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Clinical Evaluation of two Light-Cured Restorative Glass Ionomer Cements. A.P. MANFIO*, H.C.P. BELTRÃO, M.F.L. NAVARRO, M.H.S. SOUZA JR. Faculdade de Odontologia de Bauru - USP, Bauru, SP, Brazil.

Recently new restorative light cured glass ionomer cements have been developed and marketed. The purpose of this study was to evaluate and compare two light cured (FUJI II LC - F LC) and (VITREMER - 3M VT) glass ionomer cements. Eighty eight butt joint class III cavities were prepared in thirty patients. Each patient received at least one pair of restoration with both materials. The materials were manipulated according to the manufacturer's instructions. The restorations were finished after one week and evaluated by two examiners previously trained at base line (1 week) and at one year, using a USPHS rating system. At one year 26 patients (13 with one pair and 13 with two pairs of restorations) were examined. The Color evaluation for F LC showed: Score 0: 25; score 1: 14 and score 2: 0 and for VT : score 0: 25; score 1: 12 and score 2: 2; and the Marginal Degradation evaluation for F LC: score 0: 39; ecore 1: 0 and score 2: 0, and for VT : score 0: 36; score 1: 3 ; and score 2: 0. One F LC restoration had score 1 at the base line and one VT restoration had showed score 1 at base line and after one year showed score 2. These data were analysed by Wilcoxon Test (pair to pair) for Color ($p \leq 0,05$) and by X^2 Test for Marginal Degradation. Both test showed no significant differences between the restorative materials. For Marginal Discoloration, Anatomical Form, Secondary Caries and Post-operative Sensitivity data, statistical analyses were not applied due to the very little alterations observed. It was concluded that at one year evaluation both cements presented similar clinical performance.

Supported by CAPES

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Clinical Evaluation of a New Adhesive Resin System
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The purpose of this study was to evaluate the use of a new adhesive resin system, Clearfil Liner Bond II (Kuraray, Osaka, Japan). A total of 87 restorations were placed among 42 patients by two operators. Decayed dentin was identified by the caries detector, and cavities were prepared without anesthesia by removing decayed tooth substance. An equal amount of LB Primer A and B were mixed and applied to the cavities for 30 sec. The cavities were carefully dried by gentle air. LB Bond was then applied, and light cured for 20 sec. Protect liner F was applied and light cured for 20 sec, after which composite resin was placed and light cured. The number of restored teeth by cavity classification were 8 Class I , 13 Class II, 18 Class III , 3 Class IV , 21 Class V , 12 WSD, 12 Root Caries. Restorations were assessed in 5 categories: pulpal response, gingival condition, marginal integrity, retention, and secondary caries. Assessments were done immediately after placement (baseline), after 6 months and 1 year. The recall levels were 100%, 83.9%, 82.8%, respectively. At baseline, in 32 cases (36.8%) gingival surface slightly changed to white, but these discoloration disappeared in a few days. 55 restorations were rated as alpha in all categories examined. At 6 months and 1 year recall, all restorations were rated as alpha in all categories. It was concluded that these results indicated clinical effectiveness of this system.

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Clinical Evaluation of Cervical Lesions Restored with Glass Ionomer Cement. ELIZA M. A. RUSSO* & NARCISO GARONE NETTO. (Dep. de Dentística, Fac.Odont.USP, 05508-900 - São Paulo, Brazil).

This study was initiated to evaluate the clinical characteristics of three glass ionomer cement used to restore cervical abraded or eroded areas or carious lesions of teeth without the use of cavity preparation or aditional retention. The dentin was treated with: 1. pumice and water + Tergentol; 2. pumice and water + 40% polyacrylic acid; or 3. pumice and water + 0,5% sodium hypochlorite. The restorative materials used were: Ceramfil (DFL), GlassIonomer Cement II (Shofu) and Vidrion R (S. S. White). Over a 18 months period, 150 restorations were placed. Five years after, 126 restorations were evaluated. No evidence of caries was seen at the margins of any of the restorations. The restorations conserved the anatomic shape and size. Loss marginal adaptation does appear to be related to erosion lesions. Marginal discoloration does appear to be associated with diet. The patients had a diminished sensitivity or total elimination of sensitivity after placement of the restoration. We conclude that the glass-ionomer cements used here offer a good alternative when no tooth preparation is desirable.

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Bacteriological and Mechanical Evaluation of Antibacterial Filler-Containing Composite Resins. T. Syafiuddin,* T. Igarashi, T. Toko, H. Hisamitsu and N. Goto (Showa University School of Dentistry, Tokyo, Japan)

The antibacterial effect of restorative materials is important for obtaining good prognosis. The purpose of this study was to evaluate the antibacterial effect of trial composite resins which were made by Clearfil SC-II (Kuraray Co., Japan) and antibacterial powder as a filler. Two kinds of Apatite antibacterial powder, Apacider-A25 and Apacider-AW (Sangi Co., Japan), were mixed with Clearfil SC-II at the content ratio of 10, 20, 30, 40 and 50 wt%. Zeomic: Zeolite with antibacterial ion (Shinanen Co., Japan) was used as a positive control and no containing Clearfil SC-II as a negative control. In total, 16 kinds of disks (10 mm x 2 mm thick) were prepared in teflon mold. As an oral bacteria, *Streptococcus mutans* was used. Disks were placed in petri dishes and was evaluated by the width of the inhibitory zone after 24, 48 and 1 week. Moreover, in order to evaluate the effect of releasing ions, the disks which had been stored in artificial saliva for 1 week were tested with the same condition, and to evaluate the Mechanical property, direct tensile and compressive strength were tested with the Instron tested machine type 1125. The conclusions : New composite resins containing Apacider-A25 and Apacider-AW had great antibacterial effect, especially 20-30 wt% containing composite produce inhibitory zone of 13mm in diameter after 1 week against *Streptococcus mutans*, great mechanical property and no discoloration compared with Zeomic-containing composite resins.

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Development of antibacterial composite resin dental materials.
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Silver has a long history in medicine as an antibacterial agent. Recently, surface modification of ceramic materials by ion implantation has been studied by several investigators in an attempt to improve mechanical properties. To evaluate the use of silver ions in composite resin dental materials, we examined *in vitro* the antibacterial activity of SiO2 filler implanted with silver ions on oral streptococci. Following the technique of Tanaka, SiO2 filler samples (0.1g) were implanted with silver ions. The effect of the filler with silver ions (Ag^+ filler) was tested on bacteria of oral streptococci. The bacterial strains had been isolated predominantly from composite resin surface. These organisms tested were anaerobically cultured in 5 *ml* Trypticase Soy Broth containing 0.5 per cent yeast extract at 37℃ for 10-12 hours. Each bacterial strain was adjusted to a concentration of 1×10^8 cells per *ml* with reduced transport fluid (RTF). Ag^+ filler was immersed in 1*ml* of RTF and anaerobically incubated 2, 6 and 12 hours to study the antibacterial effect. The survival of bacteria was then estimated by culturing on TSBY agar plates. A plate with approximately 100 discrete colonies was chosen from the serial agar cultures and number of colonies was counted at each sampling times. The Ag^+ filler showed the antibacterial activity against all three tested strains and oral streptococci was also more sensitive to experimental composite resin included Ag^+ filler. These findings indicate that the antibacterial effect is due to silver ions released by Ag^+ filler and that it may be useful to add the filler to composite resin dental materials for secondary caries protection.

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Fluoride Release from Glass Ionomers after Daily Exposure to Fluoride. K.TAKAHASHI*, T. EGURO and T. MAEDA (The Nippon Dental University, Tokyo, Japan).

The ability of glass ionomers (GIs) to charge up and release fluoride (F) considered to be beneficial for cervical restoration. The aim of this study was to evaluate the effect of daily exposure to various low-concentrated F solutions on the F release from GIs. Materials tested are Fuji II LC (FII LC), Vitremer (VM) and Fuji Cervical Cement (FCC). 8 Disks (3 mm height, 5 mm diameter) were fabricated from each GI. After setting, specimen was placed in a plastic beaker with 2 ml deionized water at 37℃. After 24 hours, specimens were divided into 4 groups, then exposed for 3 minutes to 2ml various F solutions except for control (deionized water): 0.02% NaF solution, 1 g of 0.76% MFP dentifrice and 0.2% NaF dentifrice, respectively. Thereafter, the specimen was transferred into a new plastic beaker. This procedure was repeated daily up to 3 weeks. The F concentration (ppm) of each storage solution was measured by F electrode. Data of cumulative amount of F released were analyzed by two-way ANOVA and Tukey test. Significant main effects of material ($p<.001$) and exposure ($p<.01$) were observed, but not for interaction effect. Mean amount (S.D.) of F released for each GI was ordered: FII LC (65.3 ± 9.2) > FCC (46.2 ± 10.2) > VM (40.0 ± 5.0). There was not significant difference between FCC and VM. The mean value for each F solution was ordered: 0.02%NaF (55.8 ± 17.1) > NaF D. (55.7 ± 11.9) > MFP D. (48.2 ± 10.4) > Water (42.1 ± 12.5) There were not significant differences between 0.02%NaF and NaF D., and between MFP D. and Water. These results showed that amount of F released from GI is different from type of GI, and increased by daily application of various low-concentrated F products.

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Hybrid Ionomers - Fluoride Release and Influence on Bacterial Growth.
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The aims of the present study were (1) to measure the fluoride release of four hybrid ionomer cements, one conventional glass ionomer cement, and one cermet cement, and (2) to determine the influence of each material on bacterial growth. Test specimens of each material (Vitremer [3M] (VI), Fuji II LC [GC] (FU), Dyract [DeTrey/Dentsply] (DY), Photac-Fil [ESPE] (PF), Ketac-Fil [ESPE] (KF), Ketac-Silver [ESPE] (KS)) were eluated in 0.9% saline (2 ml /specimen) for 14 days. Every two days the specimens were transferred into fresh saline and the fluoride content of the solution was determined using a ion-selective-electrode for fluoride analysis. Furthermore, 48 hour- and 14 day - eluates were inoculated with Streptococcus mutans (NCTC.N 10449), then 4 ml nutrient medium (BBL Schaedler) were added to each culture which were incubated for 72 h at 37°C recording the bacterial growth every two hours nephelometrically at 535 nm. The distances between the growth curves of the experimental cultures and the negative controls (bacteria + nutrient medium) were calculated by integrating both curves. Statistical analysis of fluoride release and growth curves was performed using the Mann-Whitney-test at the 0.05 level of significance. KF, PF and FU showed the highest fluoride release after 48 h (27-28 ppm), followed by VI (25 ppm), DY (8 ppm), and KS (6 ppm). Each material showed significantly less fluoride release after 14 days which was about 20-25% of the 48 h-level. Each material reduced bacterial growth after 48 h and after 14 days, but the effect was significantly lower after 14 days. VI showed the highest decrease of bacterial growth both after 48 h and after 14 days, DY and KS showed the lowest decrease. Hybrid ionomer cements like FU, PF and VI and a conventional glass ionomer cement (KF) show similar fluoride release rates and decreasing effects on bacterial growth, which both drop significantly within 14 days.

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The comparison of the fluoride uptake and release of a compomer and light-cured glass ionomer cements. H.K. Yip*. Department of Conservative Dentistry, University of Hong Kong, Hong Kong.

There have been numerous *in vitro* studies on the fluoride release from adhesive restorative materials into water. The aim of this study was to compare the fluoride uptake and release of a compomer (Dyract) and four light-cured glass ionomer cements (Fuji II LC, Photac-Fil, VariGlass, Vitremer). Five samples of each material were prepared according to the manufactures' instructions and filled into, 8 mm diameter X 5 mm height, disposable Telfon moulds (*J Dent Res* 1994; 73: 184). Each sample was placed in a polypropylene vial with 2 ml deionized water and stored at 37°C. The solution was replaced weekly and the levels of fluoride were analysed day 1, day 7, 1 month and subsequently, monthly for six months using an Orion Fluoride Ion-Selective Electrode, type 9609BN connected to Orion 920A IonAnalysers (Orion Research) with TISAB III buffer. Thereafter, the samples were exposed to a 1,000 ppm fluoride solution for 2 minutes daily over a 20-day experimental period. The solution was changed at 2, 4, 6, 8, and 24 hour in day 1 and day 5, 10, 15 and 20. Immediately after the changing of solutions, 1 ml of the immersant was removed and frozen until fluoride analysis was carried out (*Caries Res* 1994; 28; 322-328). Fluoride release rate was measured in ppm and the results were analysed statistically using one-way ANOVA. All materials showed high initial release which exponentially decreased, then proceeded to a slow decline during the ensuing time. The differences in initial fluoride uptake and release were staticically significant between all materials. The compomer uptook and released significantly less fluoride than other light-cured glass ionomer cements and maintained a low level of fluoride release throughout the period of study. This study was supported by the CRC Grant 337/252/0004.