Silver Ion Doped Calcium Phosphate Based Ceramic Nano-Powder Coated implants Prevents Infection

Prof Dr Nusret Kose (Eskisehir Osmangazi University, Orthopedics and Traumatology)

The number of patients in need of orthopedic implants growing rapidly. Long-term survival and favorable outcome of orthopedic implant use are determined by bone-implant osseointegration and absence of infection neighbouring the implants. Among the various techniques, hydroxyapatite (HA) coatings are widely used to improve the biocompatibility of implants. Bacterial colonization is the primary clinical problem faced by the surgeon. One of the approaches to make biomaterial surfaces resistant to biofilm formation is to coat the surface with bactericidal/bacteriostatic substance. Infection-resistant materials are a relatively recent addition to the science of implant and device development. Leachable antimicrobial agents were utilized first as Infection-resistant materials. Nonleachable technologies are being developed. We developed silver ion doped calcium phosphate based ceramic nano-powder for implant coating to provide not only biocompatibility but also antibacterial activity to the orthopedic implants. By embedding nanoparticles of silver in bioceramic coatings for implants, the active surface area is maximized while keeping the total amount of silver low. So it is possible to tailor the antibacterial activity of the silver ions while remaining below the toxicity threshold for cells.

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