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Surface roughness of direct and indirect resin composites: Effect of tooth brushing and soft drinks

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Background: Surface roughness of composite restorations in different storage media over time is a common problem in esthetic dentistry, causing the need to replace the restoration, and spending a great deal of cost and time to patients. The indirect techniques of dental resin composites reveal an increased important of the physical and mechanical properties of the restorations, including surface roughness.

Aim: The purpose of the current study was to evaluate the effect of tooth brushing and soft drinks on surface roughness of direct and indirect resin composites.

Materials & Methods: A total of 360 standard resin composite disc shape specimens (A3 shade) were constructed, using split teflon mold with diameter of 10 mm and thickness of 2 mm. The disc shape samples were constructed from three brand of resin composites namely: Group 1: Direct microfill resin composite (Helimolar from IvoclarVivadent), Group 2: Direct nanofill resin composite (Z350 XT from 3M) and Group 3: Indirect microfill resin composite (SR NEXCO from IvoclarVivadent) equally (n=120). For all the three groups, the specimens were caused for 20 seconds from each side through the glass slaps, then cured additional 20 seconds for each side after removal of the glass slaps by using light emitting diode curing unit LED (900 MW/cm²), then, for the indirect resin composite (Group 3), curing was performed using a special oven for 10 minutes. All the groups were divided into two subgroups, subgroup 1 with brushing by medium type electrical tooth brushing (oral-B) and subgroup 2 without brushing. Each subgroup was further subdivided into three divisions, immediate, after 4 weeks and after 8 weeks. The specimens were stored in three different storage media: Red bull, sprite and artificial saliva. The surface roughness tests by Talysurf instrument were carried out often for each storage period according to the study design.

Results: Regarding the surface roughness in microfill direct resin composite with brushing and non-brushing, there was in general a significant difference between the three types of storage media at fourth and eighth weeks. Regarding the surface roughness in microfill indirect resin composite with brushing and non-brushing, there was in general a significant difference between the three types of storage media at fourth and eighth weeks. Regarding the surface roughness in nanofill direct resin composite with brushing and non-brushing, there was in general a significant difference between the three types of storage media at fourth and eighth weeks.

Conclusions: With surface roughness increase and the roughness with time in all groups, there was significant difference between baseline and 4 weeks and between baseline and 8 weeks, there was no significant difference between 4 weeks and 8 weeks and there was no significant difference between brushing and non-brushing at indirect microfill resin composite.

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