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Research paper

Effect of fluid resins on the surface roughness and topography of resin composite restorations analyzed by atomic force microscope

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ABSTRACT

The aim of the study was to verify the influence of surface sealants on the surface roughness of resin composite restorations before and after mechanical toothbrushing, and evaluate the superficial topography using atomic force microscope. Five surface sealers were used: Single Bond, Opti Bond Solo Plus, Fortify, Fortify Plus and control, without any sealer agent. The lowest values of surface roughness were obtained for control, Single Bond and Fortify groups before toothbrushing. Fortify and Fortify Plus were the sealer agents that support the abrasive action caused by the toothbrushing although Fortify Plus group remained with high values of surface roughness. The application of specific surface sealants could be a useful clinical procedure to maintain the quality of resin-based composite restorations.

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1. Introduction

Resistance to degradation in the oral environment is one of the main factors that determines the clinical longevity of the restorative material, including resin-based composites (Heath and Wilson, 1976). Wear may be defined as the ultimate consequence of the interaction between surfaces

that is manifested by the gradual removal of material (Mair et al., 1996). The wear mechanisms of dental materials in the mouth are complex due to variable movements and loadings that can occur and the hostile biological and chemical environment (Reid et al., 1990). The superficial topography of hybrid composites can be altered by the toothbrushing process, although the main problem is the surface roughness

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