



Biologic responses of anodized titanium implants under different current voltage

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The oxide layer that covers titanium is very stable and seems to result in an excellent biocompatibility and successful osseointegration. The purpose of this study is to investigate the effect of high anodic oxidation voltage on the surface characteristics of titanium implants and biologic response on rabbit tibiae. Bone tissue responses were evaluated by removal torque test and histomorphometric analysis.

Screw shaped implants with microthreads (Warantec Co.) were made of commercially pure titanium(GradeII). We prepared anodized implant under 300V(groupI), 400V(groupII), 500V(groupIII) and 550V(groupIV).

The surface characteristics of specimens were inspected in 3 categories : surface morphology, surface roughness and the thickness of oxide layer.

Screw shaped implants were installed in rabbit tibiae and the removal torque values were measured and histomorphometric analysis was done after 1 and 3months healing period.

From this study, we concluded that

1. As anodic oxidation voltage increased above 300V, oxide layer thickness increased rapidly and pore size increased.
2. The Ra values of groupIII and IV samples were higher than that of groupI and II samples. (P<0.05)
3. In removal torque test, groupIII after 1month healing period showed higher values than groupI and II in statistically significant level. (P<0.05)
4. In histomorphometric analysis groupIII and IV showed more BIC of total implant surface than groupI and II after 3months healing period. (P<0.05)

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