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Influence of the addition of diphenyliodonium hexafluorophosphate salt on resin cement adhesiveness and mechanical properties

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The diphenyliodonium hexafluorophosphate salt (DFI) is used to improve the radicular polymerization photoinitiated by dimethacrylates comonomers. The influence of the DFI on the adhesion to the tooth substrate and the mechanical properties of the resin cement were evaluated. A Bis-GMA:TEGDMA based comonomer containing camphorquinone and ethyl 4-dimethylaminobenzoate (molar ratio 1:2) was modified by the incorporation of 0 (control), 0.5, 1 or 2 mol% of DFI. A mass of 60% of silanized glass particles was incorporated. Flexural resistance (FR) and elasticity modulus (EM) were evaluated by 3 points bench test. The bond strength between the cement and the radicular dentin were measured by push-out test (PO), glass fibers post were luting to the bovine roots, which were sectioned into 3 parts: cervical, median and apical region. The photoelastic stress analysis (PS) was made inserting the cement in a central orifice of 5mm∅ and 2mm thickness of a photoelastic plastic ring. The tests were realized after 24h of preparation. The data were submitted to ANOVA and Tukey's test at 5% of significance. Means for RF (MPa) were 94±11a (control), 95±16a (0,5%), 95±17a (1%) and 108±14a (2%). ME (GPa), 4.2±0.2c (control), 4.9±0.5bc (0,5%), 5.3±0.3ab (1%) and 5.4±0.2a (2%). PO (MPa) in the cervical region 158±74a (control), 79±42b (0,5%), 63±30b (1%) and 72±45b (2%). The median and apical regions showed no differences between the cements, neither compared with the 0.5%, 1% and 2% cervical groups. PS (MPa) were 5.05±2.93a (control), 3.40±3.08ab (0,5%), 2.30±2.61b (1%) and 2.45±3.07b (2%). The use of cements with DFI is promising for luting endodontic posts.

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