properties of post and cores using different cements and time periods after cementation: Glass ionomer cement(Fuji-Ionomer, GC Dental), resin cement on the etched post space surface(Microjoin, SCI-Pharm), resin cement on the etched post space surface(Microjoin, SCI-Pharm), resin cement on the unetched post space surface, and zinc phosphate cement(Fleck's, Mizzy);115 minutes, and two weeks.

Materials and Methods : One hundred and thirty human mandibular first premolars were embedded in expoxy resin and prepared for the nine millimeter long and parallel cast post and cores. Cast post and cores were fabricated using Ag-Pd-Cu alloy(Ivoclar North Amercia) and cemented using four different cementation methods. Finish-line refinement was done 15 minutes and 2 weeks after cementation. Tensile strength test was carried 24 hours and 15 days after finish-line refinement using the Instron universal tester.

Results : When zinc phosphate cement was used as a luting agent, there was no significant difference between groups refined at 15 minutes or 2 weeks. When glass ionomer cement was used as a luting agent, the groups which have time periods of 15 minutes between cementation and final refinement and 15 days between refinement and retention test showed the highest retentive properties. When resin cement was used as a luting agent on the etched post spaces, the groups which have time periods of 15 minutes and 24 hours showed significantly lower retentive properties than the other groups. When resin cement was used as a luting agent on the unetched post spaces, the groups which have time periods of 2 weeks and 24 hours showed the highest retentive properties.

Conclusions : When glass ionomer cement is used as a luting agent for post and cores, it is better to do the final refinement after 15 minutes. When resin cement is used as luting agent on the unetched post space for post and cores, it is better to delay the final refinement for 2 weeks. When resin cement is used as a luting agent on the etched post space for post and cores or zinc phosphate cement is used, there is no difference of retentive properties whether final refinement is done 15 minutes after the cementation of post and cores or it is done 2 weeks after the cementation

OV-2

25-year Study on Number and Distribution of Fixed and Removable Restorations at Tsurumi University Clinic

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We have been surveying number and distribution of the prosthetic restorations fabricated at the Dental Clinic of Tsurumi Univ. every two year for the 25-year period, from 1972 to 1996. Number and distribution of each restoration were examined with the fee slips which were issued from the material section and calculated through personal computer. The total number of restorations had increased rapidly until 1986 and then began to decrease gradually.

However, distribution of each restoration in this period has changed very little, that is, approximately 55% of single crowns, 25% of removable partial dentures, and 10% of fixed partial dentures and complete dentures respectively. Ten years ago, ceramometal crowns were the chief restorations for the frontal teeth(38%), but now occupy only 20%. On the other hand, resin facing crowns indicate the highest rate with 71%. These changes could be explained by the introduction of resin facing crowns into social insurance in Japan.

Number and distribution of restorations are always associated with the system of social insurance there. Therefore, we have to be continuously concerned about it.

OIV-3 Does the Original Water Content in Acrylic Powder and Monomer Affect Curing Shrinkage?

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Curing of acrylic resin is accompanied by unavoidable dimensional change. The water content originally present in the acrylic powder and monomer as supplied by dental product manufacturers could affect optimal polymerization and have an adverse effect on the curing shrinkage.

Aims : The purpose of this study is (i) to determine the original water content of acrylic powder and monomer, and (ii) to investigate if dried acrylic powder and monomer produces a resin with reduced curing shrinkage.

Materials and methods : Trevalon C polymer powder was dried by silica gel in a desiccator at ambient temperature of 23℃ until it reached a constant mass between successive weighings. The monomer was dried by molecular sieve and its water content was determined by Karl Fischer titration. Fine reference crosses were marked in stainless steel moulds. Ten bar specimens(210mm × 11mm × 2.5mm) were polymerized in a hot-air oven(72℃ for 6.5h and 100℃ for 2.5h) and allowed to cool slowly inside the oven until the ambient temperature was reached. The distances between reference crosses were measured by a workshop travelling microscope with a resolution of 0.0005mm. Specimen made from powder and monomer supplied by the manufacturer were used as control.

Results : The original water content of polymer powder and monomer liquid was 0.8% and 0.06% by mass respectively. Acrylic resin made from thoroughly dried polymer beads and monomer with negligible water content showed a smaller curing shrinkage of 0.36% than control resin of 0.40%(t-test, $p<0.0001$).

Conclusion : Dry polymer and dry monomer produced improved acrylic resin with reduced curing shrinkage.

OIV-4 Stress Analysis of Dental Implants Supporting Screw-Retained and Cement-Retained Prostheses

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The use of cement-retained implant prostheses is increasing due to improved occlusal anatomy, esthetics, and simplified laboratory procedure. Little is known about the biomechanics of cement-retained implant prostheses compared to that of screw-retained implant prostheses. To data, almost all studies of implant biomechanics have focused on screw-retained prostheses. The stress transferred to the implant fixtures through the cement-retained and the screw-retained prostheses were compared using a photoelastic and strain gauge