

JULY 22nd-24th, 2013
Piracicaba, São Paulo, Brazil



GBMD 2013

brazilian group of **dental materials** *Piracicaba - SP*

ABSTRACTS

49th MEETING OF THE BRAZILIAN GROUP OF DENTAL MATERIALS

All abstracts appear as submitted by the authors without editing.



STATE UNIVERSITY OF CAMPINAS
PIRACICABA DENTAL SCHOOL



001 Effect of BAPO on the degree conversion of experimental adhesives photoactivated by LEDs

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The aim of this study was to evaluate the degree of conversion (DC) of experimental dental adhesives composed by bisalquylphosphine oxide (BAPO) and/or camphorquinone (CQ), photocured by LED single peak (Radii-cal - SDI) or polywave (Bluephase G2 - Ivoclar Vivadent). Experimental adhesives composed by BisGMA and HEMA were handled with different photoinitiators system: CQ/Amine, BAPO/Amine, BAPO, CQ/BAPO/Amine. The hydrophobic resin adhesive Adper Scotchbond Multi-Purpose was used as control. Specimens of each adhesive type in bar-type (7mm x 2mm x 1mm) were prepared (n=5) and photocured by LED single peak or polywave with 48J of energy density. After 24h, the GC was measured by FTIR-ATR. The data were submitted to ANOVA two-way and Tukey test ($p < .05$). When the LED polywave was used the adhesive BAPO/Amine showed higher GC ($69.9 \pm 3.2\%$) and was statistically different from the control group ($61.5 \pm 2.0\%$) and CQ groups ($58.2 \pm 4.2\%$) and CQ/BAPO ($59.6 \pm 4.8\%$). However, did not differ from group with BAPO ($66.8 \pm 3.7\%$) only. For the LED single peak, all groups did not differ, except the control group ($60.34 \pm 5.72\%$) than group CQ/BAPO/Amine ($49.89 \pm 5.85\%$). Regarding the apparatus, for the adhesives with BAPO the LED polywave showed statistically better average than LED single peak. When associated with amine, the BAPO showed satisfactory degree of conversion. The LED polywave promoted better monomeric conversion than LED single peak for the adhesives with BAPO.

003 Reliability of different Y-TZPs and identification of phase transformation by Micro-Raman Spectroscopy

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The aim of this study was to evaluate the reliability of different Y-TZPs flexural strength and investigate the presence of monoclinic - tetragonal phase transformation ($t \rightarrow m$) after tension fracture. (The groups were: Y-TZP Experimental (ZE), Zirconcad (ZCA), IPS e.max ZirCAD (ZMAX) and In Ceram YZ (ZYZ). 120 specimens were constructed (n = 30) and subjected to testing in three point bending speed of 0.5 mm/min, according to ISO 6872. For the analysis of variability of flexural strength, Weibull statistical analyses by means of two parameters were used: the Weibull modulus (m) and the characteristic resistance (σ_0). The phases of Y-TZPs crystalline structure have been identified by the detection of characteristic bands of each phase. (For 95% intervals; there was no statistical difference for the parameter m between groups but ZMAX showed the highest numerical values and thus a higher reliability of the results. ZCA was statistically significant different in the values of σ_0 . Micro-Raman spectroscopy showed that there was phase transformation ($t \rightarrow m$) for all Y-TZPs studied, and that the band characteristic of monoclinic phase was identified near the origin of the fracture. ZMAX showed the best reliability results of flexural strength and the presence of the monoclinic crystalline phase in the area of origin of the fracture indicates that the region subjected to high stress induced phase transformation.

005 Biomechanical evaluation of the use of mouthguard and mode of impact simulation: Finite element analysis

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The use of mouthguard can minimize the effects of dental trauma by impact energy absorption. This study evaluated the effect of the use of mouthguards on stress distribution in the tooth-bone complex by Finite Element Method (FEM). Four two-dimensional models were generated from images of a tooth-bone complex by the association with the software's of image manipulation Image J and Finite Element Analysis, Marc/Mentat-MSC software, in accordance with the factors under study: (1) presence or absence of mouthguard, (2) load application without antagonist and with the antagonist in occlusion. In the software Marc/Mentat, the manual meshing process of each structure was made and the boundary conditions were defined. Nonlinear analysis was performed with simulated friction contact between the mouthguard and tooth. Was applied a loading of 1000 N on the labial surface of the incisor. The analysis parameters were the von Mises criterion and total displacement in the X-axis. The use of mouthguard significantly reduced the stress generated in the tooth-bone complex. The presence of the antagonist at the time of load application accentuated the stress generated in the tooth and alveolar bone. The analysis of the total displacement (X-axis) demonstrated that the use of the mouthguard decreases the displacement of the tooth in front of load application. It was concluded that the use of mouthguards decreased the levels of stress in the tooth-bone complex. The presence of the antagonist at the time of load application increased the stress levels on the tooth structure.

002 Restoring the optical properties and color change in the enamel infiltrated with Icon

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The aim of this study was to evaluate the effect of optical properties of infiltrant applied in enamel carious lesions before and after staining. 30 blocks (4x4mm) were produced from bovine teeth crowns. These were divided into three groups (n = 10): control, decayed and artificially infiltrated with Icon. Color measurements by reflectance spectrophotometry (Konica Minolta CM 700d, CIELab system) were performed before and after coffee cycling pigmentation (14 days, 3 times a day for 15 minutes). The color parameters used were L, a, b and ΔE . The results were subjected to ANOVA one-way for comparison between groups and test t for comparison before and after pigmentation ($p < 0.05$). After pigmentation, results present a significant reduction in L values for all groups, and the control and infiltrant group showed no significant difference in L values (control: 88.7; infiltrant: 87.59). The a and b values decreased after staining for all groups. The color variation (ΔE) was higher in infiltrant groups (41.10) and decayed (33.19) did not differ among themselves. The control group showed the lowest ΔE values (13.12). (Conclusion: Infiltrant application restored luminosity of decayed teeth similarly to control before staining. However, after staining, the infiltrant group presented color change similar to decayed and higher than control group.

004 Effect of photo-activation protocols for resin cements on shrinkage stresses

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Finite Element Analysis (FEA) was used to evaluate how time elapsed between mixing and polymerization affects the elastic modulus (E) and residual shrinkage stresses (Shr) for different resin cements as luting agent in incisors restored with fiber-glass posts (FGP). Post-gel shrinkage of RU-RelyX Unicem (3M-ESPE), BC-Biscem (Bisco), RA-RelyX ARC (3M-ESPE) and PF-Panavia F (Kuraray), was measured by strain gauge test (N=10). The E of the resin cements at 9 root depths was measured using dynamic indentation test. The photo-activation protocols were: 1-light-curing immediate; 3m-three minutes and 5m-five minutes (N=3). 2D FEA models were created of an incisor restored with FGP to assess the Shr along the interface of the resin cement/root dentin. Stress results were evaluated by modified Von Mises criterion. Post-gel shrinkage decreased up to 70% with increasing photo-polymerization delay. The 5 minutes delayed photo-activation protocol decreased the Shr and improved the E of all resin cements.

006 Influence of the use of mouthguards and impact angulation on the strain of anterior teeth

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The occurrence of dental trauma more frequently affects the jaw anterior teeth. Custom-fitted mouthguards are devices that decrease the frequency of dental trauma by the impact absorption capability. It was developed a custom pendulum device based on Charpy test with a 210g steel ball to perform the tests in dentistry. Five bovine jaws were selected with standard ages and dimensions. Custom-fitted EVA mouthguards were made with a thickness of 6mm. The jaws were selected and fixed on the pedulum device and the impacts were performed with 90, 60 and 45° angulation, with and without the mouthguard. Strain gauges of 350 μ were attached at palatal surface of the tooth that would receive the impact. The strain and impact absorption capability of the custom-fitted mouthguards and data was analyzed with ANOVA and Tukey Test ($\alpha = 0.05$). Without mouthguards, the increase in impact angulation increases significantly the calculated strain. The average values (SD) obtained without mouthguards to the angulation was: 90°: 2562,6 \pm 828,7; 60°: 1546,3 \pm 272,6 and 45°: 101,8 \pm 33,8. With mouthguards, the average values (SD) to the strain (μ S) obtained to the angulation was: 90°: 45,2 \pm 13,4; 60°: 40,9 \pm 11,1 and 45°: 37,6 \pm 10,9. The impact absorption capability of the custom-fitted mouthguards was 98,2; 97,4 and 63,1% to the angles of 90, 60 and 45°, respectively. It was concluded that the use of mouthguards had direct influence on strain and impact absorption capability of mouthguards in situation of impact application by the different angles.

007 Bond strength of self-adhesive cements in bovine enamel

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The objective of this study was to evaluate the bond strength of self-adhesive cements RelyX U100 and RelyX U200 to enamel (E) in relation different surface treatments and comparing them with resin cement RelyX ARC. One hundred and twenty bovine incisors were selected; their crowns were separated from the roots and embedded with epoxy resin in PVC tubes. It was used silicon carbide sandpaper for planning enamel, then were delimited areas aimed at cementing with adhesive tape; the sample was divided into 6 groups (n = 10) according to the cement and realization of acid etching with phosphoric acid 37% (P) or not on the enamel surface: E-U100, E-P-U100, E-U200, E-P-U200, E-ARC and E-P-ARC. A split Teflon mold allowed manufacturing of cement cylinders, which coincide with delimited areas. The shear strength test was performed in a universal testing machine EMIC (0.5 mm / min) after 7 days in artificial saliva. The analysis of the fracture was performed with digital microscope. With illustrative purposes, two specimens of each group were observed in scanning electron microscopy. Data were analyzed with ANOVA-2 criteria and Tukey (5%). No difference was observed between self-adhesive cements. When it was done phosphoric acid etching, self-adhesive cements were better than the resin cement. 53.3% of the fractures were adhesive. It was concluded that the self-adhesive cement associated with prior acid etching of the surface can be used as an alternative to resin cement in enamel.

009 Photophysics of rhodamine-labeled dentin bonding agents

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Adhesive systems have been modified with rhodamine B (RB) in the interest of assessing bonded interfaces via confocal laser scanning microscopy (CLSM). This study aimed (i) to investigate some characteristics of excitation of fluorophores and fluorescence emission from non-simplified adhesives labeled with RB at different concentrations, (ii) to estimate the lowest ranges of concentrations of RB for CLSM. The adhesive systems Adper Scotchbond Multi-Purpose and Clearfil SE Bond were modified with RB by means of concentrated ethanol-RB aliquots. Thus, five films of each adhesive were prepared directly on microscope slides by adding different concentrations of RB (mg/mL): C1=0.50, C2=0.10, C3=0.02; C4=0.004 or C5=0.0008. The fluorescence from films was evaluated both by fluorescence spectroscopy and by CLSM. The effectiveness of some concentrations was confirmed by applying them on the assessment of dentin bonded interfaces. Fluorescence spectra showed differences in the excitation and emission bands, according to the concentrations of RB in each film. The maximum excitation wavelengths were set in the green region (553-563 nm), and the emission ones between 565-587 nm. Preliminary microscopic analysis of the films allowed the pre-selection of the concentrations C2, C3 and C4 for the assessment of dentin bonded interfaces, which were best visualized with C3. Investigating the behavior of RB-labeled adhesives allows the predetermination of relevant parameters for the optimization of the CLSM technique.

011 Influence of the cements and ceramic translucency on the luminosity of restoration of darkened teeth

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This study aimed to evaluate the masking ability of darkened substrate with ceramic with different levels of translucency (IPS E-max Press) and different cements (A1). The null hypotheses tested were that there were no difference in the restoration's luminosity according to the level of translucency (high-HT and low translucency-LT), level of teeth darkening (normal-N or darkened-D) and cement (RelyX ARC-ARC, Variolink II-V and Biodinâmica cement-B). Sixty circular fragments of bovine enamel were prepared, in which half was submitted to the darkening through the immersion in bovine blood. Circular specimens of the ceramic material (60) were obtained, half with high translucency (HT) and half with low translucency (LT). About the combination with the cements, 12 groups (n=5) were determined. The luminosity of the luted specimens were measured with spectrophotometer to determine the variation of luminosity (ΔE). The data was analyzed by three-way ANOVA and Tukey tests (p<0.05). The factors ceramic translucency and level of darkening were significant, as well as the interaction between the three factors. For the cement ARC, the high translucency and the darkened substrate (HT-D-ARC) were different from the other combinations, with higher ΔE. For the cement V, the low translucency of the normal substrate (LT-N-V) determined the smallest ΔE. The cement B did not reveal any differences among the combinations. The luminosity of restoration depends on the combination between the level of ceramic translucency, level of substrate darkness and cement.

008 Surface Treatment of Dental Porcelain with CO2 Laser – Contrast Ratio and Masking Ability

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Aim: CO2 laser continuous irradiation applied over porcelain specimens produces a surface similar to that achieved after oven glaze regarding roughness and color aspects. (Sgura R. et al., Dent Mat 2011, e72-e73). Nevertheless, the influence of CO2 laser in porcelain opacity was never evaluated. This study evaluated the opacity of dental porcelain after CO2 laser irradiation by means of Contrast Ratio (CR) and Making Ability (MA) tests. Materials and Methods: 80 porcelain discs (diam 3,5 x 2,0mm) were oven-sintered and had one of their faces mirror polished (Ecomet 3 – Buehler). Specimens were divided into groups: control (C), oven auto-glaze (G) and laser in 45 and 50 W/cm2 irradiances (L45, L50) for 3, 4 or 5 minutes. CR and MA were measured in spectrophotometer (CM3370d - Konica Minolta) by measuring reflectance and color difference (ΔE) with specimens placed over black and white backgrounds. Data were subjected to ANOVA and a Tukey post-hoc test (p<0.05). A correlation test between CR and MA were conducted. Results: Opacity in G was higher (CR=0.82) than in C (CR=0.73). CR of laser groups ranged from 0.78 to 0.88. L45/5 minutes presented the higher masking ability (ΔE=4.5) when compared to other groups. CR and MA showed a linear correlation r = -0.76 (p=0.02). Conclusions: CR of irradiated porcelains varied according to irradiance and time. The MA of the studied porcelain was not altered after CO2 laser exposition.

010 Influence of different protocols of activation in degree of conversion and knoop microhardness of a dual resin cement

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The aim of this study was to evaluate the degree of conversion and microhardness of dual-cured resin cement used for cementation of fiber posts. Forty-five roots of bovine incisors were used for this purpose. These roots were submitted to endodontic treatment and random assigned to 8 experimental groups and a control, all of them with n=5. After seven days, the fiber post White Post DC #3 was cemented with the dual-cured resin cement, RelyX ARC (3M-ESPE) in each root. Following this step, the light curing was performed with the 3rd generation LED device (Valo-Ultradent), with four different energy densities (7, 14, 20 or 28 J/cm²) and two different delay times (0 or 2 minutes). The control group was not light-cured. After the cementation, the roots were stored in distilled water at 37° C for 15 days, and the degree of conversion an Knoop microhardness were obtained in three different root segments (Cervical, Medium and Apical). Data were submitted to three-way split-spot ANOVA and Tukey's test. Dunnett's test was used for comparisons with control. Results of degree of conversion showed that the cervical root segment obtained higher values than the others, at all experimental conditions. The degrees of conversion values for 2-minutes delay time were higher than 0-minute delay-time. The energy density of 28 J/cm² obtained the highest values, with significant differences from the others energy densities. For microhardness values there were not significant differences between the delay times. For the Cervical and Apical root segments, there were not statistical differences for the energy densities tested. The energy density of 14 J/cm² showed the higher values of microhardness at the Medium root segment, while the 28 J/cm² showed the lowest. The Apical root segment obtained similar microhardness values from the same third at the control. In conclusion, the degree of conversion was influenced by the energy densities and delay times, as well as the root segment. The microhardness was not affected by the delay time at all conditions, and the energy densities showed similar behavior at Cervical and Apical root segments.

012 Push-out bond strength between glass fiber posts to intraradicular dentin with different luting agents

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The aim of this study was to evaluate the bond strength between glass fiber posts to different regions of intraradicular dentin. Forty extracted single-rooted human teeth were used in this study. After endodontic filling and mechanical preparation of root canals, teeth were divided into five groups (n=8) according to the technique adopted for the adhesive cementation: G1: Single Bond 2 + RelyX ARC; G2: Excite DSC + RelyX ARC; G3: Adper SE Plus + RelyX ARC; G4: RelyX Unicem; G5: Set. The bond strength was measured using the push-out test in a universal testing machine in different areas of intraradicular dentin (cervical, middle, and apical). The data were subjected to 2-way analysis of variance and Fisher's PLSD test. Images of representative fractured sample were obtained by scanning electron microscopy. The highest values for the push-out bond strength were found for G3 in all experimental conditions, without a significant difference for the Excite DSC in the middle and apical regions. The lowest values of bond strength were found for the other groups, with no statistical difference between them. There was a decrease in push-out bond strength in the cervico-apical direction for all groups except group 2, which did not show a difference among the different regions. The different interactions of the resin materials and the intraradicular depth influenced the bond strength of adhesives materials to dentin substrate.

013 Effect of surface treatments on the flexural strength of ceramics in lithium disilicate pressed

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Aimed to evaluate in this study the resistance of a ceramic lithium disilicate pressed, when subjected to different surface treatments and cementation. Were made 60 bars (16x2x4mm), divided into subgroups consisting of 10 bars each, and subjected to the following surface treatments: c, no treatment (control); HF, application of 10% hydrofluoric acid (HF) for 20s + wash (60s), drying (30 s) application of silane agent and hold (60s), HFC, HF (20s) + wash (60s), drying (30s), application of silane agent and hold (60s) and cementation; HFN, HF (20s) + wash (60s) + neutralization with supersaturated solution of sodium bicarbonate (SB) + rinsing for 40s (5s) + drying (30s), application of silane agent and wait (60 seconds) and cementation; HFU, HF (20s) + wash (60s) + ultrasonic cleaning in deionized water (U.S.) for 4 min + drying (30s), application of silane agent and hold (60s) and cementation; HFNU, HF (20s) + wash (60s) + neutralizing with BS (40s) + cleaning in U.S. (4 min), application of silane agent and hold (60s) and cementation. The specimens were tested for flexural strength of three points. The results showed that the HFN and HFNU groups showed lower flexural strength than the other groups ($p = 0.00$). Thus it was concluded that the neutralization with supersaturated solution of sodium bicarbonate, followed or not by ultrasonic bath results in lower mechanical strength of the ceramic lithium disilicate pressed.

015 Effect of surface treatments on the flexural strength in a lithium disilicate ceramic

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The etching creates subproducts and precipitates on the ceramic surface, blocking the microporosity of ceramic, which difficults the penetration of the resin luting agent. Thus, it is necessary to dispose of these wastes, to promote improved luting, and thus obtain a greater longevity of the restoration. Therefore, the aim of this study was to evaluate the effect of different surface treatments on the flexural strength of lithium disilicate ceramics processed by CAD / CAM. 60 ceramic bars were prepared and divided into 6 groups ($n = 10$): A, no treatment (control), HF, application of 5% hydrofluoric acid (HF) for 20s, washing (40 seconds), drying (30s); HFC, HF (20s), washing (40s), drying (30s), silanization and cementation; HFU, HF (20s), washing (40s), ultrasonic cleaning in distilled water for 4 min (US), drying (30s) silanization and cementation; HFN, HF (20s), washing (40 seconds), neutralization with supersaturated solution of sodium bicarbonate (40s), washing (5s), drying (30s), silanization, cementing; and HFNU, HF (20s), washing (40s), neutralization with supersaturated solution of sodium bicarbonate (40s), US, silanization and cementation. After 24 hours, the bars were subjected to three-point bending test. There was no significant difference between the means of the groups according to the one-factor ANOVA ($p = 0.315$). It was concluded that surface treatments did not influence the mechanical strength of lithium disilicate ceramic.

017 Construction and validation of device for humidity and temperature control in measurement of post-gel shrinkage

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The post gel shrinkage (SHR) of composites causes strain and stress in the complex restorative and may be influenced by heat and temperature environmental. The aim of this study was to develop a device for measuring of Shr that allows control of relative humidity (RH) and temperature environment ($^{\circ}$ C) and to validate testing six composites in three environments conditions of polymerization. The device is characterized by glass device with internal electrical resistance connected to a control panel. The internal temperature parameter is achieved with a sensor positioned near the test sample. The RH is controlled by humidification system with internal variation limit $\pm 1^{\circ}$ C and $\pm 5\%$ RH. For validation of the device were tested the composites Filtek LS (LS), Venus Diamond (VD), Aelite LS (AE), Evolu-X (EX), Filtek Supreme (SU) and Filtek Z100 (Z) in three conditions (22 $^{\circ}$ C and 50% RH (22/50), 37 $^{\circ}$ C and 50% RH (37/50), 37 $^{\circ}$ C and 90% humidity (37/90). Each sample was polymerized on the bi-directional gage with halogen light for 20s. Shapiro-Wilk test, two-way ANOVA and Tukey test were applied ($p < 0.05$). A Shr was directly proportional with the increase in RH and temperature for all materials tested. During the three environmental conditions, the materials presented Shr LS.

014 Influence of photoactivation time on water sorption and solubility of dental adhesives

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The aim of this study was to evaluate the influence of different photoactivation times on water sorption (WS) and solubility (SO) of dental adhesives. Two single-bottle etch-and-rinse adhesives were used: Single Bond 2 (SB - 3M ESPE) and Ambar (AM - FGM). Each adhesive was dispensed in silicon molds for confection of disc-shaped specimens (6.00 mm x 1.00 mm). Specimens were divided in 4 groups according to different photoactivation times: G1: 5s (sub-photoactivation), G2: 10s (recommended), G3: 30s, e G4: 60s ($n = 6$). Light-curing unit used was a LED Bluephase 2 (Ivoclar Vivadent) with 1050 mW/cm² irradiance. WS and SO were obtained after 7, 30, 60 and 90 days of storage in 1 mL of distilled water at 37 $^{\circ}$ C. WS and SO values were analyzed using two-way repeated measures ANOVA and Student-Newman-Keuls test ($\alpha = 0.05$). After 90 days of storage, the prolonged photoactivation times resulted in higher WS for SB (G2: 159.7 μ g/mm³ < G4: 204.6 μ g/mm³) and AM (G2: 95.9 μ g/mm³ < G4: 121.3 μ g/mm³). The influence of photoactivation time on SO was material-dependent (SB - G2: 82.1 μ g/mm³ = G4: 85.9 μ g/mm³; and AM - G2: 112.4 μ g/mm³ > G4: 76.9 μ g/mm³). Both adhesives presented reduction in WS and increase in SO when storage time was prolonged. It can be concluded that prolonged photoactivation times in dental adhesives produce increased WS and may reduce the SO. Prolonged storage times for etch-and-rinse adhesives reduce WS and increase SO.

016 Evaluation of tooth bleaching in enamel and opposite dentin after prior application of potassium nitrate

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This study evaluated the efficacy of bleaching on enamel and opposite dentin surfaces using 35% hydrogen peroxide (HP) with prior application of a desensitizing agent (5% potassium nitrate with 2% sodium fluoride). Bovine dental fragments, with thicknesses of 1.0 mm enamel and 1.75 mm dentin, were stained in a solution of black tea. The fragments were randomly divided into three groups ($n=10$) according to the following protocols: NF: 2% neutral fluoride (4min) + bleaching (45min), D: desensitizing agent (10min) + bleaching (45min), and WD: without desensitizer + bleaching(45min). The bleaching efficacy was evaluated at four times: after staining with tea (baseline) and after each of the 3 weeks of bleaching, by means of the CIE Lab method using a reflectance spectrophotometer. The data coordinate L* was evaluated by analysis of repeated-measures with PROC MIXED and Tukey-Kramer's test. The $\bar{A}E$ values were subjected to analysis of variance ANOVA and Tukey's test ($\alpha = 0.05$). Two samples from each group were randomly selected for analysis of enamel surfaces in scanning electron microscopy at 2000x. We analyzed the sample surface only with the application of 2% neutral fluoride and desensitizing. The 35% HP treatment showed greater efficacy on deep dentin after removal of enamel stains, with increasing means during all times in all treatments. The use of a desensitizing agent prior to the bleaching session did not affect the mechanism of action of 35% hydrogen peroxide with regard to tooth depth. More apparent topographic changes on the enamel surface were observed when using the PH35%.

018 Effect of protocol restorative composite resin on the deformation of cusp molars

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The post gel shrinkage and filling technique of composite resins in posterior teeth may cause strain in teeth that can manifest as broken enamel and post operative sensitive. The use of glass ionomer has been suggested to minimize this effect. The aim of this study was to evaluate the cusp strain (CS) of molars with large structural loss restored with composite resin (Filtek Supreme-3M ESPE) according to 2 factors under study: Factor 1: presence (Ion) or absence (Nion) of glass ionomer (Vitremex-3M ESPE); Factor 2: filling technique starting from the occlusal box (Co) filling technique starting from the proximal box (Cp). Twenty-eight human molars were divided into 4 groups ($n = 7$) with standardized MOD cavities that were restored. CS was obtained with strain gages fixed on the basis of the buccal (B) and lingual (L) cusps. The tests were performed with temperature (37 $^{\circ}$ C) and humidity (50%) controlled. The CS data were analyzed using factorial ANOVA (2X2) with subplots factor cusp (B, L and buccal, lingual) and Tukey test ($p < 0.05$). The values of DC (mS) were IonCo-V: 50.8 \pm 14.5; G: 72.1 \pm 21.8; IonCp-V: 60.9 \pm 16.6; G: 65.6 \pm 20, 6; NIonCo-V: 65.0 \pm 16.6, L: 101.9 \pm 13.2; NIonCp-V: 74.6 \pm 17.0, L: 105.4 \pm 25.6. The CS was significantly higher for the lingual cusp in all groups. The presence of ion results in lower CO values, regardless of the restorative technique. The restorative technique did not influence CS regardless of the presence of Ion.

019 Initiator system changes may affect the properties of resin cements

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The study examined the flexural strength (FS), flexural modulus (FM) and Knoop hardness (KH) of experimental resin cements containing different photoinitiator systems. Resin cements containing BisGMA, TEGDMA and 65wt% of silanized filler particles were prepared with the use of photoinitiators: CQ-camphorquinone, PPD-Phenyl propanedione, BAPO- Bisacylphosphine Oxide, DMAEMA-dimethylaminoethyl and DFI-Diphenyliodonium Hexafluorophosphate. The combinations used were: G1-CQ/DMAEMA, G2-CQ/DMAEMA/DPI, G3-PPD/DMAEMA, G4-PPD/DMAEMA/DPI, G5-BAPO/DMAEMA and G6-BAPO/DMAEMA/DPI. The photoactivation was made during 20 s with a ceramic (IPS Emax A2 color, thickness 1 mm) between the LED light curing (Bluephase) and resin cement. FS and FM were tested in a universal testing machine (Instron) and KH in microhardness (Shimadzu). According to the results, the values of FS (MPa) were: G5 (102.0)a; G2 (101.4)a; G6 (98.8)a; G1 (81.5)a; G4 (75.5)a and G3 (0,0)b. In the FM test (GPa) values obtained were: G2 (2.9)a; G6 (2.7)a; G5 (2.6)a; G1 (1.4)b; G4 (1.3)b and G3 (0,0)c. For DK (KHN) the values were: G6 (66.1)a; G5 (65.7)a; G2 (21.0)b; G4 (11.5)c; G1 (11.3)c; G3 (4.8)d. The resin cement containing the photoinitiator BAPO showed the highest values in the properties tested and the combination of the DFI with all photoinitiators increased the properties of resin cements.

021 Bond strength to dentin of adhesive systems irradiated with Diode LASER

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The aim of this study was to evaluate the effect of Diode LASER irradiation ($\lambda = 970\text{nm}$) on adhesive systems already applied to dentin, irradiated before light curing, on bond strength obtained by microtensile test. This study presented experimental design with two factors (Adhesive System / LASER) each divided into two subgroups, respectively: Adper™ SingleBond 2 (SB); Adper™ EasyOne (EO) / No LASER (NL); With LASER (L). Forty healthy human molars were randomly distributed in 4 groups ($n=10$) and prepared in accordance with the respective treatment for microtensile bond strength test. The test was carried out in a universal testing machine (Instron 3342), with a 500N load cell, obtaining values of bond strength in MPa, analyzed through two-way ANOVA, followed by Tukey test for individual comparisons ($p<0.05$). Mean values of bond strength (MPa) \pm standard deviation were respectively: SB-NL 33.49 ± 6.77 ; SB-L 43.69 ± 8.15 ; EO-NL 19.67 ± 5.86 ; EO-L 29.87 ± 6.98 . Both factors analyzed were able to influence on bond strength values, with significant increase in bond strength of both adhesive systems irradiated with Diode LASER. The association of Diode LASER to simplified adhesive systems seems to be promising technic to achieve a more effective adhesion between dentin and adhesive systems.

023 Bond strength between conventional resin cement and self-adhesive to dental ceramic

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The aim of this study was to evaluate the microshear bond strength between conventional resin cement and self-adhesive to dental ceramic. Twenty Starlight ceramic discs were made with 15 mm in diameter and 2 mm in thickness. The bonding process of resin cements to ceramic was made by insertion of material into tubes of 0.7 mm internal diameter. Four resin cements were used: RelyX ARC, Panavia F, RelyX Unicem e Set. The samples were stored for 24 hours or 6 months in distilled water at 37°C. The samples were submitted to microshear bond strength in a universal testing machine at a crosshead speed of 1.0 mm/min. Data was subjected to 2-way ANOVA and a Fisher's PLSD test. RelyX ARC conventional resin cement showed the highest bond strength with no statistical difference for RelyX Unicem and Set at 24 hours. The lowest values were obtained for the Panavia F, with statistically significant difference for the other cements in the two periods studied. At six months there was a significant increase in the values of bond strength for all cements, except for RelyX ARC. The bond strength is dependent on the type of resin cement, and self-adhesive resin cements behaved similarly to conventional resin cement.

020 Influence of different concentration of photoinitiator system on the properties of experimental resin composites

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The aim of this study was to determine the influence of the concentration of camphorquinone (CQ) and tertiary amine (DABE) on properties of experimental composites (EC). We tested the degree of conversion (DC), yellowing (YL), elastic modulus (EM), flexural strength (FS), sorption (SP) and solubility (SL). Ten EC were handled, varying concentrations of CQ/DABE (% by weight): 0.4/0.4, 0.4/0.8, 0.6/0.6, 0.6/1.2, 0.8/0.8, 0.8/1.6; 1/1, 1/2, 1.5/1.5 to 1.5/3. For DC, 8 specimens of each material were prepared. After 24 hours, were analyzed by Fourier Transform Infrared Spectroscopy. Subsequently, for FS and EM, the same samples were subjected to bending test in an universal testing machine. For testing YL, SP and SL, five samples were prepared for each material for each test. The YL was measured after 24 hours of storage in water, using a spectrophotometer. For testing SP and SL, the samples were dissected for 1 week and weighed daily until the maximum variation of weight was 0.0001 g of an overnight (m1). For m2, the samples were stored in water for 1 week and weighed one time only. And m3 were obtained in the same way as m1. The different concentrations of CQ and DABE did not significantly alter the properties of FS and SP. The results of DC, YL and EM were directly proportional to the concentration of CQ/DABE. Already SL was inversely proportional. High concentrations of CQ/DABE lead to the best properties, but the larger YL. The increases in the proportion of DABE not influence the properties of all EC.

022 Influence of different surface treatments on bond strength in composite- composite repairs

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This study evaluated the influence of different surface treatments on the bond strength (TBS) in composite-composite repairs (3M ESPE). 8 cylinders of each composite (Z350/Z3; Z250/Z2; P90/P) were obtained using a metal matrix (10mm X 5mm). After thermocycling (1000 cycles at 5°C/55°C) and roughening the surface (320 grit sandpaper), the cylinders were distributed according to the following surface treatments: C- without treatment (control); S- sandblasting with Al₂O₃ (50 μm), SE-sandblasting with Al₂O₃ (50 μm) + ethanol for 5 min, SC-silica coating. After silanization, the adhesive Single Bond 2 and Silorane were applied to methacrylic and P90 composites, respectively. The cylinders were placed in a matrix with 12mm in height, which was filled with a new composite, similar to the old one. After thermo-mechanical cycling (1000 cycles at 5°C/37°C/55°C and 300 000 cycles at 2.5 Hz and 98N), the cylinders were cut into beams (1mmX1mm) ($n = 28$) and subjected to the microtensile test in a universal testing machine with speed of 0.5 mm/min. Data were submitted to ANOVA and Tukey's test (5%), verifying that sandblasting and silica coating led to better values of TBS for the Z2, while for Z3, only silica coating was effective. For P, all treatments led to similar values of TBS. Z2JE showed lower values of TBS compared to others. It can be concluded that sandblasting and silica coating can be indicated as a pre-treatment in composite repairs. Ethanol after sandblasting should not be used because it is possible to damage the adhesive interface.

024 Synthesis and characterization of composites with polymeric matrices modified by polyhedral oligomeric silsesquioxane

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The aim of this work was to produce and characterize experimental composites with polymeric matrices (UDMA / TEGDMA - 70/30 w/w%) modified by polyhedral oligomeric silsesquioxane (POSS). Six experimental composites were produced by partial replacement of UDMA by POSS (w/w%): C - POSS 0%; P2 - POSS 2%; P5 - POSS 5%; P10 - POSS 10%; P25 - POSS 25% and P50 - POSS 50%. The photoinitiation system was composed by camphorquinone and EDMAB. The composites had 70% of barium borosilicate glass particles of 0.7 μm . The follow properties were evaluated: conversion degree, flexural strength, flexural modulus, hardness, and crosslink density. The micromorphology was evaluated by SEM. The obtained data were analyzed by analysis of variance and Tukey HSD test. Conversion degree: The lower result was presented by P50 and C, P2, P5 and P25 showed the highest values without statistical difference among them. Flexural strength: the lowest value was presented by P50 and the highest by P2. It was not found statistical differences in flexural modulus among all composites ($p>0.05$). Hardness: P50 showed the highest result and C, P2 and P5 presented the lowest. Crosslink density: P25 and P5 showed the best statistical results while group C had the worst. It was concluded that the introduction of POSS until the limit of 25% showed the overall best results.

025 Chemical bonding to calcium/dentin and physicochemical properties of MDP comonomers with different chemical structures

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The aim of this study was to evaluate the chemical bonding of functional monomers and their effects on the properties of all-in-one adhesives. We synthesized four comonomers of MDP (10-metacryloyloxy-decyl-dihydrogen-phosphate) with different hydrophilicities and length of the spacer carbon chain. The chemical interaction of the monomers with calcium/dentin was assessed by atomic absorption spectroscopy (AAS) and FTIR. The monomers were mixed in similar molar ratio in an adhesive blend to prepare the one-step self-etch adhesives. The ultimate tensile strength (UTS) and degree of conversion of such adhesives were evaluated. The data was analyzed with ANOVA and Tukey's test ($p < 0.05$). AAS showed better chemical bonding for monomers with long and hydrophobic spacer chains. The monomer with short spacer chain (MEP, metacryloyloxy-ethyl-dihydrogenphosphate) achieved the worst chemical interaction. FTIR showed that only the joint MEP-dentin was not stable after water rinsing. The monomers with hydrophilic chains remained attached to the dentin. The UTS was lower with MEP (8.42 ± 0.66 MPa) and metacryloyloxy-caprolactone-dihydrogen-phosphate (8.09 ± 0.8 MPa) with intermediary hydrophilic spacer chain. All monomers attained similar degree of conversion. The results showed that the length of spacer carbon chain has more influence than the hydrophobicity on the chemical bonding of phosphate acidic monomers. Monomers with shorter spacer chain induce lower UTS.

027 In situ evaluation of surface roughness and microhardness of restorative materials submitted to erosive challenges

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The aim of this study in situ was to evaluate the effect of different acidic solutions present in soft drinks and gastric juice in the microhardness and surface roughness of restorative materials. 168 specimens were randomly divided into 3 groups with 8 volunteers. The volunteers wore palatal device with 7 specimens (Ketac Nano, Ketac Nano + Biscover LV, Esthet-X, Esthet-X + Biscover LV, Supreme XT, Supreme XT + Biscover LV and bovine enamel). The group I was immersed in HCl; the group II was immersed in soft drink and the group III was subjected to saliva only. The microhardness and surface roughness data were analyzed by two-way ANOVA and Fisher's PLSD test ($\alpha = 0.05$). The results were, Supreme XT showed the highest values of microhardness before and after aging with a significant difference for the other materials. The lowest values were found for the materials sealed with Biscover LV in all periods analyzed. The Ketac Nano glass-ionomer cement showed the highest values of surface roughness after exposure in acidic solutions. The application of the sealant did not reduce the roughness values for the composites studied except for Esthet-X after the challenge in hydrochloric acid. The conclusion is the acidic solutions promoted changes in microhardness and surface roughness of restorative materials, except for the sealed materials.

029 Bond strength of self-etching and self-adhesive resin cements to enamel and dentin

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It was evaluated the bond strength (BS) of resin cements to dentin and enamel surface. It was used 36 third molars. Half of these had the occlusal face removed to exposed dentine and the other half was obtained hemi-sections of enamel. Blocks of indirect composite resin were bonded to the surface of the substrates. They were divided into 4 groups: U2-RelyX Unicem 2 and MAX-Maxcem Elite (self-adhesive), U2S-RelyX Unicem 2 associated with the adhesive system Scotchbond Universal and MU-Multilink Automix (self-etching). They were then stored in distilled water at 37°C for 24h, sectioned in shaped sticks with 0.8 ± 0.2 mm² and tensiled under speed 1mm/min (EZ Test SHIMADZU). The fractures were classified as scanning electron microscopy (SEM) and data were submitted to ANOVA and Tukey test ($p < 0.05$). U2 (13 ± 4.2 and 14.3 ± 6.8) had significantly higher value compared to MAX (12.2 ± 5.9 and 5.4 ± 3.1) when evaluated on dentin. And U2S (29.7 ± 12.1 and 50.6 ± 18.2) showed a statistically greater value than the presented by MU (20.5 ± 10.4 and 20.7 ± 10.5) to enamel and dentin. The fracture patterns in SEM for both substrates showed predominance of cohesive cement fractures for most groups, except for group MAX in dentin, which showed a predominance of mixed fracture (cohesive cement and smear layer) and MU in enamel with predominance of fractures mixed (adhesive and cohesive cement). The self-etching cements had higher BS regarding self-adhesive and among these, U2 showed higher values.

026 Internal and Marginal Misfit of Crowns Produced with a New Resin Composite Processed by CAD-CAM

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The objective of this study was to evaluate and compare the internal and marginal misfit of crowns machined by CAD-CAM of a new nanofilled resin composite reinforced with nano ceramic particles (Lava™ Ultimate - LU) with a lithium disilicate glass-ceramic (e.max CAD - EC). Dentin analogous (G10) models were manufactured with crowns preparation and replicated in dental stone. These were digitized by the CAD-CAM for virtual 3D modeling of the crowns for the two materials ($n = 5$). After machining, the crowns were placed in their respectively G10 models interposed by a light body addition silicone layer, copying the cementation space. The polymerized light body silicone film was captured with a silicon putty to obtain 4 slices corresponding to the crown faces: buccal, mesial, lingual and distal. The misfit was measured at five points: pulp, axial-pulp angle, axial, axial-lingual angle and marginal. The data were submitted to 3-way ANOVA (2 factors within groups) and Tukey's test ($\alpha = 0.05$). LU (198.1 ± 102.6 µm) showed a lower misfit ($p = 0.042$) than the EC (287.2 ± 102.6 µm). The lowest misfit was observed in the axial point for both materials ($p = 0.000$). No difference was observed ($p = 0.201$) among the crowns faces. LU showed lower misfit ($p = 0.001$) in pulp point (LU: 318.8 ± 82.6 µm / EC: 450.2 ± 104.3 µm) and marginal point (LU: 221.5 ± 67.1 µm / EC: 321.8 ± 136.4 µm) than the glass-ceramic. Crowns milled from the new resin composite had a better fit than the glass-ceramic ones, indicating that there is an important difference between the machining ability of these materials.

028 Evaluation of dimensional changes in alginates mixed by standard and dense technique

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In Orthodontics, it is a frequent practice using alginate with a heavier consistency in order to provide better molding of hard and soft tissues. This study aimed to evaluate the dimensional changes of three alginates (Jeltrate-Dentsply; AvaGel-Dentsply-Herpo; Orthoprint-Zhermack) mixed in two different ways: according to the manufacturer's instructions (standard technique) and with 33% reduction of water (dense technique). A stainless steel testing device with two micro-spherical indentations on surface was molded with the different alginates and techniques ($n = 5$). The dimensional changes were measured with a Karl Zeiss microscope with an accuracy of 5 µm, immediately and after 15, 30, 45 and 60 minutes from mixing. Data were subjected to two-way ANOVA and then Tukey test was applied ($p < 0.05$). There was no significant difference between the types of alginate, but the different manipulation techniques had significant differences in all periods. The dense technique presented higher dimensional changes compared to standard technique.

030 Clinical evaluation of in-office bleaching, with and without hybrid light source activation: 36 month follow-up

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This in vivo study compared two techniques for whitening vital teeth, the degree of color change and the stability of treatment over a period of thirty six months. Twenty patients were selected and subjected to in-office bleaching, and ten patients received 2 whitening protocols. G1A left side: 3x 15' applications (total 45') of 35% hydrogen peroxide gel (HP) (Lase Peroxide Sensy, DMC Equipment Ltd.); G1B right side: 3x35% HP gel with hybrid light activation (LED/Laser Diode, Whitening Lase II, DMC Equipments Ltd.) for 3x2', with an interval of 30" (7'30"), was totaling 22'30". Ten other patients received another two bleaching procedures: G2A left side: 3x15' applications (45') of 35% HP (Whiteness HP Maxx, FGM); G2B right side: 3x25% HP gel applications with hybrid light activation for 3x2', with an interval of 30" (7'30"), totaling 22'30". The color evaluation was performed with the Vita Easyshade (VITA) spectrophotometer after 24 hours, 1, 12 and 36 months. Two-way ANOVA testing revealed no statistically significant differences between the groups ($p < 0.05$). The Tukey's test ($p < 0.05$) for individual comparisons showed significant differences between the groups G1A ($F = 18.28$) and G2A ($F = 7.22$). The G1B group showed lower color variation ("E) at the times studied when compared to the other groups. The group that received a 35% Lase Peroxide Sensy activated with hybrid light source presented the same whitening effect but in half the time and more color stability over 36 months.

031 Comparative analysis in relation to color stability, sorption and solubility of different restorative materials

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Color stability (CS), sorption (SO) and solubility (SOL) of the materials Natural Look (NL), Herculite Classic (HC), Filtek Z250 (Z250), Natural Flow (NF), Tetric Flow (TF), Filtek Z350 Flow (Z350F), Vitro Fill (VF), Vitremer (V), GC Gold 1 (GC1), GC Gold 2 (GC2), GC Gold 9 (GC9), Vitro Molar (VM), Vitro Cem (VC), Ketac Molar (KM), Ketac Cem (KC) e Ionofil Plus (IP) were analyzed. Forty five (45) samples (n=5) for CS and ninety (90) for SO and SOL were made. For the SO and SOL tests, ISO 4049 specifications were followed. The samples for the Accelerated Aging test (AA) were exposed to UV radiation under condensation temperature (50°C), triggered at different cycles (4h of light emission and 4h of condensation) in a total of 36 cycles (=348h). The CS was verified under spectrophotometer using CIE L*a*b* software. The results were analyzed by ANOVA and Tukey (p<0,05). According to SO results, the VC (258,0) and VF (138,8) presented higher values under distilled water (353,0) (175,6). When comparing the environments, only KM achieved statistic difference. There were no statistic differences for SOL under acidic environment. Under distilled water, VC (226,30) was statistically different from GC1 (-51,40) and GC2 (-51,40). Material Z350F (10,47) presented the higher CS value, demonstrating statistic difference compared to the other materials. Conclusion is that for SO, materials VC and VF presented higher values, different to KM which had the highest value under distilled water. For SOL, only VC presented difference under distilled water. Z350F showed the highest color alteration.

033 Effect of laboratory test conditions on the behavior and properties of the composites

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Environmental conditions can alter the behavior and properties of composites. This study investigated the effect of heat and humidity in the pós-gel contraction (Shr), deformation of cusp (DC) and composite resins shrinkage stresses. Shr and DC were obtained with measurement equipment of contraction and extensometry. Heat and humidity were simulated through control adapted to Bellflower. Six groups (n10) were divided according to ambient conditions 3 (22°C and humidity 50-2250, 37° C and humidity 50-3750, 37° C and humidity 90-3790) and 2 types of resins (Charisma Diamond-CD and Direct-IPS Empress). To obtain the Shr, 4mm² specimens were polymerized with halogen light on bi-directional extensometer for 20s. Ten molars in each group with MOD cavities were restored and DC obtained by extensometry. Five were held in knoop indents depths of -4.5 0.5 mm from the cavity. The hardness data were used to calculate the modulus of elasticity (E). Shr and values and were used in finite element models (MEF). Two-way ANOVA and Tukey test (p) were used. (This paper concludes that heat and humidity interfere in Shr values obtained by mechanical testing, the DC and the stress distributions.

035 Effect of indirect restorative material on the transmittance of light emitted by curing units

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This study evaluated the influence of different types of restorative indirect materials (zirconium oxide and lithium disilicate) in transmittance of light emitted by different types of curing units. Discs with 1 mm thickness and 10 mm diameter were prepared from the indirect restorative materials: IPS e.max ZirCAD (Ivoclar Vivadent) and IPS e.max (Ivoclar Vivadent). A nano-fluorapatite ceramic (IPS e.max, Ivoclar Vivadent) was applied over the indirect materials with 1 mm thickness. Five different light curing units were tested: Arc Light II (Air Technologies), ColtoLux LED (Coltène Whaledent), Elipar Free Light 2 (3M ESPE), Astralis 10 (Ivoclar Vivadent) and Ultralume 5 (Ultradent), which was used in regular mode, only light blue and only violet. The irradiance through different restorative materials was measured using a spectroradiometer (DAS 2100, Labsphere Inc.) associated with a specific software (Spectra Suite v5.1, Ocean Optics Inc.). Data were analyzed by two-way analysis of variance and Tukey test (p<0,05). The plasma arc curing unit (Arc Light II) showed the highest irradiance values through different restorative materials, while the light source Ultralume 5, violet mode, showed the lowest irradiance values through different restorative materials. The zirconia allowed higher light intensity passed through it when compared to lithium disilicate. The indirect restorative materials tested showed distinct properties regarding the transmittance of light and the type of curing unit influenced the results significantly.

032 A simple method for improved bonding to zirconia

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The aim of this study was to develop a simplified method for bonding to yttria-stabilized zirconia ceramic. The method was based on the deposition of a silica reactive layer on the ceramic surface using Si and Zr alkoxide precursors followed by heat treatment for condensation of a SiO_x layer. The study had six steps: (i) preparation of solutions using four concentrations of tetraethyl orthosilicate (TEOS) and zirconium tert-butoxide (ZTB) diluted in hexane; (ii) preparing the zirconia substrate; (iii) application of the silica based treatments before (infiltration, INF) or after (coating, COA) full zirconia sintering; (iv) analysis by scanning electron microscopy and energy dispersive spectroscopy (SEM-EDS); (v) μ -Raman confocal spectroscopy analysis; and (vi) shear bond strength of resin cement to zirconia after storage for 24h, 3 months, and 6 months. An untreated (control) and a commercial reference groups were tested (Rocatec Plus, 3M ESPE). Quantitative data were analyzed using two-way ANOVA and Tukey's post-hoc test (5%). SEM micrographs showed that the zirconia surface was covered by nanoparticle clusters, while EDS and μ -Raman analyses confirmed that this layer was composed by silica. The bond strength results showed that most groups that received COA and INF silica-coating treatments presented a higher bonding potential than the control group. Almost all experimental groups had results similar to the commercial reference. Mixed failures were predominant. The storage time had no influence on the zirconia bonds.

034 Evaluating of capacity of masking and opacity of ceramic systems according to different resin cements

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This study evaluated the capacity of masking (CM) and opacity (OP) of two ceramics (feldspathic and lithium disilicate-reinforced), cemented with different resin cements, by calculating the color difference (ΔE) in the measurement of the coordinates L* a* b* reflectance on white and black background. Were made 15 sample of each ceramic discs with 10 mm diameter and 1.5 mm thick that were divided into 3 subgroups according to the type of cement (n=5): Ra, RelyX ARC, Rv, Variolink II, Ru, RelyX U200. The color analysis was done on a spectrophotometer. Two-Way ANOVA showed that for values of CM factor cement was statistically significant (P<0.002). There was no significance for the factor ceramic (P=0.737) and the interaction between the two factors (P=0.758). For OP, it showed significant for the type of cement (P<0.004). However, ceramic type (P=0.555) and the interaction between the two factors (P=0.893) were not significant. Tukey test ($\alpha=0.05$) showed that values of CM and OP showed significant differences between cements Ra and Ru, and Ru had higher CM and lower OP. The correlation between CM and OP was determined by Pearson correlation showed a coefficient r²=0.973, p<0.001, indicating that there is correlation between CM and OP. It was concluded that none of the materials tested were able to mask the black background, as ΔE values were above the limit of clinically acceptable ($\Delta E < 3$). CM and OP were affected only by the cement, and, Ru showed a lower capacity masking and lower opacity than Ra.

036 Immediate and delayed photoactivation of self-adhesive resin cements and retention of glass-fiber posts

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The aim of this study was to evaluate the effect of immediate and delayed photoactivation of self-adhesive resin cements (SARCs) on the retention of glass-fiber posts luted into root canals. Bovine incisors were endodontically treated and 9-mm-deep postholes were prepared. The fiber posts were luted using two SARCs (BisCem – Bisco, or RelyX Unicem clicker – 3M ESPE) or a regular (etch-and-rinse) resin cement (AllCem – FGM). Photoactivation was carried out 5 or 10 min after cementation. The root/post specimens were transversally sectioned 7 days after luting into 1-mm thick slices, which were submitted to push-out testing in a mechanical testing machine. Bond strength data were analyzed by two-way ANOVA and Student-Newman-Keuls' method ($\alpha = 0.05$). Immediate photoactivation resulted in the highest bond strength for Unicem, while BisCem had higher values when photoactivated after 10 min. For AllCem, immediate photoactivation yielded the lowest bond strengths, while there was no difference between 5 and 10 min of delay. In conclusion, the moment of photoactivation of resin cement might interfere with the intra-radicular retention of fiber posts depending on the resin cement used for luting.

037 Light transmission capacity of glass fiber post on self-adhesive resin cement polymerization

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This study evaluated the influence of translucency of glass fiber post (GFP) on activation of resin cement (RC) by the limitation of the light transmission. Three GFP were tested (Ex, Exact Post n.3; Wp, WhitePost n.3; and Dt,DT Translucent n.3) as regards the conversion degree (CD) of the RC (RelyX Unicem), simulating different depths of the root canal (2, 4, 6, 8, and 10 mm) depending on the light side lateral and apical of the root canal, and also the transmittance (Tr) of the incident light in the GFP. A Teflon Device (TD) composed of 5 disks allowed to measure depths of CD by FTIR method. The TD with side perforations in the depths allowed measuring the CD on the side of the GFP. The Tr was measured with light emission sensor Spectra Phys positioned on apical and lateral in the GFP, using high potency laser with wave length (WL) of 514.5; 457.9 and 405.0nm. The Apical CD on the depths 2 to 10 mm were: Ex: 46/44/36/37/30; Wp: 36/27/25/16/17; Dt: 32/28/31/26/29. The CD lateral was: Ex, 24/19/19/17/10; Wp:29/23/18/15/16; Dt: 23/23/18/17/12. The values Tr WL were 514.5 apical;457.9 and 405, 0nm: Ex, 0.6/0.3/0.2; Wp: 0.4/0.5/0.1; Dt: 0.6/0.3/0.1. Lateral Tr were: Ex, 0.15/0.17/0.16; Wp: 0.18/0.14/0.14; Dt: 0.08 0.09 0.09. The data were analyzed by Anova Factorial (3 x 5) and Tukey test. The apical CD was influenced significantly by the depth for Ex and Wp; and the lateral CD for all GFP. Ex resulted in statistically apical CD greater than Wp at all depths. It is concluded that the optical characteristic of translucency of the GFP significantly influences the properties of RC.

039 Influence of chemical structure of MDP co-monomers on the physicochemical properties of experimental adhesives

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The aim was to evaluate the effects of acidic phosphate monomers with different length and hydrophilicity of the spacer chain on the properties of all-in-one adhesives. To a base blend (control) based on HEMA, UDMA, BisGMA, TEGDMA, water, ethanol, EDMAB, camphorquinone and iodonium salt, it was added equimolar percentages of MDP co-monomers with spacer chains with different length and hydrophilicities: MEP (spacer chain with two carbons), MDDP (twelve carbons), MTEP (highly hydrophilic spacer chain) and CAP-P (intermediate hydrophilicity). The ultimate tensile strength (UTS) was assessed in dumbbell-shaped specimens. The degree of conversion was determined by FTIR. Disc-specimens were used to survey the water sorption (Wsp). Data was analyzed by ANOVA and Tukey's test ($\alpha=0.05$). The UTS (MPa) of MTEP (10.9), MDDP (10.4), and MDP (10.2) were significantly higher than MEP (8.4), Cap-P (8.1) and control (6.1); Control presented the lowest UTS ($p<0.05$). All monomers attained similar degrees of conversion (%) (MTEP-89.0; MDDP-91.5; MDP-89.0; MEP-82.7; CAP-P-87.2; Controle-83.5). Wsp ($\mu\text{g}/\text{mm}^3$) of MTEP (101.0) and Cap-P (85.5) were significantly higher than MEP (67.1), MDP (61.0), MDDP (59.4) and Control (62.7). It can be concluded that monomers with short spacer chain provide lower UTS; the water sorption was more influenced by the hydrophilicity than by the length of the spacer chain; the length and hydrophilicity did not influence the degree of conversion.

041 Adhesion to Zirconia: study of films deposition based on silica in the YTZ-P surface

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This study proposed to evaluate the influence of silica-based film coated on the Y-TZP (In-Ceram YZ, Vita) surface on the durability bond strength (BS) between ceramic and resin cement. Eighty Y-TZP blocks (4x4x3 mm) were obtained, included in acrylic resin and were divided into 4 groups according to the surface treatments (n=20): (TBS) tribochemical silica coating (Cojet, 3M/ESPE), (F-5) 5 nm SiO₂ film and silanization, (F-500) 500 nm SiO₂ film and silanization, and (F-500HF) 500 nm SiO₂ film + HF + silanization. Specimens of composite resin ($\theta = 3,25$ mm) were cemented with resin cement (Relyx ARC) to Y-TZP blocks. Half of the specimens of each treatment was tested 24 hours after adhesion (D- dry), and another half were subjected to the aging (A- storage for 90 days and 10,000 thermal cycles). The specimens were subjected to shear test (1mm/min). After debonding, the surfaces were analyzed by optical microscopy and SEM. Data were statistically analyzed for Kruskal-Wallis/Mann Whitney ($\alpha=0.05$) tests. The bond strength was influenced by the type of surface treatment, in conditions D ($p=0.0001$) and A ($p=0.0000$). Means (SD) for BS data (MPa) were: TBS/D: 10.2 (5.1)A; F-5/D: 12.0 (3.9)A; F-500/D: 14.9 (4.7)A; F-500HF/D: 4.1 (5.6)B; TBS/A: 9.1 (4.4)A; F-5/A: 7.8 (5.3)A; F-500/A: 0.1 (0.0)B; F-500HF/A: 1.4 (2.3)B. It was concluded that adhesion to zirconia can be enhanced if the surface to receive the 5 nm SiO₂ film deposition or be subjected to sandblasting with silica particles followed by silanization.

038 Evaluation of enamel wear due to etching and different bleaching gels

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This in vitro study aimed to evaluate the wear of enamel due to etching and different concentrations of bleaching gels after simulated tooth brushing. Fragments of standard bovine teeth were divided in half, one half determining the control area and another half the test area, subdivided and one side received etching prior to bleaching. One session (5x8') was held and activated with hybrid light source (LED blue or violet/Laser), determining 6 groups (n=10): Control; 35% Total Blanc Office; 35% Lase Peroxide Sense; 25% Lase Peroxide Sense, 15% Lase Peroxide Lite and 10% Lase Peroxide Lite (violet light). The specimens were stored in artificial saliva for seven days and then subjected to 100,000 cycles of simulated brushing. The surface wear after brushing and bleaching was determined by averaging (im) the three readings with a Rugosimeter Hommel Tester T 1000 in a function profiler. Two criteria ANOVA and Tukey testing ($p<0.05$) were employed. The results demonstrated a significantly lower wear in the control group, and significantly higher wear for the 25% Group. The presence of acid caused greater wear in all groups except in the Total Blanc Office group. The etching prior to the bleaching treatment increased the wear values. All gels caused increased wear and the 25% gel was the most aggressive.

040 Effect of the moment of fiber post cutting on post retention to root canal

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This study investigated the effect of the moment of fiber post cutting on push-out bond strength. Glass-fiber posts were luted into 60 incisor roots using conventional resin cement RelyX ARC (ARC) or self-adhesive cement RelyX Unicem (UNI). The posts were cut prior to cementation, immediately after the luting, or after building up the core (n = 10). After storage for 24 h, each root was sectioned into 6 slabs, which were subject to a compressive load (0.5 mm/min) until the post was dislodged. Data (n = 10) were submitted to two-way ANOVA and Tukey's test ($\alpha = 0.05$). The moment of fiber post sectioning did not affect the bond strength for UNI, whereas immediate cutting reduced the bond strength for ARC. In conclusion, the moment of fiber post cutting can influence post retention to root canal.

042 Development of experimental 3-step dental adhesives formulated with BAPO and PPD as photoinitiator systems

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The aim of this study was to evaluate the dentin microtensile bond strength (M_{ts}), dentin permeability (PerD), degree of conversion (GC), flexural strength (RF) and elastic modulus (ME) of experimental adhesives formulated with alternative photoinitiators (Camphorquinone – CQ, PPD and BAPO). Thus, the adhesives contained BisGMA/HEMA as organic matrix, with different photoinitiator content: G1- CQ/amine, G2- PPD/amine, G3- CQ/PPD/amine, G4- BAPO/amine, G5- BAPO, G6- CQ/BAPO/amine, G7- PPD and G8- the hydrophobic resin of Adper Scotchbond Multi-Purpose as control. For the M_{ts}, 70 molars were restored and beams (1 x 1mm) were made and the M_{ts} was performed after 24h using the machine EZ-Test (0.5mm/min). The PerD was measured by the dentin sealing method, using a dentin permeability device. For the GC, RF and ME, specimens (7 x 2 x 1mm) were made and evaluated by FTIR (GC) and then submitted to the three-point bending test for the measurement of RF and ME. For all tests, the adhesives were photoactivated by LED for 40s. Data were submitted to ANOVA and Tukey's test ($\alpha = 0.05$). G4, G5 and G8 showed M_{ts} values similar to G1. In relation of the PerD, there was a higher dentin sealing for the groups G4 and G8 (95.8% and 91% respectively). Evaluating GC, RF and ME, the groups containing BAPO presented the higher means. Camphorquinone can be replaced by BAPO and PPD in hydrophobic adhesive resins, since the alternative photoinitiator systems promote higher bond performance, dentin sealing and physical properties.

043 Bleached enamel susceptibility to coffee and sports drink staining at different intervals elapsed from bleaching

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The aim of this study was to analyze the enamel susceptibility to coffee and sports drink (Gatorade) staining at different time intervals post-bleaching, using photo-reflectance methodology. It was used the in-office bleaching technique with 38% hydrogen peroxide (38%HP). The buccal surfaces of seventy-two bovine incisors were prepared for initial measurements using a spectrophotometer, and after selection of the samples, they were divided into 9 groups (n = 8). All samples (except those of control group 3) were stained with sports drink or coffee in the time intervals: after 1 hour, 12 hours and 24 hours from the last session of bleaching and then stored in artificial saliva. The measurements were taken: before treatment; immediately after bleaching and after immersion in coffee or Gatorade, according to the experimental groups. After exploratory analysis, data from experimental groups were analyzed using mixed models for repeated measures and Tukey-Kramer test. The level of significance was set at 5%. It was observed that the 38%HP was effective to increase reflectance values of the bleached samples, which were more susceptible to staining than non-bleached samples. Coffee and Gatorade lead to dental staining, but the results were dependent on the time post bleaching that the samples were exposed to staining.

045 Influence of radiation and dentin pretreatment with doxycycline on dentin bond strength using different adhesives

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The purpose of this in vitro study was to evaluate the effect of radiotherapy on dentin bond strength mediated by adhesive systems, with or without doxycycline. The occlusal surface of 60 human third molars were worn and divided into 3 groups (n=20): Control group, not submitted to radiation; Group (RtRe) underwent radiotherapy before being restored, and Group (ReRt), underwent radiotherapy after being restored. In half of the samples were used Adper Scotchbond MP, 3M, and half Clearfil SE, Kuraray, with or without the application of doxycycline. In the submitted to radiation samples, it underwent 60 Gy in fractionated doses of 2Gy/day, for 6 weeks. A resin block of Z250, 3M, 5 mm thickness was attached to the tooth, and light cured for 40 seconds. After 24 hours at 37 ° C, the samples were sectioned perpendicular on union area to obtain beams with 1mm² area and submitted to microtensile bond strength test in a speed of 0.5 mm/min. The data were submitted to ANOVA and Tukey's test (5%). The values of bond strength, MPa, Adper Scotchbond MP (25.5 ± 11.1) and Clearfil SE (27.6 ± 9.1) were not statistically different from each other. The use of doxycycline (21.7 ± 7.6) significantly reduced bond strength compared to groups without doxycycline (33.6 ± 8.6). Control group (30.5 ± 10.9) and ReRt group (29.2 ± 10.4) were significantly higher than the RtRe group (23.1 ± 7.2). The radiation of the samples prior to the composite restoration procedure significantly decreased microtensile bond strength. The use of doxycycline significantly reduced bond strength.

047 Influence of nanotube growth on the surface of the CPTi dental implant: characterization and degree of wettability

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The osseointegration of dental implants is dependent of the material used, the manufacturing process, drawing, machining conditions, the type of bone, surgical technique, and features of the prosthesis to be applied on the implant and loading conditions during chewing. Above is strongly dependent of the interaction between cells and the surface of the implant. Titanium oxide nanotubes have been the subject of recent studies regarding their ability to promote differentiation of various cell lineages. We evaluated the wetting of layer nanotubes formed on titanium oxide (TiO₂) prepared by anodic oxidation on the surface of commercially pure titanium implants (CP Ti) ASTM F67/Grade 4. Nanotubes were grown by anodization using glycerol DI-H₂O (50-50 v / v) + NH₄F (0.5-1,5% / 10-20V) for 3 hours at 37 ° C. After the formation of nanostructures the surface topography was evaluated measuring the amount, height and diameter of the nanotubes by scanning electron microscope of field emission (FE-SEM). The wettability was evaluated by measuring the contact angle obtained in anodized surface using Goniômetro300F1 (Ramé Inst.Co-Hard) mode sessile drop / 5 drops / ml. the control group not used anodized surface. The results showed values of 39.1 ° for nanotube surface and 75.9 ° for control surface. It was concluded that the growth of nanotubes was effective in the experimental conditions used and allowed a higher wettability and lower the surface tension of titanium.

044 Evaluation of disinfection with electrolyzed acid water of elastomers

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The aim of this study was to evaluate the efficacy of electrolyzed acid water (EAW) in the disinfection of elastomeric impressions. EAW was produced by electrolyzing an aqueous solution of sodium chloride, with pH reaching between 2 and 3 and a redox potential higher than 1100mV. Two impression materials were used: vinyl polysiloxane (Xtreme Hydro) and polyether (Impregum). 10x10x2mm specimens were sterilized in hydrogen peroxide plasma and transferred into a 24-well plate. Biofilms of *Staphylococcus aureus* were grown on these specimens for 24 hours at 37°C. After, the test specimens (n=3) were immersed for 10 minutes in the following solutions: sterile saline solution (negative control), 2% glutaraldehyde (positive control), and acid electrolyzed water. The biofilm present in each sample was aseptically collected, diluted and aliquots of the dilutions were inoculated onto blood agar. After 24 hours of incubation at 37°C, the number of bacterial colony forming units in each of the test specimens was counted, and the results expressed in UFC/ml. Data were analyzed using one-way ANOVA e Tukey multiple comparisons at a significance level of 5%. The results showed that there was growth in the specimens immersed in sterile saline. There was no bacterial growth in specimens immersed in glutaraldehyde and electrolyzed acid water (p<0,001). It was concluded that electrolyzed acid water was efficient in the disinfection of the elastomers evaluated.

046 Effect of grinding with resin-bonded diamond discs and diamond burs on the mechanical behavior of Y-TZP ceramics

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This study compared the effects of grinding on Y-TZP ceramic performed by disc and diamond burs on the micromorphology of the surface, phase transformation (t - m), biaxial flexural strength and structural reliability (Weibull analysis). 170 discs (15 x 1.2mm) YZ (Lava) were made and divided into 5 groups, considering the surface treatment employed: without treatment (Ctrl, as-sintered) extra-fine diamond bur (25um, Xfine), diamond disc 600 Grit(25um, D600), coarse diamond bur (181um, Coarse) and diamond disc 120 Grit (160um, D120). Grinding with diamond burs was executed with a Contra-Angle Multiplier (T2 Revo,Sirona) and a straight hand piece at low speed (Kavo), while for the resin-bonded diamond discs (Allied) a Polishing Machine (Ecomet, Buehler) was employed, both under water cooling. Abrasion with diamond burs developed different micromorphological aspects (deeper scratches) if compared to diamond discs. Higher grit sizes of the grinding tool resulted in an increase at monoclinic content. There was no statistically difference for the characteristic strength values between treatments with lower grit sizes (D600-1050,08 and Xfine-1171,33) which were statistically higher than Ctrl (917,58). As for higher grit sizes it was observed a statistically difference (Coarse-1136,32>D120-727,47) being D120 the lowest statistically values. Weibull Modules were statistically similar. Thus for the treatments studied, under the conditions evaluated, only for lower grit sizes, grinding with diamond discs and burs promoted similar effects.

048 Synthesis, characterization and photocuring of siloxane-oxirane monomers

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The aim of this study was synthesize, characterize and photopolymerize an alternative monomers for use in dentistry. Three siloxane-oxirane monomers were synthesized and the products conversion was followed by Fourier-transform infrared spectroscopy. The products obtained were characterized by ¹H and ¹³C NMR and evaluated for viscosity and refractive index. The polymerization was evaluated by formulating of two experimental photoinitiation systems which varied for the presence of 1,2 ethanediol. A ternary system with camphorquinone (CQ), ethyl 4-dimethylaminobenzoate (EDAB) and diphenyliodonium hexafluorophosphate (DPI) was used as control. The degree of conversion was accessed by FTIR and DSC-PCA. The NMR confirmed the synthesis success with 75, 87 and 55% yield for the monomers synthesized. Moreover, the presence of 1,2 ethanediol increase the degree conversion of the siloxane-oxirane monomers. This study showed simple and effective way to synthesize siloxane-oxirane monomers with a high potential for application in dental materials.

049 Effect of a bleaching gel on pulp cells differentiation

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The effects of a bleaching gel with 17.5% hydrogen peroxide (HP) on pulp cell differentiation were assessed. Enamel/dentin discs individually adapted to transwells devices were applied on odontoblast-like MDPC-23 and human dental pulp cells (HDPC) previously seeded in wells. The bleaching gel was applied or not on enamel for different periods, giving rise to the following groups: G1 – no treatment (negative control); G2 – 3x15 min; G3 – 1x15 min; G4 – 1x5 min. Cell viability was assessed immediately after bleaching. Mineralized nodule (MN) formation and alkaline phosphatase activity (ALP) were evaluated at 7, 14 and 21 d post-bleaching periods (Kruskal-Wallis and Mann-Whitney; $\alpha=5\%$). For HDPCs, significant reduction on cell viability was observed in G2 (86.1%), G3 (76.6%) and G4 (65.1%). Increase on ALP activity with time was observed for all groups with no difference compared to G1. MN deposition in G2 was significantly lower than in G1 in all periods evaluated. However, no significant difference occurred when G3 and G4 were compared to G1 at 21 d. Significant reduction on MDPC-23 viability was observed in G2 (33%) and G3 (25.4%). The ALP activity observed in bleached groups was significantly lower than in G1 at 7 d, with significant increase at 14 and 21 d. No difference on MN formation occurred when G3 and G4 were compared to G1 at 14 d, and even for G2 at 21 d. It was concluded that pulp cells damaged with 17.5% HP gel maintained their differentiation ability up to 21 d post-bleaching period.

051 Influence of antioxidants incorporation on adhesive systems performance and durability of the bonded interface

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The aim was to evaluate the effect of antioxidants (AO) incorporation into adhesive systems (AS) on bond strength (iTBS), nanoleakage (NA), degree of conversion (DC) and polymerization rate (RP). 144 human premolars were used and divided into groups according to the AS (Adper Single Bond 2-SB, Clearfil SE Bond-CS or Adper Easy Bond-EB) and AO incorporation (no antioxidant-CO, Ascorbic Acid-VC, α -Tocopherol-VE and Quercetin-Q). The samples were restored with Filtek Z350XT and stored for 24 hours in distilled water or for 6 months under simulated pulpal pressure previously to obtain sticks for μ TBS testing and qualitative NA analysis. The μ TBS values (MPa) were analyzed using ANOVA and Tukey's test, at $\alpha 5\%$. For DC and RP, the data were plotted and a curve was obtained by non-linear regression. In 24h, SBVC (63) and SBVE (56) showed higher iTBS than SBVC (40) e SBQ (31). CSVC (69) showed higher μ TBS than CSVC (56), CSVE (41) and CSQ (40). EBCO (48), EBVE (41) e EBQE (46) showed higher μ TBS than EBVC (14). In 6 months, only SBVC (50) showed iTBS decreased (SBVC 39; SBVE 55; SBQ 38; CSVC 69; CSVC 61; CSVE 57; CSQ 69; EBCO 51; EBVC 30; EBVE 58; EBQ 44). In general, the NA decreased over time using AO while the inverse was observed in the CO groups. Less DC was obtained in AO groups compared to their CO for SB and EB and polymerization kinetics revealed a reduced RP for AS with AO. In conclusion, the AO performance varied according to the AS and the AO incorporation did not increase the iTBS compared to CO groups, however, was able to maintain or increase the initial iTBS.

053 Influence of light exposure protocol on characterization of methacrylate resin-composite by dynamic mechanical analysis

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The aim of this study was to evaluate the degree of conversion (DC) and to identify the viscoelastic properties storage modulus (E'), loss modulus (E''), $\tan \delta$ and glass transition temperature (T_g) of a microhybrid resin-composite light-activated with four different protocols. A Filtek Z250 (3M ESPE) shade A3 was inserted in a Teflon mold (1.0 X 5 X 21mm) and light-activated according to the following light exposure protocols: QTH (XL) 500 mW/cm² X 38s, LED (S) 1000 mW/cm² X 19s, LED (HP) 1400 mW/cm² X 14s, LED (PE) 3200 mW/cm² X 6s, all set up to deliver 19 J/cm². Dynamic Mechanical Analysis (n=3) was performed in single cantilever clamped mode. DC (n=5) was measured by FTIR on top (T) and bottom (B) surfaces and the data was submitted to a split-plot 1-way ANOVA. There was a significant effect for surface; T showed higher DC than B. Light exposure protocols did not affect DC. Viscoelastic properties (E' , E'' , $\tan \delta$, T_g) were not affected by light exposure protocols. It could be concluded that polymer structure was not influenced by the light exposure protocols. Light exposure protocols delivering 19 J/cm², applied in continuous mode with at least 500 mW/cm² results in polymers with similar crosslink density.

050 Action of different monomers on the degree of conversion, optical and physical properties of experimental composites

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The aim of the present study was to evaluate the degree of conversion (DC), resistance to degradation by hydrolysis and the optical properties of experimental composites formulated with different monomers. Groups were formulated containing monomers BisGMA, Bis-EMA, Bis-EMA 30, UDMA and UDMA-modified (FIT 852) in a proportion of 70%. To this mixture was added 30% diluent monomer (TEGDMA) and 60% of inorganic particles by final weight, and a photoinitiator system (CQ + EDMAB). The optical properties were evaluated using a spectrophotometer, applying the CIELab parameter. The polymerization kinetics and DC, were evaluated from the ATR-FTIR technique. Absorption and solubility were analyzed from adaptation of standard ISO4049. The results were submitted to ANOVA and Tukey 95%. Result: The group formulated with Bis-EMA 30 had the highest DC, but with a slower onset of polymerization compared to the others groups. Groups with UDMA and Bis-EMA showed less degradation. As for the optical properties, the groups formulated with UDMA and Bis-EMA had lower color changes. Bis-GMA generated materials with minor changes in brightness. Based Formulations of Bis-EMA and UDMA showed less degradation by hydrolysis and color change (ΔE). The BIS-GMA showed lower brightness variations. Generally, Bis-EMA/TEGDMA provided the best mixture.

052 Optic behavior of ceramic composites through the Kubelka-Munk method

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The objective of this work was to determine the absorption (K) and the scattering (S) coefficients of three ceramic composites as a function of thickness, through the Kubelka-Munk method. Three ceramic composites were used (IA-alumina/glass; IS-spinell/glass and IZ-alumina/zircônia/glass). Ten discs were prepared for each material and then serially worn out for optical analysis, in the following thickness: 2.0; 1.5; 1.0 e 0.5 mm. Using a spectrophotometer, reflectance values were obtained from the materials on two different backgrounds (black and white), which were used for the calculation of the materials coefficients (K and S) by the Kubelka-Munk model. Spectral graphs were constructed correlating the values of K and S as a function of wavelength (λ). All three composites have showed 0 as minimum value of K (mm⁻¹) and maximum values of 0.7, 0.2 and 3.0 for IA, IS and IZ respectively. This coefficient increased with decreasing λ for all materials. The coefficient S (mm⁻¹) has decreased with decreasing λ for all the materials and showed values ranging from 1.0 to 7.5 for IA, from 2.5 to 4.5 for IS and from 5.0 to 80 for IZ. Within the range of visible light wavelengths, all the materials showed scattering values (S) significantly higher than the absorption values (K), indicating that the optical behavior of these ceramics is regulated by the scattering phenomenon.

054 Fracture load, mechanical fatigue and finite element analysis of glass fiber posts

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This study evaluated fracture resistance (FR), fatigue and stress distribution by finite element analysis (FEA) of glass fiber posts with different coronal diameters. Double-tapered posts (White Post DC, FGM) with different diameters were tested (n=20): 0.5 (1.4mm), 0.5E (1.8mm), 1 (1.6mm), 1E (2mm), 2 (1.8mm), 2E (2.2mm), 3 (2mm) and 4 (2.2mm). Each specimen was inserted in a PVC cylinder that was filled with epoxy resin. Ten posts of each group (n= 10) were tested for FR (45°) and the other ten (n= 10) were submitted to mechanical fatigue (3,000,000 cycles, 45°, 50N, 4Hz and 37 °C). The eight types of posts were modeled in 3D finite elements for stress distribution simulation and the load application was the average FR of each group. Only 0.5 group did not survive mechanical fatigue. One-way ANOVA showed that FR of posts with the same diameter was not different. According to failure analysis, 95% of specimens failed due to shear stress. FEA showed similar values of shear stress in relation to the real values calculated. In relation to FR, larger posts had better performance compared to thinner posts. Due to the failures observed, more studies are necessary for evaluation of new configurations of fiber posts to minimize the effects of shear stress.

055 Effect of specimen positioning and loading on microshear bonding outcomes: a non-linear finite element analysis

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This study compared the effect of different testing parameters on the stress distribution of microshear specimens. Three-dimensional models consisting of ceramic plates with two resin cement cylinders were generated. The distances between the two cylinders were varied (1.0, 1.5, 2.0, 2.5, 3.0 mm). A 10 N load was applied on one cylinder using a 0.2 mm diameter orthodontic-looped wire in three different directions: Y (perpendicular to adjacent cylinder), X+ (towards adjacent cylinder) and X- (away from adjacent cylinder). Additional three-dimensional microshear models with one resin cement cylinder were loaded (10 N) by: large stainless-steel tape (LT), small stainless-steel tape (ST), chisel (CH), orthodontic-looped wire (OW), or customized chisel (CC). Stress concentration arising from the loaded cylinder reached the adhesive region of the adjacent non-loaded cylinder for 1.0, 1.5 and 2.0 mm models for all loading directions. When 3.0 mm apart, no stress elevation was found at the non-loaded cylinder. For the CH and OW loading, tensile stresses were more dominant at the interface. The model loaded with the CC scheme presented lower tensile and shear stresses. A predominance of shear stresses was verified for the ST and LT loading systems. A 3.0 mm separating space between cylinders is a safe distance to avoid unwanted stress to reach the non-loaded cylinders. Loading the cylinders perpendicularly with straight-aligned wire appears the most suitable condition. Loading specimens with small (ST) and large (LT) stainless-steel tapes seem the better alternative.

057 Surface roughness of composite resins composition and morphology of filler particles

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The aim of this study was to analyze the morphology and composition of filler particles of five composites and the surface of these materials in scanning electron microscopy (SEM) and rugosimeter after finishing / polishing procedures (FP) and after 6 months of storage and brushing (SB). Twenty discs were prepared (2mm thickness and 5mm diameter) from the materials: Z100 (Z1, 3M) Z350XT (Z3, 3M), Estelite Sigma (ES, Tokuyama), Beautiful II (BE, Shofu) and Dyad Flow (DF, Kerr). The Sof-Lex (3M) polishing system was used for the FP. After the FP half of each resin sample was stored in distilled water (37° C) for 1 week before rugosimeter analysis (SE 1700, Kosaka) and SEM (5600LV, JEOL). Other half was subjected to SB (30,000 cycles) and stored in distilled water for 6 months (n=5). Surface Roughness data (Ra, µm) were analyzed by ANOVA two way and Tukey's test (5%). For particle composition and morphology analysis energy dispersive X-ray (Link ISIS) and SEM were used. At the evaluation of the initial roughness, the materials showed no statistical difference. After SB, resins ES, BE and DF showed a higher Ra. The resins showed particles with different size and shapes. All particles contain silica. Z1 and Z3 presented zirconia in the composition, while DF presented sodium. SB increases the roughness depending on the material. Resins vary in the size and particles' morphology. Silica was detected in all materials.

059 Influence of cement layer thickness and variation of temperature in the mechanics of ceramics fragments

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Considering that the thickness of the resin cement and the variation of oral temperature are factors influencing the success of conventional ceramic restorations, the aim of this study was to analyze, through the finite element method, the behavior of the layer of cement and ceramics, varying the thickness of this layer and the temperature in a restoration with ceramic fragment. After obtaining the set of microtomography images of a maxillary central incisor, the tooth model was developed in the program Mimics. From this model (M), five models were prepared in the SolidWorks program simulating the restoration of the angle distoincisor with the use of a ceramic fragment, varying the thickness of the cement layer: M1 - 0 mm in thickness, M2 - 50 µm to the fullest extent; M3 - 50 µm and 100 µm in margins distance; M4 - 50 µm with the banks and 200 µm distance, and M5 - 100 µm with the banks and 200 µm distance. For all models were simulated by 4 temperature changes similar to the changes that occur in the oral cavity (5, 20, 37, and 50 °C). The finite element mesh was generated in the program Ansys Workbench. The maximum principal stress in the fragment models M1 to M5 in temperature was 5 °C (MPa): 7.81, 7.82, 27.3, 27.4 and 1.83, respectively. To 50 °C, the values were 35.6, 35.6, 87.6, 79.2 and 25.9, respectively. The fragment had higher tensile stress as increased temperature and higher values of compressive stress with decreasing temperature, whereas the highest stress values were located on its banks.

056 Effect of the bur grit on the flexural strength of leucite-reinforced glass-ceramic

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The aims of this study were: 1) to determine the biaxial flexural strength (BFS) of a CAD/CAM leucite reinforced glass ceramic cutting by different diamond bur grit sizes; 2) to analyze the correlation of BFS and the roughness of the cut surface. A hundred four (104) tabs (12 X 10 X 1.5 mm) were obtained from CAD/CAM ceramic blocks (IPS Empress CAD®, I12). The upper side of the tabs were polished and divided into 4 groups (n = 26). The lower side of the tabs were cut with tapered diamond burs (#4138, KG Sorensen) according to the different grit size groups: extra-fine (FF), fine (F), medium (M) and coarse (C). Roughness parameters (Ra, RyMáx) were measured and the tabs were kept dry for 7 days. The flexural test was carried out according the ISO 6872 and the BFS was calculated. The BFS, Ra and RyMáx data were subjected to the Kruskal-Wallis analysis of variance and post-hoc LSD test. Weibull analysis was used to compare characteristic strength and Weibull modulus (reliability). Regression analysis for Ra, RyMáx vs. BFS was performed. The grit size was found to have a negative effect on the ceramic BFS (116,71 MPa for FF and 82,65 MPa for G). The correlation (r) between surface roughness and BFS was 0,78 for RyMáx and 0,73 for Ra. The diamond grit size has a significant negative effect on BFS of leucite-reinforced glass-ceramics. This suggests that the cut of sintered glass-ceramic should be done or maybe completed using burs with the finest grit possible, in order to minimize the roughness of the internal surface and maximize the structural strength.

058 Influence of different resin cements on the optical properties of ceramics: Evaluation by means of spectroscopy

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The aim of this in vitro study was to evaluate the color of two ceramics (feldspathic and lithium disilicate-reinforced), cemented with different resin cements by calculating the color difference (ΔE) by measuring the coordinates L * a * b * of transmittance. It was made 16 discs of each ceramic with 10 mm diameter and 1.5 mm thick. Each group was randomly divided into 03 subgroups according to the type of cement used (n = 5): RV, Variolink II, Ra, RelyX ARC; Ru, RelyX U200. A disc of each ceramic was evaluated without being cemented, which is the control sample. After preparation, the samples were stored in a dark bottle and dry at room temperature for 24 hours. Subsequently, the samples were subjected to the test in a spectrophotometer with a wave length (θ) of 360-740. The data of ΔE obtained for each group were analyzed using Analysis of Variance Factorial (2 x 3) (α = 0.05). There was no statistical significance for any of the factors analyzed: ceramic (P = 0.283), cement (P = 0.139), and interaction among ceramic and cement (P = 0.912). Knowing that the transmittance is the fraction of light that passes through the sample and the more a material is translucent, the greater the fraction of transmitted light, one can conclude this work that light passed through the materials tested similarly, and both ceramics evaluated and resin cements showed similar transmittance optical property.

060 Cationic polymer [QAMP]: structural elucidation and antimicrobial potential after incorporation into adhesive system

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The aim of this study was to elucidate the chemical structure of a new quaternary ammonium methacrylate polymer [QAMP] by nuclear magnetic resonance spectroscopy [NMR] for incorporation into adhesive systems in order to provide antimicrobial effectiveness of these materials. The antimicrobial potential of QAMP was assessed as minimal inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) against *Streptococcus mutans* after incorporation into Clearfil™ SE Bond, Clearfil™ Protect Bond with the standard antimicrobial [MDPB] and Clearfil™ SE Bond without QAMP were used as controls. The release of quaternary ammonium compounds from the adhesive systems after 1, 7, 14, 21, and 30 days were also carried out. Considering 1H NMR spectrum of QAMP, 1H chemical shifts of methyl and methylene groups attached to the quaternary ammonium were assigned at δ 3.18 and 3.39 ppm, respectively. Regarding the 13C-DEPT NMR spectrum, QAMP showed a deshielding effect on its methyl groups and shifted the peak (δ 45.8 ppm) assigned to the methyl groups adjacent to nitrogen of Eudragit™ E100 to downfield (δ 50.9). MIC/MBC were 20, 10 and 80 µL.mL⁻¹ to Clearfil™ SE Bond QAMP, Clearfil™ Protect Bond and negative control, respectively. Clearfil™ SE Bond containing 5% QAMP showed a cumulative release of quaternary ammonium compounds of only 5.1% while Clearfil™ Protect Bond released 47.2% of MDPB. These data confirm the development of a new quaternary ammonium polymer with antimicrobial effect for adhesive systems.

061 Influence of 3 or 4 points bending test on the elastic modulus of orthodontic wires

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The aim of this study was to evaluate the influence of 3 or 4 point bending test and wire diameter on stainless steel (SS) orthodontic wires elastic modulus (E). 10 SS wires (Morelli®), 45mm length, of each diameter (0.016" or 0.020") for each test configuration (3 or 4 point bending) were used. E was calculated from the linear portion of stress/strain graphics obtained from tests. E results were analyzed by factorial ANOVA 2 x 2 and Tukey's test (alpha=0.05). Elastic modulus of 0.016" and 0.020" wires obtained from 3 point bending test showed no statistical differences, 174,37(9,83)GPa and 178,45(9,07)GPa, respectively, and they were statistically lower than those obtained from 4 point bending test, 284,07(24,64)GPa to 0.016" wire and 241,39(14,17)GPa to 0.020" wire, statistically different with each other. It could be concluded that the wire diameter did not influence the E on 3 point bending test while it did on 4 point bending test, also, the test configuration influenced the E, so that 4 point bending presented higher E values.

063 Influence of weakened cusp, composite resin and loading presence on behavior of premolars: Laboratory and FEA

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The study evaluated the influence of weakened cusp, composite resin type and axial loading presence, on the cusp deformation (CD), marginal integrity (MI), fracture strength (FS) and stress distribution of restored teeth. It was selected 40 maxillary premolars (MP), which received Class II MOD cavities, and 20 of these teeth had both weakened cusps (V/P). Were established 4 groups (n = 10) according to the factors under study: resin (Z250/Venus Diamond-VD), weakened cusp (with/without), and presence/absence of axial loading (100N). The specimens were submit to strain gauge test, thermal and mechanical cycling, epoxy resin replicas confection for analysis of MI using SEM, and FS testing. A selected tooth was scanned and 8 finite element (FE) models were generated, representing the same factors of the laboratory testing. To characterize the shrinkage stress, post-gel shrinkage of the resins were measure by means of strain gauge method and the elastic modulus was calculated by micro hardness knoop testing. The laboratory results showed that the presence of weakened cusps not affected the CD, however decreased MI and FS. The Z250 composite resin generated higher value for CD and smaller to MI and FS. The compressive load decreased CD, but according FE, the stress had a synergistic effect, greatly increasing its concentration in the marginal interface. It was concluded that the type of resin, the presence of weakened cusp and compressive loading, it can influence the biomechanical behavior of teeth with large composite restorations.

065 Synthesis, characterization and sintering Y-TZP/TiO₂ depending on the amount of TiO₂ and the sintering temperature

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The objective of this work was to synthesize, characterize and sinter the composite Y-TZP/TiO₂ varying the amount of TiO₂ and the sintering temperature (ST). The synthesis of the composite Y-TZP/TiO₂ occurred with the precursors (zirconium oxychloride, titanium chloride and yttrium chloride) by coprecipitation technique with ammonium hydroxide, the following groups were produced: Z (100% Y; TZP), ZT10 (90% Y-TZP and 10% TiO₂) e ZT30 (70% Y: TZP and 30% TiO₂). The powders produced were characterized by X-ray diffraction (XRD), particle size (PS) by laser diffraction, gas adsorption for evaluation of specific surface area (SBET) and scanning electron microscopy (SEM). Discs (15 mm in diameter and 2.5 mm in thickness) were pressed (65 MPa) and sintered at 1400 °C or 1500 °C for 2 hours with subsequent measurement of the density (D) by the method of Archimedes and microstructural analysis by SEM. The SEM and PS showed that the powders are formed of agglomerates and their average size (µm) ranged as follows: Z (0.5 e 5.4), ZT10 (0.7 e 17.6) e ZT30 (0.7 e 11.4). The SBET values of the powders (m²/g) were: Z (47.4), ZT10 (42.3) e ZT30 (58.0). The XRD analysis showed peaks of tetragonal and monoclinic zirconia in all groups. All the discs have a density exceeding 94% and SEM showed that the higher ST (1500 °C) and the greater amount of TiO₂ favored grain growth. The amount of TiO₂ affected SBET and PS of the powders. ST did not affect D. The grain growth was higher in the samples sintered at 1500 °C and TiO₂.

062 Effect of bur set and machining order on the surface roughness of a sintered leucite glass ceramic

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Considering that machining can produce defects at the ceramic surface, the aim of this study was to evaluate the effect of the bur set and machining order on the surface roughness of leucite glass ceramic discs obtained by a CAD/CAM system (Cerec inLab ® MC XL). Six bur sets (A-F) were used for the machining of 155 IPS Empress CAD® ceramic blocks (1 disc for each block). Twenty-eight discs (n=28) were machined by the first 5 bur sets (A-E). The last bur set (F) was used for the machining of the remaining 14 blocks (n=14). A total of 144 discs had their surface roughness measured in a contact profilometer (Ra and Rz). Spearman coefficient indicated a significant, moderate to strong, correlation between machining order and Ra (rsRa = -0.66) and Rz (rsRz = -0.73). Therefore, the F bur set was excluded from the variance analysis. Kruskal-Wallis analysis showed a significant difference in Ra and Rz values obtained from the first five bur sets (p<0,05). The Rz values varied from 7.71 ± 1.77 µm for the C bur set to 9.33 ± 1.16 µm for the B bur set (statistically higher than those obtained for the C and A bur sets). In conclusion, different values of roughness can be expected even for identical burs, in geometry, composition and manufacturing. In addition, the surface roughness seems to reduce according the number of specimens produced by the same bur set increases.

064 Effect of immersion in different alcoholic beverages on the roughness and microhardness of composite resins

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The purpose of this study was to evaluate in vitro the microhardness and surface roughness of composite resin submitted to cycling 30 days in alcoholic solutions. Three composites were selected for the study (Durafill / Kulzer, Z250 XT and Z350 XT). 120 samples were prepared for each material and after polymerization the samples were stored in 100% relative humidity for 24 h at 370C. The surface roughness was measured with atomic force microscope then the initial microhardness analysis. The samples were divided into four groups (n = 30) according to solutions: G1-artificial saliva; G2 - Beer, G3 - Vodka, G4 - Whisky. The immersion were performed 3X daily for 30 days. Analysis of surface microhardness and roughness were repeated after 30 days of immersion. The values of roughness and hardness were tested using ANOVA one way, complemented by Tukey's test at a significance level of 5%. The results of surface roughness revealed that all composites analyzed showed increased roughness after 30 days soaking in beer and whiskey. The results showed significant reduction in the surface hardness of the resins analyzed after immersion in alcoholic solutions for 30 days and more significant for composite Durafill. Based on the results it was observed that the surface degradation of composites depends on the composition, immersion time, alcohol content and pH of the solutions.

066 Effects of antioxidants application time on bond strength of enamel after bleaching

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This study evaluated the effect of antioxidants application time on bond strength of enamel after enamel bleaching. Were obtained enamel samples from 70 third molars and randomly divided into 7 experimental groups. G1 – Bleached with 10% camabide peroxide (CP); G2 – CP + 10% sodium ascorbate gel (SA) for 15min; G3 – CP + SA for 30min; G4 – CP + SA for 60min; G5: CP + 10% green tea gel (GT) for 15min; G6 – CP + GT for 30min; G7 – CP + GT for 60min. The CP was applied onto the enamel surface for 6 hours, every day for 14 days. The SA was applied in the groups 2, 3, and GT in the groups 5, 6 and 7 according the applications time as described above. Immediately after treatment, the specimens were bonded with Adper Single Bond 2 and Filtek Z350 XT. The specimens were sectioned perpendicular to the adhesive-tooth interface and microtensile bond strengths were measured with a universal testing machine. Fracture mode analysis of the bonded enamel surface was performed using scanning electron microscopy. The data were statistically analyzed by two-way ANOVA and Dunnett's test (á = 5%). The means (standard deviation) were: G1 – 23.29(3.20); G2 – 25.18 (3.95); G3 – 26.41(5.40); G4 – 30.17(4.46); G5 – 26.63(3.43); G6 – 22.02(5.41); G7 – 31.40(3.35). All groups had a higher percentage of adhesive failures. In conclusion, only when the antioxidants were applied for 60 minutes, the bond strength values were higher than bleached group.

067 Bond strength and contact angle of feldspathic ceramic subjected to different conditioning methods

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To evaluate the effect of different concentrations of hydrofluoric acid (HF) in the contact angle and bond strength between feldspathic ceramic and resin cement. In order to analyze the contact angle, 30 ceramics specimens (12x10x2,4mm) (Vita Blocks Mark II) were divided into 6 groups (n=5): CS1- HF10% + wash/dry; CS2- HF1% + wash/dry; CS3- HF3% + wash/dry; CS4- HF5% + wash/dry; CS5- no conditioning; CS6- silane only. The contact angle measurements were performed on a Goniometer. For bond strength test, 40 ceramic blocks were made (12x10x4mm), which were subjected to the following surface treatments (n = 10): CS1- HF10% 1min + wash/dry + silane; CS2-HF1% 1min + wash/dry + silane; CS3- HF3% 1min + wash/dry + silane; CS4- HF5% 1min + wash/dry + silane. The specimens were stored in distilled water (37°C) for 24 hours and sectioned in the x and y directions. The microtensile test was performed in a universal testing machine (1mm/min). Data obtained were submitted to one-way ANOVA and Tukey's test ($\alpha=0,05$). CS5 had the largest contact angle ($61.4^\circ \pm 5.6^\circ$), whereas CS1 showed the smallest value ($17.5^\circ \pm 4^\circ$). Different concentrations HF promoted bond strength statistically similar (14.2 to 15.1 MPa) ($p < 0.05$). In terms of adhesion, the tested ceramic can be etched with HF in the evaluated concentrations. The modification of the micromorphologic pattern of the treated surfaces did not affect the bond strength, which may mean a strong importance of silanization in the adhesion.

069 Influence of the incorporation of antimicrobial monomer in antibacterial activity of composite experimental

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The aim of this study was to evaluate bacterial inhibition promoted by triclosan methacrylate monomer added to an experimental resin composite. Triclosan methacrylate monomer (TM) was synthesized by esterification chemical process. The materials were evaluated: a) experimental composite resin (C), control group, b) C + 30% of MT (CTM). Four specimens (5mm diameter x 1mm thick) of each material were prepared. Cultures of *Streptococcus mutans* UA159 were grown for 24 h, adjusted to an optical density (OD550nm) of 1.0, and diluted 20-fold in brain heart infusion broth supplemented with 0.1% sucrose. Biofilms were statically formed on the surface of the materials for 24 h. Specimens were washed for 5 min and biofilms disrupted by vortexing. Cell suspensions were serially diluted and plated onto mitis salivarius agar. After incubation for 48 h, cell counting was performed. Four independent experiments were conducted in triplicate. Data were analyzed with ANOVA ($p < 0.01$). Bacterial counting (log) in the control group (C) was 8.9 ± 0.29 while CTM reach 7.2 ± 0.15 . That difference was statistically significant ($p < 0.01$), showing an antibacterial effect against *Streptococcus mutans* of 1.7 log order reduction. The triclosan methacrylate monomer demonstrated inhibition effect against *Streptococcus mutans* when added to experimental resin composite.

071 Influence of adding phenathrenequinone optical properties of experimental composites

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The system Camphorquinone/amine (CQ/AM) presents several drawbacks, like high yellowing effect caused by the excess of no reactive CQ after polymerization and the potential of oxidation by the addition of an amine in the system. Phenathrenequinone (FQ) could be an interesting possibility, because present low yellow colors than CQ and theoretically, present a larger number of actives sites for the initiation of the polymerization process. The aim of the present study was to evaluate the optical properties, depth of cure and degree of conversion of experimental composites formulated with FQ and CQ with different co-initiators. Experimental composites were formulated with BisGMA and TEGDMA as organic matrix (50/50 wt%) and the following photoinitiator/co-initiator were added: CQ + EDMAB, CQ + EDMAB + DPI + FQ, FQ + EDMAB, FQ + DPI and FQ + EDMAB + DPI. Inorganic particles were added in 60% by final weight. Optical properties were evaluated using a spectrophotometer, applying the CIELab parameter. Depth of cure through the ISO 4049 and degree of conversion was analyzed using FTIR / ATR. The results were submitted to ANOVA and Tukey 95%. CQ groups showed lower ΔE than FQ. The addition of DPI in groups with FQ caused a drop in color grade. CQ generated higher depth of cure than FQ. FQ alone, was able to promote satisfactory degree of conversion (51 ± 1 G3), but the addition of co-initiators promote better values ($G4 = 54 \pm 2$, $G5 = 62 \pm 2$, $G6 = 62 \pm 3$). The CQ was able to produce materials with improved optical properties and greater depth of cure than FQ. However, FQ was able to produce an affective polymerization even without the presence of co-initiators.

068 Tooth structural reinforcement and sealing ability of temporary fillings

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The purpose was to evaluate the capability to reinforce remaining tooth structure and sealing ability of temporary filling materials. Forty hidid human premolars received root canal treatment and class II MOD cavities. Restorations (n = 10) were placed with three temporary filling materials: pre-mixed non-eugenol cement (CIM – Cimpat N, Septodont), glass ionomer cement (GIC – Vidrion R, SSWhite) and a light curable composite (BIO – Bioplic, Biodinâmica Ltda). Hidid premolars (H) and endodontic treated premolars with MOD cavities (C) were used as control. The samples were tested for compressive strength. For microleakage test teeth were prepared with MOD cavities and after restoration placement (n = 6) the samples were soaked in methilen blue for 24 hours dye penetration and evaluated under optical microscope. Beam-shaped specimens of each materials (n = 10) were facricated and tested for flexural strenght. Means \pm standard deviations for maximum compressive load (N) were 10006.0 ± 273.7 ; 790.3 ± 259.8 ; 622.1 ± 157.2 ; 330.4 ± 105.6 and 324.9 ± 155.2 for H, GIC, CIM, BIO and C, respectively. Flexural strength (MPa) was 29.2 ± 4.3 for GIC; 5.9 ± 2.0 for CIM and 28.7 ± 7.3 for BIO. GIC presented higher microleakage (2.1) compared to BIO (0.5) and CIM (0.3). BIO and CIM presented the lower microleakage scores and can be considered good choices to seal cavities; however GIC presented the higher fracture resistance.

070 Volumetric shrinkage and conversion of low-stress flowable dental composites

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Recently, low-stress restorative technologies have been developed, both as regular consistency pastes and easier to place flowable materials, which have been proposed as bulk-fill composites. This study analyzes such materials compared to their conventional analogs in terms of their shrinkage and conversion, important determinants to final mechanical properties and stress development. Six composites were selected: Venus Diamond (VD) and EsthetXHD (EHD) as the conventional controls, Venus Diamond flow (VDF) and EsthetX flow (ESF) as conventional flowable composites, and Venus Bulk Fill (VBF) and Surefil SDR flow (SDR) as low-stress flowable composites. Volumetric shrinkage (VS, n=3) was determined in a linometer (ACTA) for 30min. Specimens (6mm x 1.5mm) were photoactivated (740mW/cm²) for 27s. Conversion (DC) was determined on the same specimens right after the linometer run in near-IR (6165cm⁻¹). Results were analyzed with one-way ANOVA/Tukey's test ($\alpha=5\%$). Due to their lower filler content, flowable composites presented higher VS, in general accompanied by higher DC. VD presented the lowest VS due to its higher molecular weight compared to conventional counterparts. Within the "low-stress" materials, SDR presented the lowest VS but also the lowest DC. In spite of their higher VS and conversion, a better modulus match with dentin may help reduce overall stress. Provided that the occlusal layer is constructed with high inorganic content composites, bulk-filled flowable restorations may be a viable, less time consuming restorative alternative.

072 Influence of non-carious cervical lesion geometry and occlusal loading on biomechanical behavior of maxillary premolars

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Occlusal contact outside the long axis of tooth can be critical when associated with non-carious cervical lesions (NCCL). This study aimed to analyze the influence of the NCCL geometry, restored or not, and the loading condition on the biomechanical behavior of maxillary premolars. Three-dimensional finite element method was used, and 7 linear, elastic, isotropic models were generated. Besides the sound tooth (H), 3 different morphologies of NCCL: Wedge (CN), Rounded (RE), and Mixed (MI), and their respective models restored with composite resin (R) were generated. The mechanical properties were set after volume definition tridimensional mesh was generated. Models underwent to 3 loading conditions (100N): Vertical (CV), Buccal (CB) and Palatal (CP); with displacement at the base and lateral of the models. Data were analyzed by Maximum Principal Stress. CP group showed the highest tensile stress values at the lesion center, while for CV and CB stresses were concentrated at the upper wall of the LCNC. The CN model showed the highest stress concentration. It was concluded that the lesions associated with acute angles, resulted in higher stress concentration when subjected to oblique loading. The CP was the most damaging to the tooth structure. NCCLs restored with composite resin favor similar stress pattern, to sound tooth models.

073 Analysis of the degree of conversion of different resin cements polymerized under different ceramic systems

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This study aimed to evaluate the degree of conversion (DC) of polymerized resin cements under ceramic systems. Were evaluated four resin cements (n = 5): one self-curing resin cement (Multilink); and three dual-curing resin cements (Variolink II; Allcem, e RelyX U200), photocured after 5 minutes, under three types of ceramics (feldspathic, lithium disilicate glass-ceramic and reinforced by zirconia), for 120 seconds. The control group consisted of polymerization of the cement without the interposition of the ceramic disk. After 24 hours, the GC was measured by Fourier transform infrared spectroscopy (FTIR). Data were analyzed by factorial ANOVA with two factors studied (resin cement and ceramic), followed by Tukey's test ($\alpha = .05$). It was significant for the cement factor ($P < 0.001$). However, the factor ceramic ($P = 0.540$), and the interaction between the factors ($P = 0.893$) were not significant. Means and standard deviations for the GC: Allcem (67.2 ± 5.2) A; Variolink II (64.5 ± 1.7) AB; RelyX U200 (63.7 ± 4.1) B; Multilink (57.6 ± 4.2) C. Was concluded that the ceramic system did not affect the GC of resin cements, while the chemically activated cement showed the lowest values for the GC.

075 Influence of clip material and cross-section of the bar framework on the stress in implant-retained overdentures- 3D FEA

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The aim of this study was to evaluate the stress concentration caused by different cross-sections of bar frameworks and clip materials used to retain overdentures. Three-dimensional models of a severely resorbed jaw and an overdenture retained by two implants and bar-clip attachment system were modeled using specific 3-D modeling software (SolidWorks 2010). A vertical misfit of 100 μ m between the implant and the bar framework was made in the right side. A total of six models were made according to the cross-section of the bar framework (round, oval or Hader®) and the clip material (gold or plastic). Finite element models were obtained by importing the solid model into mechanical simulation software (ANSYS Workbench 11). The base of the mandible was set to be the fixed support and a pressure (100 MPa) was applied to the right inferior canine. The analysis was made by means of von Mises stress for the prosthetic components and microstrain to the bone tissue. Round bars led to lower values of stress in the clip, prosthetic screw of the ill-fitted component and lower microstrain values in the peri-implant bone tissue. The lowest values of stress in the bar were observed in the Hader® groups. Plastic clips reduced the stress concentration in all structures when compared to gold clips. The clip material and the cross-section of the bar framework presented relevant influence on the stress distribution in overdentures retained by a bar-clip system presenting vertical misfit.

077 Influence of different ways and times of volatilization of solvent on the mechanical properties of adhesive systems

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Union to dentin can be affected by the presence of residual water or excess solvent interfering in the mechanical properties of adhesive systems. This study evaluated the influence of time and form of solvent volatilization of ultimate tensile strength (UTS) (n = 10), flexural strength (RF) (n = 5) and modulus of elasticity (ME) (n = 5) of adhesive system Scotchbond Multi-SMP and Clearfil SE-CSE. For this shaped samples bar (2x1x7mm) were confectioned with 10 μ l of primer, evaporating with jets of air at $\pm 23^\circ\text{C}$, $\pm 40^\circ\text{C}$ and a negative control at the times 5, 20, 30 and 60 seconds according to the experimental group, and put up 20 μ l of bond on the primer, and homogenized for 60 seconds and light-cured for 60s. The result of the ANOVA and Tukey showed that volatilization to $\pm 40^\circ\text{C}$ resulted in better ME, for both adhesives and in any time interval. There were no significant differences between the times and modes of volatilization for UTS. The CSE had higher RF and the time of 30s for solvent volatilization for CSE increased the ME. The results of this study indicate that the volatilization temperature of $\pm 40^\circ\text{C}$ was able to promote the mechanical properties based on the relative stiffness of the material of both adhesives tested independent of the time of evaporation

074 Biodegradation of restorative materials, in situ
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The aim of this study was to evaluate the influence of biofilm on the surface characteristics (roughness-Ra, surface hardness-VHN, energy dispersive spectroscopy-EDS and scanning electron microscopy-SEM) from different restorative materials, in situ. Fifteen discs of each material [IPS E.Max (IN), Filtek Supreme (FS); Vitremer (VI); Ketac Molar EasyMix (KM); Amalgam GS-80 (AM)] were prepared in a metallic mold (4.0 mm x 1.5 mm). Ra, VHN, SEM and EDS were initially evaluated. Fifteen healthy volunteers wore palatal devices containing 5 wells (one restorative material per well) for 7 days. After interacting with the biofilm, Ra, VHN, SEM and EDS were again evaluated. Data were statistically analyzed using the Kolmogorov-Smirnov and Tukey-Kramer tests ($p < 0.05$). All esthetic restorative materials demonstrated a significant increase in Ra values after biodegradation. Observed increase in VHN for AM, KM and VI compared to VHN values before biodegradation. After biodegradation, the VHN values were significantly different: $EM > AM > FS = KM > VI$. The SEM showed porosities, cracks and surface irregularities in all materials tested. While the EDS for FS showed accumulation on the surface of Cl-, K+ Ca2+ and a decrease of the F- peak for VI and KM after biodegradation. Under the conditions of this study, one can conclude that the effects of biofilm on the surface properties are material-dependent.

076 Efficiency of electric currents applied to dentin resin adhesives

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The aim of this study was to assess the effect of the application of different electric currents on the tensile bond strength of dentin adhesives. There were used third molars, which were divided into groups according to the bonding agent and the electric current employed (n=5). There were assessed two self-etch adhesives (Clearfil SE Bond, Kuraray and Adper Easy One, 3M ESPE) and one etch-and-rinse adhesive (Adper Single Bond 2, 3M ESPE). Each adhesive was applied under different electric current (0 μ A, 5 μ A, 10 μ A, 15 μ A, 20 μ A, 25 μ A, 30 μ A, and 35 μ A). Build-ups were constructed using the resin composite Filtek Z350 XT (3M ESPE). The microtensile bond strength (μ TBS) was analyzed after 24h. The results of μ TBS were assessed using a two factors ANOVA test, and a Tukey test ($p < 0.05$). The results show significant differences between the electric currents and the adhesives systems evaluated, Easy One and the 5 μ A – 20 μ A obtained the lowest μ TBS, concluding that the μ TBS could be improved with the application of adhesives under electric currents

078 Interaction of surface between universal adhesives of one bottle and chemical and dual cure resin cements

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The aim of this study was to evaluate the morphology and bond strength (SB) of contemporary adhesive systems on dentin surface. The occlusal surfaces of 42 third molars were removed and dentin prepared with medium sandpaper 600 SiC. The indirect restorations LAVA were blasted with aluminum oxide and silanized. The tooth were divided into 6 groups according to the cementation technique: Group 1 - All Bond / C & B Bond, Group 2 - Single Bond Universal (SBU) photoactivated and RelyX Ultimate (RX) Chemical Group 3 - SBU photoactivated / RelyX Ultimate photoactivated, Group 4 - chemical SBU / RelyX Ultimate photoactivated, Group 5 - chemical SBU / RelyX Ultimate chemical, and Group 6 - SBU + DCA / RelyX Ultimate chemical. The tooth (n = 7) were stored in distilled water at 37 $^\circ\text{C}$ for 24 hours and sectioned shaped sticks with area $0.8 \pm 1.0 \text{ mm}^2$ for the tensile test using a testing machine EZ-Test. The fracture mode was observed by SEM (scanning electron microscopy). The results were submitted to ANOVA and Tukey's test ($p < 0.05$). The results for SB were: 1- to 59.9 (9.3); 2- to 57.6 (15.9); 3- to 63.9 (12.7); 4- to 53.7 (13.9); 5- to 16.2 (6.4) and 6-15.3 (4.3). All the materials that were light cure exhibited SB statistically higher when compared with the chemical polymerization method. The findings of this study support the concept that some materials depend significantly on light to reach polymerization effective and achieve the maximum mechanical properties.

079 Evaluation of different surface treatments with H₂O₂ in the bond strength of fiber posts to resin cement

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This study evaluated the effect of surface treatment of fiber glass pin with different concentrations of hydrogen peroxide (H₂O₂) on the bond strength to the resin cement (RelyX Unicem). Fifty bovine roots received endodontic treatment and then were randomly divided in five groups (n=10), according to the surface treatment performed: G1, negative control; G2 industrialized 24% H₂O₂, G3, 24% H₂O₂ manipulated; G4 35% H₂O₂, G5, H₂O₂ 40%. The roots were sectioned perpendicularly to the long axis, resulting in slices of 1 mm thickness in different thirds (cervical, middle, and apical). The samples were subjected to mechanical testing of push-out. The surface treated pins was evaluated by Scanning Electron Microscopy (SEM). Two-Way ANOVA showed no statistical difference for the surface treatment factors (P = 0.304), and interaction between it and the root region (P = 0.083). There was significant difference between the root thirds (P <0.001). One-Way ANOVA showed no statistical difference between the treated groups and the control group (P = 0.102). SEM analysis showed that in G2 and G5 treatment with H₂O₂ was able to increase the surface roughness of the pin due to disruption of epoxy resin matrix. It was concluded that the surface treatment with different concentrations of H₂O₂ did not affect the bond strength between fiber post and resin cement in the root canal, and, regardless of treatment, cervical showed higher bond strength.

081 Survival rate, load to fracture and FEA of anterior teeth restored with laminate veneer varying the design prepare

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This study evaluated the survival rate, load to fracture and stress distribution in maxillary anterior teeth restored with ceramic veneers varying the design prepare. Thirty maxillary central incisors (CI) and thirty canines (C) were selected. After standardizing the specimens, they were allocated in four groups (n = 15): Gr1-IC with conservative preparation; Gr2-IC with conventional preparation with palatal chamfer; Gr3 - C with conservative preparation; Gr4 - C with conventional preparation with palatal chamfer. The specimens were restored with ceramic veneers based lithium di-silicate. The specimens were subjected to 4 million mechanical cycles (45 °, 37 ° C, 100 N, 4 Hz) and evaluated at every 500,000 cycles. The specimens that survived were submitted to load to fracture test. 2D models, corresponding to each groups, were obtained (RhinoCeros 4.0) and evaluated (MSC.Patrans e.MSC.Marc 2005r2 2005r2) by the values of Maximum Principal Stress. The survival rates were calculated by Kaplan-Meier test and log-rank test ($\alpha = 0.05$), and the fracture load values using T-Student test ($\alpha = 0.05$). The different designs of preparation had no influence on survival rates or on the loads to fracture values. The finite element analysis showed higher tensile stress concentration in veneers submitted to conventional preparation with palatal chamfer. We conclude that different designs of preparation does not influence the mechanical behavior of teeth restored with ceramic veneers.

083 Evaluation of coconut water neutralized by different agents on the viability of fibroblasts

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Coconut water (CW) is proposed as a storage medium for avulsed teeth by having nutrients which maintains cell viability. However, its acidic pH should be adjusted. The aim of this study was to compare the effect different pH adjustments of the CW on the fibroblasts viability (FB). Natural and industrial CW (DuCoco) were adjusted to pH 7.0 using: (1) NaOH, (2) NaHCO₃, (3) Triethanolamine, (4) AMP(amino methyl propanol). Fibroblasts were plated at 2x10⁴/ well in 96 well plates in DMEM 10%. After confluence, DMEM was removed and replaced with a solution of 2, 4 and 6 hours. The positive control was represented by FB maintained in DMEM and the negative one kept in tap water. Then, we analyzed the viability by MTT formazan method. Data were analyzed by Grafpad. At 2 h, CW set with natural substances 2, 3 and 4 showed higher viability than its corresponding industrialized (p <0,05). At 4 h, natural CW neutralized by substances 1 and 3 were significantly higher than their corresponding industrialized (p <0,05). At 6 h, natural CW showed statistically higher absorbance than industrialized CW adjusted with the same agents. The results of this study indicate that pH adjusted natural CW showed better performance, independently of adjusted solution used.

080 Influence of reline material type on stress distribution over ridge: Finite Element Analyses

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The process of mandibular ridge bone resorption promotes misfit between prosthesis base exacerbating bone resorption; in this case, relines have being used. This three-dimensional finite elements method study aimed to evaluate the effect stress of a overdenture in models that simulated bone resorption (in installing prosthesis, 3, 5 and 10 years of use) and reline materials (soft or hard) on stress distribution in posterior ridge. Through the computer aided design software (SolidWorks), three-dimensional prosthetic components were built and jaw models resulting in four models. These geometric models were obtained through export to the specific mechanical simulation software (ANSYS Workbench), and subjected to a load of 100 N in the first right molar region. The lowest observed values were in the period of installation prosthesis for all situations. The stress distributions in models with 3, 5 and 10 years of resorption were similar considering the location of tensions; however, the stress concentration increased values in bone, always on the side of load application. The longer resorption, the higher stress values were generated, with the influence of reline materials. It can be concluded that: the power increase of posterior ridge or peri-implant bone resorption promotes increased tensions in the prosthetic components in the bone tissue; the use of soft or hard relines, minimized the generated tensions; regardless the stuff resilience, the hard reline was more efficient in reducing tensions when compared to soft reline.

082 The role of resin cement on bond strength of glass-fiber posts (GFPs): a systematic review and meta-analysis

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A systematic review was conducted to verify if there is difference in bond strength to dentin between regular and self-adhesive resin cements and verify the influence of several variables on the retention of GFPs. This report followed the PRISMA statement. In vitro studies that investigated the bond strength of GFPs luted with self-adhesive and regular RCs were selected. Searches were carried out in PubMed and Scopus databases. No publication year or language limit was used, and the last search was made in October 2012. Global comparison between self-adhesive and regular resin cements was performed. Two subgroup analyses were performed: self-adhesive × regular resin cement + etch-and-rinse adhesive, and self-adhesive × regular resin cement + self-etch adhesive. The analyses were carried out using fixed-effect and random-effects model. The results showed heterogeneity in all comparisons and higher bond strength to dentin was identified for self-adhesive cements; self-adhesive cements also presented higher dentin bond strength than regular resin cements + etch-and-rinse or self-etch adhesives. The in vitro literature seems to suggest that the use of self-adhesive resin cement could improve the retention of GFPs into root canals.

084 Influence of polishing systems and chemical degradation on the color of the resin materials

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This study evaluated the influence of different polishing systems (PS) and staining solution on color of composites. 72 cylindrical samples (7 mm diameter x 2 mm thick) were prepared with Filtek Z350XT (3M/ESPE) and Vitalescence (Ultradent) composites. After 24h at 37°C, the samples were polished with Soflex (3M/ESPE) or Jiffy (Ultradent) systems. They were randomly divided into 8 groups (n= 9) in accordance with composite, PS and solution (coffee (CF) and artificial saliva (SA)-control). Initial color measurements were made using CIEL*a*b* system. Then, each sample was immersed in 4 mL of CF for 15 min, 3 times a day for 14 days. After that, the color was measured again and color variations were calculated (ΔE). Normal data distribution was verified (Kolmogorov-Smirnov test, p>0.05) and submitted to three way ANOVA and Holm-Sidak test (p<0.05). Both composites showed some staining after degradation in CF and SA. Differences were showed in triple interaction (p= 0.001). The composites polished by PS showed higher staining in CF than SA. The Z350, in CF and SA, showed similar staining for SofLex and Jiffy. However, Vitalescence in SA showed higher staining when polished with Jiffy; and in CF, showed higher staining when polished with SofLex. The staining was influenced by the three factors studied. The staining on Z350 was not affected by PS. However, Vitalescence showed less staining when immersed in SA and polished with SofLex; and when immersed CF and polished with Jiffy. It could be concluded that color stability is material, solution and PS dependent.

085 Morphological and structural changes of Y-TZP ceramics after different surface treatments

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The purpose of this study was to evaluate morphological and structural changes of three Y-TZP dental ceramics (LAVA Frame - LF, LAVA Plus - LP and IPS ZirCad - IZ) submitted to three surface treatments. Plates obtained from sinterized blocks of each ceramic were divided into four groups according to the surface treatments: Control - C - (as-sintered); 30 (abrasion with 30 μm Si-coated Al_2O_3 particles); 50 (abrasion with 50 μm Al_2O_3 particles) and 150 (abrasion with 150 μm Al_2O_3 particles). After the surface treatments, the plates were submitted to the following analysis: surface roughness (S_a - μm) by using a 3-D profilometry; phase-transformation by using X-ray diffractometry; surface morphology by using scanning electron microscopy (SEM) and elemental composition by using energy dispersive X-ray spectroscopy (EDS). The abrasion increased the roughness of all ceramics, with 150 μm group presenting the highest values. It was observed tetragonal to monoclinic and cubic phase transformation in all ceramic surfaces after abrasion. SEM analysis showed changes in ceramic surface morphologies, with presence of grooves, after abrasion. The elemental composition analysis showed a decrease in Zr content and a increasing in O and Al elements after abrasion. The presence of Si was also detected in 30 μm group. It was concluded that although the surface treatments increased the roughness, they also produced a tetragonal to monoclinic and cubic phase transformation which could compromise the mechanical behavior of materials.

087 Linear polymerization shrinkage and shrinkage stress of silorane varying the photoactivation mode

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The aim of this study was to analyze the linear of polymerization shrinkage (LPS) and the Shrinkage stress (SS) of different composites: Durafill VS/Heraeus Kulzer (D), Filtek Z250/3M-ESPE (Z2), Filtek Z350/3M-ESPE (Z3), Filtek P90 /3M-ESPE(P). Cylinders (2mm X 2mm) of each composite (n=5) were photocured with different methods and similar power density (24J/cm²): Low (600mW/cm² x 40s), High (1000mW/cm² x 24s) and Softstart (200mW/cm² x 15s + 600mW/cm² x 35s). For LPS, each composite (n=5) was inserted between two glass plates treated with hydrofluoric acid and silano, and an extensometer (EMIC) recorded the polymerization shrinkage for 10 min. For SS, polymethylmethacrylate rods treated with methyl methacrylate liquid and coated with the Single Bond 2 (3M ESPE) for methacrylic composites and the Silorano Adhesive for P. The SS considered the values of compliance mountings. LPS (%) and SS (MPa) were recorded for 10 min. Data were statistically analyzed by two-way ANOVA and Tukey test (5%). For LPS only individual factors were statically significant: P=Z3=Z2; D Z3S = Z3L; PS < PH = PL. Conclusion: All the composites showed lower values for LPS using the S mode and the kind of composite influenced data of LPS. For SS, the S mode led to the lowest values for P and Z3, with no influence to Z2.

089 Evaluation in vivo of the roughness and surface morphology of enamel after removal of brackets with different polishing

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The aim of this study was to evaluate the roughness and morphology of the enamel by surface roughness tester and scanning electron microscopy (SEM) after removal of metal brackets. 10 patients were selected, they had no caries, restoration, trauma, bruxism or cracks on the upper incisors. After the conclusion of treatment, the brackets were removed. The teeth of the patients were randomly polished, to one side previously drawn was performed finishing and polishing with Sof-Lex or carbide bur multi-laminated (n = 10). Replicas dental with polished teeth were obtained using epoxy resin. Surface roughness measurements were performed. The data were statistically evaluated by Student t test. After the roughness test, three specimens from each group were used for the SEM analysis. Student t test showed that the carbide bur group (0.31 \pm 0.07 μm) had significantly greater irregularities when compared with the Sof-Lex group (0.25 \pm 0.02 μm) after composite resin removal. The Sof-Lex polishing system showed the best polishing enamel.

086 Effect of cooling protocol on biaxial flexural strength and failure behavior of a bilayer ceramic system

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The purpose of this study was to evaluate the biaxial flexural strength (δF) of a bilayer ceramic system submitted to cooling protocols of porcelain layer (VM9) applied on zirconia ceramic (YZ). Z discs were manufactured, received a layer of VM9 and were divided into groups according to cooling protocol from sintering to room temperature with furnace opening at: 200°C, 400°C, 600°C or 800°C. After surface finishing, samples were submitted to flexural strength (σF) test, which was interrupted at the first signal of fracture. Failure mode was classified as crack of VM9 until system interface or catastrophic failure. Flexural strength was influenced by the opening-temperature from sintering furnace (p=0.0283). The lowest strength values was found in G800 (62.91 MPa)B, and G400 presented the highest flexural strength values (112.99 MPa)A. Remaining groups presented middle strength values: G200 (97.46 MPa)AB, G600 (95.88 MPa)AB. The main failure mode found was crack of VM9 until system interface for all tested groups, and in previous failures (VM9 presenting cracks after cooling). Furnace opening is advised to be carried out on temperatures lower than 600°C, since an increase in bilayer ceramic system strength was observed under this condition.

088 Analysis of the wettability of experimental monomers and Icon®

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The wettability of a liquid is determined by the contact angle once the greater is the wettability; the smaller is the contact angle. The aim of this study was to evaluate the wettability of four experimental resin materials (MER) over two different surfaces: smooth(S) and rough(R). The infiltrant Icon® was used as commercial control group. The materials were distributed in the following groups (n=10): G1-TEGDMA (pure monomer); G2-(TEGDMAi) TEGDMA infiltrant with 0.5% of canphoroquinone, 1% of DMAEMA and 0.1% of BHT; G3-TEGDMAi+0.1% of Chlorhexidine (CHX); G4-TEGDMAi+0.2%CHX; G5-Icon®. The wettability was evaluated by the left and right contact angles which were obtained by drop in the glass surface (S and R), using goniometer Digidrop (Labometric, Lda). The data were submitted to two way ANOVA and Tukey test (p<0.05) to compare G1, G2, G3 and G4 with each other; and Dunnet's test (p<0.05) to compare G5 with the other groups. There were interaction between the surfaces and materials (p<0.01). In S surface, G1 (51.98 \pm 5.50) showed higher contact angles and was statistically different when compared with groups G3(41.94 \pm 4.69) and G4(41.92 \pm 4.72). In R surface, G1 (47.28 \pm 8.26) and G2(45.57 \pm 8.59) showed higher contact angles, followed by G5(35.29 \pm 9.32), G3(24.62 \pm 6.69) and G4(20.94 \pm 3.31). Comparing the materials over different surfaces, G3, G4 and G5 showed higher contact angle than G1 and G2. According to the results, it was concluded that the materials with CHX-added on rough surface showed the lowest contact angles; and influenced positively in the MER wettability property.

090 Influence of the matrix for making cylinders to testing bond strength by microshear

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The aim of this study was to compare bond strength of composite resin cylinders to dentin prepared with three types of matrices. Composite cylinders were prepared on bovine dentin blocks, using three types of matrices (n = 20): 1 - Matrix made with addition silicone, 2 - Matrix made with drilled noodles; 3 - Matrix made with Tygon tubes. The cylinders were made with simplified conventional adhesive (Single Bond / 3M ESPE) and flowable composite (Filtek Z-350 Flow / 3M ESPE). 1 and 3 types of matrices were removed by cutting. Noodles matrices were removed after cylinder immersion in water for 1h. Dentin fragments who failed pre-test were excluded. The specimens were submitted to microshear (EMIC DDL 500, 1mm/min). The fracture pattern was evaluated with a stereomicroscope (Leica Microsystems, 50x). Data were analyzed by ANOVA with a criterion ($\alpha = .05$). There was no statistical difference between the types of matrices (p = 0.7427). The matrix of noodles showed the highest rate of cohesive failures in the substrate, and showed no failures pretest. The silicone matrix showed the highest rate of adhesive fractures. The matrix of Tygon had the highest rate of fractures mixed, with showed most pretest flaws, followed by silicone matrix. All matrices were effective for making cylinders. The matrix of noodles simplified the process and this way pre-test failure does not occur.

091 Bactericidal activity evaluations of adhesive systems

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This study evaluated the direct contact bactericidal activity of three adhesive systems containing antibacterial compounds against four facultative bacterial species (*Staphylococcus aureus*, *Enterococcus faecalis*, *Streptococcus mutans* and *Lactobacillus casei*). Test adhesives: Gluma 2Bond (G2B - Heraeus), Clearfil SE Protect (CSP - Kuraray Noritake), Clearfil SE Protect Primer (PCSP) and Peak Universal Bond (PUB - Ultradent). Control adhesives: Gluma Comfort Bond (GCB), Clearfil SE Bond (CSB) and Peak LC Bond (PLB). Positive controls: chlorhexidine 0.2% and 2% and glutaraldehyde 5%. Negative controls: physiological saline solution or only the inoculum. After bacterial growing, isolated colonies were suspended until reaching 0.5 of the McFarland scale (inoculum). Thirty microliters of adhesive systems were dispensed in a sterile cylindrical device and photoactivated. Each cylinder adhesive or control substance was added to a well (96 well plate) containing 90µL of inoculum (test performed in triplicate). After contact, 5µL of the inoculum from each well were plated at the following times: 5 min, 10 min, 30 min, 1 hour and 24 hours. After 24 hours it was verified the bacterial growth (not bactericidal). The G2B presented results similar to its negative control (GCB). The PCSP promoted antimicrobial activity against all oral pathogens. The PUB was not bactericidal against any bacteria tested. The G2B, CSP and PCSP showed antimicrobial activity, while PUB promoted no bactericidal potential.

093 Effect of alteration of the dimensional elastic orthodontic stored in sodium fluoride and artificial saliva

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The aim of this study was evaluation of the dimensional changes of orthodontic elastics, being subjected to storage in artificial saliva 37C (control) and sodium fluoride 0.05% during the immediate 24 hours and 30 days. The elastic split in five different colors with five samples each (Grey, Green, Black, Pink and Transparent) and trademarks (Morelli, 3M Unitek, Ormco). We used analysis machine dimension (profilometer) Mitutoyo to evaluate the changes in size of each elastic as the factors involved. Then the data were analyzed statistically, getting the results and therefore made tables and charts. The results showed that the orthodontic elastics in the middle of artificial saliva showed significant change after 30 days. Amid sodium fluoride 0.05% had no significant dimensional change between periods. Faced trademarks, dimensional stability both presented in accordance with the storage times for both synthetic saliva and sodium fluoride 0.05%. Generally when compared to media solution, the sodium fluoride was higher dimensional change when compared with the artificial saliva.

095 Restorative system and thermocycling effect on tooth/class V interface: OCT evaluation

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It was evaluated tooth/class V restoration interface accomplished by different adhesive systems -AS (total and self-etching) and restorative composites -RC (low shrinkage and conventional), submitted to thermal cycling (TC), using Optical Coherence Tomography (OCT). 60 class V cavities were accomplished on extracted sound 3rd molars, and distributed into 6 groups according to AS and RC (n=10): G1- Adper Single Bond 2 (SB2) + Aelite LS Posterior (AP); G2- SB2 + Venus Diamond (VD); G3- SB2 Filtek Z250 + XT (Z250); G4- Clearfil SE Bond (CSE) + AP; G5- CSE + VD; G6- CSE + Z250. Specimens were analyzed by OCT before/after TC (1000 cycles: 5°C and 55°C, dwell time of 30s in each bath). The interface dentin/restoration and enamel/restoration gap (%) was evaluated separately from one OCT shot from each group using Image J. Statistical analysis used was of mixed model methodology for repeated and Tukey Kramer Test ($p \leq 0.05$). For dentin interfaces, it was observed a significant interaction between AS and TC; the restorations with CSE AS, after TC, showed smaller percentages of gaps at the dentin/restoration interface, for all composites, comparing to the SB2 adhesive system. Concerning TC, the results showed lower values of interfacial adaptation, when compared the same samples prior to their implementation. In enamel, it was not observed interface gaps (pre and post-TC), for all RC and AS. Depending on the AS, TC can provide higher percentage of gaps at the dentin/restoration interface, for all RC. CSE provided improved interfacial adaptation than SB2. OCT was capable of evaluating the marginal integrity of class V resin composite restorations.

092 Influence of the initiation system in performance and stability of an experimental self-adhesive composite resin

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This study simulated the shelf life to evaluate the stability of initiation systems in an experimental self-adhesive composite resin (SACR). As SACR model was used a mixture by Bis-GMA, TEGDMA, GDMA-P and filler particles. Five SACR were formulated changing the initiation system: CQ, CQ+EDAB, CQ+EDAB+DPIHFP, BAPO e TPO. Analysis of the polymerization kinetics in real time was carried out in triplicate by infrared spectroscopy (IS). To simulate shelf life the SACR were maintained at 23 °C and according to the storage time were evaluated for degree of conversion (DC) and microtensile bond strength (μ TBS). Analysis of DC by IS was performed in triplicate after 0, 7, 14, 30, 60, 90 and 180 storage days of SACR. To evaluate the μ TBS in dentin (n=10), restorations were build up after 0, 30, 60, 90 and 180 storage days of SACR, which were sectioned and the beams was tested for μ TBS after 24h and 6m. Data were analyzed by one-way ANOVA and Holm-Sidak ($p < 0.05$). The initiation system CQ+EDAB+DPIHFP showed higher polymerization rate. The DC of CQ+EDAB, CQ+EDAB+DPIHFP and BAPO were similar (40%) and higher than TPO e CQ (20 e 10%), maintaining stable up to 180 days. The CQ, CQ+EDAB e TPO did not presented adhesion. The aging of SACR (180 days) did not affect the adhesion. The immediate μ TBS (Mpa) CQ+EDAB+DPIHFP (8.4) was similar to BAPO (10.5), however after 6m only CQ+EDAB+DPIHFP maintained bond strength. The choice of a suitable initiation system is crucial to the performance and stability of SACR.

094 Effect of non-carious cervical lesion, restorative material and loading on the deformation of premolars-Moiré Method

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The tooth structure reduction is modulating factor of the premolars biomechanical behavior. The aim of this study was to analyze the influence of non-carious cervical lesions (NCCL), mesio-occlusal-distal (MOD) cavity restorative material and occlusal loading variations on the deformation of premolars (PMS), using the Moiré projection technique. Eighteen premolars (PMS) were selected and randomly distributed into 6 groups (n = 3). Group A: MOD cavity restored with amalgam, AL: MOD amalgam + not restored NCCL; ALR: MOD amalgam + restored NCCL; R: composite resin MOD; RL: composite resin MOD + NCCL not restored; RLR: composite resin MOD + restored NCCL. The samples were subjected to two types of occlusal loading: axial and oblique. The deformations were analyzed by Moiré projection technique in mesiodistal (MD), cervical occlusal (CO) and bucco-lingual (BL) directions. After ANOVA and Tukey test ($p < 0.05$), the results showed that the groups with not restored NCCL presented higher strain values in both CO and MD directions, regardless of the occlusal loading type. The AL group subjected to oblique loading showed the highest strain values for CO and MD directions. On BL direction the type of loading and MOD cavity restorative material influenced the samples deformation. From the results, it was concluded that through the Moiré projection technique it is possible to quantify the deformations in the tooth structure and that the presence of NCCL, variations of occlusal loading and restorative material type influence the deformation pattern of premolars.

096 Marginal adaptation between glass fiber post and primary root dentin

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The aim of this study was to evaluate the influence of filling materials and cleaning agents in marginal adaptation between glass fiber post and root canal dentin. Roots of primary bovine teeth were endodontically treated and assigned into groups: Control (no material - C); Calen® + Zinc Oxide (CZO); Vitapex® (V); Calcipex II® (CP). After 7 days, the filling materials were removed and the roots were subdivided according the groups (n=10): No cleaning (NC); 70% Ethanol (E); Tergenform® (T). Glass fiber posts were luted using resin cement RelyXTM ARC after acid etching, rinsing and application of adhesive system Adper Single Bond 2TM. Specimens were sectioned (± 1 mm), polished and replicas were made with epoxy resin. Images obtained by scanning electron microscopy were measured using the software Image J 1.45. The percentage of gap formation (%G) was analyzed by an examiner calibrated. The data were submitted to two-way ANOVA and Tukey's test ($\alpha = 5\%$). Interaction was observed between the studied factors ($p < 0.05$). C/E showed the lowest %G (29.45 ± 15.65), significantly different from T (56.92 ± 19.74). The highest %G was observed for V/E (59.13 ± 21.34) and significantly different from T (35.25 ± 19.89). CZO and C showed no significant difference between cleaning agents. In conclusion, the filling materials and cleaning agents influenced the marginal adaptation of glass fiber post to root dentin. When Vitapex® is used for root canal filling, its indicate cleaning with Tergenform®, while Calen®+OZ and Calcipex II® not require cleaning agents.

097 Effect of different tooth bleaching therapies on human dental pulp cells viability

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The aim of this study was to evaluate the influence of applications of a bleaching gel with different concentrations of hydrogen peroxide (H₂O₂) on human dental pulp cells (HDPCs) viability. Enamel/dentin discs adapted to trans-wells devices were placed on cultured HDPCs, establishing the following groups: G1 - no treatment (control); G2- 35% H₂O₂ / 1x15 min.; G3- 35% H₂O₂ / 3x15 min.; G4- 17,5% H₂O₂ / 1x15 min.; G5- 17,5% H₂O₂ / 3x15 min.; G6- 10% H₂O₂ / 1x15 min.; G7- 10% H₂O₂ / 3x15 min.; G8- 8,75% H₂O₂ / 1x15 min.; e G9 - 8,75% H₂O₂ / 3x15 min. Cell viability (MTT assay) was evaluated immediately (T1) or 72 h post-bleaching (T2) (Kruskal-Wallis e Mann-Whitney; $\alpha=5\%$). The variables frequency of application and concentration of H₂O₂ in the bleaching gel had significant effect on HDPCs viability. In groups G2, G3, G4, G5, G6, G7, G8, and G9 the cell viability reduction (in T1) was: 92.8%; 96.7%; 75.1%; 85.1%; 37.2%; 72.7%; 36.2%; and 59.7%, respectively. G6 and G8 presented no significant difference compared to control (G1). In T2, all groups presented cell viability increase, except G3. Cell viability greater than 100% at T2 period was observed in G6 (102.2%) and G8 (114.4%). It was concluded that bleaching gels with low concentrations of H₂O₂, such as 10% and 8.75%, applied for 15 min on enamel, cause discrete reduction in HDPCs viability, which was recovered at 72 h post-bleaching period.

099 Effect of dentin desensitizers on resin cement bond strengths

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To evaluate the effect of dentin desensitizers on bond strengths of one resin cement. Twenty bovine teeth were prepared until obtaining flat surfaces of median dentin. A standardized smear layer was created just before the adhesive procedures. Twenty composite blocks, 3 mm thick (Estenia C&B, Kuraray Noritake/KN) were used. The composite surfaces were abraded with aluminum oxide, and then silanized. The samples were randomly divided into the following four groups (n=5): no treatment (CON, Controle), Gluma Desensitizer (GD, Heraeus Kulzer), Super Seal (SS, Phoenix Dental) and TeethMate Desensitizer (TMD, KN). The dentin surfaces were then treated with ED Primer II (KN). The composite blocks were bonded to the dentin surfaces with a resin cement (Panavia F2.0, KN) according to the manufacturer's instructions. After 24-hour storage (37°C, 100% RH), the bonded samples were cut into beam-shaped microtensile specimens and loaded in tension until failure. Data were analyzed with Anova and the Dunnett's test ($\alpha=0.05$). SEM was used to examine the fracture modes. The microtensile bond strengths (MPa \pm SD) were: CON - 24.4 \pm 3.2 B, GD - 14.0 \pm 5.6 C, SS - 8.6 \pm 4.7 D and TMD - 34.7 \pm 4.6 A. The efficacy of the desensitizers agents is material-dependent. GD and SS decreased the μ TBS, however the TMD improved. More studies about the mechanism of TMD are necessary in the future.

101 Influence of cross-sections and vertical misfit in overdentures bar system in stress distribution

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Passive fit is very important on the long-term success of rehabilitation. However, obtaining this situation is not always a reality due to the inherent problems on manufacturing of infrastructure/prosthesis. When an ill-fitted framework is installed, the prosthetic screws are torqued and might propagate tensions to the whole system.

098 Influence of post-thickness and material on the fracture strength of teeth with reduced coronal structure

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To evaluate the fracture strength of endodontically treated teeth with reduced coronal structure reinforced with glass-fiber posts and cast posts and core (nickel-chromium alloy) with different thickness. Forty maxillary central incisors were sectioned at 1 mm of the cement enamel junction and endodontically treated. The teeth were divided into four groups (n=10) and restored with cast post and core and glass-fiber posts with diameters of 1.5 mm and 1.1 mm. The fracture strength was evaluated using a Universal Testing Machine (Instron 1144) at 45° of angulation. The results were submitted to analysis of variance two-way and Tukey's test (P<0.05). The failure mode was also evaluated. Cast post and core were statistically superior to the glass-fiber posts with the self-post diameter (P<0.001). When the self-post material was considered, no significant difference was observed between the two post-diameters (P=0.749). The glass-fiber post-groups presented more fractures in the cervical third than the cast post and core groups. Teeth restored with cast post and cores present higher fracture strength than those reinforced with glass-fiber posts. An increased post-thickness does not increase the fracture strength. Glass-fiber posts lead to less severe fractures.

100 Influence of implant's inclination on stress distribution in overdenture-retaining bar system with vertical misfit

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A concern about implants inclination during clinical planning of an overdenture is always present, especially by the effects on the biomechanics of various restraint systems, such as bar-clip system. The present study evaluated the overdenture bar-clip system with: different latero-lateral inclinations in an implant (-10, -5, 0, +5, +10); vertical misfits on the second implant (50, 100, 200 μ m) and bar materials (Au type IV, Ag-Pd, Ti cp, Co-Cr) through finite element analysis. Three-dimensional models of an overdenture retained by 2 implants and bar-clip system were modeled using 3-D modeling software. Finite element models were obtained by importing the geometric model to mechanical simulation software. The inclination +10° showed the worst biomechanical behavior, presenting higher von Mises stress in the bar and the highest values of Maximum Principal stress in peri-implant bone tissue. The group -5° with Au bar showed the lowest values of tension on the prosthetic components (151 MPa; 9,37 MPa; bar and prosthetic screw, respectively), and -10° with Au alloy, showed the best distribution tension in the peri-implant bone tissue (5,08 MPa). The increase in the vertical variation and hardness of the material of the bar caused an increase in the stress values measured in all structures. The implants' inclinations have significant influence on the stress distribution at overdenture-retaining bar system. Increase of the vertical variation and different materials bar leads to an increase in the stress values.

102 Effect of 2% CHX on dentin/resin bond strength at different dentin substrate conditions and storage time

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The aim of this study was to evaluate the effect of 2% chlorhexidine digluconate (CHX) on microtensile bond strength (μ TBS) and degradation between an adhesive system and dentin under 3 dentin conditions and storage times. The bonding interface was also analysed using SEM. Forty-eight dentin surfaces from sound third molar were divided into 3 groups, according to dentin substrates: sound dentin(Sd), caries-infected dentin(Ci) and caries-affected dentin(Ca). Ca and Ci were submitted to development of artificial caries using visual inspection with Caries Detector solution. It was considered as Ci: soft and deeply pigmented dentin and Ca: hard and slightly pigmented dentin. CHX was applied on half of groups, just after etching with 35% phosphoric acid gel. Afterwards, the dentin surfaces were bonded with Adper Single Bond 2(3M ESPE) adhesive system according to manufacturer's instructions. Teeth were longitudinally sectioned across the bonded interface (1.0mm²). The specimens were stored in deionized water at 37°C for 24h, 6 months and 1 year later. Two additional teeth were used to analyze the bonding interfaces by SEM. Data was submitted to ANOVA and Tukey's test ($\alpha=0.05$). Ci decreased the bond strength values, when compared to Ca and Sd. Stored samples for 6 months and 1 year decreased the μ TBS for all analyzed conditions. CHX did not influence bond strength to dentin over time, regardless substrate conditions. Time is the most important factor in the bond strength degradation. The bonding to caries-infected dentin decreased the bond strength values, when compared to caries-affected and sound dentin.

103 Evaluation of the abutment retention force in cone Morse implants after removal cycles

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The prosthetics interferences of Morse cone are based on the mechanical principle of “cone inside cone”, which promotes great imbrication by contact between the surfaces. The objective was to evaluate the prosthetic retention of the cone Morse implant system after innumerable activations and deactivations. 10 implant/abutment set were used, one with 2mm prosthetic interface (G1) and other with 3mm (G2). Each set were sequentially activated for 3 times with 60N and 0 degrees. 10 abutment activation/removal were made for each set. The data in MPa was submitted to ANOVA and Tukey's test ($\alpha=0.05$). G1 showed no difference ($p>0.05$) from cycle 1 (81.05 ± 14.73) to cycle 8 (87.51 ± 11.55), however a higher traction force ($p<0.05$) were found in cycle 9 (109.08 ± 16.32) and 10 (109.59 ± 14.22). G2 showed no difference among the 10 activation/removal cycles (cycle 1 – 82.68 ± 10.55 , cycle 10 – 97.35 ± 12.17). Cone Morse system showed no retention reduction after successively activations and removals, characterizing a stable system.

105 Effect of silane application form on lithium disilicate ceramic and resin cement bond strength

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The use of silanes as adhesion promoters agents have been routinely employed in dental clinics. In order to evaluate the influence of silanes application form in microshear resistance interface: IPS e.max Press ceramic - RelyX ARC resin cement, 20 samples were manufactured in ceramics, etched with 10% hydrofluoric acid (FGM) for 20 seconds and separated into 5 groups of ceramic silanized with: A-silane Angelus, B- Relyx Ceramic Primer (3M ESPE), C- Bis-Silane (Bisco), D-silane Dentsply, E- Prosil (FGM). The applications of silanes were performed according to manufacturers' recommendations. On the ceramic, silicone rubber matrices with three perforations, were positioned and fulfilled with RelyX ARC in all groups. The light activation was done using LED Bluephase (Ivoclar Vivadent) for 30 seconds. The samples were stored in environment at 37°C for 24 hours and positioned at Instron testing machine to microshear test. The results were submitted to analysis of variance and Tukey's test ($p < 0,05$). Statistical analysis showed microshear bond strength value significantly lower for group D. The standard fracture analysis showed predominance of ceramic cohesive failure in groups C and E and adhesive problems in groups A and B. Group D showed the same percentage of fractures adhesive, cohesive ceramic, and mixed. It was concluded that the manner of application of silane showed different effect on the bond strength between ceramic lithium disilicate and resin cement.

107 Critical analyses of glass and quartz fiber post treatment surface protocols – Literature review

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The step of treating the glass fiber post surface, prior to adhesive cementation, is critical to the rehabilitation successful. The present study aimed, through literature review, elaborate the most suitable protocol for glass fiber post surface treating. As a method, it sought through the platform MEDLINE / PubMed, articles of associations with the following keywords: fiber post, fiber post AND adhesion, fiber post AND bond, e fiber post AND surface treatment. It was found 705 articles of which 515 papers were excluded because they are not in English; was about others themes and materials or physic-mechanical properties tests; was literature review; was not completed available; and did not treated the post surface; remaining 190 articles. It was found that the silane was the most common material used, mentioned in 115 (60,52%) papers, followed by application of primer and/or adhesive and use of alcohol, consisting of 70 (36,84%), and 72 (38,29%) of the works, respectively. Even mentioned by only 11 (5,78%) of the authors, hydrogen peroxide showed favorable results, unlike treatment with abrasive particles, cited in 34 (17,89%) of the studies, which can promote fractures and damage to the fibers. It was concluded that the surface treatment has no standard protocol established, and for most successful rehabilitation treatment, it is recommended the use of hydrogen peroxide as promoter of roughness and removal of epoxy resin, followed by silane for optimization of chemical bonding.

104 In vitro marginal adaptation evaluation of different restorative materials after thermal cycling

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Despite advances in restorative materials marginal defects can appear as a result of secondary caries. The aim of this study was to evaluate in vitro the marginal adaptation of restorative materials submitted to thermal cycling. 60 cavities were prepared in enamel and dentin of bovine teeth and were randomly divided into 3 groups ($n = 10$): G1 - KetacTM Molar Easymix, G2 - VitremerTM, and G3 - FiltekTM Z350. After 24 hours, replicas were made and the specimens were submitted to thermal cycling (Elquip, São Carlos, SP, Brazil - 2880 cycles of 30s at temperatures of 5 °C and 55 °C, for 24 hours). After thermal cycling, new replicas were made and observed by scanning electron microscopy to measure the gaps formed (in percentage) using the software Image J 1.45. It was calculated the difference between the final and initial gaps formed (ΔF). The data were analyzed using Wilcoxon, Kruskal-Wallis and Dunn ($\alpha = 0.05$). No significant difference were observed between the materials studied ($p>0.05$), in enamel, regarding the gap formation. In dentin, significant difference between G1 and G2 ($p = 0.0046$) and between G1 and G3 ($p=0.0145$) were observed. G2 and G3 showed no difference between groups ($p>0.05$). It could be concluded that the enamel marginal adaptation was not affected by thermal cycling, however, the dentin restored with conventional glass ionomer cement showed a greater tendency to gap formation when compared to resin modified glass ionomer cement and composite resin.

106 Evaluation of surface roughness of denture liners in different time periods

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The aim of this study was to clinically evaluate a possible change on the surface roughness of different denture liners. Thirty complete denture wearers were selected to participate of this in situ study with 2 phases of 21 days. Samples of 2 denture liners (silicone and acrylic based materials) and acrylic resin (control) were inserted inside the maxillary denture and the surface roughness was evaluated before and after their insertion. The samples were removed of the dentures after 7, 14 and 21 days. The denture liners showed higher surface roughness than acrylic resin (control) ($p<0.001$), with no difference between denture liners ($p=0.109$). Surface roughness was lower on day 7 than on days 14 and 21 ($p<0.001$). We can conclude that the denture liners tested should be used with caution since they showed an increase of surface roughness over time.

108 Influence of the model and brand of diamond bur in flexural strength and failure pattern

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The diamond burs are rotary abrasives instruments used to perform dental preparations and finishing restorations, and consist of shank, intermediate shaft and active tip. The objective of this study was to measure the flexural strength of the shank and intermediate shaft of six different diamond burs commercial brands, using three-point flexural test and analysis of the failure pattern. It was used 60 diamond burs, 30 burs model 2200 ($n = 5$) and 30 burs model 2135 ($n = 5$), of brands KG Sorensen, Option, Microdont, FAVA, Zeep, Vortex. The samples were subjected to the load applied to the center of the shank (2200) and intermediate (2135) by triangular device to the point of fracture, held at the Universal Testing Machine (EMIC). Two failure patterns were defined by analysis of possible fractures of each sample in a magnifying 40X, as follows: A- bends and B-total fractures. As result, it was observed that KG Sorensen rotary instruments, stood out in all tests, showing high values of flexural strength for shank and intermediate shaft, without total fracture failure. Option brand had the highest rate of total fracture failure. It is conclude that is not standardization between the flexural trademarks, and the use of instruments with low resistance may cause higher rates of failure, damaging the equipment or cause injuries to the tissues of the patient.

109 Influence on compressive strength of a composite resin containing nanoplates, nanorods and nanospheres Of ZnO and Ag

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Antimicrobial restorative materials may be one way to prevent the biofilm formation in dental composites and, therefore, secondary caries. Nanoparticles (NPs) of ZnO and Ag have shown antimicrobial potential when incorporated into dental resins. The aim of this study was to evaluate the compressive strength of dental composite FiltekTMZ350 XT (R) plus ZnO NPs and Ag. ZnO:Ag NPs were synthesized at room temperature (RT), by hydrothermal (HS) and Pechini methods (PS), characterized by X-ray diffraction, thermogravimetry and scanning electron microscopy. Composite specimens (Ss) were prepared in stainless steel cylindrical molds (6x4mm) and stored in artificial saliva at 37 °C for 24h prior the test. Three Groups (R - Control, R + 1% NPs and 2% NPs) with 8 Ss (n = 24) underwent compressive strength test, determined with EMIC universal testing machine with 10kN load cell at 0, 5mm/min. The results were submitted to two-way analysis of variance (ANOVA) followed by Tukey test for multiple comparisons. The synthesis generated polycrystalline powders with nanoplates of ~ 10 nm agglomerated in microspheres (RT), hexagonal nanorods of ~ 345 nm (HS) and nanospheres with ~ 88 nm (PS). ANOVA showed a significant difference (p > 0.05) between NPs HS 2%, 1% PS, PS 2% and the control Group. The compressive strength decreases with the increase of NPs in resin, however, inclusion of 1%, 2% of nanoplates and 1% of nanorods do not change significantly the compressive strength of the resin.

111 Evaluation of the behavior of colored alumina/feldspar based ceramics facing a new production protocol

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The aim of this study was to characterize by evaluating the elastic modulus, hardness and roughness, the behavior of alumina / feldspar colored bodies after using a new production process, considering that the process initially used generated excessive porosity. The ceramic raw material was formed of pink and blue alumina powder, produced by a new process of ceramic pigment, combined with 20 wt% of feldspar resulting in groups R20 (pink alumina + 20% feldspar) and A20 (blue alumina + 20% feldspar). After mixing the pressing additives with the powders, the mixture was compacted and pressed into disc-shaped with 12.0(± 0.2)mm of diameter and 1.2(± 0.2)mm of thickness. The pieces were kept in a stove at 100°C for 24h before sintering. The first stage of sintering protocol used was similar for both groups, they were a heating using a rate of 100°C/h up to 400°C, remaining on this temperature for 4 hours. Next, was used a heating rate of 150°C/h up to 1450°C for 8h to R20, and 1300°C for 10h to A20. After sintering, the elastic modulus of the sintered pieces was evaluated by ultrasound, as well as the microhardness and roughness. The elastic modulus of the groups R20 and A20 were 198 MPa and 182 MPa respectively. The mean values of Vickers hardness for the groups R20 and A20 were 419 (± 37) and 367 (± 29) and roughness mean values were 0.43 (± 0.1) and 0.49 (± 0.04). From the results obtained it can be concluded that the production protocol suggested produced pieces with the most promising properties.

113 Influence of successive light-activation on degree of conversion and knoop hardness of the first composite increment

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The aim of this study was to evaluate the influence of light-activation of four successive increments on Knoop Hardness (KHN) and degree of conversion (DC) of top (T) and bottom (B) surfaces of the first increment. Samples were made in four-overlapped Teflon mold (2mm high each). A microhybrid composite was light-activated according to the experimental groups (n=5). G1 to G4 (multiple irradiation) and G5 to G8 (single irradiation) were light-activated with QTH XL (500 mW/cm² X 38 s); and LED S (1000 mW/cm² X 19 s), HP (1400 mW/cm² X 14 s) and PE (3200 mW/cm² X 6 s). In groups 1 to 4, after each light-activation, T and B surfaces of the first increment were measured in DC and KHN. In groups 5 to 8, only the first increment was made, and the four measurements of DC and KHN were taken at 15 minutes interval. Results for DC and KHN were analyzed separately; the data were analyzed by using PROC MIXED for repeated measures and Tukey test (á=0.05). For KHN, B showed lower values than T. For both single and multiple irradiations, T and B of first measurement showed the lowest KHN and the fourth measurement showed the highest, with significant difference between them. For DC, except QTH, T presented higher DC than B. The light-activation of successive increments influenced the KNH of the first increment but did not influence the DC.

110 Edge chipping test on microhybrid and nanocomposites

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The aim of this study was to investigate the influence of indenter type on the “edge toughness (TE)” of two different restorative composites. A microhybrid composite, (Z250 - Filtek Supreme XT, 3M-ESPE, MN) and a nanocomposite (Z350 - Filtek Supreme XT, 3M-ESPE, MN) were used to prepare 3 bars (5x32x2.5 mm) samples for each material. The specimens were light-cured using a LED with an irradiance of 1200mW/cm² (RADII CAL SDI, Bayswater, AUS). Three base increments were photo-activated for 20s each and a final surface increment for 120s. Specimens were storage for 7 days in distilled water at 37°C. The edge chipping tests were carried out in a universal testing machine, with a constant load (0.1 mm/min). Rockwell (conical 120°) and Vickers indenter were used. The load was applied in different distances between the upper longitudinal edge and the indenter (da). Each specimen was chipped around twenty times, with five different da values, from 0.1 mm to 0.5 mm. An average force and standard deviation were calculated for each distance. The relationship between mean critical force (FC) and da was plotted. TE was defined as the slope of the linear trend on these graphs. The results showed that highest values of TE was found using Vickers indenter. Differences between composite (Z250 TE = 335.9 and Z350 TE = 277.5) were found with Vickers indenter, but not with Rockwell indenter (Z250 - TE = 234.9 and Z350 - TE = 235.0). The type of indenter influences on TE value. Vickers indenter was able to distinguish the different composite, while Rockwell indenter showed similar toughness for them.

112 Influence of the framework design on the stress distribution: finite element analysis

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The aim was to study the influence of the framework design on the thermal residual stresses (TRT) at the porcelain, by the finite element method. Axisymmetric finite element models of crowns were generated according to 4 framework designs: (1) CV: conventional coping, (2) CVC: CV with cervical brace, (3) CMOD: Coping modified; (4) CModC: CMOD with cervical brace. A cooling protocol of the model from 600°C to 25°C was simulated. The data of temperature in this step were incorporated into the structural analysis. The peak value and the distribution pattern of the maximum principal stress (δ1) were evaluated at the porcelain. It was observed that the presence of convex regions at the zirconia/porcelain interface reduces the tensile stresses in the porcelain. Thus, two new models were generated: M1, with concave surface in the porcelain interface with zirconia, and M2 with convex surface. The analysis of TRT was performed following the protocol described previously. The values of δ1 for each framework design were: CV = 22 MPa, CVC = 20 MPa, CMod = 11 MPa, CModC = 10 MPa. For the models M1 and M2, the values of δ1 were 26 MPa and 7 MPa, respectively. It can be concluded that the presence of cervical brace did not cause a considerable decrease in the tensile stress values. The influence of the framework design in the generation of TRT may be related to the change of curvature of the porcelain/zirconia interface. The TRT is more favorable in framework designs which porcelain surfaces attached to zirconia is convex.

114 Effect of non-carious cervical lesions morphology and loading on the biomechanical behavior of maxillary incisors

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Non-carious cervical lesions (NCCLs) are formed by loss of tooth structure in the cervical third of the crown and root surface, with multi-factorial origin. The aim of this study was to measure the effect of five morphological types of NCCLs, simulating two different loads on maxillary incisors, by quantifying the stress distributions. Eleven virtual models of maxillary incisors were generated using the CAD software rhinoceros 4.0. These models presented six NCCLs morphologies: Sound (H), CONCAVE (CO), IRREGULAR (IR), NOTCHED (NO), SHALLOW (SH) AND WEDGED-SHAPE (WS); unrestored and restored with composite resin. The models were exported to an analyses software (Ansys Workbench 12.0), considered homogeneous, linear and isotropic. Then, the models were meshed and submitted to two types of load (100 MPa): palatine (P) and incisal (I). The displacement restriction was made on the base and on the sides of the bone. Data summarizing the stress distributions were obtained in MPa using Von Mises criteria. As results, the models CO, WS and IR showed higher stress concentration on the bottom of the lesion. Models with the center of the NCCL at acute angle (WS and IR) showed higher stress on the junction of the ceiling and floor walls. All the restored morphologies, independent of the load type, showed biomechanical behavior similar to the H. It was conclude that deeper NCCLs and with acute angles, shows higher stress on the deep of the lesion; and restore with composite resin is important, independent of the morphology.

115 Morphological characterization of bonding between dentin and resin cements

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The aim of this study was to investigate the morphology of the interface between human dentin and resin cements Rely X Unicem (3M ESPE), SET (SDI) and C&B Cement (Bisco). The occlusal surface and roots of six third molars were removed, producing 12 dentin discs with 2.0 mm thick. The dentine surface was prepared with abrasive SiC granulation 600, cemented in pairs according to the manufacturers' recommendations, mesio-distal and enclosed in PVC tubes with epoxy resin. SiC sandpaper in grits 600, 1200, 2000 were used to plan each pair of disk cemented. Then felt and diamond pastes, granules in 3, 1, 1 / 4, alternating with ultrasonic cleaning for 12 minutes were used to finish the polishing. Each sample was etched with phosphoric acid 50% for 3 seconds and immersed in 2.5% NaOCl for 10 minutes. After this period, the samples were washed three times with distilled water, placed in solutions of increasing concentration of ethanol (25, 50, 75 and 100%) for 10 minutes, immersed in HMDS for 10 minutes and stored dry for 12 hours. Finally, the samples were metallized and observed under a scanning electron microscope (SEM). The results of morphological analysis of the union showed no hybrid layer formation for self-adhesive cements Rely X Unicem and SET. Only chemically activated C&B Cement produced hybrid layer.

117 Shear bond strength to CAD/CAM materials using four adhesive luting strategies

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The adhesive luting of indirect materials relies on a correct treatment of their surfaces in order to achieve a good interaction with the resin cements. This study evaluated the shear bond strength (SBS) to CAD/CAM materials [Empress CAD glass-ceramic (EC); LAVA Ultimate indirect resin (LU)] using four adhesive protocols, including the use of an adhesive system that contains silane and the MDP monomer in its formula (Scotchbond Universal, SBU). Plates of EC and LU materials received standard surface treatment (EC: sandblasting, HF 10% 60 sec, ultrasonic bath; LU: sandblasting, ultrasonic bath). For both materials four adhesive protocols were used: G1: Silane (S) + SingleBond2 + RelyXARC; G2: S + U200; G3: SBU + RelyX Ultimate; G4: SBU + U200. For each combination of material and adhesive protocol 14 cement cylinders were built (area=4.15mm²). SBS was measured after 24 hours. Results of ANOVA and Tukey ($\alpha=5\%$) showed that for EC protocols G4 and G2 were superior than G1 and equal to G3. For LU, G3 and G4 were higher than G1 and G2. SBS to LU was higher than to EC when using G3 and G4. Use of SBU as a surface treatment acting both as silane and adhesive was effective, especially for LU.

119 Influence of diameter for platform switching on implant biomechanics

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The aim of this study was to evaluate the influence of the reduction of abutment's diameter for platform switching on stress distribution of single implant with external or internal connection using three dimensional finite element analyses. A total of 8 virtual 3D models were constructed containing one single implant (5.0 X 11mm) in a mandibular segment supporting a single first molar screwed crown. The implants present external or internal hexagon connection. It was used UCLA abutment platforms with different diameters: 3.8; 4.2; 4.6 or 5.0 mm. All structures were considered perfectly bonded and each model received a 200 N oblique load on the occlusal surface distributed on 8 different points. The maximum principal stress and the maximum elastic strain were calculated for the cortical and trabecular bone and equivalent von-Misses for dental implant and platform abutment using ANSYS Workbench Software. The reduction of abutment's diameter produced a reduction of stress and strain values on bone tissue. However, the smallest diameter for external hexagon connection produced the highest stress values. On the other hand, the reduction of abutment's diameter increased the stress and strain in abutment and implant, regardless of implant connection. The reduction of abutment's platform diameter improves stress distribution in bone tissue, independently of the implant connection type. However, it increases the stresses within the implant and abutment, which could compromise their mechanical resistance.

116 Effect of non-carious cervical lesion, root morphology and loading on the biomechanical behavior of premolar

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The premolars have a higher prevalence of non-carious cervical lesions (NCCLs). The present study aimed to investigate the biomechanical behavior of premolars, analyzing the root morphology, the NCCLs depth, and type of load; by the finite element analysis and strain gage test. Six models virtual 3D models were generated: single-rooted (high; lesion of 1.5 and 2.5 mm) and bi-rooted (healthy, 1.5 and 2.5 mm). Each model was subjected to axial and oblique loading and data analysis was performed by the Von Mises criterion and Maximum Principal Stress. For strain gage test, 14 premolars were selected and divided into 2 groups (single-rooted and bi-rooted), which received strain gage in the buccal and mesial faces. The healthy samples received a compressive loading (0-100N). This was followed by the simulation of the 1.5 mm NCCL, with 3118 diamond bur, and the samples subjected to new loading. Then, the 2.5mm lesion was simulated and the load was applied again. As a result, the bi-rooted teeth associated with oblique loading showed higher strain values. The axial loads showed lower rates of deformation. NCCLs promoted greater depths with a higher concentration of stresses and strains. It is concluded that the deeper NCCLs associated with bi-rooted teeth and oblique loading, increase the concentration of stresses and deformation in the tooth structure.

118 Stress distributions in different overdenture-retaining system

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This study evaluated the influence of cross-section geometry of the bar framework on the distribution of static stresses in an overdenture-retaining bar system simulating horizontal misfit and bone loss. Three-dimensional FE models were created including two titanium implants and three cross-section geometries (circular, ovoid or Hader) of bar framework placed in the anterior part of a severely resorbed jaw. One model with 1.4-mm vertical loss of the peri-implant tissue was also created. The models set were exported to mechanical simulation software, where horizontal displacement (10, 50 or 100 μ m) was applied simulating the settling of the framework, which suffered shrinkage during the laboratory procedures. The bar material used for the bar framework was a cobalt-chromium alloy. For evaluation of bone loss effect, only the 50- μ m horizontal misfit was simulated. Data were qualitatively and quantitatively evaluated using von Mises stress for the mechanical part and maximum principal stress and ϵ -strain for peri-implant bone tissue given by the software. Stresses were concentrated along the bar and in the joint between the bar and cylinder. In the peri-implant bone tissue, the ϵ -strain was higher in the cervical third. Higher stress levels and ϵ -strain were found for the models using the Hader bar. The bone loss simulated presented considerable increase on maximum principal stresses and ϵ -strain in the peri-implant bone tissue. In addition, for the amplification of the horizontal misfit, the higher complexity of the bar cross-section geometry and bone loss increases the levels of static stresses in the peri-implant bone tissue.

120 Effect of polishing systems and chemical degradation in surface roughness of resin-based materials

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This study evaluated the influence of polishing systems and coffee immersion on the surface roughness (Ra) of composites. 72 Cylindrical samples (7 x 2 mm) were prepared and divided into 8 groups (n = 9) in accordance with the factors (Soflex and Jiffy / Filtek Z350XT and Vitalescence / coffee (CF) and artificial saliva (SA)-control). The initial Ra was measured. Then, each sample was immersed in 4 mL of solution for 14 days (CF: for 15 min, three times a day). After that, the Ra was measured again and the Delta values (Δ Ra) were calculated. The results were submitted to tree way ANOVA and Tukey test ($p < 0.05$). After degradation in both solutions for both composites, there was a reduction in surface roughness. There were no statistically significant interaction between composites and polishing system ($p < 0.001$). Independent of the solutions, Vitalescence composite showed no significant change in surface roughness when polished with the Soflex (Δ Ra = -0.05) and Jiffy (Δ Ra = -0.09). However, the resin Z350 showed differences for the polishing system, with greater Δ Ra for the Jiffy (Δ Ra = -0.25) compared with Soflex (Δ Ra = -0.01). After the degradation, the Soflex polishing system does not promote variations in Ra for both composites. However, the Jiffy promoted smaller Δ Ra for the Vitalescence (Δ Ra = -0.09) than in Z350 (Δ Ra = -0.25). The solutions did not affect the surface roughness of composites. However, the composition of the composite resins and the different polishing systems influenced the surface roughness of composite restorative after the degradation by the solutions.

121 Physical-mechanical properties and μ CT evaluation of low shrinkage resin composites

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The aim of this study was to evaluate the physical-mechanical properties (PMP) of low shrinkage resin composites (LSRC). Thus, commercial LSRC were evaluated (Kalore - GC Corp and Venus Diamond - Heraeus Kulzer) and compared to a conventional microhybrid composite (CMC) (Filtek Z250 - 3M). All specimens were photocured by LED - 16J. 5 specimens were scanned using a μ CT, before and after the photoactivation. The composite volume was measured before and after the curing process, and the % of shrinkage was measured and the volumetric shrinkage (VS) evaluated. 10 bar specimens of 7x2x1 mm of each resin composite were performed to evaluate the PMP. After 24 hours, the degree of conversion (DC) was evaluated by FT-IR. The flexural strength (FS) and elastic modulus (EM) were measured by a three-point bending test. Data were submitted to one-way ANOVA and Tukey's test ($\alpha = 0.05$). The μ CT evaluation showed that the LSRC showed lower VS values (Kalore = 1.8 % and Venus Diamond = 1.7%) compared to the Z250 (2.0 %) ($p \leq 0.05$). For the FS and EM, only Kalore showed lower values compared to CMC. Also, Kalore presented higher DC (68,8 %) compared to the other LSRC (49,5 %) and also to the CMC (49,6 %). In conclusion, the low shrinkage composites showed lower VS without affecting the physical-mechanical properties.

123 Influence of experimental adhesives on cell metabolism and MMP expression

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To evaluate the effect of experimental adhesives with different hydrophilic characteristics on metabolism and expression of metalloproteinase-2 (MMP-2) by cultured odontoblast-like cells. Sterile filter paper discs were impregnated with 10 μ l of different experimental adhesives: R1, R2, R3, R4 and R5 (in increasing order of hydrophilicity), and two commercial available adhesives (Scotchbond-SC and Single Bond 2-SB2), and then light cured for 20 s. The specimens were individually immersed for 6 or 12 h in 1 ml of culture medium (DMEM) to obtain the extracts (DMEM+ components released from adhesives), which were applied on cultured MDPC-23 cells (3x10⁴cells/cm²) for 8 h. Discs not impregnated with adhesives (R0) were used as control. Cell metabolism (MTT assay) and MMP-2 expression (zymography) were evaluated. The data were submitted to two-way ANOVA complemented by Tukey's test ($\alpha=0.05$). After 6-h elution, the cells exposed to the extracts obtained from R1, R5 and SB2 presented lower metabolism than the other groups. At 12-h elution, the extracts from all adhesives significantly decreased the cell metabolism compared to control group ($p<0.05$). The MMP-2 expression was statistically lower for R4 and SB2, after 6-h elution. At 12-h elution, the cells exposed to the extracts obtained from R5, SC and SB2 presented lower MMP expression than the other groups ($p<0.05$). It can be concluded that the adhesives can influence the metabolism and expression of MMP-2 by odontoblast-like cells. However, the effects of these resin-based materials on the cells activity are not modulated by their hydrophilic characteristics.

125 Analysis of shear strength of repairs after different treatments on ceramic surface

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The aim of this study was to determine the shear strength of repaired ceramic after different treatments. It was used forty ceramic discs Noritake EX-3 (Group E) and another forty discs with the system Noritake Cerabien (Group C). Group E1 and C1: laser application, Group E2 and C2: etching with hydrofluoric acid 10%, Group E3 and C3: sandblasting with aluminum oxide, Group E4 and C4: roughened with silicon carbide grain # 400 (control). All discs were given applying a layer of coupling agent for ceramics and a layer of adhesive. In the center of the ceramic disk, a block was made in composite. Each group was maintained at 100% humidity at 37 ° C for one to four weeks in the greenhouse cultivation. Sandblasting with aluminum oxide showed the highest values of shear strength at the interface between the composite and ceramic EX3, and the same occurred in Cerabien pottery, but pottery EX3 with the storage time of 1 week and the ceramic Cerabien with the storage time of 4 weeks. Sandblasting with aluminum oxide surface treatment was the one that showed better results in both types of ceramics. The storage time of 4 weeks did not have a significant influence in this study.

122 Bonding effectiveness of universal self-etching adhesive systems to chlorhexidine-treated dentin

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Chlorhexidine (CHX) is an antimicrobial agent with ability to detain the endogenous activity of the matrix metalloproteinases in phosphoric acid etched dentin substrate. However, it is speculated that the chlorine residues on dentin surface after CHX treatment could interfere chemical and physically on immediate bond strength of universal self-etching adhesive systems. The aim was to evaluate the prior application of 2% CHX influences on tensile bond strength (TBS) of universal self-etching adhesive systems. For TBS test, third molars were cut to expose a middle flat dentin surface and randomly assigned into 4 groups: (CSE) Clearfil SE Bond – hybridization according to manufacturer's instructions; (CSE+CHX) CHX applied during 20s following hybridization with CSE; (SBU) Scotchbond Universal – hybridization according to manufacturer's instructions at self-etching mode; (SBU+CHX) CHX applied during 20s following hybridization according SBU system. Filtek Z350 composite resin blocks were incrementally built up. After 24h, specimens were sectioned in 1mm² beams and subjected to tensile test (n=18). The data were analyzed with two-way ANOVA two-way and Tukey's test ($p<0,05$). Groups (CSE) 39,77 \pm 11,56MPa and (SBU) 38,43 \pm 12,49MPa presented the highest TBS values and were not statistically different among each other. (CSE+CHX) 22,61 \pm 5,18MPa and (SBU+CHX) 22,25 \pm 5,58MPa presented the lowest TBS values and were not statistically different. In conclusion, it is suggests that pre-treatment of dentin with 2% CHX adversely affects the immediate bonding efficacy when associated with universal self-etching adhesive systems.

124 Effect of polishing systems and staining solution on surface gloss of restorative materials

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This study aimed to evaluate the influence of two polishing systems in the gloss of composites after degradation in coffee. 72 cylindrical samples were made (7 mm diameter x 2 mm thick) of the composites Filtek Z350XT and Vitalescence. After 24 h at 37 °C, the samples were polished with SofLex systems (3M/ESPE) and Jiffy (Ultradent), and then randomly separated into 8 groups (n = 9) according to the composite, the gloss and the staining solution [coffee (CF) and artificial saliva (SA) – control]. Initial measurements of gloss of surface were made. Then, each sample was immersed in 4 mL of CF for 15 min, 3 times a day for 14 days. After that, the gloss of surface was measured again and variations of gloss (Δ gloss) were calculated. The normal distribution of data was verified (Kolmogorov-Smirnov test, $p>0.05$) and then subjected to ANOVA and Holm-Sidak test (5%). There was interaction between restorative material and polishing system ($p = 0.007$). Regardless of the solutions, Vitalescence not exhibited significant Δ gloss differences in gloss values when polished by SofLex systems (3.80) and Jiffy (4.68). However, Z350 showed significant differences with the greatest Δ gloss after polishing with SofLex (10.32) when compared with Jiffy (5.85). After degradation, regardless of polishing system employed, Vitalescence did not show significant Δ gloss of surface in CF and SA. However, Z350 showed less Δ gloss in SA (6.14) than in CF (10.03). It is concluded that after degradation in CF, the composite resin Z350 showed higher variation in gloss when polished with the system SofLex and immersed in CF. Vitalescence not exhibited significant variations in gloss of surface in all the situations studied.

126 Influence of photo-initiation system on the radical polymerization of elastomeric monomers

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The aim of this study was to evaluate the degree of conversion (DC), the kinetic of polymerization (KP), and the rate of polymerization (RP) of elastomeric monomers (exothanes) containing different photo-initiation systems. Five exothanes (8, 9, 10, 24, and 32) were mixed with the following photo-initiation systems: unitary [camphorquinone (CQ)]; binary [CQ + tertiary amine (EDAB)]; and ternary [CQ + EDAB + diphenyliodonium (DPI)] at concentrations of 0.5%, 1% and 1% in weight for CQ, EDAB, and DPI, respectively. UDMA was used as control. Each resin blend was evaluated in infrared spectroscopy (RT-FTIR, Shimadzu Prestige-23) using a diamond crystal (n=3). The DC data was analyzed by two-way ANOVA (factors monomer type x photo-initiation system) and Tukey's test ($p<0.05$). Independently of the photo-initiation system used, the exothanes 8, 9, and 32 demonstrated higher DC than the others. The exothane 24 resulted in the lowest DC values, although the ternary system presented similar DC when compared to the control and higher DC than the unitary and binary systems. The unitary system was effective as initiation system for the polymerization of the exothanes and the UDMA. Regarding the KP, the exothane 32 was completely transformed in polymer from 12 to 17s of photo-activation. Within the RP results, the binary and ternary systems increased the exothane's reactivity, but not the control's one. Therefore, urethane derived monomers (UDMA and exothanes) performed as co-initiators of the radical polymerization of CQ. The exothanes 8, 9, and 32 were the most reactive ones, reaching DCs higher than 80%.

127 Analysis of inflammatory markers and systemic cytotoxicity of endodontic pastes

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The aim of this study was to evaluate of the natural extract endodontic paste systemic toxicity. Wistar rats were randomly divided into five groups (n=12). Control group was not submitted to endodontic procedure. The remaining groups were submitted to pulpectomy in upper incisors and the root channel was fulfilled with Vaseline (control positive); iodoform-based paste with rifocort® (Guedes-pinto's paste); iodoform-based paste with guaco extract and iodoform-based paste with copaiba oil. After 14 and 28 days, blood samples were collected for analysis of C reactive protein, alanine aminotransferase (ALT), aspartate aminotransferase (AST) and creatinine. The statistical analysis was performed with Kruskal-Wallis and Dunn's tests (P < 0.05). Mean body weight were not significantly different among groups after 14 days. Liver weight and relative liver weight were decreased in Vaseline group. Mean spleen weight were increased in guaco group but this difference were relative to mean body weight. No significant increase in creatine kinase MB, ALT, AST and creatinine serum levels were found on day 14. After 28 days, mean body weight were decreased in Vaseline group and increased relative liver and kidney weights were found in rifocort® and guaco groups, respectively. A high rate of renal clearance was found in rifocort® group, as reduced creatine levels, compared to Vaseline e copaiba groups. Concluded that the iodoform-based paste with natural extracts were more promissory that positive control group and iodoform-based paste with rifocort®.

129 Degree of conversion and hydrolitic degradation of experimental composites: influence of surface treatment filler system

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The aim of this project was to analyze the influence of the surface treatment of inorganic fillers system on absorption, solubility and degree of conversion of experimental composites. The commercial available composite Z250 (3M ESPE) was used as a standard. In the experimental group E1, the particles were not treated. In E2 group, the particles were silanized with γ -MPS. In groups E3 and E4, particles of barium-borosilicate were conditioned for 2 min with 10% hydrofluoric acid in order to create porosities and increase interaction with the organic matrix. Finally, the particles in group E4 were also silanized. Regarding the degree of conversion, group E2 showed the lowest value (70,37% \pm 0,88) and the group E3 showed the highest value (77,32% \pm 0,73). The group E5, used as standard showed the value of 74,49% \pm 6,00. Regarding the absorption, group E1 had the lowest value (48,86 μ g \pm 5,78) and the experimental group E4 showed the highest value (83,64 μ g \pm 10,19). The group E5, used as standard showed the result of 37,51 μ g \pm 5,70. For the solubility the experimental group E1 presented the lowest result (6,43 μ g \pm 1,40) and the experimental group E4 showed the highest result (24,69 μ g \pm 3,40). The group E5, showed the value of 5,37 μ g \pm 1,52. It is possible to conclude that the increasing in filler particles porosity increased the degree of conversion and the silanic layer and porosity could increase the composite degradation.

131 Biological characterizations of implant surfaces - in vitro study

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The aim of this study was to evaluate the biological performance of titanium alloys grade IV under different surface treatments: G1, sandblasting and etching (Neoporos, NEODENT); G2, surface with wettability increase (Acqua - NEODENT) on response of preliminary differentiation and cell maturation. Immortalized osteoblast cells were plated on G1 and G2 titanium discs. The polystyrene plate surface without disc was used as control group (C). Cell viability was assessed by measuring mitochondrial activity (MTT) at 4 and 24 h (n = 5), cell attachment was performed using trypan blue exclusion within 4 hours (n = 5), serum total protein and alkaline phosphatase normalization was performed at 4, 7 and 14 days (n = 5). Data were analyzed using one-way ANOVA, Kruskal-Wallis and Dunn's tests. The values of cell viability were: 4h: C- 0.32 \pm 0.01A; G1- 0.34 \pm 0.08A; G2- 0.29 \pm 0.03A. 24h: C- 0.43 \pm 0.02A; G1- 0.39 \pm 0.01A; G2- 0.37 \pm 0.03A. The cell adhesion counting was: C- 85 \pm 10A; G1- 35 \pm 5B; G2- 20 \pm 2B. The amounts of serum total protein were 4d: C- 40 \pm 2B; G1- 120 \pm 10A; G2- 130 \pm 20A. 7d: C- 38 \pm 2B; G1- 75 \pm 4A; G2- 70 \pm 6A. 14 d: C- 100 \pm 3A; G1- 130 \pm 5A; G2- 137 \pm 9A. The values of alkaline phosphatase normalization were: 4d: C- 2.0 \pm 0.1C; G1- 5.1 \pm 0.8B; G2- 9.8 \pm 2.0A. 7d: C- 1.0 \pm 0.01C; G1- 5.3 \pm 0.5A; G2- 3.0 \pm 0.3B. 14 d: C- 4.1 \pm 0.3A; G1- 4.4 \pm 0.8A; G2- 2.2 \pm 0.2B. Different letters related to statistical differences. The surfaces tested exhibit different behavior at dosage of alkaline phosphatase normalization showing that the G2 is more associated with induction of cell differentiation process and that G1 is more related to the mineralization process.

128 Effect of 5% sodium thiosulfate in reestablishing the bond strengths to 5,25% sodium hypochlorite-treated dentin.

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Evaluate the antioxidant efficiency of 5% sodium thiosulfate, at different times, in reestablishing the bond strengths to 5,25% sodium hypochlorite-treated dentin. Thirty crowns of bovine incisors were cut to expose the pulp chamber. The dentin surfaces were treated as follows: group 1: 0.9% sodium chloride for 30 min; group 2: treated with 5.25% sodium hypochlorite (NaOCl) for 30 min, 17% EDTA for 3 min and additional 5.25% NaOCl for 1 min; groups 3: immersion in 0.9% sodium chloride for 10 min after the same treatment performed in group 2; group 4, 5, 6: followed the same treatment performed in group 2, adding the final applications of 5% sodium thiosulfate solution for 1 min (group 4), 5 min (group 5) and 10 min (group 6). After that, Scotchbond Multipurpose adhesive system was applied to pulp chamber dentin, followed by Filtek Z250 composite. After storage in water for 24h at 37°C, twenty-five rectangular sticks were obtained from the specimens of each group and subjected to the microtensile bond test. The data converted to MPa were analyzed by one-way ANOVA and Fisher's test (p < 0.05). The groups 2 and 3 had significantly lower bond strength than the control (group 1). There was no statistically significant difference between groups 1 and 6 (p = 0.944), but both are statistically different from the groups 2 and 3. The reversal effect on compromised bonding to NaOCl-treated dentin is obtained using 5% sodium thiosulfate for 10 min. On the other hand, the washing with 0.9% NaCl does not reestablishes the bond strength values.

130 Influence of thermal simulation on the stress distribution in ceramic veneers Y-TZP crowns

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The aim of this study was to evaluate the stress distribution in ceramic veneers Y-TZP crowns and evaluate the compatibility between the coefficients of thermal expansion (CTE) the materials after the heating and cooling cycle using by three-dimensional finite element analysis. Virtual crowns were constructed using microtomography images of superior central incisor. The models were composed of ceramic veneer with a thickness of 2mm (feldspathic ceramic) and 0.4mm framework (zirconia, alumina or metal). The finite element software Ansys Workbench was used for thermal analysis and the loading was performed in 2 steps, simulating the heating and cooling manufacture cycle: 1st step – from 403o to 750o C, 2nd step – from 750o to 25o C. The Maximum Principal (σ_{max}) and Minimum Principal (σ_{min}) stress was used to evaluate the ceramic veneer and ceramic frameworks. The equivalent von Mises (σ_{VM}) used for the evaluation only the ceramic and metal frameworks. The results showed higher stress values on the ceramic veneer models with metal framework (376.76 MPa), followed by alumina (310.24 MPa) and zirconia models (213.32 MPa). Compressive stresses followed the same behavior showing higher values in metal-ceramic prosthesis. The stresses were concentrated at the cervical margin for all models regardless of material used. The difference in stress distribution between systems shows that the compatibility between the CETs is essential to keep mechanical performance of ceramic veneer.

132 Dislodgement resistance of root canal filling materials: meta-regression of push-out studies

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The aim was verify the influence of technical variables, materials and parameters of push-out test on dislodgment resistance of root canal filling materials to root canal dentin. A systematic review was performed using the "pushout" and "push-out" terms to search at PubMed database. Laboratorial studies published until 2013 were included. From the 639 identified studies, 39 met the inclusion criteria. Four reviewers extracted data regarded origin country, year of publication, tooth type, smear layer removal, root canal sealer, core material, obturation technique, sample storage, tooth portion, velocity of test machine and slice thickness. A meta-regression of 237 groups resultants was performed to analyze the influence of each variable on outcomes, in MPa. The regression model could explain 85% of the between-groups variance. Tooth type (p=0.53), irrigant solution (p=0.16), sample storage time (p=0.47), radicular portion (p=0.22) and test machine velocity (p=0.92) did not influence the dislodgement resistance of materials. The other analyzed variables influenced the push-out values (p < 0.05). The dislodgment resistance, measured by push-out assay, is influenced by variations on technique used to prepare and filling the root canals and by parameters adopted on test.

133 Evaluation of the removal torque on different alloy/coating external hexagon prosthetic screws

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The purpose of this study was to investigate the maintenance of the tightening torque in different types of screws for implant-supported single-tooth restorations by assessing the torque removal of each system. In addition, a new method for gold coating of abutment screws was also evaluated. Hexagonal (Hx) and square (Sq) titanium screws types were selected and designated to eight experimental groups (n=5): HxAu1 and SqAu1- screws subjected to gold-sputtering for 120 s; HxAu2 and SqAu2- screws subjected to gold-sputtering for 240 s; HxTi and SqTi- screws kept unchanged; HxDLC- hexagonal titanium screws with diamond-like carbon coating; HxGT- hexagonal gold screws. One assembly of implant and abutment was used to test each group. The screws were tightened with 32 N cm and loosened three times each, and the torque necessary to loose the screw was recorded. Data were submitted to two-way ANOVA repeated measures and Tukey's test. All groups showed lower torque removal values in comparison to the initial torque applied. No statistical differences were found between the tightening times. The screws with dry lubrication (HxGT and HxDLC) showed the lower torque removal values, being statistically similar to each other. The gold-sputtered screws HxAu1, SqAu1 and SqAu2 were statistically similar to Successive tightening did not influence the maintenance of the torque applied. The lubricant coating on the screws influences the maintenance of the applied torque.

135 Preliminary comparative study of two conventional bleaching systems

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The objective of this work is to analyze and compare 2 in-office bleaching systems through the clinical application of these to groups of patients and further evaluation of color change during time: preoperative, immediate postoperative, 7, 14 and 30 days after the treatment. 22 patients were randomly divided into two groups (n = 11) and underwent one bleaching session according to the manufacturers' instructions: Boost, 38% hydrogen peroxide (HP) - Opalescence Xtra Boost (Ultradent); Pola, HP 35% - Pola Office + (SDI). Three different systems were used in color evaluation: Vita Classical Shade Guide (VC) Bleachedguide Vita 3D-Master (VB) and Vita-EasyShade spectrophotometer (SP), with the measurements being made in the central incisors and canines. Statistical analyzes were performed by means of 3 way ANOVA. Comparisons of factor level means were performed through contrasts. For evaluation systems VC and VB, the two bleaching agents behaved similarly, with the bleaching effect being observed, for incisors and canines, from pre-operative to post immediate and maintaining the color obtained until the 30-day period. As for the SP evaluation the same difference was observed, however only in canines a second bleaching peak occurred between the post immediate and 7 days. Therefore, the two systems promoted significant bleaching effect in all evaluations and none of the treatments relapsed to the initial shades.

137 Feldspar as alternative filler for dental composites

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The aim of the study was to determine the effect of the filler type and size on the mechanical properties of experimental composites. Knoop hardness and depth of cure of 10 experimental composites based on BisGMA / TEGDMA with different types and sizes of filler particles (C1: Silica; C2: Barium glass/silica; C3: Barium glass 1µm; C4: Barium glass 0.02µm; C5: Barium glass mixture; C6: Feldspar 2µm; C7: Feldspar 1 µm; C8: Feldspar 0.8 µm; C9: Feldspar mixture; C10: Feldspar / Silica) were determined. Cylindrical specimens were prepared (n=10) and light-cured for 40s. The uncured portion was removed and the remaining thickness of the specimen was measured with a digital caliper. After 24h, the Knoop hardness was measured using a microhardness tester HMV 2000 - Shimadzu (3 indentations, load 50g, 30s). Data were submitted to ANOVA and Tukey's test ($\alpha=0.05$). The hardness of the experimental composites ranged from 59.5 KNH (C1) and 32.1 KHN (C8). Depth of cure ranged from 2.71mm (C1) and 5.05mm (C4). It was observed that the type and size of filler particles influenced the hardness and depth of cure of the composites. The feldspar appears to be a reliable alternative for mechanical reinforcement of composites, however, the use of 0.8µm particles (C8) caused a reduction on hardness and depth of cure when compared with other particle sizes of feldspar. Silica caused an increase on hardness, but reduced the depth of cure on the composite containing only silica (C1) and those in which it was combined with other types of fillers (C2 and C10).

134 Effect of filling technique and composite on cuspal strain, bond strength, shrinkage and physical properties

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To evaluate the effect of composite resins and filling techniques on cuspal strains (CS), bond strength (iTBS), composite ultimate strength (UTS), shrinkage stress and mechanical properties of the composites in molars. 135 human molars received standardized Class II MOD and restorations with 3 composites (LS, Filtek LS; Ae, Aelite LS; SU, Filtek Supreme) using 3 filling techniques (bulk, 8 and 16 increments). CS was measured by strain gauges; the same restored teeth were used to assess iTBS and UTS. The elastic modulus (E) and Vickers hardness (VH) at different depths were determined from microhardness. Polymerization shrinkage was modeled by Finite elements using post-gel shrinkage, measured using the strain gauge (n=10). The CS, iTBS, UTS, E and VH data were statistically analyzed using split-plot ANOVA and Tukey test ($p = 0.05$). The CS was higher for 16 increments. Filtek LS caused lower CS. The iTBS and UTS were similar for 8 and 16 increments and higher when compared to the bulk filling in all composites. E and VH were constant through the depth when applied in 8 or 16 increments. Post-gel shrinkage values were: LS < Ae < Su. The 16 inc filling caused substantially higher stresses and strains in the cervical enamel region. The 8 increments resulted in less CS with the same iTBS and UTS, without affecting E and VH through the depth of the composites. Increasing the number of increments, and high post-gel shrinkage caused higher stresses. Cuspal deformation measured by strain gauge validated the finite element analyses.

136 Evaluation of flexural strength in ti-6al-4v alloy welded with different settings for tig welding

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This study evaluated strength mechanics of Ti-6Al-4V alloy with 3.18 mm in diameter, through testing flexural strength, welded with different parameters for TIG welding machine. It was made 40 samples, which were divided into 4 groups (n = 10): Control, intact bars, G2, power 5 (A) and time 2 (ms); G3, power 5 (A) and time 3 (ms), G4, power 5 (A) and time 4 (ms). The samples were welded in a TIG welding machine and evaluated radiographically for verification of bubbles and porosities. Then test for liquid penetrant was applied to observe surface discontinuities. The samples were subjected to mechanical testing flexural strength and subsequently analyzed by stereomicroscopy by the program Motic Images Plus 2.0ml, and the welded areas calculated for assessment of weld penetration. Maximum values of flexion were analyzed by bending the formula for obtaining the flexural stress (MPa) for bodies of circular cross section and then subjected to statistical tests Dunnett and Tukey ($p < 0.05$). Most samples showed the presence of bubbles and internal porosity and no sample showed surface discontinuities. There was significant difference between the control group with the experimental groups for the parameter maximum stress. Regarding the penetration area only G2 showed significant difference with others. It is concluded that changes in the regulation of the time for joining prosthetic infrastructure did not affect the flexural strength of the welded areas.

138 One year clinical evaluation of two in-office bleaching systems

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The aim of this study was to evaluate the efficacy and fadeback of two in-office bleaching systems. 40 patients were randomly divided into 2 groups (n = 20) and submitted to a bleaching treatment according to manufacturers instructions: 1. Boost, 38% de hydrogen peroxide (HP) - Opalescence Xtra Boost (Ultradent), 2. Zoom, 25% HP-Zoom 2 + Zoom AP Light (Phillips Oral Healthcare). Teeth shade was measured on superior central incisors and canines using 3 different measuring systems: VITA Bleachedguide 3D-Master (VB), Vita Shade Guide Classic (VC) and Vita-EasyShade Spectrophotometer (SP). Measurements were made immediately before and after the treatment and at 7, 14, 30, 180 e 365 days. Statistical analyzes of the results were made using 3-way ANOVA. VC: Showed that both systems promoted bleaching and color stability at 365 days. VB: For both experimental groups canine teeth presented a stable bleaching result at 365 days. Bleaching results were also observed for incisive but at the 180 days measurement Zoom group showed fadeback, and remained stable at 365 days. Fadeback was also observed for incisive for Boost group at 365 days measurement. SP: Zoom group showed bleaching results immediate post op that improved at 7 days, maintaining it stable at 365 days. The same behavior was observed only for the canine teeth for Boost group. We concluded that Zoom group presented a superior bleaching result in all visual analyzes for both canines and incisive as well as superior delta E result for canine teeth. For all measurement methods used, neither system showed fadeback to the original shades after 365 days.

139 Development and characterization of a resin based endodontic sealer containing α -tricalcium phosphate and chlorhexidine

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The aim was to develop and characterize a methacrylate-based endodontic sealer containing α -tricalcium phosphate (α -TCP) and chlorhexidine (CHX). A base resin was formulated using: 70% of UDMA, 15% of BISEMA and 15% of GDMA. Ytterbium trifluoride was added as a radiopacifier agent - 60%wt. Nine experimental groups were formulated adding different concentration, in weight, of α -TCP and CHX: 0/0; 0/2.5; 0/5; 25/0; 25/2.5; 25/5; 50/0; 50/2.5; 50/5%. Sealers were submitted to radiopacity, flow, and film thickness according ISO 6876:2001; sorption and solubility according ISO 4049:2009; pH; degree of conversion with FTIR; microbial growth and diffusion disc tests. All groups presented radiopacity higher than 3mmAl. The flow varied from 15.09 \pm 0.11 to 17.33 \pm 0.48mm. All sealers presented film thickness inferior than 50 μ m. The addition of CHX increased the solubility, but did not interfere in sorption. All groups presented pH results were close to neutrality and degree of conversion higher than 60%. The addition of CHX inhibited bacterial growth. The addition of CHX and α -TCP appear a promising filler in develop of experimental endodontic sealers.

141 Effect of non-carious cervical lesions and coronary structure loss on biomechanical behavior of premolars

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Dental lesions and cavity preparations can impact the biomechanical behavior of teeth due to tooth structure loss. The aim of this study was to analyze the influence of non carious cervical lesions (NCCLs) and coronary preparations on the biomechanical behavior of premolars, using finite element analysis (FEA). It was generated 2D linear and elastics models, (Auto-CAD) simulating sound tooth (S); MOD preparation (P); MOD preparation restored with composite resin (PR), cervical lesion (L); cervical lesion restored with composite resin (LR), and combinations, PR + LR, P + L, L PR +, P + LR. The areas of each structure were meshed (Ansys FEA) with eight-node elements (PLANE183). All structures were assumed isotropic except enamel and dentin, considered orthotropic. Oblique load (45N) was applied on buccal and palatine cusps, simulating a sphere contact. Data were analyzed by Von Mises (VM) and Principal Maximum Strain (S1) criterion. VM showed similar pattern of stress distribution for S, PR, LR and PR + LR. Models L, P + L, P + LR e PR + L had the highest strain at the center of the lesions with S1 levels of 0.22, 0.2, 0.25 and 0.31 MPa, respectively. For groups P e P + LR, VM stress concentration was observed at the internal angles of the preparations and at the cusps base. It can be concluded that NCCLs associated with loss of coronal tooth structure promotes greater strain values at the center of the lesion. Models restored with composite resin presents similar biomechanical behavior to the S model and load application influenced in stress distribution.

143 Biofilm formation in different materials used to restore non-carious cervical lesion

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Restoration of non-carious cervical lesions (LCNC) requires use of aesthetic materials such as composite resin and glass ionomer or possibly ionomer resin modified. This study evaluated the effect of the parameters of topography and hydrophobicity of these materials in biofilm formation. We analyzed four materials: conventional glass ionomer cement (KF), resin-modified glass ionomer cement (VT), nanofilled resin-modified glass ionomer (KN) nanofilled resin composite (FZ). In the analysis using 3D laser profilometry (n = 10), we calculated the amplitude parameters (Sa and Sq), space (Sds) and hybrid (Ssc). Hydrophobicity measured as the contact angle of water on the surface (n = 5). The biofilm was evaluated by confocal laser scanning microscopy, examining parameters and thickness of the biofilm biovolume (n = 5) after 24 hours of culture and staining with sodium fluorescein at 1%. All data were analyzed by ANOVA for single factor followed by Tukey's test, and was used Pearson correlation test between topography data with the parameters of the biofilm ($\alpha = .05$). The parameters of topography showed significant direct correlation with biofilm formation. There were significant differences between the parameters of amplitude (FZ=KN>VT>KF). KN showed the highest hydrophobicity. FZ and KN showed less biofilm thickness and biovolume compared to VT and KF. The use of nanoparticulate materials results in better performance in the topography and biofilm formation.

140 The effect of abutment material on stress distribution in single anterior implant-supported restoration

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The aim of this study was to evaluate the effect of the abutment material on stress distribution in single anterior implant-supported restorations, through the finite element method. Three experimental groups were design from the combination three abutment material (titanium, zirconia and hybrid) on morse tapered (MT) implants: MTTi, MTZr, MTH. Finite element models were obtained with the aid of modeling software and consisted of: Titamax Ex 4x13mm MT implants; MT Anatomic Abutment in titanium, zirconia and hybrid; lithium disilicate central incisor crown cemented over the abutment. The occlusal loading, consisted of a magnitude of 49N in 45 degrees to the implant long axis, was applied in six steps in order to simulate the incisal guidance. The equivalent von Mises criterion (σ m) was used for both qualitative and quantitative evaluation of abutment. The maximum (σ max) and (σ min) minimum principal stresses were obtained for numerical comparison of zirconia abutment and zirconia abutment body. The highest abutment σ m (MPa) occurred in MTZr, followed by MTH and MTTi (315.61; 293.61; 289.36 respectively). The σ max and σ min values were lower in MTH group than MTZr group. The stress distribution concentrated in the abutment/implant interface in all groups, regardless the abutment material. It was concluded that the hybrid abutment had similar mechanical performance to titanium one, and these were better than zirconia abutments.

142 Photoelastic analysis of the stress distribution of different coating materials in prosthetic occlusal protocol

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The aim of this study was to analyze, through the photoelasticity method, the tension generated in different situations of the Branemark protocol prostheses retained by 4 implants, considering: 1. Different lengths of cantilever; 2. Different occlusal materials coating (Acrylic Resin – RA, Metal – M, and Porcelain – P); 3. Tilt posterior implants to 30°. Two photoelastic models were made: model 1 - 4 implants external hexagon (Conexão Sistemas de Próteses, Brazil) (4.1x10mm) distributed perpendicular to the alveolar ridge; model 2 – medial implants (4.1x10mm) perpendicular to the alveolar ridge and posterior implants (4.1x13mm) tilt to the 30°. It was made three Branemark protocol prostheses with RA, M and P occlusal coatings. Axial loads of 100N were applied in the premolar and molar and conducted analysis photoelastic. In the model with straight implants, the stress distribution generated by the prosthesis with porcelain occlusal coating was close to the metal coating, and that acrylic resin coating showed a lower stress. Loading the molar observed forming one more fringe order in the pattern of stress distribution compared to the loading premolar. The model 2, the premolar and molar loading showed no significant difference in the stress distribution among the different coating occlusal materials. The inclination of the implants decreased the extent of the cantilever and is biomechanically more favorable providing less stress on implants. In dentures retained by 4 implants with posterior tilt no difference in stress distribution among the different occlusal coating materials.

144 Fiber glass posts bond strength fixed with experimental resin cements containing an onium salt

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Cementation of fiber glass is still a challenge, mainly due to polymerization in the apical region. This study aimed to evaluate the bond strength (RU) of fiber glass fixed with experimental resin photo-activated resin cement (CRE), containing different concentrations of the hexafluorophosphate of difenilodonium salt (DFI) ranging tertiary amines EDAB and DMAEMA and compare them to a commercial resin cement (dual and photo-activatable). Eighty bovine incisors roots 15 mm long and 2 mm diameter were divided into 8 groups (n = 10): G1 - CRE without addition of DFI 2 mol% of EDAB G2 - CRE, 0.5 mol% DFI, 2 mol% of EDAB; G3 - CRE, 1 mol% of DFI, 2 mol% of EDAB; G4 - CRE without adding DFI, 2 mol% of DMAEMA G5 - CRE, 0.5 mol% of DFI, 2 mol% of DMAEMA and G6 - CRE, 1 mol% of DFI, 2 mol% of DMAEMA and G7 - Variolink II, photo-activatable; G8 - Variolink II dual. The adhesive protocol used was, etching, application of primer and bond Scotchbond Multipurpose. RU evaluated by the push-out speed of 1 mm / min and load cell of 200 N. Analysis of variance was applied to a criterion with split plots and Tukey test ($\alpha = 0,05$). The amine type did not influence the RU (P > 0,05), the higher values of RU were found in G2, G3, G5, G6, G8, and lower values for G1, G4 and G7. Invariably the apical region showed the lowest values of RU. The CRE containing DFI proved able to cementation of fiber glass. The tertiary amine type and concentration of DFI had no effect on RU.

145 Pre-heating experimental composites containing different filler loadings: evaluation of material's sorption and solubility

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The aim of this study was to investigate the effect of composite pre-heating on material's sorption and solubility. An experimental composite was evaluated, which contains different filler loadings. Forty seven specimens were obtained using this experimental composite (FGM, Joinville, Santa Catarina, Brazil). The specimens were built up using a stainless steel matrix with 8x2 mm. Two temperatures (25°C and 60°C) and four composite filler loadings in %/weight (74.5, 75.5, 78.2; and 78.53) were investigated. The specimens were weighed at the following conditions: M1- after drying at 37 ° C for 24h; M2- after more 7 days of storage in ethanol / water (75% / 25%); M3- after another day of drying. The specimen's dimensions as well M1; M2 and M3 weights were used to calculate material's sorption and solubility. Data were analyzed using a Two-Way ANOVA design (temperature and composite loading), considering $\alpha = 5\%$. The results of this study showed that the investigated factors as well their interaction did not influence the data obtained for both sorption and solubility ($p > 0.05$). It was concluded that within the limitations of this study, heating the composite at 60°C did not affect the sorption and the solubility of the material in comparison with the resin activated at 25°C. The results were not dependent of composite's filler loading, at least for the experimental material evaluated.

147 Different Mechanical Tests to Evaluate Bond-Strength on Y-TZP

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The objective of the present study was to evaluate the bond strength using different geometries of test, between a Y-TZP ceramic and composite resin, according two types of surface treatments. For test execution were used 330 Y-TZP blocks (size / shape according to each test) [YZ Cubes / In Ceram VITA], received one of the two surface treatments: UT- control (untreated) (N = 180) and SS- silica coating (CoJet/ESPE) + silanization (RelyX – ceramic primer 3M/ESPE) (N = 180). Composite resin (Opallis/FGM) of different geometries were made and cemented with resin cement (RelyX U100-3M/ESPE) in the Y-TZP. The 180 specimens was divided into 6 subgroups (n = 30) according to mechanical test: TBS: tensile; μ TBS: microtensile; SBS: shear; μ SBS: microshear; PSH: push-out; μ PSH: micropush-out. One-way ANOVA and Kruskal-Wallis were used for data analyzing. Both the type of surface treatment as the size of the specimen showed a statistically significant difference between groups ($p = 0.00$). Independent of the type of surface treatment, microtensile test (μ TBS/SS: 37,24- 5,63 MPa) and microshear (μ SBS/UT: 9,25- 5,45 MPa; μ SBS/SS: 9,25- 5,45 MPa) had higher values than their equivalent macro: (TBS/UT: 4,58- 2,06 MPa; TBS/SS: 10,47- 5,13 MPa; SBS/UT: 4,22- 0,99 MPa; SBS/SS: 11,89- 4,04 MPa), on the other hand, push-out found higher values in the macro tests (PSH/UT: 41,47- 9,92 MPa; PSH/SS: 50,96- 6,99 MPa), instead of micropush-out (μ PSH/UT: 28,93- 10,69 MPa; μ PSH/SS: 38,05- 6,67 MPa). According to the results obtained, microshear, microtensile and shear tests have proved to be more satisfactory for evaluating bond strength.

149 Influence of geometries and thickness of porcelain on the thermal residual stresses: finite element analysis

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Studies that evaluate the thermal residual stresses (TRS) are performed using different specimen geometries. This study aimed to analyze, by the finite element method, the TRS at porcelain generated in specimens with different geometries and porcelain thicknesses. Axisymmetric finite element models of discs, cylinders and spheres were constructed by varying the porcelain thickness (1 mm, 2 mm and 3 mm). The zirconia thickness was kept at 0.7 mm for all models. The cooling protocol of the specimens (from the glass transition temperature porcelain of 600°C to room temperature) was simulated. The materials were considered homogeneous and linear elastic. The interface porcelain/zirconia was considered perfectly united. The peak and the distribution of the maximum principal stress (σ_1) at the porcelain were analyzed. For the discs, the peaks of σ_1 were 14 MPa, 23 MPa and 26 MPa for 1 mm, 2 mm and 3 mm respectively. The values of σ_1 increased from the porcelain/zirconia interface to the outer surface, with no tensile stress in the central region (negative σ_1), regardless of the thickness. For the cylinders, the peaks of σ_1 were 13 MPa, 23 MPa and 28 MPa for 1 mm, 2 mm and 3 mm respectively. The values of σ_1 decreased from the porcelain/zirconia interface to the outer surface, regardless of the porcelain thickness. For the spheres, the peaks of σ_1 were 34 MPa for 1 mm and 35 MPa for 2 mm and 3 mm. The stress distribution pattern of spheres was similar to the cylinders. The extrapolation of the TRT results obtained for simplified geometries to crowns is critical, since the geometry of the specimen influenced the distribution of stress in the veneering porcelain.

146 Influence of the cementum presence and the periodontal ligament width on stress distribution: finite element analysis

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The aim of the present work was to investigate, by finite element analysis (FEA), the influence of the cementum presence and the periodontal ligament (LP) width on the stress distribution by an intrusion loading. Four axisymmetric FEA models were created from a maxillary second premolar geometry: LPU-SC: uniform LP (0,25 mm of width) without cementum, LPU-C: LP uniform LP with cementum, LPNU-SC: nonuniform LP (0,3 mm of width at the cervical and apical third, and 0,2 mm at the middle third) without cementum, LPNU-C: LP nonuniform LP with cementum. LP, cementum, enamel, dentine, pulp, cortical and cancellous bone were considered elastic and isotropic. A total load of 10N was applied at the occlusal surface, simulating an intrusion movement. The displacement of the nodes at the cancellous bone base was restricted. The minimum principal stress (σ_3) distributions were analyzed in the radicular dentin, LP and cortical bone. For the radicular dentin, the peak of σ_3 was obtained at the cervical region (-0,57 MPa to LPU-SC and LPNU-SC; -0,58 MPa to LPU-C; -0,59 MPa to LPNU-C). For the periodontal ligament, the peak of σ_3 was obtained at the apical region (-0,34 MPa to LPU-SC, LPNU-SC and LPNU-C; -0,43 MPa to LPU-C). For cortical bone, the peak of σ_3 was obtained at the middle third radicular (-0,34 MPa to LPU-SC, LPNU-SC and LPNU-C; -0,27 MPa to LPU-C). The FEA analysis demonstrated that the cementum presence and the LP width did not affect the stress distribution in the radicular dentin, PDL and cortical bone.

148 Leveraging the effect of hydrogen peroxide concentration 6% maximum

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The aim was to quantify the efficacy of hydrogen peroxide 6%, associated with Fenton or Photo-Fenton technologies, and compare it to 38% conventional peroxide. An aqueous solution of the Carmine Cochineal dye (0.005%) was prepared, and submitted to different bleaching processes according to their experimental group: Group 1 - Carmine Cochineal dye (C), Group 2 - C + hydrogen peroxide 6% (H2O2 6%), Group 3 - C + H2O2 6% + Fe2+ + ,Group 4 - C + H2O2 6% + Fe2+ + LED irradiation for 15 min, group 5 - C + H2O2 6% + Fe2+ + UVA light irradiation for 15 min, Group 6 - C + hydrogen peroxide 38% (H2O2 38%). For each experimental group 3 samples were performed and these were analyzed by a spectrophotometer, where the initial and final concentration level of dye was recorded. Results were analyzed statistically by ANOVA and Tukey test, where all groups were different. Group 5 showed the greatest reduction compared to the initial concentration of dye (58.6%), followed by group 4 (49.8%), group 3 (20.9%), group 6 (14.9%) and group 2 (10.8%). Group 1 did not change. Thus, we conclude that the reactions of Fenton and Photo-Fenton influenced positively for decolorization. The lower concentration hydrogen peroxide (6%) associated with the Fenton or the Photo-Fenton technology presented a superior result when compared to the hydrogen peroxide at higher concentration (38%).

150 Effect of the type of die and infrastructure material on the final color of prosthetic crowns

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The objective of this study was to evaluate the effect of the type of die and infrastructure material on the final color and lightness of prosthetic crowns. A steel model simulating an abutment tooth was used to design prosthetic crowns. Three types of infrastructure (IS) material were evaluated (n=8): MC - NiCr alloy IS; YZ - Y-TZP IS (Vita In-Ceram YZ); IZ -In-Ceram Zirconia IS (Vita). All IS were veneered with the same shade (2M2) and thickness of porcelain. The color difference (dE) and lightness difference (dL) between the initial porcelain shade and the final crown were obtained using a clinical spectrophotometer (VITA Easysshade). Two measurements were taken from each crown, one with the crown placed over a metal die and another over a resin composite die, using a black background. Data were analyzed using two-way ANOVA and Tukey's test with a significance level of 5%. For both parameters, only the factor material showed statistical significance ($p=0.001$). dE was higher and similar for YZ and IZ groups. MC showed a significantly lower dE value. IZ group had the highest dL value, resulting in a whiter crown than MC and YZ. It was concluded that the type of die had no influence on the color and lightness of the evaluated crowns. In addition, all-ceramic crowns showed a higher color difference than metal-ceramic crowns. Yet, the color differences observed are within the clinical threshold (dE lower than 3.3).

151 Influence of different surface treatments on the bond strength between composites and a resin cement

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This study aims to evaluate the influence of different surface treatments on bond strength (BS) between different composite and resin cement. 75 composite discs was fabricated (10 x 2 mm) - Filtek P90, Filtek Z250 and Filtek Z350 XT (3M ESPE), were divided into 5 groups according to the surface treatment: C = control - no treatment; sandblasting J = aluminum oxide (50 μ m); sandblasting JE = + 99.3% ethanol for 5 min; silica coating S = (3M-ESPE Cojet - 30 microns); SS = silica coating + silane. PVC tubes (0.5 x 0.80 mm) were attached on the composite disc, and then, inserted resin cement (3M ESPE-RelyX ARC). After 24 hours artificial saliva storage at 37 $^{\circ}$ C, the specimens were tested for microshear crosshead speed of 1.0 mm / min. Data were evaluated in two-way ANOVA and Tukey's test (5%) for contrast. The sandblasting with aluminum oxide was efficient in increasing the BS for composites Z350 and P90. The composite Z250 was not influenced by the treatments studied, with the exception of ethanol treatment that reduced the values. However, silica coating followed by silane application showed similar results as control for all composites. In conclusion, BS values were dependent on the type of composite used and the surface treatment. The sandblasting with aluminum oxide was the best treatment leading to higher BS values, and should be suitable for surface treatment, while the use of ethanol is doubtful.

153 Micro-Raman characterization of HANano adhesive/dentin interface

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The aim of this study is to characterize the adhesive interface of an experimental resin using micro-Raman spectroscopy. Human molars were cleaned and stored. The superficial enamel was removed and each tooth was divided in blocks. Exposed dentin was etched and commercial primer was applied. Adhesive resin was applied in the dentin in different concentrations of HANano: 0%; 0,5%; 1%; 2%; 5%; 10% and 20%. Furthermore, two commercial adhesives were tested. Above the adhesive, one resin increment was placed. Interfaces were prepared by sectioning perpendicular to the flat adhesive-dentine surface. Analysis was performed using Raman Microscope and one-dimensional mapping was performed over 150 μ m line across the adhesive-dentine interface at 1 μ m intervals using the XYZ axes. One mapping was performed and processing allowed differentiating spectral components of the adhesive and dentine. One correspondent peak of each substance was used for integration: hydroxyapatite at 960cm⁻¹ and resin at 1610cm⁻¹. The presence of hydroxyapatite could be seen throughout the hybrid layer. However, in the groups of commercial adhesive system, any phosphates were observed. Experimental adhesive resins with HANano seem to improve adhesive interfaces.

155 Degradation of EDC-biomodified collagen and MMP inactivation in situ

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This study evaluated the effect of EDC application in short periods of time on dentin collagen degradation and matrix-bound MMP inactivation. Two hundred beams (1x1x3mm) were obtained from mid-coronal dentin of sound third molars and completely demineralized in 10% phosphoric acid for 18 h at 25 $^{\circ}$ C. The specimens were randomly divided into 5 groups and treated for 30 or 60s with the following solutions: deionized water (negative control); 0.5M EDC, 1M EDC, 2M EDC and 10% glutaraldehyde (GD) (positive control) (n=10). Ten beams of each group were submitted to a microcolorimetric assay (Sensolyte) to evaluate the total MMP activity before and after the treatments. The remaining 10 beams were tested for HYP release and dry mass loss after 1 week of artificial saliva storage at 37 $^{\circ}$ C. Data were analyzed by Kruskal-Wallis, Mann-Whitney, ANOVA and Tukey tests ($\alpha=0.05$). All treatments were able to inactivate MMPs and the best results were observed for the group treated with 2M EDC for 60s (82.7%). EDC was capable of reducing mass loss and HYP release irrespective of concentration and time of application. Dentin treatment with EDC is effective in reducing collagen degradation and may enhance the stability of resin-dentin bonds over time. This work was supported in parts by ROI DE 05306 from NIDCR, CAPES 6937/11-0, CNPq 305204/2010-6 and FAPESP 08866-4.

152 Temperature and type of silanes effect in bond strength of glass fiber post and composite resin core/resin cement

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The aim of this study was evaluate the effect of temperature (23 $^{\circ}$ e 60 $^{\circ}$ C) and type of silane (3 prehydrolyzed: Silano, Angelus; Prosil, FGM; and RelyX Ceramic Primer, 3M ESPE; and 1 two-component, Coupling Agent, Dentsply) on push-out bond strength (RuPs) of glass fiber posts (PFV) and resin cement (Cr) or and composite resin core (Np). PFV were treated with hydrogen peroxide 24% for 1 minute. The negative controls did not receive any silane. In other groups, it was applied 1 of the 4 tested silanes for 1 minute. Then, on half the PFVs was used air jet (23 $^{\circ}$ C); on the other half hairdryer air jet (60 $^{\circ}$ C controlled by multimeter) was used, both for 5 s. The PFVs were divided in two groups to test RuPs on Np and Cr. Np/PFV were embedded with composite (Filtek Z250) in circular plastic matrix. Cr/PFV were cemented (RelyX U100) into endodontically treated bovine roots. The samples were sectioned and RuPs evaluated. The failure pattern was analysed by confocal microscopy. Two-way ANOVA (2X4) and Tukey's test evaluated the effect of the study factors, with subdivided for root region in Cr. The one-way ANOVA and Dunnett's test compared the Np and Cr with control groups. Values of RuPs (Mpa) Cr: between 27.5 \pm 10.5 and 12.2 \pm 2.7; in Np: 13.2 \pm 2.7 and 16.9 \pm 2.6. It is possible to conclude that higher temperature (60 $^{\circ}$ C) improves RuPs only Cr (resin cement). Temperature had no significant influence on silanes used on Np (composite resin). The two-component silane had greater variability (p=0.003) in 23 $^{\circ}$ and 60 $^{\circ}$ C. The pre-hydrolyzed silanes had good performance in 23 $^{\circ}$ and 60 $^{\circ}$ C regardless of the root region.

154 Effect of cutting with rotary instruments in the integrity, morphology and flexural strength of fiber posts

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To evaluate the effect of cutting with different rotary instruments on the 3-point (n=10) and 2-point (n=10) flexural strength, and the surface micromorphology (n=2). One hundred and thirty-two posts (White Post, FGM, Brazil) were allocated into 12 groups: Ctrl – without cutting, DB – Coarse Diamond Bur (KG Sorensen), DBff – Extra Fine Coarse Diamond Bur (KG Sorensen), CB – Carbide Bur (KG Sorensen), CD – Carborundum Disc (Komet), DD – Diamond Disc (KG Sorensen). After specimen preparation, all cutting procedures were performed with abundant irrigation. The data obtained from the flexural strength tests were inserted into specific formulas for calculating the recommended resistance. Micromorphological analysis of cutting surfaces was made by SEM. One-way ANOVA indicated no statistical significant difference among the groups (p=0.0968) for 3-point bending test, though statistical difference was found (p=0.0233) for the 2-point bending. Tukey's test indicated statistical difference between DC and Ctrl, with higher values for CD group. Micromorphological analysis showed superficial changes generated by the cutting instruments assessed, but insufficient to affect the flexural strength of the polymer. The cutting instruments used with simultaneous cooling not affected intrinsic strength of the fiber post tested. Therefore, these methods seem to be suitable for cutting the assessed composite.

156 Flexural strength of monolithic and trylayer ceramics structures

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The aim of this study was to evaluate the flexural strength (σ) and weibull modulus of monolithic (M) and trylayer (T) ceramics structures used for the CAD-on (Ivoclar) technology. Bar-shaped M (IPS e.max ZirCAD - Ivoclar Vivadent) and T specimens (IPS e.max ZirCAD – IPS e.max CAD Crystall./Connect - IPS e.max CAD Ivoclar Vivadent) with 1.8 mm x 4 mm x 16 mm were fabricated (n=30). All specimens were flexural strength tested in 37 $^{\circ}$ C distilled water using a universal testing machine at a crosshead speed of 0.5 mm/min. The failure load was recorded and the flexural strength values were calculated. Fractographic analysis was performed using optical and scanning electron microscopes (SEM) to examine the fractured surfaces identifying fracture markings and the critical crack. Results were statistically analyzed using Student t test ($\alpha=0.05$). Mean flexural strength (σ) and standard deviation (SD) values for M = 915.55 \pm 143.77a, and T = 763.07 \pm 208.24 b, Weibull modulus M = 7.6 (5.7 – 10.1)a, and T = 4.1 (3.1 – 5.3)b, characteristic strength (σ_0) M = 975 (928 – 1025)a, and T = 841 (766 – 923)b, 5% failure probability (σ_5) M = 660 (577 – 756)a and T = 405 (317 – 518)b. The 95% confidence intervals are in parentheses. The monolithic structures (M) showed significantly higher mean values than the T for all parameters evaluated.

157 Influence of ceramic thickness on sorption and solubility of dual resin cements

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The aim of this study was to evaluate the sorption (SO) and solubility (SOL) of 3 resin cements light-cured beneath a dental ceramic. Five specimens with 6 mm diameter and 0.5 mm of thickness (RelyX ARC, RelyX U100 and Variolink II-VAR) were carried out using a metallic mold and light-cured beneath a ceramic disk with 12 mm diameter by 0.7 mm of thickness. The specimens were immersed in distilled water, lactic acid, and propionic acid to 37 °C and were weighed at intervals of 1, 24, 48, and 72 h to obtain masses (m1, m2, m3). The diameter and thickness of the specimens after final drying (m1) were measured to obtain the volume (V) of each specimen and calculate the rates of SO and SOL. Data were submitted to ANOVA and Dunn's test ($\alpha = 0.05$). According to SO data, VAR and ARC had the highest values in lactic acid with statistical difference in relation to the propionic acid and water. No statistical difference was observed for U100 cement. For SOL, propionic acid values were statistically superior to other solution storage, for the three cements, except for the ARC into lactic acid. It was concluded that Variolink II had higher values of sorption and solubility in all solution media.

159 Influence of Candida albicans biofilm and MMA surface treatment on adhesion of soft liners to acrylic resin

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This study analyzed the influence of Candida albicans biofilm on bond strength between soft denture liners and poly (methylmethacrylate) - PMMA resin, which previously received, or not, methylmethacrylate (MMA) pretreatment. Specimens were prepared and randomly divided into eight groups, according to study factors: PMMA pretreatment (MMA and no treatment), denture liner type (silicone-based and PMMA-based denture liner), and C. albicans biofilm accumulation (with and without biofilm). PMMA bars were prepared and had its surface treated. Denture liners were applied between two treated PMMA bars and specimens (n=10) were submitted to biofilm formation, or PBS storage, for 12 days, at 35° C, under agitation. Afterwards, tensile bond strength test was performed and failure type was evaluated in stereomicroscope. Highest tensile bond strength was observed in groups with silicone-based denture liner, with or without PMMA pretreatment, stored in PBS (p<0.01). Silicone-based specimens presented mostly adhesive failures, while PMMA-based groups presented predominantly cohesive failures. In vitro exposure to C. albicans biofilm reduced the tensile bond strength of denture liners to PMMA resin, and MMA pretreatment of denture base may be recommended for relining procedures.

161 The effect of poly (methyl methacrylate) surface treatments on the adhesion of silicone-based resilient denture liners

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Different surface treatment protocols of poly (methyl methacrylate) (PMMA) have been proposed to improve the adhesion of silicone-based resilient denture liners to PMMA surfaces. The aim was to evaluate the effect of different PMMA surface treatments on the adhesion of silicone-based resilient denture liners. PMMA specimens were prepared and divided into 4 treatment groups: no treatment (control - C), methyl methacrylate (MMA) for 180 seconds, acetone (AC) for 30 seconds, or ethyl acetate (EA) for 60 seconds. PMMA disks (30.0 mm in diameter x 5.0 mm thick; total specimen number=40, n=10) were evaluated regarding surface roughness (SR) and surface free energy (SFE). To evaluate tensile bond strength, the resilient material was applied between 2 treated PMMA bars (60.0 x 5.0 x 5.0 mm; n=20 for each group) to form a 2-mm-thick layer. Data were analyzed by 1-way ANOVA and the Tukey HSD tests ($\alpha < .05$). Failure type was assessed and the PMMA surface treatment modifications were visualized with scanning electron microscopy (SEM). The SR was increased (P<.05) by MMA treatment. For groups AC and EA, the SFE decreased (P<.05). The tensile bond strength was higher for the MMA and EA groups (P<.05). Specimens treated with AC and MMA presented a cleaner surface, while the EA treatment produced a porous topography. The MMA and EA surface treatment protocols improved the adhesion of a silicone-based resilient denture liner to PMMA.

158 Discolored tooth substrate - Influence of thickness on the masking ability of laminate veneers

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The aim of this study was to evaluate the masking ability and optical effect of different thicknesses of the enamel and dentin layers on ceramic veneers in vitro, simulating dental substrate with higher (shade A2) and lower (color C4) value by using ceramic discs. The combination of ceramic discs of enamel (E) and dentine (D) of different thicknesses (0.5 mm, 0.8 mm and 1.00 mm) resulted in the following groups (n = 10): D1E1, D1E0.8; D1E0.5; D0.8E0.8; D0.8E0.5, D0.5E0.5. It was evaluated the translucency of mono and bilayer specimens, and the influence of the substrate on the final color of bilayer specimens both with CIEL*a*b* (ΔE), Vita Classical and Vita 3D Master. All measurements were performed with a spectrophotometer Vita Easyshade (Vita Zahnfabrik/Bad Saeckingen, Germany). For the monolayer groups, both enamel and dentine ceramics, as lower the thickness the higher the translucency. For bilayer groups, both the translucency and the influence of the tooth-colored background were more sensitive to the dentin layer thickness. The color variation (ΔE) with tooth-colored backgrounds was greater with the lower value background. In comparison to the higher value background, it was observed that for the lower value background the set thickness was more critical. The final color ranged around C3 and C2 for thicker specimens and around C3 and C4 for thinner specimens. It was concluded that the reduction in thickness of the dentin layer and a tooth-colored background with lower value had greater influence in the final color assessment for laminated veneer ceramics.

160 Correlation between bond strength and nanomechanical properties of adhesive interface

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To evaluate the correlation between nanohardness and elastic modulus of the adhesive interface and microtensile bond strength of adhesive systems to dentin. 40 sound human third molars were randomly divided into four groups according to the adhesive system. Correlation between bond strength and mechanical properties of adhesive interface was evaluated with Spearman's test. ANOVA and Tukey's test was used to evaluate the influence of adhesive system on all variables ($\alpha=0.05$). The Spearman analysis did not showed significant correlation between microtensile bond strength and mechanical properties of adhesive interface (p>0.05). Microtensile bond strength of Clearfil SE Bond (62,57 ± 11,49) was significantly higher than Single Bond 2 (43,97 ± 9,73) and Clearfill S3 (41,84 ± 6,52); Adper Scotchbond Multipurpose (56,94 ± 9,90) showed bond strength statistically higher than Clearfil S3 Bond. Adhesive systems did not influence significantly the nanohardness and elastic modulus of the hybrid layer. Nanohardness and elastic modulus of adhesive layer using Single Bond 2 (HA=0,40 ± 0,03; YA=6,69 ± 0,57) was significantly higher than the Clearfill SE (HA=0,33 ± 0,03; YA=5,08 ± 0,35), Clearfill S3 (HA=0,31 ± 0,04; YA=5,41 ± 0,55) and Adper Scotchbond Multipurpose (HA=0,32 ± 0,02 ; YA=5,49 ± 0,19). The 4 adhesive systems tested haven't shown correlation between nanohardness and elastic modulus of the adhesive interface and microtensile bond strength to dentin after 24h storage.

162 Effect of surface treatment of composite resins on bond strength to adhesive resin cements

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The self-adhesive cements have been popularized by the ease use, without treatment of the substrate, but little is known about his union to composite resin commonly used as core. Thus, this study aimed to evaluate the bond strength of two self-adhesive resin cements to composite resin, simulating the core of indirect restorations. The substrate used in this study was confectioned with the composite resin Tetric Ceram (Ivoclar). The resin surface was treated with one of following treatments (n=10): 35% Phosphoric acid for 30s (PA); silane; PA + silane; PA + adhesive; or PA + silane + adhesive. The absence of treatment was used as control. After the treatments, silicone mold containing a rounded orifice with 1 mm2 of diameter was placed over the composite resin and one of self-adhesive resin cements (RelyX U-100 – 3M ESPE; or Biscem – Bisco) was inserted into orifices and light-cured. The self-adhesive cement cylinders were submitted to shear load and data analyzed by two-way ANOVA and Tukey's test (P<0.05). Independently of cement, PA + silane + adhesive showed higher bond strength values than PA and PA + silane. There was no difference between the other treatments, while U-100 presented higher bond values than Biscem for all experimental conditions. In conclusion, the pre-treatments of composite resin surface can to affect the bond strength of self-adhesive resin cements to this substrate, but no one of treatments evaluated differed from the control without treatment.

163 Analysis of stress distribution at the interface of adhesive class V restorations

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The aim of this study was to analyze the finite element method, the influence of the elastic modulus (E) of the composite stress distribution in adhesive interfaces of Class V restorations. Two 2D models of premolar were created, representing enamel, dentin, pulp, adhesive and resin composite. For the model called "flow", the composite was simulated with E 5.3 GPa for the "traditional" model, E was 16.6 GPa materials were homogeneous, and linear elastic. An oblique load of 100 N was distributed in 3 nodes of the external dimension of the buccal cusp. The displacement of the nodes of the external root surface located 5 mm below the cemento-enamel junction has been restricted. It was observed values of principal maximum stress (σ_1) along the interface adhesive / dentin and composite resin / adhesive to both models. The highest values were observed in σ_1 cavosurface angle of interfaces. Although the flow model has shown the highest peak tensile stress curve σ_1 versus distance at the interface showed a sharp drop away when the cavosurface angle, so that a larger extent of the interfaces was with smaller values of tensile stress when compared the interfaces of the traditional model. The choice of composite type flow seems interesting to restore cervical lesions, by request unless the interface when the occlusal loading tends to lengthen the restoration towards cervical-occlusal.

165 Bioactivity of a novel adhesive resin with incorporation of niobium pentoxide

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The purpose of this study was to evaluate, in vitro, the bioactivity of experimental adhesive resins with incorporation of niobium pentoxide (Nb2O5). An experimental adhesive resin was formulated with different concentrations of Nb2O5 (0, 5, 10 and 20 wt%). Three specimens for each concentration were produced. After photoactivation, the specimens were immersed at Simulated Body Fluid (SBF) for 7, 14 and 28 days. After each immersion period, the specimens were evaluated by micro Raman, Scanning Electron Microscopy (SEM) and Energy Dispersive Spectroscopy (EDS). An area of 20736 μm^2 for each specimen was analyzed by micro Raman, performing one analysis each 9.6 μm . It was used a 785 nm laser for 10 s with 2 co-additions. SEM images were obtained with a low vacuum electron microscope. EDS analysis was performed using 2000X magnification images. Despite the concentration of Nb2O5 and immersion time at SBF was possible to observe at Raman, SEM and EDS analysis the deposition of material compatible with PO4 at the surface of the specimens with Nb2O5. At control group, it was not possible to detect the presence of PO4 deposition. Therefore, Nb2O5 incorporation presented in vitro bioactivity for experimental adhesive resins.

167 Evaluation of surface roughness of ionomer cement after manipulation in conventional glass plate and paper block

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The aim of this study was to evaluate the surface roughness of conventional glass ionomer cement (GIC) (C Vitro Cem A3 - DFL), with a profilometer (Mitutoyo), after manipulation in a glass plate and a paper pad. 5 samples were used in the MIC test handled in conventional glass plate and pad, with a plastic spatula, according to the manufacturer's recommendations. Manipulated ionomers were divided into two groups (n = 5) according to the protocols: S1 - glass plate; S2 - pad. After the setting time of approximately 5 minutes, the samples were subjected to quantitative analysis of surface roughness (Ra) measured by profilometer. There were five readings on each specimen, with a speed of 0.5 mm/s and obtained the statistical difference of roughness between the glass plate and pad. By statistical analysis it was concluded that the surface roughness of the IVC when handled in paper pad is higher than when manipulated on the glass plate, the authors concluded therefore that it is most suitable to use the glass plate associated with a plastic spatula.

164 Effect of saliva on enamel after microabrasion: in situ study

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Aim: To evaluate, in situ, the effect of saliva on enamel after microabrasion. Bovine enamel blocks were divided into 9 groups (n=19), being: 1 control group, without treatment and 7 days of salivary exposition; 4 groups treated with 35% phosphoric acid + pumice and 4 groups with 6.6% hydrochloric acid + silica. The groups with microabrasion were subdivided in accordance with the in situ protocol: without, with 1 hour, 24 hours or 7 days salivary exposition. Nineteen volunteers used an intraoral appliance. The surface microhardness (SMH) and roughness (Ra) were evaluated before and after the microabrasion, and after salivary exposition. Representative specimens were evaluated by Scanning Electron Microscopy (SEM). The results were analyzed with PROC MIXED, Tukey-Kramer and Dunnett tests ($p < 0.05$). For SMH and Ra, all groups presented reduction of mean values after microabrasion with statistical differences in relation to the control. For SMH, the treatment with HCl + Silica presented the lower reduction. After the in situ regimen, the results showed that the microabrasion with HCl + Silica was more prone to action of saliva, once with 1 hour the SMH present increase in its value with difference in relation to the analysis after microabrasion. Only for SMH, HCl + Silica was able to reestablish this property as similar found in the control. SEM analysis showed, for both treatments, the saliva effect on different time observed. The microabrasion treatment with HCl + Silica resulted in an enamel surface more prone to remineralization.

166 Different design tests for the evaluation of the bond strength between resin cement and zirconia

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This study evaluated the effect of different methods of shear (wire or knife) and different specimens (cement cylinders or composite resin cylinders) on the bond strength between resin cement and zirconia by bond strength test and finite element analysis (FEA). For the study, twenty zirconia blocks (YTZP Vita Zahnfabrik, Germany), with dimensions of 10 x 10 x 5 mm were obtained and sandblasted with Cojet (3M ESPE, USA). On the zirconia block was build up a resin cement cylinder (Panavia F, Kuraray, Japan) and cemented a composite resin cylinder (Z 250, 3M ESPE, USA). Both cylinders were obtained with a plastic matrix ($\theta = 3$ mm). Half of the specimens were subjected to shear test with a wire ($\theta = 0.4$ mm) and the other half to shear test with a knife (1 mm / min) (EMIC DL 2000, PR, Brazil). The values of the bond strength were subjected to ANOVA-two way and Tukey test ($\alpha = 0.05$). The specimens were submitted to failure analysis. Statistical analysis showed no influence of the shear method ($p = 0.933$) or the material used to fabricate the cylinder ($p = 0.806$). However, the failure analysis showed predominance of adhesive failure between the cement and zirconia submitted to wire and for the resin cement cylinders. The FEA distribution showed more favorable tensile stress for the occurrence of adhesive failure between the cement / zirconia for the wire shear test. Thus, the current study conclude that the use of wire and resin cement cylinders enable a better evaluation between the resin cement / zirconia interface.

168 Assessment of enamel microabrasion technique and their effects over time: Case study

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The presence of stains and irregularities on dental enamel may compromise dental esthetics, but when localized in most superficial layers of the enamel, they can be removed by enamel microabrasion technique. The aim of this study was to demonstrate through different clinical reports, the steps of the technique, the indications and limitations, and longitudinal clinical following of more than 20 years of observation. With the presentation of cases, it was observed, after performing microabrasion technique, a significant improvement of dental esthetics with the removal of stains, which over time, still show surface smoothness, brightness, anatomy and proper esthetics. It may be concluded that the enamel microabrasion technique is a safe clinical procedure, simple to perform, with excellent esthetic resolution.

169 Influence of delayed photoactivation time at self-adhesive resin cements

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The aim of this study was to evaluate the influence of immediate and delayed photoactivation time at the degree of conversion, depth of cure and solvent degradation of dual-cured self-adhesive resin cements (RelyX U100 and BisCem). According to the time for photoactivation, five groups were evaluated: G30s, light activation after 30 sec; G60s, after 60 sec; G150s, after 150 sec; G5m, after 5 min; G10m, after 10 min. The degree of conversion was evaluated by Fourier Transform Infrared (FTIR) spectroscopy (Bruker), using an attenuated total reflectance (ATR) device. The depth of cure was evaluated using spectroscopic micro Raman and solvent degradation by Knoop microhardness before and after immersion in ethanol for 4 hours. The degree of conversion increased in all groups after photoactivation, regardless of the delayed time ($p < 0.05$). The depth of cure, after 7 days, showed no statistically significant difference in both cements ($p > 0.05$). The cement BisCem with 5 and 10 minutes delayed photoactivation showed degradation in ethanol ($p > 0.05$). The delayed photoactivation of 5 minutes of BisCem increased degradation the material degradation in solvent. Therefore, the delayed photoactivation time did not improved the degree of conversion and depth of cure of the self-adhesive resin cements tested.

171 Comparison of vertical misfit of fixed implant frameworks: conventional casted X CNC milled

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Passive fit of an implant framework is one of the mechanical parameters can affect the longevity of the prosthesis. Several complications in treatment with dental implants may be due to misfit of metallic frameworks and can be aggravated by the absence of periodontal ligament. The objective of this study is to compare the misfit of a one-piece casted and a metallic milled by CAD CAM system implant frameworks. On a master aluminum model were installed four analogues of conical abutments. On these, were fabricated two frameworks: a casted in CoCr and a milled by CAD CAM system. The vertical misfits in the framework analogues interface were measured using an optical microscope. The mean misfit in each of the pillars (45, 43, 33 and 35) and the mean misfit of each framework were measured. In milled framework there was a reduction in the values of vertical misfit in all pillars. The casted framework showed a mean vertical misfit (108.6 μ m) approximately 10 times larger than the milled framework (9.6 μ m).

173 S. mutans adherence on the surface of toothpaste-treated resin-based materials

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The aim of this study was to evaluate the adherence of Streptococcus mutans on resin-based materials treated with fluoride and non-fluoride containing dentifrice. Cylindrical specimens ($n=9$) (5.0 mm diameter x 2.5 mm thickness) of composite resin (CR) and resin sealant (RS) were fabricated and immersed in Brain Heart Infusion (BHI) broth supplemented with 10% sucrose and inoculated with 0.1 mL of S. mutans suspension (1×10^7 CFU/mL). Specimens were incubated for 24 h (t1) or 7 days (t2) after being treated with the supernatant from fluoride toothpaste (FT), a non-fluoride, phytotherapeutic toothpaste (NFP) or saline (C – control). Adhered cells were serially diluted and analyzed according to the number of viable microorganisms (UFC/mL x 105). Data were analyzed by three-way ANOVA and Holm-Sidak multiple comparison ($\alpha=0.05$). Analysis of variance showed a statistically significant influence of “treatment” while no effect was detected for period and material as well as for any possible interplay ($p > 0.05$). For CR, only the FT treatment was effective in reducing the number of adhered microorganisms ($p < 0.01$), with no difference between NFP and C ($p > 0.05$). For RS, both toothpaste treatments significantly reduced the number of S. mutans on the surface of the material. Both resin-based materials contributed similarly to S. mutans adherence after 24 h and 7 days and only the FT treatment was effective for both materials.

170 Analysis of wear of diamond burs by scanning electron microscopy

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Diamond burs are abrasives rotary instruments used in restorative dentistry. These tips may differ in granulation diamond, resulting in damage to the quality and standardization of preparations. The aim of this study was to analyze and compare by scanning electron microscopy the quality of the diamond beads impregnated and the amount of wear experienced by diamond burs. It was used 70 diamond burs, model 1014, of seven trademarks: Kg Sorensen, Option, Microdont, Fava, Vortex, Zeep and Kerr. The instruments were tested in a nanohybrid composite resin block ($n = 5$) and lithium disilicate ($n = 5$). The samples were subjected to three sequential wear of 3 minutes. At the beginning and end of each stage, SEM was performed. As a result, it was observed that Microdont and Fava presented few diamond impregnated or irregular distribution of the granules initially. After periods of wear, the brands presented partial loss or large wear of the diamond. After testing, it was concluded that there was a change of shape, besides the loss of diamonds. Thus, it emphasizes the importance of replacing Rotary instruments in clinical activity.

172 Degradation of primary caries-affected dentin bonding to MDPB-containing adhesive system after S.mutans storage

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The aim of this study was to evaluate the effect of S. mutans culture and water storage on the durability of bonding of fluoride/MDPB monomer-containing adhesive system to primary artificial caries-affected dentin (CAD). Twelve primary molars were selected. Flat surfaces of dentin were submitted to artificial caries development in S. mutans and BHI broth. Caries-infected dentin was removed with burs according to clinical criteria and CAD cavities were restored with Adper Scotchbond Multi-Purpose (SBM) or Clearfil Protect Bond (CPB) ($n=6$). Nontrimmed resin-dentin bonded interfaces (1mm²) were stored in S.mutans + BHI for 3 days, in deionized water for 3 months and afterwards subjected to microtensile bond strength (μ TBS) test. The control group was not submitted to storage and immediate μ TBS testing was performed. Fractographic analysis was performed after μ TBS testing. Two-way ANOVA with split-plot design and Tukey's tests were performed. There was a significant difference between μ TBS values of SBM (25.2 ± 8.5 MPa) and CPB (15.6 ± 6.1 MPa) only for control group. A significant decrease in μ TBS values after S. mutans culture and water storage was observed for SBM (18.7 ± 5.7 MPa and 17.4 ± 4.1 MPa, respectively) and CPB (13.9 ± 5.2 MPa and 13.7 ± 4.8 MPa, respectively), but no difference was found between them. The fluoride/MDPB-containing adhesive system did not prevent the degradation of primary CAD bond strength in both degradation methods.

174 Influence of hydrogen peroxide-based bleaching agents on the bond strength of resin-enamel/dentin interfaces

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This study evaluated the effect of different bleaching techniques on the bond strength of pre-existing adhesive restorations in enamel and dentin. Hydrogen peroxide-based bleaching gels with different concentrations (7.5% and 35%) were used on composite restorations of Adper Single Bond 2 (3M/ESPE, St. Paul, USA) and Filtek Z250 (3M/ESPE, St. Paul, USA). Twenty human third molars were randomly divided into 8 groups: GE – enamel control; GE7.5 – bleaching using 7.5% hydrogen peroxide; GE35 – bleaching using 35% hydrogen peroxide; GE 7.5+35 – bleaching using 7.5% and 35% hydrogen peroxide; GD – dentin control; GD7.5 – 7.5% hydrogen peroxide; GD35 – 35% hydrogen peroxide; and GD 7.5+35 – 7.5% and 35% hydrogen peroxide. Bleaching was performed using long clinical application-time to low concentration gel, and short clinical application-time to high concentration gel. Unbleached specimens were stored in artificial saliva for 14 days. Specimens subject to micro-shear testing and data were analyzed by Analysis of Variance and Tukey's test ($p=0.05$). Enamel micro-shear bond strength was reduced after 7.5% hydrogen peroxide and after association of 7.5% and 35% hydrogen peroxide. Bleaching treatment altered dentin bond strength only when using 7.5% hydrogen peroxide. The results suggest that the bond strength of the restorations was influenced by the clinical extent of bleaching-gel application time and was not dependent on bleaching-gel concentration.

175 Tribocorrosion behaviour of dental alloys in contact with human teeth

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The complexity of contact in the mouth leads to an interplay of sliding wear, abrasion, corrosion and fatigue, irrespective of the surfaces in contact, which involve either tooth-to-tooth or tooth-to-restoration. The aim of this study was focused on in vitro tribocorrosion tests of dental alloys under reciprocating sliding. Tests were done involving four different dental alloys (Ni-Cr, Ni-Cr-Ti, Co-Cr and commercially pure Ti) tested against human teeth in artificial saliva. The main idea was to characterize the dental alloys emphasizing the influence on human teeth. A normal load of 3 and 10 N, reciprocating amplitude of 4 mm, and frequency of 1 Hz were used. Tests lasting up to 900 cycles were conducted. An increase in normal force induces an increase in current and a decrease in potential accelerating the depassivation rate of the tested dental alloys. Sliding wear affects the repassivation behaviour of the tested materials by increasing the anodic current in the wear track area.

177 Evaluation of chlorhexidine release from microcapsules incorporated into a resin sealant

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The aim was to evaluate the feasibility of the incorporation of microparticles loaded with chlorhexidine into a dental sealant. A commercial resin sealant (Bioseal, Biodynamic, Brazil) was used. In its pure form, the sealant was used as control. Test formulations were prepared by incorporating 10% (w/w) of microparticles, which were loaded either with chlorhexidine diacetate (DA) or digluconate (DG). Specimens (2 cm diameter x thickness 1 mm, n = 3) were prepared for each formulation. Each specimen was placed in a polystyrene tube containing 1.0 ml of distilled water at 37° C. For quantification of chlorhexidine release, aliquots (1.0 mL) were collected, and this volume was immediately replaced. Quantification was through UV-visible spectrophotometry ($\lambda = 255$ nm) and concentrations were obtained based on the calibration curves for each salt of chlorhexidine. Readings were taken after 6 h, 24 h and at weekly intervals for 90 days. The release of chlorhexidine in all groups occurred after a latency period. The release of the group containing DA started after 24 h, though this was more evident from 40 days. After 90 days, this formulation released about 11.31% (168.17 μ g) of chlorhexidine. The group containing DG showed a further latent release, which initiated and was maintained under control only after 24 days. However, after 90 days, this group presented a release rate of approximately 12.89% (230.85 μ g). The results suggest a delayed and controlled release of chlorhexidine when they are microencapsulated and incorporated into this commercial sealant.

179 Influence of addition of tantalum oxide in an experimental adhesive resin

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The aim of the study was to evaluate the influence of tantalum oxide (Ta₂O₅) in an experimental adhesive resin. A resin was formulated with 50%wt BisGMA, 25%wt TEGDMA, 25%wt HEMA and 1% mol of camphorquinone and EDAB as initiator system. Ta₂O₅ was incorporated in resin in different concentrations, by weight: 0, 1, 2, 5 and 10%. The resins with Ta₂O₅ addition were evaluated by degree of conversion, radiopacity and color parameters. For degree of conversion, three specimens from each group were evaluated by FTIR-ATR before and after light curing for 20 seconds. The radiopacity was evaluated according to ISO 4049 standards by a digital system. The color parameters were evaluated in the CIELab system by a spectrophotometer. Statistical analysis was performed using one-way ANOVA and Tukey's test at the 0,05 level of significance. The degree of conversion ranged from 70 to 62%, decreasing significantly compared to control (0%) from the incorporation of 5% of the inorganic filler (p < 0,05). The addition of 5% and 10% showed significant difference in radiopacity (p < 0,05), increasing with the addition of the filler. The reflectance increased significantly (p < 0,05) for all wavelengths (400, 500, 600 and 700 nm) with increasing concentration of the filler. The ΔE of the samples with addition of Ta₂O₅ showed color parameters alteration at all concentrations according to the CIELab system. It is concluded that Ta₂O₅ seems to be promising filler for adhesive resins.

176 Effect of different light-activation times on physicochemical properties of an experimental dental adhesive

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This study evaluated the effect of different light-activation times on water sorption (WS), solubility (SO), modulus of elasticity (ME) and flexural strength (FS) of an experimental self-etch adhesive. The blend was prepared with Bis-EMA (40%), TEGDMA (10%), HEMA (10%), UDMA (10%), GDMA-P (15%), water (10%), camphorquinone (1%), EDAB (1.5%), diphenyl iodonium (1.5%), and phenylpropanodione (1%), weight percentages. The blend was dispensed in molds to prepare disc-shaped specimens (6mm x 1mm) for WS and SO surveys (after 7 and 90 days), and bar-shaped specimens (1mm x 1mm x 7mm) for three-point bending test. Specimens were divided in 4 groups according to different light-activation times: G1: 5s, G2: 10s, G3: 30s, e G4: 60s (n=5). Light-activation was performed with LED Bluephase 2 (Ivoclar Vivadent) with 1050 mW/cm² irradiance. Values were analyzed using one-way ANOVA and Student-Newman-Keuls test ($\alpha=0.05$). WS increased when prolonged light-activation time was performed (7d - G1: 88.7 μ g/mm³ < G4: 138.5 μ g/mm³, and 90d - G1: 88.1 μ g/mm³ < G4: 149.9 μ g/mm³). The SO reduced by increasing light-activation time only after 90d-storage (7d - G1: 6.9 μ g/mm³ = G4: 4.1 μ g/mm³, and 90d - G1: 17.6 μ g/mm³ > G4: 5.4 μ g/mm³). The ME and FS augmented by prolonging light-activation time; however, there was no statistical difference between G3 and G4 (ME - G1: 0.91GPa < G4: 1.26GPa, and FS - G1: 61.6MPa < G4: 81.5MPa). It can be concluded that prolonged light-activation time of an experimental self-etch adhesive results in increase of WS, ME, and FS, and reduction of SO.

178 Color change, diffusion of hydrogen peroxide and cytotoxicity caused by in-office bleaching protocols

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The present study evaluated color change, cytotoxicity and diffusion of hydrogen peroxide (H₂O₂) in bovine teeth with different protocols of in-office whitening. Group 1- the specimens were not whitened; Group 2- (3x15 minutes) 3 consecutive applications, the bleaching agent was refreshed every 15 minutes. Group 3- (1x45 minutes) one 45 minutes-application of hydrogen peroxide 35%. This procedure was done 3 times at weekly intervals. The analysis of the color change was carried out by spectrophotometry reflection. The penetration of H₂O₂ into enamel during bleaching was measured by placing the specimens into artificial pulp chambers (APCs), which contained acetate buffer solution that stabilizes the H₂O₂ that has permeated the tooth structure. Immediately after bleaching, this solution was collected, processed and submitted to optical density analysis by spectrophotometry. For cytotoxicity analysis, the specimens were placed into APCs, and the diffusion of the bleaching products together with the culture medium were applied on MDPC-23 odontoblast cells culture for 1 hour. The cell morphology and its viability (cytotoxicity) were evaluated by MTT analysis and SEM, respectively. Both whitened groups had similar results considering color change and diffusion of H₂O₂. In addition, both groups caused not only decrease in cell metabolism but also alterations in cells morphology. It can be concluded that despite the effectiveness of whitening, bleaching with high concentrations of peroxide is potentially aggressive to odontoblast cells.

180 Evaluation and comparison of rNickel-titanium rotary endodontic instruments before and after clinical use

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The aim of this study was evaluate the resistance of NiTi instruments to cyclic fatigue before and after clinical use. Twenty four groups of rotary endodontic instruments ProTaper system were divided into two groups randomly. The instruments of group 1 (n=12) were stored while the instruments of group 2 (n=12) were performed by the same endodontist which used to prepare ten root canals. The instruments were tested for their resistance to cyclic fatigue with a simulator of curved canal. The time for occurs the fracture was analyzed and the size of the fragments. Data were analyzed using Kolmogorov-Smirnov test at the level of significance of 1% and two-way ANOVA (RPM and fragment size), followed by Tukey's test at a significance level of 5%. The results showed statistically significant difference for the RPM factor (p = 0.008) but not significant for the factor size of fragment (p = 0.12). All instruments were analyzed in a side view and fracture surface in scanning electron microscopy for qualitative analysis of fractured instruments. In front of the limitations of this study, it is concluded that all instruments analyzed (S1, S2 and F1) showed a lower resistance to cyclic fatigue after being used clinically in preparing ten root canals when compared with the new instruments. And regarding the size of these fragments NiTi rotary instruments, there was no relationship between the use or do not use of them.

181 Evaluation of physicochemical properties of experimental root canal sealers based on MTA and salicylate

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The aim of this study was to develop and evaluate physicochemical properties of three experimental root canal sealers based on MTA and a salicylate resin with different calcium phosphates. The sealers were composed by base and catalyst pastes mixed in 1:1. The base paste was made with bismuth oxide and butylene glycol disalicylate. Three different catalyst pastes were formulated: (1) MTA, Resimpol 8 and titanium dioxide, (2) MTA, Resimpol 8, hydroxyapatite and titanium dioxide, (3) MTA, Resimpol 8, dibasic calcium phosphate dehydrate and titanium dioxide. MTA Fillapex (Angelus) was used as control. Working time and flow were tested according to ISO 6876 and setting time according to ASTM C266 (n = 3). The materials were placed in PVC molds (8 mm diameter x 1.6 mm thick) and stored in 20 mL of deionized water at 37°C for solubility and water sorption tests (n = 10 for each material and test). After 1, 7, 14 e 28 days the samples were removed from the solutions and blotted dry for solubility and water absorption tests. Data were analyzed using ANOVA and Tukey's test (p < .05). MTA Fillapex showed the highest values of flow (29.04 mm) working (30 min) and setting time (218 min). MTA Fillapex had the lowest solubility values (18.10%) and water sorption (12.65%). MTA Fillapex and experimental sealers showed values in accordance with ISO 6876:2001. The experimental sealers exhibited satisfactory physicochemical properties.

183 A dye degradation by exposure to hydrogen peroxide associated with catalysts according to the time

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The objective of this study was to quantify in vitro degradation of a food dye according to the time of exposure to bleaching agents with or without the addition of catalysts and irradiation with LED or UVA/visible. A solution was prepared of 0.01% Carmine dye (C) and various solutions of H₂O₂ (25% H₂O₂) and ferrous gluconate 0.03% (Fe²⁺). The experimental groups were: a - 0.5 ml of "C" + 0.5 ml distilled water + 0.005 ml of "H₂O₂"; b - 0.5 ml "C" + 0.5 ml of "Fe²⁺" + 0.005 ml "H₂O₂"; c - 0.5 ml "C" + 0.5 ml of "Fe²⁺" + 0.005 ml of "H₂O₂" + LED irradiation; d - 0.5 ml "C" + 0.5 ml of "Fe²⁺" + 0.005 ml of "H₂O₂" + UVA / visible irradiation. Was obtained the dye concentration by spectrophotometric analysis, before the preparation of the groups (C) immediately after the preparation (time 0) and subsequently every 3 minutes up to a total of 15 minutes of reaction. The concentration was determined from a straight of concentration / absorbance previously defined. For each test, three replicates were performed. The data were submitted to the test Factorial ANOVA where the variables, treatment, time, and their interaction were significant (p < 0.000). Group 1 was not statistically different in 0-15 minutes, group 2 was statistically different after 0-15 minutes and groups 3 and 4 were statistically different starting from 0-3 minutes. The major degradation over time was found for the experimental group "d" followed by the experimental groups respectively "c", "b" and "a".

185 Profile of stress distribution at the interface of restorative materials and dental cements

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The knowledge about the mode of stress distribution in dental cements is poorly described when referring to the elastic modulus of the material. The objective was to evaluate the elastic modulus (E) of different cementing agents, using mathematical models, the distribution of the stress generated by the restorative material. Generated a solid three layers (10x10mm) with a height that varies according to the material, the first from the bottom up to the substrate (4mm), the second cement (100µm) and the third for restoring material (1.5 mm) It generated a mesh with a 200N load applied at the center of the third layer. The cements used were zinc phosphate (SSWhite), RelyX U200 clicker and automix (3M ESPE), Ketac-Cem (3M ESPE); materials and Lava Ultimate restorative LAVA (3M ESPE), and e.maxPRESS e.maxCAD (Ivoclar), and gold. For properties, (E) and Poisson's ratio, we used values reported in the literature. 40 groups were created by combining cement / restorative material. It captured the image of the cement / restorative material and deployed. We obtained values for the voltage spikes along the interface. These values were modeled via a normal distribution and generated a distribution curve. Each cement was fixed to observe the behavior of ceramics and vice versa. Lava Ultimate absorbed more tension between all restorative materials. Gold, e.maxPRESS and e.maxCAD showed similar behavior. The Lava showed lower absorption voltage. Observing cements, zinc phosphate lowest absorbed less tension while the other cements had a similar profile. The analysis of the finite element method suggested by observations only the modulus appears to influence the stress distribution profile.

182 Effect of cure mode on biaxial properties of resin cements

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To determine the effect of curing mode on 1-hour biaxial modulus and strength values of commercial and experimental dual-cured resin cements. Paste components of four commercial, dual-cured resin cements [RelyX Unicem2, RelyX ARC and RelyX Ultimate (3M/ESPE); Panavia F2.0 (Kuraray)] were dispensed and mixed according to manufacturers instructions and placed into Teflon molds (6.5 X 0.5 mm). The material was immediately light-cured (S10, 3M ESPE) or allowed to self-cure. Specimens were isothermally conditioned at 35°C for 1 hour immediately after placement into mold. Cured specimens were retrieved, trimmed of flash, and tested. Ten disc-shaped specimens from each test group were placed into a biaxial-flexure jig and a vertical load was applied (1.27 mm/min) on a universal testing machine (model 5844, Instron Corp., Norwood, MA) until specimen fracture. Software calculated biaxial flexural strength from the recorded data. Statistical analysis consisted of a 2-way ANOVA and Tukey's post-hoc test at 0.05 pre-set alpha among products and cure modes within each test parameter. ANOVA for modulus indicated significant effects of product and cure mode (p < 0.001), but not their interaction (p = 0.212). ANOVA for strength revealed significant effect of product and cure more with significant interaction (p < 0.001). Providing direct light curing of resin cements significantly improved flexural modulus and strength for most products, while strength of one product remained unchanged.

184 Evaluation of physical properties and antibacterial activity of a modified composite resin with TiO₂ nanoparticles

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The aim of this study was to evaluate the influence of TiO₂ nanoparticles incorporation in a composite resin (FiltekTM Z350 XT) at 1.0 and 2.0% concentrations in color stability (ΔE*), compressive strength (CS) and antibacterial activity (AA). 50 specimens (10x2mm) were divided into 6 groups for ΔE* test: G1 (control - Resin (R) without nano, articial saliva (AS)), G2 (R- without nano, coffee), G3 (R + 1% nano, AS), G4 (R + 1% nano, coffee), G5 (R + 2% nano, AS), G6 (R + 2% nano, coffee). The ΔE* was obtained by CIE-L*a*b* with a spectrophotometer-45/0 immediately, 30 and 60 days after storage at 37 °C (± 1 ° C). 24 specimens (6x4mm) were used for the CS test. 18 specimens were prepared (4x2mm) for AA of S. Mutans (SM). The SM biofilm was induced on the specimens and the survival % was calculated. Contact inhibition was observed by SEM. ΔE* values greater or equal to 3.3 showed clinically unacceptable color change and detection by eye. ANOVA and Tukey's post-test were performed for CS and AA. The lowest and highest values of ΔE* were G1: 1.47 (± 0.84), 30 days in AS and G6: 32.22 (± 1.22) 60 days in coffee (p > 0.05). The addition of TiO₂ nanoparticles did not change the color in AS after 30 days at 1% and 2% concentrations, 60 days with addition of 1%. For the CS test, the lower and higher mean values were G3 (2%) - 194.58 (± 35.26), G2 (1%) - 227.67 (± 49.41) and G1 (p > 0.05), however, the TiO₂ at 1 and 2% did not provided significant changes in the CS. The survival test, G1: 100%, G2 (1%): 54% and G3 (2%): 91% indicated a significant antimicrobial effect mainly at 2% (p < 0.05). The TiO₂ incorporation showed significant AA, without change in color and CS and may be an option as antibacterial agent in composite resins.

186 Influence of filler's surface area over optical and surface properties of resin composites

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The aim of this study investigates the influence of nanoscale filler's surface area over optical and surface properties of model resin composites before and after aging. Three model composites were formulated with different silica filler sizes, inserted in different masses in order to equalize the surface area (BET method): 7nm-15% (G1), 12nm-26% (G2) and 16nm-35.5% (G3), in a matrix of BISGMA/TEGDMA 1:1. The CIE L*a*b* parameters, the color difference (ΔE*), the translucency parameter (TP), the surface gloss (SG) and surface roughness (SR) were determined before and after aging procedures of immersion in water and toothbrush abrasion. Results were submitted to two-way ANOVA followed by Tukey's post-hoc test performed at a pre-set alpha of 0.05. Results: The immersion in water leads to increase CIE a* (p < 0.05) in G2 and decrease CIE b* (p < 0.05) in G3, did not lead significant difference in G1, CIE L* and TP of any group. The toothbrush abrasion leads to decrease SG (p < 0.05) and to increase SR (p < 0.05) in all groups, despite it wasn't observed any difference between groups. Conclusion: The optical properties were influenced by filler's size, smaller the filler greater the color stability. When equalizing the filler's surface area, it was observed no significant difference in surface properties between groups.

187 Water degradation of resin-dentin interfaces subjected to direct and indirect exposure

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The aim of this study was to assess the effects direct or indirect water exposure on the 3 months hydrolytic degradation of three dentin bonding agents. The samples were divided in three groups: Clearfil SE Bond, Clearfil S3, Adper Singlebond 2; and the samples were restored with Filtek Z350. Subsequent to the restorative procedures, the specimens of each group were divided into three subgroups (immersed in water deionised): Control (24h-37°C), Direct Water exposure DWE for 3 months (37°C), Indirect water exposure (IWE-3m) with enamel margins for 3 months (37°C). After the storage the samples were sectioned into sticks and μ TBS testing (EZ test) and Scanning Electronic Microscopy assessed the failure mode. The μ TBS data were statistically analysed using two-way ANOVA and Tukey's test at $\alpha=0.05\%$. The samples were processed for nanoleakage evaluation immersed in 50 wt% ammoniacal silver nitrate (24 h), rinsed and immersed in a photo-developing solution for 8 h. After 3 months CSE was the least affected by water degradation regardless the aging strategy. IWE afforded very little variation on μ TBS after 3 m. Intense nanoleakage was observed with DWE groups with increases incidence of mixed failures instead bonded dentin margins are more prone to hydrolytic degradation than resin-enamel interfaces. The increased nanoleakage and the drop of bond strength showed this.

189 Influence of fatigue and thermocycling on Bond strength to ceramic

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The purpose of this study was to evaluate the influence of surface treatments with 5% and 10% hydrofluoric acid on the microtensile bond strength of ceramic/cement/composite, after thermocycling and fatigue. Twenty-four brocks were made with ceramic IPS Empress Esthetic and divided into 6 groups (n=4): Groups 1, 2 and 3 - acid etching with 5% hydrofluoric acid for 60 s; Groups 4, 5 and 6 - acid etching with 10% hydrofluoric acid for 60 s. Silane was applied on treated ceramic surfaces and the blocks of the ceramic were bonded to a block of composite with RelyX ARC and photoactivated for 160 s. All specimens were stored in distilled water at 37°C for 24 hours and specimens of groups 2 and 5 were submitted to 3,000 thermal cycles and groups 3 and 6 were submitted to a fatigue test of 250,000 cycles. After, the specimens were sectioned perpendicular to obtain beams with area of 1mm² and submitted to a microtensile at a crosshead speed of 0.5mm/min. Data were submitted to ANOVA and Tukey's test ($p<0.05$). The bond strength values (MPa; mean \pm standard deviation) for the specimens stored 24 hours: groups 1 (50.84 \pm 4.34) and 4 (51.11 \pm 4.70) were significantly higher than thermocycled groups 2 (33.80 \pm 2.84) and 5 (32.52 \pm 2.23) and fatigue groups 3 (31.13 \pm 3.19) and 6 (30.09 \pm 2.65). The thermocycled groups were significantly stronger than the fatigue groups. No significant difference was found between the two surface treatments. In conclusion the thermocycling and fatigue significantly decreased the microtensile bond strength for both ceramic surface treatments in relation to control groups.

191 18-months clinical evaluation of previous etching with EDTA using one-step adhesive

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The benefits of previous etching with EDTA have only been demonstrated in an *in vitro* setting. This 18-months randomized clinical trial study evaluated the performance of Adper Easy One (3M ESPE) in non-cervical caries lesions applied according to the manufacturer's directions (EO) or with previous etching with EDTA. Forty-eight patients with at least two NCCL with similar size participated in this study. A total of 96 composite resin restorations were placed by two operators. In half of the restorations the adhesive was applied as per manufacturer's directions (EO) while in the other half the adhesive was applied after etching with EDTA (EDTA+EO). The restorations were placed incrementally using the composite resin Z 350 (3M ESPE). They were evaluated at baseline and after 6, 12 and 18 months following the FDI criteria. Statistical differences between the groups at each period were tested using with McNemar's test and the clinical performance over time for each group with the Fisher's exact test ($\alpha=0.05$). The retention rates for EO+EDTA were 100%, 95.2% and 88.1% and for EO were 95.7%, 93.1% and 76.4%, respectively for 6, 12 and 18-months of clinical evaluation ($p<0.05$). Despite 63.5% of patients reported tooth sensitivity, this occurrence did not occur in the immediate postoperative and only 17.5% after 18-months clinical evaluation. No statistically differences regarding the other FDI items were detected. The previous etching of dentin with EDTA can improve the retention rates of composite resin restorations in NCCLs when bonded with the one-step adhesive Adper Easy One.

188 Evaluation of mechanical properties of composite resins

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The aim is to evaluate the mechanical properties of composite resins, three flowable and seven conventional. We prepared three shapes of specimens, bar-shaped for bending test, cylinder-shaped for compression test and hourglass-shaped for ultimate tensile strength (UTS), Knoop hardness, and crosslink density (CLD) surveys. The composites tested were: Filtek Z100, TPH, Natural Look, Opallis Fill Magic, Llis, Charisma, Fill Magic Flow, OpallisFlow and Natural Flow. Data were submitted to ANOVA and Tukey test ($p<0.05$). Z100 obtained higher Knoop hardness both in the top and the base while lowest hardness were detected with flowable resins that were significantly similar to Fill Magic. In the compression test, Z100 achieved the highest outcomes which were similar to Fill Magic, Llis and TPH. Natural Flow attained the lowest compressive outcomes. TPH and Z100 obtained the greatest flexural strength whereas all other resins had statistically similar results. The elastic modulus was higher with Natural Flow and lower and Fill Magic Flow. UTS of TPH and Z100 were higher than that of Charisma and all other resins were similar overall. CLD was higher for flowable resins, except for Fill Magic Flow. In conclusion, Filtek Z100 promotes better mechanical strength against different strains. With lower elastic modulus, Natural Flow and Fill Magic Flow are the most adequate as "liners".

190 Development and evaluation of experimental resin primers for repair resin composite restorations

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The aim of this study was to evaluate the microshear bond strength (μ SBS) and the degree of conversion (DC) of experimental resin primers bonded to repaired resin composite. Five primers were prepared with silane, solvent, UDMA, HEMA, and GDMA-P, varying only the concentration of GDMA-P in: P1=10%; P2=20%; P3=30%; P4=40%; and P5=0%. Resin composite blocks were thermo-cycled in 1000 cycles, embedded in acrylic resin and polished with #600- silicon carbide papers. Each primer was actively applied in two layers for 20s, followed by the solvent drying for 20s. An elastomeric matrix was placed over the block surface, which was photoactivated for 20s and filled with the correspondent resin composite (n=16). After 24h, each specimen was tested in the μ SBS test; the failure pattern was determined under magnification of 40x. The DC (%) (n=3) was measured after the solvent drying (20s) using infrared spectroscopy. Data were statistically analyzed with one-way ANOVA and Tukey's test ($p<0.05$). The mean \pm SD values were: P1=41.7 \pm 1.4; P2=27.2 \pm 10.9; P3=26.8 \pm 3.4; P4=23.0 \pm 8.2; and P5=43.0 \pm 0.8 for DC analysis; and P1=19.0 \pm 9.3; P2=25.3 \pm 8.7; P3=19.78.2; P4=26.8 \pm 7.2; and P5=26.5 \pm 11.7 for μ SBS analysis; no statistical differences were verified between the groups for both DC and μ SBS analysis. Regarding the failure pattern results, the percentage of cohesive failure in the thermo-cycled resin composite was: P1=60%; P2=73%; P3=33%; P4=80%; and P5=50% of cohesive failure in thermo-cycled resin. It can be concluded that the concentration of acidic monomer seems to not influence the composite's repairing procedure.

192 Effect of the radiant exposure on the physical properties of methacrylate- and silorane-based composites

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The objective of this study was to evaluate the effect of different radiant exposures on the Degree of conversion (DC), Knoop hardness number (KHN), plasticization (P), water sorption (WS), and solubility (S) of different monomer resin-based. Circular specimens (5 x 2 mm) were carried out of the methacrylate (Filtek Z250, 3M ESPE) and silorane (Filtek P90, 3M ESPE) composite resins, and light-cured at 19.8, 27.8, 39.6, and 55.6 J/cm², using second-generation LED at 1390 mW/cm². After 24 h, DC (n = 5) was obtained using a FT-Raman spectrometer, KHN (n = 10) was measured with 50-g load for 15 s, and P (n = 10) was evaluated by percentage reduction of the hardness after 24 h immersed in absolute alcohol at top and bottom surfaces. WS and S (n = 5) were determined according to ISO 4049. Data were subjected to 2-way ANOVA and Tukey's test ($\alpha=0.05$). Methacrylate material presented higher DC, KHN, P, and WS than silorane ($p<0.05$). There was no difference in the S values ($p>0.05$). In general, top surface showed higher DC and KHN than bottom, for both materials ($p<0.05$). The increase of the radiant exposure did not improve most physical properties of the composites and were monomer-based dependent.

193 Bond strength of glass fiber post to root dentin after different treatment with filling materials and cleaning agents

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The aim of the study was to evaluate the bond strength and failure patterns in adhesive interface of glass fiber posts to root dentin after treatment with filling materials and cleaning agents. One-hundred and twenty roots from bovine primary teeth were endodontically treated and assigned into groups: Control (no material - C); Calen® + Zinc Oxide (CZO); Vitapex® (V); Calcipex II® (CP). After 7 days, filling materials were removed and subdivided in: No cleaning (NC); 70% Ethanol (E); Tergenform® (T). Posts were luted, specimens were sectioned (± 1 mm), prepared for push-out test ($n=10$) and the failure pattern was analyzed and classified by SEM (40X and 250X). Data from push-out test were submitted to two-way ANOVA and Tukey test's ($\alpha=.05$) and failure patterns were calculated in percentage and analyzed descriptively. Interaction was observed between the studied factors ($p=.004$). CZO/E showed the highest bond strength values (12.21 ± 2.73), significantly different from NC (6.85 ± 0.98). V and CP showed no significant difference between cleaning agents. The lowest bond strength values were found for C/T (4.37 ± 3.07). The failure adhesive-type between dentin/resin cement was the most frequently observed in the groups C/NC (60%), C/E (70%), CZO/E (40%), V/NC (80%), V/T (80%) e CP/NC (70%). Cohesive failure was not observed in CZO/NC and V. Mixed failure between adhesive/cohesive was found in all groups. In conclusion, the filling materials and cleaning agents influenced the bond strength and failure pattern. Calen®+OZ showed the best associated with 70% ethanol.

195 Influence of hydrofluoric acid concentrations on the microshear bond strength between glass ceramics and resin cement

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This study evaluated the influence of hydrofluoric acid (HF) concentration on the surface and microshear bond strength on ceramics: IPS Empress Esthetic (EST), IPS e.max Press (EMX), bonded to a resin cement (Variolink II). Each type of ceramic blocks with 8 mm \times 8 mm \times 2 mm was separated into 12 groups ($n=6$), according to the acid concentration: 1%, 2.5%, 5%, 7.5%, 10% and 15%. Etching time was fixed in 60 seconds for EST and 20 seconds for EMX. All the groups were silanated after etching and the acronym 'UR' on the designated groups received a layer of an unfilled resin after silane application. Characterization of the etching patterns was conducted by SEM. For the microshear bond test, resin cylinders were built on the ceramic surface, photoactivated during 40 seconds and stored in distilled water during 24 hours, 37°C. The data were submitted to three-way ANOVA and Tukey's test ($p<0.05$). SEM images showed that poor etching was detected when using HF 1% on EST and EMX groups. HF 2.5% resulted in large remnants of vitreous phase and shallow grooves on ceramic surface. Similar etching patterns were detected for HF 7.5 and 10%. Deep channels were extensively observed on surfaces etched with HF 15%. The results showed no statistical difference among EST and EMX. Groups with unfilled resin showed statistical higher microshear bond values and HF10% and HF15% showed higher values compared to HF1% and HF2.5%. Conclusion: Hydrofluoric acid concentration influenced the ceramic topography and microshear bond strength values and the unfilled resin resulted in higher bond strength.

197 Effect of intrinsic nanoparticle pigmentation on the color stability of denture base acrylic resins

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To investigate the effect of intrinsic nanoparticle pigmentation on the color stability of acrylic resins, Onda Cryl, QC 20, Classico, and Lucitone resins were evaluated. A total of 21 specimens (30 mm-diameter, 3 mm-thick) were fabricated from each resin. Seven were colored with 3% Poli-Cor intrinsic pigment used to color denture base, 7 were colored with 7% pigment, and 7 were not pigmented. In addition, 7 specimens were fabricated containing only pigment. The specimens were thermally cycled 2000 times between 5°C and 55°C with a 30-second dwell time at each temperature. The specimen colors were measured with a spectrophotometer and evaluated with the CIE L*a*b* system before (B) and after thermal cycling (T). The pigment morphology was analyzed by using a scanning electron microscope (SEM) and energy-dispersive x-ray spectroscopy (EDS) techniques. The results were analyzed with the ANOVA and Tukey HSD tests ($\alpha=.05$). Classico acrylic resin with and without pigment underwent the least color change, followed in order by Lucitone, Onda Cryl, and QC-20. The presence of pigments reduced the color change of the acrylic resins, with statistical significance ($P<.05$) for the specimens containing 7% pigment ($0.32 \pm 0.18 \Delta E$). Titanium was the sole metallic component present in the pigment, probably in the oxide form (TiO₂). Nanoparticle pigments enhanced the color stability of denture base acrylic resins.

194 Biomechanical analyses of impla partial prostheses made from different materials and levels of vertical misfit

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Currently, the literature has suggested the use of various materials for making prosthetic infrastructures. Regardless of the material, the presence of mismatches in the prosthesis is considered an important factor in the long-term success. The aim of this study was to evaluate the influence of the material infrastructure and vertical misfit on stress distribution over implant fixed partial prosthesis. A model representing the posterior region of a mandible with two implants in the second premolar and second molar was made using specific software. Finite element models were obtained by importing the solid model mechanical simulation software. The groups were divided according to the material infrastructure of the prosthesis (type IV Au, Ag-Pd, CP Ti, Co-Cr, and Zi) and level of vertical misfit (10, 50 and 100µm). An offset was made in the region of misfit simulating the screw tightening. The zirconia caused higher stress concentration in infrastructure (3458.5 MPa) and the screw (95.9 MPa). However, Au type IV showed the highest values in the veneering porcelain (1376.0 MPa). Bone tissue showed no significant changes with different material infrastructure. A considerable increase in the stress concentration was observed in all the frames with the mismatch amplification evaluated. The material infrastructure influenced the stress concentration in the prosthetic components, but no difference in bone tissue. All structures have been significantly influenced by increased levels of vertical misfit.

196 Study of the influence of radiation in ionising diametral tensile ionomer cements glass

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The aim was evaluate the influence of ionizing radiation under three glass ionomer (conventional, resin modified and silver added) on the diametral tensile strength. Samples were made with into a cylindrical bipartite mould of PTFE high according to manufacturer's instructions. All samples were stored in plastic tubes protected from light for 24 h at 37° C in a culture stove. After that, each group was divided in a control ($n=20$) or submitted to ionizing radiation ($n=20$), in 35 daily applications of 2 Gy by a linear accelerator. The diametral tensile strength test was performed in a universal testing machine, with 1 mm/min of cross-head speed. Data were submitted to analysis of variance and multiple comparison test of Tukey ($\alpha=0.05$). Significant differences were recorded ($p<0.001$) between the glass ionomer tested for diametral tensile strength. Comparing groups with the same classification, submitted or not to radiation, there was no significant difference. Riva Light Cure control showed an average (MPa) of 31.83 in comparison to 24.82 of irradiated group. Riva Silver control showed an average of 12.06 in comparison to 17.29 for the irradiated group. Riva Self Cure control showed an average of 14.05 in comparison to 26.04 irradiated group. Comparing all groups of different classification submitted to ionizing radiation, there were significant difference between them ($p<0.001$). Riva Silver control showed the lowest average (12.03) in comparison to Riva Light control (31.83). The radiotherapy applied as protocol to head and neck cancer therapy do not act negatively in the diametral tensile strength of the three glass ionomer tested.

198 Effect of photoactivation time in degree of conversion of resin cements photoactivated through fiber post

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The aim of this study was to evaluate the effect of the moment of photoactivation in the degree of conversion (DC) of selfadhesive resin cements light-cured of through glass-fiber post. A cast with a 2x2mm² orifice was used to make specimens. Cylinders of acrylic resin containing three posts were prepared for the polymerization could be made through of posts; these cylinders had 7, 10 and 13 mm in height, representing the cervical, middle and apical thirds of root canal, respectively. Samples were prepared with RelyX U-100 and BisCem, these being photoactivated in these times: Immediately; after 5, and 10 min of its insertion into the cast. The DC was measured after 24 h using a spectrometer Fourier transform infrared spectrometer FT-IR with attenuated total reflectance (ATR) coupled. Data were analyzed by Three-Way ANOVA and Tukey's test ($\alpha=0.05$). The degree of conversion of BisCem showed greater than U-100 in all experimental conditions, with a tendency for reduction of degree of conversion with the increasing of the distance. The moment of light curing did not affect the degree of conversion of the U-100, while the BisCem showed higher degree of conversion with immediate photoactivation. The curing time have more influence with increasing the photoactivation distance. It was concluded that both the photoactivation time as well as the distance from the light may influence the degree of conversion of adhe resin cement through fiberglass posts.

199 Chemical analysis of enamel after bleaching and acid etching

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The objective was to determine the effect of in-office and commercial free for sale bleaching agents on the chemical composition of enamel. Bovine incisors were used after properly cleaning and were stored in thymol solution. The buccal surfaces of the teeth were polished to obtain flat areas in enamel, which were divided in halves. One half served as a control and the others were divided into 3 groups according to the bleaching agent used: Opalescence 10% (O10, Ultradent); WhiteKin (WK, Kin); Clysiden Express Kit (CKE, Ern SA). The products were applied according to manufacturers' instructions for 4 weeks. Teeth were stored in artificial saliva at 37° C. The enamel composition was analyzed by X-ray spectroscopy. After initial analysis, control and bleached surfaces were conditioned with phosphoric acid and again observed. Data were analyzed with Student t-test ($p < 0,05$). In mineralized enamel, there was no difference in the levels of calcium and phosphorus for the control and bleached substrates. After acid etching, there was a decrease in the levels of calcium and phosphorus for CKE compared to control. Comparing the groups treated with bleaching agents after conditioning, there was an increase in calcium levels, but no difference in phosphorus levels. The application of bleaching agents did not alter the chemical structure of mineralized enamel. In bleached enamel after acid etching, there was an increase of free calcium on the surface of teeth bleached with all products.

201 Influence of storage medium on the Vickers microhardness of acrylic denture base

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The aim of this study was to evaluate the influence of three storage media in Knoop microhardness for two acrylic denture bases. Sixty samples were fabricated in acrylic with 10 mm in diameter and 4 mm high and divided into two groups according to the method of activation (thermal activated and microwave). After determining the initial Knoop hardness, were divided into three subgroups within each activation method according to the storage medium (distilled water, wine and cola). Two impressions were made by specimens after 7 days storage at 37° C. Data were submitted to ANOVA and Tukey ($\alpha = 0.05$). The values recorded (KHN) were: Heat-polymerized - initial microhardness 4.12; Heat-polymerized wine - 4.06; Heat-polymerized - distilled water 5.53; Heat-polymerized - Coca-Cola 4.68; Microwave - initial microhardness 4.56; Microwaves - wine 4.97; Microwave - distilled water 5.02, and microwave - Coca-Cola 5.05. The tests showed a statistically significant difference in hardness between both resins activated by heat or microwave, and among the storage media used.

203 Effect of dentifrices associated to 10% carbamide peroxide on superficial/cross-sectional enamel microhardness

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Dental enamel surface alterations after the bleaching treatment (BT) could be clinically significant or not. The aim of this study was to evaluate the action of 10% carbamide peroxide (CP) associated or not to a dentifrice with 1100ppm/F (DenF) or placebo (Den), after each daily session of BT. Sixty blocks (4x4mm) of bovine enamel were cut, polished, selected from superficial microhardness (SH) and randomly divided into 6 groups ($n = 10$): G1-CP+DenF; G2-CP+Den; G3-CP; G4-Non bleached, control (CO)+DenF; G5-CO+Den and, G6-CO. The groups submitted to BT, the CP was applied for 4h/daily during 21 days. The slurry was applied for 1min after the BT. During the experiment, all specimens were stored in artificial saliva at 37°C. In the end, the superficial and cross-sectional microhardness were determined to calculate the % of SH loss and the hardness integrated area (HIA), respectively. The data of %SH and HIA were submitted to two-way analysis of variance followed by Fisher's PLSD and Student-Newman-Keuls, respectively. The groups submitted to BT presented superior mineral loss (%SH and HIA) when compared to groups non bleached. The DenF reduced the mineral loss of the bleached enamel and demonstrated similar %SH loss to non bleached groups. Therefore, it can be concluded that the immediate application of DenF after each daily session of bleaching treatment with 10% CP may decrease mineral loss of enamel structure.

200 Effects of different polishing systems on the surface roughness and microhardness of a silorane-based composite

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The aim of this study was to investigate the effects of different polishing systems on the surface roughness and microhardness of a silorane-based resin composite. Forty disks were fabricated (ϕ 12 mm x 2.5 mm) of a silorane-based resin composite (Filtek P90 - 3M ESPE, USA). The specimens were divided into four groups ($n = 10$), according to the polishing system: G1 - Mylar strip (control); G2 - Felt-disc + diamond paste, G3 - Sandpaper discs; G4 - Rubber tips. The specimens were stored in distilled water at 37°C for 24 h. The external surface roughness was determined through measuring the Ra of the specimens. The Vickers microhardness was measured using a microhardness tester. The values of surface roughness and microhardness of each specimen were statistically analyzed using one-way ANOVA, Games-Howell and Ryan-Einot-Gabriel-Welsch (REGW-Q), and setting the statistical significance at $p \leq 0.05$. The results observed were that G2 (0.42 μ m) and G4 (0.43 μ m) showed statistically significant differences when compared to groups G1 (0.25 μ m) and G3 (0.19 μ m) ($p < 0.05$). There was no statistical difference between groups regarding microhardness ($p > 0.05$). We concluded that polishing systems altered the surface roughness of a silorane-based resin composite, but did not influence the microhardness values.

202 Comparison of two application techniques of luting agent for retention of fiberglass posts

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The aim of this study was to evaluate the bond strength of intracanal fiberglass posts (PFV) and dentin, using two techniques of insertion of self-adhesive resin cement. We selected 28 bovine teeth whose crowns were sectioned, leaving the roots to 18mm in length. The conduits were instrumented and prepared for the attachment of PFV Reforpost # 3 (Angelus) leaving 4 mm apical shutter. The roots were randomly divided into 2 groups ($n = 14$) according to the technique for insertion of resin cement: (B) Lentulo drill and (S) Centrix® syringe with needle tip. The RelyX U200 (3M) was photoactivated (Bluephase, Ivoclar Vivadent, 1340mW/mm², 40sec) under the load of 10N. After 7 days, roots were sectioned perpendicular to the long axis of the tooth obtaining two specimens of 1 mm thickness in each third root: coronal (C), medium (M) and apical (A). The bond strength was measured by push-out test (MPa). The cement line obtained was qualitatively assessed with a stereomicroscope (40x). The strength values, in MPa, of the C, M and A thirds in group B were 10.6 ± 3.1 , 9.4 ± 3.5 and 9.4 ± 3.4 respectively. In group S, the mean (\pm SD) in thirds C, M and A were 10.3 ± 3.2 , 9.8 ± 3.8 , 11.6 ± 2.9 , respectively. Statistical analysis (ANOVA and Tukey test) showed no significant difference between groups B and S ($p = 0.278$) or between the root thirds ($p = 0.521$) in each group. It was concluded that the technique of insertion of RelyX U200 did not influence the values of bond strength between PFV and bovine root dentin.

204 Kinetics and degree of conversion of light-cured temporary restorative materials

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This study aimed to evaluate the kinetics and degree conversion of light-cured temporary restorative materials. Four materials were tested: Bioplic - Biodinâmica(B), Fermil Inlay - Ivoclar Vivadent™ (F), Fill Magic Tempo - Vigodent™ (FM) and Revotek LC - GC América (R). The test was performed by Fourier transform infrared spectroscopy (FTIR, Spectrometer Shimadzu Prestige21) with an attenuated total reflectance (ATR), composed of a diamond crystal (Smiths Detection, Danbury, CT). A support was connected with the purpose of fixing the LED photo-activating (Radii™ Curing Light, SDI, Bayswater, Victória, Austrália) to the spectrophotometer enabling standardized distance between the tip end of the optical fiber and the sample. The degree of conversion after 60s was (mean \pm standard deviation): B ($69,4 \pm 1,5$), FM Tempo ($59,7 \pm 7,3$), R ($59,3 \pm 5,5$) and F ($33,7 \pm 14,0$). The percent conversion after 20 sec with respect to the end of the polymerization was: B (84.5%), FM (93.8%), R (81.9%) and F (62.1%). The maximum rate of polymerization (R_{pmax}) of B, FM and R occurred at a maximum time (t_{max}) of about 5 sec, while the F showed a low R_{pmax} in a t_{max} around 12s. It is concluded that after 20 sec the polymerization Fill Magic Tempo, Bioplic and Revotek converted more than 80% and the Fill Magic Tempo showed higher polymerization rate.

205 Dentin bond stability and antibacterial effect of an experimental adhesive with Butiá oil

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The objective of this study was to evaluate the stability for microtensile bond strength (iTBS) and the antibacterial effect by direct contact test (DCT) of an experimental adhesive containing butiá oil (*Butia capitata*). The materials used were experimental adhesive with oil (AO), experimental adhesive control (AC), Clearfil Protect Bond (CPB) and Clearfil SE Bond (CSEB). For iTBS, bovine teeth were restored and stored in distilled water at 37 ° C for 24 h. Then dental sticks were obtained and tested in the testing machine (speed of 0.5 mm / min and load cell of 100N). Specimens were also evaluated after 24h, 6 m, 1 and 2 years of storage. For TCD adhesive systems were applied to the sidewalls of a 96-well plate then was placed 10µl of the suspension (BHI grow + *S. mutans*) and stored for 1, 3 and 6h, then were taken for reading of the absorbance in espectrofometer. Data were subjected to two-way ANOVA followed by Fisher LSD test ($p < 0.001$). For iTBS had statistical difference both time ($p = 0,001$) and material ($p = 0,001$), presented interaction between two variables. The CPB showed better stability up to 1 year, in two years all had similar performance. TCD showed statistic difference for material but not for time, presented interaction between time and material. Conclusion the experimental adhesive with oil showed antimicrobial effect and the stability similar than others after two years.

207 Degree of polymerization and optical properties of self-adhesive flowable composites formulated with initiation systems.

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To evaluate the influence of the photoinitiator system on the curing efficiency and optical properties of experimental self-adhesive composites formulated with different initiators. Ten experimental groups were formulated, which varied in relation to the organic matrix content– (1) BISGMA-HEMA (50/50%, control group), and (2) the self-adhesive 2MP-HEMA (70/30%) - and the photoinitiator system: CQ, TPO, BAPO, CQ and CQ + TPO + BAPO. Degree of conversion (DC) and maximum rate of polymerization (Rpmax) was determined by spectroscopy (FTIR). The yellowing effect (b^*) was measured before and after polymerization with a spectrophotometer. 24 hours after polymerization and after 10 days of immersion in water, Knoop hardness (KHN) was determined on the irradiated surface. The results were submitted to ANOVA and Tukey's tests (95% confidence). With the exception of the CQ group, all other composites showed higher DC in the self-adhesive formulation than conventional. The Rpmax did not differ for the groups with TPO regardless of the monomer serie. CQ had lower Rpmax in the self-adhesive mode than the traditional, whereas for BAPO it was observe an opposite situation. Self-adhesive materials tend to present lower b^* values than conventional ones. CQ had the lowest KHN values of all composites evaluated. There was no significant difference between those composites formulated with TPO. DC, Rpmax, KHN and yellowing were dependent on the photoinitiator system and the type of monomeric system used- traditional or self-etching.

209 influence of solvent type on the physicochemical properties of experimental dental adhesives

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The aim of this study was to evaluate the influence of different solvents (ethanol, acetone, tetrahydrofuran [THF] and dimethyl sulfoxide [DMSO]) on physicochemical properties of experimental dental adhesives. Two model resin blends (etch-and-rinse [E&R], and self-etch [SE]) were prepared and afterwards 10wt% of each solvent was added. In order to determine the modulus of elasticity (ME) and flexural strength (FS), bar-shaped specimens ($n = 10$) with 1mm x 1mm x 7mm were made and subjected to three-point bending test. The water sorption (WS) and solubility (SO) were determined by preparing disc-shaped specimens for each experimental adhesive ($n = 10$). The results were analyzed with one-way ANOVA and Tukey's test ($\alpha = 0.05$). THF (ME: 0.88 GPa; FS: 81.3 MPa) and DMSO (ME: 0.89 GPa; FS: 54.7 MPa) presented the highest mechanical properties in E&R and SE respectively. DMSO obtained the highest WS (E&R: 66.9 µg/mm³; SE: 194.7 µg/mm³) and SO (E&R: 93.8 µg/mm³; SE: 107.4 µg/mm³) in both experimental resins. It can be concluded that incorporation of alternative solvents as DMSO and THF into dental adhesives may improve their mechanical properties.

206 Physical and mechanical properties of light-cured temporary restorative materials

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There are many temporary light-cured temporary restorative materials. However, little is known about their physical and mechanical properties. The objective of this study was to evaluate the cohesive strength (CS), sorption (WS) and solubility (SL) of five commercial temporary restorative materials. The materials tested were: Bioplic - Biodinâmica(B), Fermit Inlay - Ivoclar Vivadent™(F), Fill Magic Tempo - Vigodent™ (FM) e Revotek LC - GC América (R) e Luxatemp Inlay - DMG™ (L). For the CS, hourglass shaped specimens were made ($n = 10$), polymerized for 20s and taken to the EMIC universal testing machine with load cell of 100 N and speed 1.0 mm/min. The SW and SL test was performed according to ISO 4049. Data were evaluated by Kruskal-Wallis test followed by Fisher's LSD ($p < 0.05$). CS (mean ± standard deviation): R (32,8 ± 3,1)a, F (9,5 ± 1,9)b, B (8,9 ± 2,4)b, FM (5,7 ± 0,9)c and L (4,4 ± 1,4)c. Para SW: L (3,0 ± 0,1)ab, F (2,2 ± 0,0)bc, FM (2,3 ± 0,0)abc, B (4,2 ± 1,0)a e R (1,6 ± 0,9)c. SL: L (0,9 ± 0,0)a, F (0,5 ± 0,0)ab, FM (0,1 ± 0,0)bc, B (-0,1 ± 0,7)bc and R (0,0 ± 0,0)c. Materials with greater CS ($p < 0.001$) were R, followed by F and B. B, L, and FM showed higher sorption, whereas L and F presented higher solubility. R was the material with significantly lower sorption and solubility. It was concluded that the Revotek LC showed better performance on trials of cohesive strength and sorption and solubility.

208 Evaluation pH and calcium release of experimental root canal sealers based on MTA and salicylate modified by calcium

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The objective of this study were to develop and evaluate the pH and calcium release of three experimental root canal sealers based MTA and resin salicylate with different calcium phosphate (CaP). The sealers were composed by bases and catalyst pastes mixed in 1:1. The base paste was made with bismuth oxide and butylene glycol disalicylate. Three different catalyst pastes were formulated: (1) MTA, Resimol 8 and titanium dioxide, (2) MTA, Resimol 8, hydroxyapatite and titanium dioxide, (3) MTA, Resimol 8, dibasic calcium phosphate dehydrate and titanium dioxide. MTA Fillapex (Angelus) was used as control. The materials were placed in PVC molds (8 mm diameter x 1.6 mm thick) and immersed in 10 mL of deionized water in cylindrical polystyrene-sealed container stored at 37°C for the pH and calcium release tests ($n = 10$ for each material and test). After 3 and 24 hours and 4, 7, 14 28 days the soaking water was collected for Ca and pH analysis. Data were analyzed using ANOVA and Tukey's test ($p < .05$). The higher pH values were found in the initial times (up to 24h), except for MTA Fillapex. The experimental sealer 1 showed higher pH values in 3h-4 days period, and MTA Fillapex in 7-28 days period. High calcium release occurred at 28 days for all sealers except for the experimental sealer 3 (14 days). Generally, the experimental sealer 1 released more calcium than others sealers. All experimental sealers and MTA Fillapex showed basic pH and calcium ion release in the times analyzed.

210 Effect of different bleaching agents on roughness, surface gloss, speed and longevity of tooth whitening

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The aim was to evaluate the surface properties, speed and longevity of whitening treatments performed with two different agents. 40 bovine incisors were darkened with coffee solution for 30 days. Then, they were subjected to hydrogen peroxide 7.5% (PH) or carbamide peroxide 22% (PC) up to 10 days. Color parameters CIE L * a * b *, gloss (BS) and surface roughness (SR) were determined before and after the bleaching agents. After bleaching treatment, the specimens were again immersed in coffee and their optical properties evaluated for up to 30 days to establish the longevity of the treatment according to each experimental group. The results were submitted to ANOVA and Tukey's test (95%). The bleaching results led to a significant increase in CIE L *, a significant reduction in a *, b * and BS in both groups, with no significant differences between them. Darkening, after bleaching led to a significant decrease in CIE L *, increase in a *, b *, BS and SR in both groups. At the end, RS was greater in PH than PC. There were no significant differences in speed and longevity of the whitening treatment when hydrogen peroxide and carbamide peroxide were tested. However, hydrogen peroxide promoted greater surface roughness.

211 Contact angle of Zirconia pretreated with atmospheric plasma

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This study investigated the effect of atmospheric pressure plasma application (AP) on contact angle of 2 zirconia ceramics. 5 sintered zirconia plates (10 x 10 x 1 mm) of Katana (Kuraray Noritake) and Lava (3M ESPE) were obtained using zirconium dioxide stabilized by yttrium oxide. The plasma torch (Surface plasma tool model: SAP - Lab Applications) ran at room temperature (22°C) and 20 mm long, using argon gas (Praxair 4.8) with 1.0 liter per minute output. The distance between the nozzle and the samples was 10 mm and the time of plasma exposure was 1 minute for each treatment. Immediately after the exposition, a water drop of approximately 15 to 20 μ l was placed at zirconia surfaces. Contact angle data were analyzed by two-way ANOVA and Tukey test (5%). Measurements to evaluate the hydrophobic recovery of Katana and Lava zirconia were executed acquiring hourly the contact angle by Image J Software (National Institutes of Health). Profile images were acquired with a digital 300x microscope. The contact angles of both materials decreased around 50% if compared to the initial one and became constant in approximately 12 hours after treatment. Lava's got a faster hydrophobic recovery. AP pretreatment shows a possible technique to improve the bond strength between zirconia and polar resins, since the surface wettability increased after plasma exposure.

213 Characterization of topography of a yttrium stabilized zirconia after silica-coating at the pre-sintered state

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Characterize the microstructure and determine the surface roughness (Ra) and phase transformation of Y-TZP structures after the following surface treatments (ST): (a) Control (without ST, as sintered surfaces); (b) Silica-coating using 30 μ m aluminum oxide particles modified by silica (CoJet-Sand) after final sintering; and (c) Silica-coating before final sintering. Y-TZP bar-shaped specimens (1.2 mm x 4 mm x 20 mm) were fabricated and divided into 3 groups according to the ST described above. Silica-coating was performed perpendicular to the Y-TZP surface, at 10 mm for 15 s at a pressure of 2.8 bars. An optical profilometer was used to examine the surface roughness (Ra), a scanning electron microscopy (SEM) to examine the topography of Y-TZP after ST, and X-ray diffraction (XRD) for phase transformations determination. Ra values were analyzed by one-way ANOVA and Tukey post-hoc test (5%). Group c) presented significantly lower surface roughness (0.26) in comparison to group a) (0.56) and c) (0.82). When the silica-coating was performed at the pre-sintered state, XRD peaks for the monoclinic phase were observed (17%), however after final sintering the monoclinic phase decreased to 0%. In group b), the monoclinic phase content was 7%. Group c) showed a rough surface topography consisting of rounded depressions and projections, while group b) showed sharp peaks. Group c) also revealed large areas with loss of structure at the treated surface that resulted in a reduction in the specimen's original thickness ranging from 0.50 to 4 μ m. The TS is preponderant on the final topography, and eliminates the problem of phase transformation which is advantageous from the clinical point of view because it would be expected a longer lifetime.

215 Surface treatments: Effect on bond strength and analysis by confocal scanning laser

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This study aimed to evaluate the influence of methods of surface treatment of indirect composite resin on the microtensile bond strength and analyze the infiltration of resin cement through confocal scanning laser. Were made 50 blocks (5.0 x 5.0 x 2.0 mm) divided into 5 groups (n = 10), according to the surface treatments: group A - spherical diamond bur, B - bur spherical diamond, and application of silane bond, C - etching with hydrofluoric acid 10%, D - etching with hydrofluoric acid 10%, and application of silane bond and E (control) - none. The resin blocks were cemented in bovine teeth etched with 37% phosphoric acid and adhesive system. The samples were subjected to the test of the microtensile bond strength in a universal testing machine (EZ Test). Other samples (n = 3) prepared in the same manner were analyzed in confocal laser scanning for analysis of cement penetration in composite resin blocks. The resin cement was mixed dye (Rhodamine). The data were submitted to ANOVA and Tukey test (p < 0.05). Results: The values of bond strength microtensile (MPa) were: Group A - 27.41 \pm (7.40) B, B - 28.48 \pm (7.64) B, C - 26.62 \pm (3.03) B, D - 39.46 \pm (7.40) A, E - 33.71 \pm (2.78) AB. The best surface treatment for cementation of indirect composite resin prostheses seems that combines the application of hydrofluoric acid, and silane bond. And, it is possible to establish a correlation between penetration of cement and the microtensile bond strength.

212 Long term effect of chlorhexidine on the dentin microtensile bond strength of resin cements: a two-year in vitro study

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This study investigated the effect of dentin pre-treatment with chlorhexidine on the long-term bond strength of resin cements. Composite blocks were luted to caries-free human coronal dentin using a conventional (RelyX ARC, 3M ESPE: ARC) or a self-adhesive (RelyX U100, 3M ESPE: U100) cement with/without dentin pretreatment by 2% chlorhexidine. Chlorhexidine was applied for 60s on etched-dentine for ARC and on the smear layer covered dentin for U100. Bonded teeth (n=10) were stored in water for 24h and sectioned in 0.9mm X 0.9mm sticks for microtensile bond strength (μ MTBS) test. Composite-dentin sticks from each bonded tooth were randomly divided to be tested immediately or after two-years of storage in artificial saliva. Fracture failures were determined by scanning electron microscopy. Repeated measures factorial ANOVA and Tukey Kramer Test ($\alpha=0.05$) revealed that resin cement, time, the interaction between resin cement, time and dentin pre-treatment (p<0.001) had significant effects on the dentin μ MTBS. U100 provided reduced bond strengths at 24h and two-year storage periods (p<0.05); two-year storage did not cause U100 bond-strength reduction (p>0.05). Pretreatment with 2% chlorhexidine reduced dentin bond strength loss of ARC after storage (p<0.05); there was no adverse effect on the 24h and two-year storage of U100 μ MTBS (p>0.05). Chlorhexidine is effective to reduce long-term bond strength loss of conventional resin cements contributing to increase indirect restorations longevity. Chlorhexidine use with self-adhesive cements does not impair immediate or aged dentin bond strength. Its use to increase durability of restorations luted with self-adhesive cements seems irrelevant.

214 Effect of light sources with different wavelengths in micro and ultramicrohardness of a nanohybrid composite resin

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This study evaluated in vitro the hardness (micro and ultramicro) and of a nanohybrid composite resin (Tetric N-Ceram/Ivoclar-Vivadent) with different colors, light sources and thickness. The specimens were divided into groups (n=5): KHN-Knoop microhardness, DUH-nanohardness; colors: A2 and Bleach-M (BM); light sources: LEDblue Elipar Free light 2/3M-ESPE (750mW/cm²/ 25s/430-480nm- (FL)), LEDblue/violet Bluephase/Ivoclar-Vivadent (1.200mw/cm²/15s/380-515nm) (B15) and 30s (B30); thickness: 1mm, 2mm and 3mm, compared to the irradiated surface (0mm). Specimens were stored dry for 24hours at 37°C after photo curing. Assays were performed at KHN in HMV-2000/ Shimadzu with load of 25gf at 40s and DUH/ME in DUH 211S/Shimadzu with force of 10mN and no hold time (0s). 5 indentations of each test were made in the surfaces opposites to the photo curing. A statistical analysis was performed by ANOVA, Tukey and Pearson correlation (p<0.01%). Pearson's test showed a direct correlation between KHN and DUH. Comparison between KHN and DUH in the studied resins indicated that the light source FL promoted higher values of KHN and DUH to both resins tested. Regarding thickness 0mm and 1mm showed higher KHN and DUH than 2 and 3mm thickness. A2 color showed higher KHN and DUH than BM. Conclusion: The LEDblue/violet was not better for curing the light color of the nanohybrid resin, than LEDblue.

216 Deproteinized dentin bond strength evaluation of etch-and-rinse adhesive systems

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The aim of this in vitro study was to evaluate the microtensile bond strength (MBS) of two adhesive systems (AS) after different strategies of adhesion: acid conditioning (AC) or prior application of 10% sodium hypochlorite (SH), and water storage or SH storage. Two AS was performed: Gluma 2Bond (Heraeus) and One Step (Bisco). Twenty-eight human third molars was used and AS were applied following the instructions of each manufacturer with prior application of SH and stored for 1 year. After AS applied, a composite were incrementally built on dentin surfaces and the teeth were stored for 24hours (h). The teeth were prepared to microtensile bond strength test (Ez Test, Shimadzu), whereas 1/3 were immediately tested (T1), 1/3 were stored in SH for 3h and washed for 10min before the test (T2) and the remaining of samples were water stored for 1 year (T3). Data were analyzed by two-way ANOVA and Tukey test (5%). The bond strength means (SD) were (MPa): Gluma 2Bond T1: 48,4(13,1) and SH- 36,7(6,7); T2: 36,4(8,5) and SH- 26,3(2,9); T3: 43,0(5,7) and SH- 31,1(4,7); One Step T1: 54,2(6,2) and SH- 49,9(9,8); T2: 41,4(5,8) and SH- 39,1(7,9); T3: 49,1(7,7) and SH- 45,2(19,5). The application of SH before AC decrease MBS only for Gluma 2Bond. After 1 year of water storage and SH storage showed lower MBS for all AS but SH showed less MBS. The MBS of AS did not differ among them when they were used according manufacturers.

217 YTZP crowns retention varying the substrate, surface treatment and cement

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To compare the retention of YTZP zirconia crowns cemented to different substrates considering different cementation protocols. 216 extracted molars were prepared for full crown (n=12); 108 were reconstructed with glass fiber post and composite resin core. YTZP zirconia copings were milled and 144 specimens were divided into 12 groups according to the factors: dentin (D) and composite resin (C); cements: Multilink (M) and Relyx ARC (R) and zirconia surface treatments: alcohol (A) silica coating (S) and vitrification (V). The remaining 72 specimens were divided into 6 groups cemented with Relyx Luting (Civ), Relyx U100 (Aut) and zinc phosphate (Fo) in dentine (D) and composite resin (C) on untreated zirconia. The specimens were thermally cycled (5-55°C, 6000 cycles) and data from the tensile test were analyzed by Kruskal Wallis and Dunn test. The retention values were: DMA: 44.8 (+9.3); DMS: 55.7 (+16.5); DMV: 53.8 (+11.9); CMA: 20.5 (+3.5); CMS: 29.9 (+13.1); CMV: 38.8 (+19.6); DRA: 16.6 (+10.3); DRS: 37.6 (+26.3); DRV: 42.4 (+9.7); CRA: 22.8 (+5.3); CRS: 25.2 (+7.8); CRV: 25.9 (+5.3). Dciv: 11.4 (+6.3); Daut: 42.9 (+18.7); Dfo: 0 (0); Cciv: 5.4 (+5.1); Caut: 4.9 (+4.2); Cfo: 8.6 (+7.5). For the zirconia surface treatment groups the cement type was important for the dentine substrate. For groups without zirconia surface treatment the cement type was only important for the zinc phosphate group in dentine.

218 Collagen biomodification by EDC enhances the stability of resin-dentin bonds

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The aim of this study was to evaluate the effect of dentin treatment with EDC on immediate and long-term bond strength of Single Bond 2 (SB). Forty-eight sound third molars were divided into 3 groups (n=16) according to dentin treatment: deionized water (control), 0.5M EDC applied for 30s and 0.5M EDC applied for 60s. Flat dentin surfaces were etched with 37% phosphoric acid for 15 s, rinsed and blot-dried with absorbent paper. The treatment solutions were passively applied on etched dentin by the pre-determined period of time, also followed by rinsing and drying. SB was used according to manufacturer's instructions and crowns were reconstructed with composite resin. Specimens with adhesive area of 0.81mm² were produced and submitted to microtensile test 24h, 6 or 12 months after artificial saliva storage at 37°C. Bond strength (TBS) data were submitted to ANOVA and Tukey tests ($\alpha = 0.05$). The dentin treatment with 0.5M EDC for 30s (25.4 ± 4.6 MPa) and 60s (27.4 ± 6.2 MPa) did not interfere on immediate TBS compared to the control group (26.1 ± 4.6 MPa). After 12 months, the highest TBS were observed for the group treated with EDC for 60s (29.2 ± 6.5 MPa) followed by the group treated with EDC for 30s (22.2 ± 5.1 MPa). The lowest TBS values were seen for the control group (19.9 ± 6.3 MPa). EDC was capable of preventing resin-dentin bond degradation after 12 months of artificial saliva storage.