

PROTOCOLOS DE INVESTIGACIÓN - ODONTOLOGÍA

ANALYSIS OF THE ABRASIVE EFFECT OF STANNOUS FLUORIDE TOOTHPASTES ON COMPOSITE RESINS: AN IN VITRO STUDY USING THE SPECKLE TECHNIQUE

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Direct composite resins are widely used in aesthetic restorations due to their good adhesion, satisfactory appearance, and minimally invasive approach. However, their clinical longevity may be compromised by the abrasiveness of toothpastes used in daily brushing, which can cause loss of gloss, increased roughness, and wear of the restored surface. This in vitro study aims to evaluate the abrasive effect of stannous fluoride toothpastes with different levels of abrasivity (low, medium, and high – according to the RDA index) on direct veneers made with nanoparticulate composite resin (Filtek Z350 XT). The samples will undergo simulated mechanical brushing equivalent to two years of use and will be divided into four groups: four experimental groups with the

toothpastes Sensodyne Sensibilidade e Gengivas (RDA ~80), Colgate Total Fresh Mint (RDA ~70), Colgate Periogard (RDA ~90), and Oral B Detox (RDA ~100); a positive control group with Edel White Care Forte (RDA ~60); and a negative control group with water brushing. A total of 20,000 brush strokes will be performed using standard brushes in an automated brushing machine, following ISO 11609 standards. Analyses will include optical profilometry and speckle pattern imaging. Literature review shows that, although there are already studies on the wear of restorative materials, there are still gaps regarding the direct impact of the abrasivity of stannous fluoride toothpastes on composite resin veneers. Furthermore, few studies apply innovative techniques such as laser speckle. It is expected that high-RDA toothpastes will promote greater surface wear, while low-abrasivity ones will cause less impact. The speckle technique is expected to be effective in detecting microscopic changes, contributing to methodological validation. The results aim to guide professionals and patients in choosing safer toothpastes, preserving the aesthetics and durability of composite resin restorations.

Palavras-chave: composite resin; stannous fluoride; toothpaste abrasivity; speckle image analysis.