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Bacterial Growth on Titanium vs Zirconia Healing Caps: An In Vitro Study

Purpose: To evaluate and compare bacterial growth on zirconia vs titanium healing caps. ***Materials and Methods:*** Streptococcus sanguinis (Ss) and *Ftreptococcus nucleatum* (Fn) were grown on titanium and zirconia healing caps that were fixed to the cover of a 96-well microtiter plate. A drop (10 µL) of bacterial suspension was placed on each healing cap and allowed to dry for 1 hour at 37°C. After this time, the cover was replaced on the plate such that the caps were completely immersed in fresh liquid medium. Each plate contained only one bacterial strain, with two control groups. Bacterial growth was monitored over 18 hours by following the optical density (OD) at 650 nm. One-way ANOVA comparison test was used for statistical analysis. Scanning electron microscope (SEM) images of healing caps of each material were taken after 48 hours of incubation with Ss or Fn to assess bacterial attachment and with no bacteria as a negative control. ***Results:*** Ss growth was similar in both types of healing cap, with no significant differences between these groups and the control ($P = .990$). However, there was significantly less growth of Fn on the zirconia caps than on the titanium samples ($P < .0001$) or the control ($P < .0001$). SEM imaging revealed obvious differences in the surface characteristics of the titanium and zirconia caps. The number of bacteria attached to the rough apical area was particularly high. ***Conclusions:*** The use of zirconia healing caps may reduce the growth of some bacterial species compared to that seen on titanium healing caps.

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