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Free radical concentration analysis by Electron Paramagnetic Resonance in dual cure resin cement

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The capacity to conduct light of translucent glass fiber post (GFP) is cited by some author and the dental industries. For that reason the free radical concentration (FRC) formed during GFP cementation, using dual cure resin cement (DCRC), as well as the influence of the anatomical shape of the GFP (conical or cylindrical), were analyzed by Electron Paramagnetic Resonance (EPR) spectrum. The first stage consisted of 3 groups, according to the GFP cementation method in a silicone matrix: G1- DCRC light cured for 40 seconds, with light emitting diode (LED), with intensity of 1.500mW/cm^2 , leaning against the outer surface of the post; G2 - DCRC without light activation; G3- treatment similar to G1, but blocking the post/matrix interface. In the second stage, GFP were sectioned to obtain two sections: GA- cylindrical section and GB- conical section, 10mm in length each, cemented similarly to G1. The FRC was evaluated in: T0-10 minutes after cement's spatulation e T1-24 hours after, in sections obtained from different GFP depths. The resonance spectrum analysis indicated that G1 e G3 had a greater FRC. Post translucency did not influenced the FRC at depths greater than 12mm. Cylindrical posts presented greater FRC as well as samples closer to the light source. For that reason we can conclude that the FRC is influenced by the polymerization method, as well as the GFP anatomical shape; GFP capacity to conduct light does not interferes in the degree of conversion on DCRC in regions of greater depth.

Keywords: Electron Spin Resonance Spectroscopy; Post and Core Technique; Free Radicals.

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