

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

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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°C 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°C for 6.5h and 100°C 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.

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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 date, 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

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analysis. The deflections of the prostheses at the time of the loading were also measured. In the single crown test, the cement-retained crowns transferred less stress. In two unit fixed partial denture test, there were no differences between the two different prostheses. In the two implant supported distal cantilevered prostheses, the screw-type prosthesis developed more stress around the apex of both implants.

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A Mixture of Platelet-Rich Plasma and Bovine Bone Mineral(Bio-Oss): Evaluation of Osteogenic Potential in Calvarial Defects

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Several techniques have been described to generate new bone to fill the gap between the bone defects in implant dentistry. It is important that the bone graft or bone substitute results in a bone volume and hardness sufficient for implant function prior to second surgery. Furthermore, increasing the rate of bone formation, it is possible to shorten the total treatment period.

Platelet-rich plasma (PRP) is an autologous source of cytokines (platelet derived growth factor and transforming growth factors etc.) involved in bone regeneration. Marx introduced that adding platelet rich plasma to autogeneous cancellous marrow graft increased the rate of bone formation and enhanced the density of the new bone.

The purpose of this study is to evaluate the osteoinductive or osteoconductive potential of the mixture of platelet-rich plasma and natural cancellous bovine bone mineral (Bio-Oss®) in the bony defects.

In adult rabbits, round segment of calvarial bone was excised to produce defects greater than the critical size defect for spontaneous bone repair (16mm). One group received natural cancellous bovine bone mineral (Bio-Oss®) without added autologous PRP. In the second group, the bony gap was filled with PRP added into the bovine bone mineral (Bio-Oss®) and applied topically after the mixture into the defects. The author examined the fluorochrome labeled specimen, measured the bone mineral density (BMD), and assessed the hardness of the bone newly formed at 4 and 8 weeks.

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Effects of Bone Engagement Types & Length of Implant Body on Stress Distribution by Using 3-D FEA Method

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Finite element analysis method can be utilized to analyze stress and strain fields when complicated geometries are being considered. This method has been employed and accepted in the field of orthopedics as both an analysis and design tool. In implant dentistry this method has been used to investigate and compare the stress transfer at the implant-bone interface in various implant designs. The three dimensional implant model (Nobel Biocare) was fabricated and Ansys 5.5 finite element program was utilized as an