

P-47

## EFFECT OF MULTILAYER COATING ON THE CORROSION RESISTANCE OF SINTERED STAINLESS STEELS

**Han-Cheol Choe, Yeong-Mu Ko**

Dept. of Dental Materials and Research Center of Nano-Interface Activation for Biomaterials, College of Dentistry, Chosun University, 501-825, Korea

In this study, in order to fabricate sintered dental implant, the effects of HA, Ti and TiN on corrosion and biocompatibility, cell toxicity, osseointegration of electroless Cu-plated and sintered stainless steel implant were investigated using various characteristics.

The effects of Ti/TiN/HA coating on the interface activation and surface characteristics of sintered stainless steels (SSS) by electron-beam physical vapor deposition (EB-PVD) method have been studied. Stainless steel compacts containing 2, 4, and 10 wt% Cu were prepared by electroless Cu-plating method which results in the increased homogenization in alloying powder. The specimens were coated with HA, Ti and TiN with few  $\mu\text{m}$  thickness respectively by EB-PVD method. The microstructures and phase analysis were conducted by using SEM. Biocompatibility were investigated in experimental dog. The corrosion behaviors were investigated using potentiostat in 0.9% NaCl solution and corrosion surface was observed using SEM and XPS.

Sintered stainless steel containing 4wt% Cu showed good mechanical strength and has a good porosity for dental implant materials. Also it showed a good cell growth without toxicity. The HA and Ti/TiN/HA coated films showed fine columnar structure and a good corrosion and pitting resistance. And Ti/TiN/HA coated SSS containing 10wt% Cu had good resistance to pitting corrosion due to the formation of dense film on the surface and the decrease of interconnected porosity by

electroless coated Cu. Especially, The HA and Ti/TiN/HA coated 4wt%Cu SSS showed a same corrosion and pitting resistance.