihiko KOIKE²⁾, Satoshi MURAKAMI²⁾, Masaki SHIMONO¹⁾ and Takashi INOUE²⁾

1) Department of Pathology, Oral Health Science Center, Tokyo Dental College

2) Department of Clinical Pathophysiology, Oral Health Science Center, Tokyo Dental College

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ABSTRACT

The purpose of the current study was to evaluate the bone formation when β -tricalcium phosphate (TCP) was implanted in bone defects of rat femurs. β -TCP granules were applied to defects created in the femurs of 65 male rats who were sacrificed 3, 7, 10, 14 or 30 days later. Bone tissues were embedded in paraffin, serial sections were cut and then stained with hematoxylin-eosin. Histomorphometric analyses were also conducted. Furthermore, total mRNAs were extracted, homogenized, and reverse transcribed, after which quantitative PCR assays were conducted with a LightCycler™ using the double stranded DNA dye Syber Green I with primers for either rat osteopontin or osteocalcin. Tissues in defects without β -TCP were used as controls. The amount of newly formed bone tissue in the β -TCP implanted group was significantly greater in both the side areas and the central area of defects than in the control group. Expressions of osteopontin and osteocalcin mRNAs of cells in the defects of the experimental group were up-regulated compared with the control group at all time periods. Taken together, these results prove that β -TCP is an appropriate material for osteoconduction and promotes bone formation in bone defects.

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