Effect of Remineralization Treatment on Enamel Bleaching

IWAYA Izumi, MUKAI Yoshiharu and TERANAKA Toshio

Division of Restorative Dentistry, Department of Oral Medicine, Kanagawa Dental College

Abstract: The aim of this study was to evaluate the effect of artificial saliva during enamel bleaching for 12 weeks in vitro.

Cut bovine incisors were classified into six groups. In Group C, enamel specimens were immersed in artificial saliva (pH 6.5) for 12 weeks as a control. In Groups Hw and Hr, the enamel specimens were bleached with HiLite (containing 35% hydrogen peroxide) once a week for 12 weeks. In the Group Hw, the specimens were kept in deionized water along with being subjected to bleaching. On the other hand, in Group Hr, the artificial saliva was used for keeping them. An acid resistance test was performed in Groups CD, HwD, and HrD following a 6 week treatment period.

Compared with Group C, slight demineralization with 60 vol% mineral was detected in Group Hw. The integrated mineral loss (IML) was significantly higher than that in Group C. Also, the nano-hardness value of the surface was decreased. On the other hand, the mineral profile of Group Hr was similar to that of Group C, and no subsurface lesions were detected. Furthermore, the nano-hardness of the surface did not decrease. The acid-resistance tests showed lesions in the CD, HwD, and HrD groups; there were no significant differences between the groups.

Raman spectra from the surface of Group Hr showed that the bleached surfaces had a more intense phosphate peak than those of non-bleached surfaces. A difference was not recognized at other depths in the cross-cut sections. From the results of this study of long-term bleaching for 12 weeks, we can conclude that saliva in the oral cavity replenishes mineral elements on bleached surfaces.

Key words: Bleaching, Remineralization, Phosphate group