Advantage of Combined Amalgam-Composite Restoration: In Vitro Leakage Study

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Conclusion: The addition of 1% Colemanite to PMMA improved the physical properties of PMMA.

FC115
Effects of Calcium-Silicate Based Materials on the Dentine
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Aim: The study was designed to compare the composition and chemical reaction between analyzed bioactive calcium-silicate based materials and dentin during cavity lining.

Materials and methods: The standardized class I cavities were prepared in human extracted posterior teeth (collected in a written agreement with every patient) and, accordingly filled with Biodentine and MTA+. Next dentinal discs were prepared and the 1 mm specimens were sectioned longitudinally with diamond cutter Micracut 175. The samples were processed by SEM, EDS and Raman Spectroscopy to observe the structure and chemical composition of both of them in contact with dentine.

Results: Significant differences in composition of organic phase and microelements between both materials were found. There were also visible differences in the structure of the new layer on the border with dentine (Transition Zone). Additionally, Biodentine showed higher bioactivity than MTA+.

Conclusions: Biodentine and MTA+ are bioactive materials. Bio-mineralization reaction took the place between dentine and materials. Methods used in the research are suitable to investigate reaction initiated by Biodentine or MTA+.

FC116
Effects of Different Accelerators on Setting Properties of Mineral Trioxide Aggregate
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Aim: The aim of this study was to examine the effect of different accelerators on setting time and crystalline formations of white Mineral Trioxide Aggregate (WMTA).

Materials and methods: WMTA mixed with 15% Na₂HPO₄, 15% Na₂CO₃, 10% CaCl₂, 23.1 wt% Calcium Lactate Glukonat (CLG), ProRoot white MTA (Dentsply Tulsa Dental, Tulsa, OK) was used as a control group. The setting times were evaluated using a vaticronic (Matest, Italy). To prepare samples for setting time experiments, stainless steel ring molds were used. These ring molds have an inner diameter of 10 mm and a thickness of 4 mm. The setting time for using liquid phase of deionized water, with 15% Na₂HPO₄, 15% Na₂CO₃, 10% CaCl₂, 23.1 wt% CLG was recorded when the needle failed to create an indentation in three separate areas. Set materials were characterized by scanning electron microscopy (SEM), X-ray diffraction analysis (XRD). The final setting times were determined by the arithmetic mean of ten repetitions of the test for each experimental group. The data were analyzed by ANOVA and the Tukey test (p < 0.05).

Results: There was a statistically differences between control and experimental groups (p < 0.05). The final setting time was greater for CLG and 15% Na₂HPO₄.

Conclusions: The addition of amorphous CLG-based liquid phase and 15% Na₂HPO₄ to WMTA reduced the setting time and these combinations may be a viable option in single visit procedures.

FC117
Advantage of Combined Amalgam-Composite Restoration: In Vitro Leakage Study
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Purpose: Evaluate the leakage of Class II box composite restorations compared with composite lined by flowable composite and combined amalgam-composite restoration.

Method: Fifty-four Class II box shaped cavities were on the distal (1 mm below CEJ) surfaces, 18 cavities for each. Scotchbond Multi-Purpose adhesive system, Filtek Z250 composite, and a metal band system were used for all. After thermocycling test (1000 cycles, 5–55°C with 30 s) and dye immersion, the teeth were sectioned longitudinally in a mesio-distal direction and dye penetration was recorded.

Results: Combine amalgam-composite restorations showed less ginglyval leakage than composite alone and composite lined by flowable composite restorations, significantly.

Conclusion: For class II box composite restorations, the ginglyval leakage, below CEJ with rinsing enamel, can be reduced by placing amalgam ginglyival combined by composite occlusally.

FC118
Influence of TiO₂ Nanoparticles on Surface Microhardness and Roughness of Experimental Resin Composites
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Aim: The aim of this study was to evaluate the effect of additional TiO₂ nanoparticles on the surface microhardness and roughness of experimental resin composites.

Materials and methods: A light curing resin matrix was made by mixing 60 wt% Bis-GMA and 40 wt% TEGDMA. Silane coated glass filler was added in the ratio of 63 wt% of the resin composites. TiO₂ nanoparticles were added with the concentrations of 0.1, 0.25, 0.5 and 1 wt% by sol-gel methods. TiO₂ was not added in the control group.

Disk shaped specimens (diameter = 5.0 mm, thickness = 2.0 mm) were pressed between two glass slides to obtain standardized smooth surfaces. The disks were light polymerized for 40 s. After storage (37°C/1 week) the microhardness was