

以動物實驗評估經陽極表面處理微型骨釘之癒合效果與穩

固度

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Abstract

The porous oxide surface characteristics of titanium (Ti) alloy can be improved by the technology of anodization which benefits cell adhesion and tissue growth. It also accelerates the quality and quantity of bone growth that in turn, helps to shorten the period of bone healing. The purpose of this study was to evaluate the effects of anodized mini-screws on stability in vivo. The chosen sizes of the mini-screws were 1.3 and 1.5mm. We used 12 screws each on 3 male beagles. We selected edentulous areas for implantation, and the times of healing before applying a force were 0, 2, and 6 weeks, respectively. Then we connected nickel/titanium (NiTi) coil springs to the mini-screws in the same group, and the magnitude of the applied force was controlled to 200g. A histological analysis was carried out to measure the area of the bone-implant contact (BIC). The results showed that the success rates were 87.5% (10/12) for the 1.3-mm mini-screw and 100% (12/12) for the 1.5-mm one. The extents of the BIC of the former group were 37.57% (for a healing time of 0 week), 78.52% (for a healing time of 2 weeks), and 47.73% (for a healing time of 6 weeks). Values for the 1.5-mm mini-screws were 49.33%, 59.08%, and 46.86%, respectively. These were all higher than values reported in previous studies. In a future development, we hope to be able to combine this technology of anodization to shorten the length of mini-screws for clinical use in order to improve their safety and stability.