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Adhesion of Streptococcus mutans NCTC 10449 to artificial teeth: an in vitro study.

Hahnel S, **Rosentritt M**, **Bürgers R**, **Handel G**.

Department of Prosthetic Dentistry, Regensburg University Medical Center, Regensburg, Germany. sebastian.hahnel@klinik.uni-regensburg.de

STATEMENT OF PROBLEM: Plaque on dentures may foster the occurrence of denture stomatitis and periodontal diseases in gingival tissues adjacent to partial dentures. Thus, it is beneficial for dental materials to have a low susceptibility to plaque adhesion. PURPOSE: The purpose of this study was to evaluate the susceptibility of commonly used artificial teeth to adhesion of the oral bacterium Streptococcus mutans. MATERIAL AND METHODS: Fifteen specimens each of 12 different artificial teeth were prepared by cutting standardized slabs from the buccal tooth surfaces. After normalizing size (round specimens, diameter of 5 mm, 2 mm thick), polishing (grinding paper, grain 1000 and 4000; universal polishing paste), and assessing surface roughness with a profilometric contact surface measurement device, specimens were incubated with Streptococcus mutans NCTC 10449 suspension for 2.5 hours at 37 degrees C. A veneering composite resin (Sinfony) was used as a control. Adherent bacteria were quantified using a fluorometric assay (Resazurin reduction); relative fluorescence intensity correlates linearly with the number of adherent bacteria. Medians and 25%/75% percentiles were calculated, and statistical analysis was performed using the Kruskal-Wallis test and the Bonferroni-adjusted Mann-Whitney U test. RESULTS: The highest values, indicating high adhesion of streptococci, were observed for filler-supplemented teeth with median relative fluorescence values ranging from 6356 to 18,770. Similar values were recorded for a double cross-linked resin tooth (6444). Significantly lowest values, ranging from 1173 to 3974, were found for unfilled PMMA acrylic resin teeth and acrylic resin teeth with an interpenetrating network (1436). CONCLUSIONS: Within the limitations of this study, it can be concluded that the adhesion of Streptococcus mutans to unfilled PMMA teeth and teeth with an interpenetrating network is lower than adhesion to artificial teeth supplemented with fillers or double cross-linked acrylic resin teeth.

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