Skin implant

Implant-associated soft tissue infections at the skin-implant interface represent the most frequent complications in reconstructive surgery and lead to implant failures and revisions. Titanium implants with deep porosity, called skin-and-bone-integrated-pylons (SBIP), allow for skin ingrowth in the morphologically natural direction, thus restoring a reliable dermal barrier and reducing the risk of infection. Silver coating of the SBIP implant surface using physical vapor deposition technique offers the possibility of preventing biofilm formation and exerting a direct antimicrobial effect during the wound-healing phase. In vivo studies employing pig and rabbit dorsum models for assessment of skin ingrowth into the pores of the pylon demonstrated the safety of transcutaneous implantation of the SBIP system. No postoperative complications were reported at the end of the follow-up period of 6 months. Histological analysis proved skin ingrowth in the minipig model without signs of silver toxicity. Analysis of silver release (using energy-dispersive X-ray spectroscopy) in the model of intramedullary-inserted silver-coated SBIP in New Zealand rabbits demonstrated trace amounts of silver after 3 months of in-bone implantation. In conclusion, selected temporary silver coating of the SBIP implant surface is powerful at preventing the periprosthetic infections without impairing skin ingrowth and can be considered for clinical application [1)].

1)
Shevtsov M, Gavrilov D, Yudintceva N, et al. Protecting the skin-implant interface with transcutaneous silver-coated skin-and-bone-integrated pylon in pig and rabbit dorsum models [published online ahead of print, 2020 Sep 16]. J Biomed Mater Res B Appl Biomater. 2020;10.1002/jbm.b.34725. doi:10.1002/jbm.b.34725