Effect of polishing systems on surface loss of composite resins.

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Introduction:
Finishing of composite restorations provides benefits such as oral health, function, biocompatibility, mechanical properties and esthetics. However, some of these procedures might cause severe surface loss.

The objective of this study was to determine the surface loss of twelve composite resin composites polished with three different finishing systems: two based on silicon carbide-impregnated rubbers and other based on aluminum oxide flexible disks.

Materials and methods:
Objectives: The aim of this study was to determine the surface loss of twelve composite resins polished with three different finishing systems: one based on silicon carbide-impregnated rubber and two based on silicon-rubber and aluminum oxide. Methods: Fifteen samples, 15 x 2 cm, were prepared for each material as follows: G1: Filtek Z250® (3M/ESPE), G2: Tetric® Cem (Ivoclar-Vivadent), G4: Amelogen® (Ultradent), G5: EsthetXHD® (Dentsply Caulk), G6: Heliomolar® (Ivoclar-Vivadent), G7: Ultradent® (SDI), G8: Filtek Z100® (3M/ESPE), G9: Brilliant® (Coltène), G10: Tetric Nceram® (Ivoclar-Vivadent), G11: Premisa® (Kerr SDS), G12: Grandio® (VOCO). They were prepared using incremental technique and light curing each increment for 40 seconds (Curing Light XL300® (3M) at 550 mW/cm²). Each group was randomly divided into three subgroups of 5 samples depending on the finishing system: J: Jiffy (Ultradent), S: Super (Shofu) or A: Amelogen (Ultradent). Samples were stored in distilled water 24 hs at 37°C. Height in each sample was measured in three points before and after polishing using a digital micrometer (Mitutoyo Corporation/Japan). Samples were polished for 30 seconds (10 sec per grit), using constant speed and pressure and refrigeration. Results were statistically analyzed using two-way ANOVA and Tukey test. Results: both resin and polishing system had significant effect (p<0.01). Surface loss obtained (mm) was: G2: 0.035 (0.022), G3: 0.036 (0.019), G4: 0.039 (0.024), G5: 0.046 (0.015), G7: 0.044 (0.025), G8: 0.045 (0.027), G9: 0.050 (0.009), G11: 0.056 (0.010), G12: 0.062 (0.036), G13: 0.076 (0.019), G14: 0.076 (0.015). Loss (mm) for each finishing system was: J: 0.044 (0.019), A: 0.0468 (0.021), L: 0.065 (0.041). Conclusions: Under the experimental conditions of this study, it can be concluded that resins have a different behavior when polished with the evaluated systems. Besides, Jiffy produced the highest surface loss regardless of the type of resin.

Conclusion:
Under the conditions of this research, the composite wore differently depending on the polishing system tested. It could be attributed to the diversity in quantity, geometry, mechanical properties, manufacturing process of the filler and chemistry of the matrix. However, Jiffy® polishing system produced greater loss regardless of the composite used.

References:

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