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Mohammad Khodaei, Hossein Saleh Kelishadi



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The effect of different oxidizing ions on hydrogen peroxide treatment of titanium dental implant

Mohammad Khodaei^{*1}, Hossein Saleh Kelishadi²

¹ Dental Research Center, School of Dentistry, Isfahan University of Medical Sciences, Isfahan, Iran.

² Center for Advanced Engineering Research, Majlesi Branch, Islamic Azad University, Isfahan, Iran.

* Corresponding author:

E-mail: m.khodaei@ma.iut.ac.ir; khodai1358@gmail.com (Mohammad Khodaei) Tel.: +98 9131088076.

Abstract

The major disadvantage of titanium dental implants is their bio-inertness, which could be alleviated using surface treatment techniques. Oxidation using hydrogen peroxide (H_2O_2) was used for surface treatment of titanium dental implants in this study. The effect of some oxidizing ions such as Cl and F in addition to post-heat treatment were investigated using X-ray diffractometry (XRD), Raman spectroscopy, Field Emission-Scanning Electron Microscopy (FESEM) and wettability assessment. The results of the study indicated that the different ions did not change phases on the surface of titanium implants however, they affected the morphology, thickness and wettability of treated titanium implants surface. The maximum thickness of anatase including macro cracks was formed on the surface of H_2O_2 treated titanium while maximum wettability was obtained on the surface of $H_2O_2 + Cl$ treated titanium implant, and fluoride ion inhibit anatase formation on the surface of H_2O_2 treated titanium implant.

Keywords: Titanium surface treatment; Hydrogen peroxide; Anatase.

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