

Effects of Different Divalent Cation Hydrothermal Treatments of Titanium Implant Surfaces for Epithelial Tissue Sealing

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論 文 名 : Effects of Different Divalent Cation Hydrothermal Treatments
of Titanium Implant Surfaces for Epithelial Tissue Sealing
(異なる二価の陽イオンによる水熱処理がチタンイプラント周
囲の上皮封鎖性に与える影響)

区 分 : 甲

論 文 内 容 の 要 旨

The improvement of peri-implant epithelium (PIE) adhesion to titanium (Ti) may promote Ti dental implant stability. This study aims to investigate whether there is a positive effect of Ti hydrothermally treated (HT) with calcium chloride (CaCl_2), zinc chloride (ZnCl_2) and strontium chloride (SrCl_2) on promoting PIE sealing. We analyzed the response of a rat oral epithelial cell (OEC) culture and performed an in vivo study that maxillary right first molars of rats were extracted and replaced with calcium (Ca) -HT, zinc (Zn) -HT, strontium (Sr) -HT, or non-treated (Cont) implants. The OEC adhesion on Ca-HT and Zn-HT Ti plates had higher expression of adhesion proteins than cells on Cont and Sr-HT. And the implant-PIE of the Ca-HT and Zn-HT groups revealed better expression of immunoreactive laminin-332 (Ln-322) at 2 weeks after implantation. The Ca-HT and Zn-HT groups also showed better attachment at the implant-PIE interface, which inhibited horseradish peroxidase penetration. These results demonstrated that the divalent cations of Ca (Ca^{2+}) and Zn (Zn^{2+}) -HT improve the integration of epithelium around the implant, which may facilitate the creation of a soft barrier around the implant to protect from foreign body penetration.