Clin Oral Implants Res. 2006 Oct;17(5):521-6.
# Oxidized, bioactive implants are rapidly and strongly integrated in bone. Part 1--experimental implants.
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Source
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Abstract
OBJECTIVES:
The study presented was designed to investigate the speed and the strength of osseointegration of oxidized implants at early healing times in comparison which machined, turned implants.
MATERIAL AND METHODS:
Screw-shaped titanium implants were prepared and divided into two groups: magnesium ion incorporated, oxidized implants (Mg implants, n=10) and machined, turned implants (controls, n=10). Mg implants were prepared using micro-arc oxidation methods. Surface oxide properties of implants such as surface chemistry, oxide thickness, morphology/pore characteristics, crystal structures and roughness were characterized with various surface analytic techniques.

Implants were inserted into the tibiae of ten New Zealand white rabbits. After a follow-up period of 3 and 6 weeks, removal torque (RTQ), osseointegration speed (DeltaRTQ/Deltahealing time) and integration strength of implants were measured. Bonding failure analysis of the bone-to-implant interface was performed.
RESULTS:
The speed the and strength of osseointegration of Mg implants were significantly more rapid and stronger than for turned implants at follow-up periods of 3 and 6 weeks. Bonding failure for Mg implants dominantly occurred within the bone tissue, whereas bonding failure for turned implants mainly occurred at the interface between implant and bone.
CONCLUSIONS:
Oxidized, bioactive implants are rapidly and strongly integrated in bone. The present results indicate that the rapid and strong integration of oxidized, bioactive Mg implants to bone may encompass immediate/early loading of clinical implants.