Original Article

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Effects of surface coating agents on surface microhardness of bis-acryl provisional materials

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Objective: To compare surface microhardness of bis-acryl provisional materials after applied various types of surface coating agents using Vickers hardness tester.

Materials and Methods: Forty bis-acryl specimens were prepared, polished and randomly divided into 8 groups, with n=5, 1) Protemp™4 without surface coating, 2) Protemp™4 coated with Palaseal®, 3) Protemp™4 coated with EQUIA Forte® coat, 4) Protemp™4 coated with Optibond™ FL, 5) LuxaTemp® without surface coating, 6) LuxaTemp® coated with Palaseal®, 7) LuxaTemp® coated with EQUIA Forte® coat, 8) LuxaTemp® coated with Optibond™ FL. The specimens from each group were tested for surface microhardness by Vickers surface microhardness tester. Load used was 50 gf. for 15 seconds. The indentations were evaluated and measured with stereomicroscope at 50x. The measurements were converted into HV (Vickers hardness number) and analyzed with two-way ANOVA.

Results: The mean surface microhardness values of LuxaTemp® group were statistically higher than Protemp™4 group. The mean surface microhardness values of LuxaTemp® group were statistically decreased after application of Palaseal® and Optibond™ FL. There were no statistically significant difference between the surface microhardness values of LuxaTemp® coated with EQUIA Forte® coat and LuxaTemp® control group. However, it was statistically different from the surface microhardness of the other groups.

Conclusion: Three coating agents applied on Protemp™4 have no effects on its surface microhardness. On the other hand, surface microhardness of coated LuxaTemp® group showed statistically significant decrease, except for EQUIA Forte® coating group which was not statistically significant different from control group. (P<0.05)

Keywords: bis-acryl provisional materials, Microhardness, surface coating agent, surface hardness

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Introduction

Bis-acryl resin composite is the material for temporization that was introduced in 1990s to overcome the negatives of polymethyl methacrylate (PMMA) in terms of mechanical properties, physical properties and application methods[1]. Due to the structure of bis-acryl monomer, it provides crosslinking with another monomer chain that causes high mechanical properties[2,3] compared to the linear structure of polymethyl methacrylate (PMMA)[1,2,4,5]

In the clinical practice, because of the various color shades of bis-acryl resin composite, smoothness and less porous surface compared to methacrylate groups[6], bis-acryl resin composite is often used for esthetic reasons. After polishing, the surface can be coated with surface coating agents to improve its surface qualities by providing better color stability and surface smoothness[7,8] by reducing surface irregularities and fill out their micro-defects and micro-fissures without creating oxygen inhibited layer. Even in areas that are difficult to polish, such as interproximal areas of

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