1920 A New Enamel Restoring Agent for Use after PMTC

M. NISHIO[1], H. KAWMATA[1], K. FUJITA[1], T. ISHIZAKI[1], R. HAYMAN[1], and T. IKEMI[2]
1 Sangi Co., Ltd, Tokyo, Japan, 2 Nihon University at Matsudo, Japan

Objective: Professional mechanical tooth cleaning (PMTC), which uses abrasives to remove biofilms and other surface deposits, also causes microscopic damage to tooth enamel. This can lead to early return of plaque, and in fact increase the risk of caries and periodontal disease. We developed and tested an agent designed to restore tooth enamel to its original state after PMTC treatment. Method: Extracted human anterior teeth without previous restorative treatment, caries or white-spot lesions were polished with a commonly used PMTC abrasive agent. The teeth were then polished with a hydroxyapatite-based agent designed to restore the enamel surface (PRTC Super Fine, SANGI). The enamel surface was observed before PMTC, after PMTC, and after post-PMTC polishing with the enamel restoring agent, using a scanning probe microscope (SPM) (SPI4000, Seiko Instruments) and a scanning electron microscope (SEM) (S-4500, HITACHI). SPM observation allowed both qualitative (three dimensional) and quantitative (computed) evaluation of the enamel surface at each stage of processing. Result: SPM observation showed some coarseness in the enamel surface prior to PMTC treatment, believed to result from toothbrushing and other normal abrasion. The enamel surface after PMTC treatment was much coarser, both qualitatively and quantitatively, indicating that further damage to the surface enamel had occurred. After post-PMTC polishing with the enamel restoring agent, the enamel surface closely resembled that prior to PMTC treatment, suggesting that restoration of the enamel had occurred. SEM observation confirmed that the enamel surface was rougher after PMTC treatment than before, and that after post-PMTC treatment with the new enamel restoring agent, it closely resembled the original enamel surface. Conclusion: The hydroxyapatite-based agent tested effectively restores post-PMTC tooth enamel to its near-original state. We called this new agent PRTC (‘Professional Re-enamel Tooth Cleaning') Super Fine, to distinguish it from traditional PMTC polishing agents.