有無經過電化學處理對於鈦迷你植體骨整合之影響之動物實驗

Animal Study of Osseointegration on Titanium-based Mini-implants with and without Electrochemical Treatments

中文摘要

鈦基金屬及其合金於人體的生物相容性(biocompatibility)有極高的評價，非常適合做爲人體的植入物，其原因主要是與鈦金屬表面的氧化層有關。植體表面氧化層厚度與孔徑大小對於細胞初始的攀附行爲、增殖及分化有密切的關係。若能有效增加氧化層厚度與降低植體表面孔徑尺寸將對骨整合會有所助益。因此，本研究以電化學陰極處理方式使迷你植體表層形成一層氫化鈦(TiH2)薄膜，再以電化學陽極處理，使表面形成一層網狀奈米多孔性的二氧化鈦(TiO2)結構，以物理及化學性的分析儀器測試迷你植體表面之成分、元素、膜厚、孔洞大小及結構後，再進行動物試驗，就型態上以 OM、SEM 等觀察迷你植體經表面處理後在動物體內骨整合的現象。

英文摘要

Titanium-based alloys with excellent biocompatibility have been investigated by many researchers. It is due to its passive oxide film. The surface characteristics of titanium implant, such as pore sizes, roughness, or oxide thickness are related to initial cell behaviors and osseointegration. It seems to be helpful to osseointegration if it can effectively keep the oxidation in nanoporous and increase oxide thickness. Based on this, mechanism of bone healing on nanoporous implant surface and interaction were discussed clearly. The present electrochemical process was performed as surface treatment of titanium-based implant. Titanium hydride (TiH2) was formed on titanium implant surface after cathodic treatment. Nanoporous titanium oxide structure was formed by anodic surface treatment. Furthermore, animal study was done to evaluate the influence with or without treatment