♦P9

Studies on Root Restoration: Embedding Titanium and Cultured Periodontal Ligament Fibroblasts into the Intradentinal Cavities in Dogs.

T.Yamamoto, M.Hirata, Y.Iwamatsu, Y.Tadatomo, M.Shimonishi, Y.Murakami, S.Nagaoka, S.Higuchi, H.Sato, M.Kanehira, K.Kindaichi, M.Komatsu

Division of Operative Dentistry, Tohoku University Graduate School of Dentistry, Sendai, Japan.

The purpose of our study is new formation of periodontal ligament (PDL) around titanium implants. In this study, we investigated histologically whether cultured periodontal ligament fibroblasts (CPLFs) would form new PDL on titanium implants in beagle dogs. PDL fibroblasts were obtained from upper premolars of dogs and cultured in α-MEM supplemented with 10% FBS. Some CPLFs were cultured on glass-beads-sandblasted titanium specimen. Artificial intradentinal cavities were prepared through alveolar bone to dentin of lower premolars. First, the titanium specimens attached with CPLFs were embedded into the cavities and the rest of CPLFs were seeded with culture medium on them. In opposite site of same teeth, titanium specimens were embedded without CPLFs as control. After three months later, dogs were sacrificed and undecalcified sections were stained with toluidine blue. Light microscopy revealed newly formed alveolar bone and PDL with cellular cementum between the titanium and dentin. In controls, there was newly formed alveolar bone without PDL. Second, PDL cells were cultured on microcarrier (Cultispher) used as "carrier". Titanium specimens, shaped U, were embedded into the cavities. CPLFs on microcarriers were seeded on them and they were covered with GTR membrane (GC). In opposite site of same teeth, titanium specimens were embedded without CPLFs and/or micro carrier. After three months, newly formed alveolar bone and PDL with cellular cementum were observed on the titanium. The orientation of the PDL fibers was almost perpendicular to the surface of titanium. In control site, the orientation was parallel to the surface of titanium. These results suggest that CPLFs have possibility to form PDL tissue around titanium.

♦P10

Study on Carisolv™ fromView Point of Free Radical.

Y. Tsujimoto, H. Gomi, N. Tsukada, S. Hirayama*, T. Ikemi*, M. Yamazaki.

Department of Endodontics and Operative Dentistry*, Nihon Uiversity School of Dentistry at Matsudo, Japan.

Carisolv™ system was developed for removal of carious dentin with chemo-mechanical method by Swedish researcher. Carisolv™ is composed of 0.5% NaClO and three kinds of amino acid, i.e. glutamic acid, leucine and lysin. After these agents are mixed together, the gel mixed is applied to carious dentin and the carious dentin is removed with hand instrument without using burs. The mechanism of softening the dentin is postulated that the degenerated collagen by caries is chlorinated and the decomposed. But the details of the mechanism are not clarified yet. The authors performed the present study to clarify the mechanism of action of the particular agent Carisolv™ from view point of free radical study.

Materials and Methods Chemicals : Carisolv™ was obtained from DENICS Co. (Japan). Spin-trapping agent, 5,5,dimethyl-1-pyrroline-N-oxide, was obtained from Dojin Chemicals (Japan). Glutamic acid, leucine and lysin were obtained from Wako Pure Chemicals Co. (Japan).

Free radical measurement : The ESR spectra were measured using a Radical Bio Sensor (JEOL JES FR-80). The measurement conditions were as follows: microwave power, 5 mW; magnetic field, 335.4 ± 5 mT; sweep time, 2 min; modulation frequency, 100 kHz; and time constant, 0.3 s.

Results and Discussion: From the reaction of 0.5% NaClO and DMPO (trapping- agent), a typical DMPO-X was detected and from reaction of the gel and DMPO slight amount of hydroxyl radical (· OH) was detected.

From the mixed gel, amino acid radical was detected at first, it changed to · OH later. From glutamic acid and leucine, DMPO-X was detected but from lysin, like amino acid radical and · OH were detected. Active oxygen species are known to decompose

organic substance by oxidation. It is considered that ·OH which is the most reactive oxygen species in conjunction with amino acid radical may play an important role of softening the carious dentin.

♦P11

Effects of Dipping in Tooth Reserving Solution on Bond Strength of 4-META/MMA-TBB Dentin Bonding System.

M. Kubota, T. Yanagidani, M. Hashimoto, Y. Kudou.

Department of Operative Dentistry and Endodontics, Iwate Medical Univ., Morioka, Japan

The purpose of this investigation was to determine the effect of dipping in tooth reserving solution on bond strength of 4-META/MMA-TBB dentin bonding system. The flattened dentin surface of bovine lower incisor was used for this investigation. The tooth were dipped in the tooth reserving solution (ViaSpan; Du Pont Pharmatical / Teeth Server "NEO";Neo Dental Chemical products CO/ LTD, Japan/ Saline, Fuso Chemical CO, LTD, Japan) for 30 min. These tooth were rinsed with water syringe or not rinsed, and used to measure the tensile bond strength. The control was not dipped in the tooth reserving solution. Then, the 4-META/MMA-TBB dentin bonding system was applied. Tensile bond strength was measured at cross head speed 0.5mm/min after 24 hours. The data was statically analyzed by one way ANOVA, and Fisher's PLSD ($p>0.05$). It was suggested that the rinsing of the tooth after dipping in tooth reserving solution, especially in ViaSpan, was effective on tensile bond strength.

	ViaSpan		Neo		Saline		Cont.
	Rinsing	+	Rinsing	+	Rinsing	+	
Average	19.0	10.5	17.9	20.4	14.1	14.5	16.5
Min. Value	15.2	7.3	11.4	7.7	10.3	8.3	12.4
Coefficient of variation	0.15	0.30	0.25	0.44	0.21	0.32	0.30

significant difference MPa, N=7

♦P12

Microleakage of Class V cavity restored with flowable and microfill composite resins after load cycling.

Suk-Ho Kang, Ho-Hyun Son

Department of Conservative Dentistry, College of Dentistry, Seoul National University, Seoul, Korea)

Flowable and microfill composites have been recommended for Class V cavities. But the use of flowable composites is controversial because of its physical properties. Objectives: The aim of this study was to evaluate the microleakage of 6 composites (2 hybrids, 2 microfills, and 2 flowable composites) with/without load cycling. Methods: Notch-shaped Class V cavities were prepared on buccal surfaces of 180 extracted human upper premolars and then divided into non-load cycling group(G1) and load cycling group(G2). All preparations were restored with 6 composites shown in the Table (n=15). Samples of G2 were subjected to occlusal load (100N/50,000cycles;MTS 858, MTS Systems Corp., Minneapolis, Minn.). All samples were immersed in 2% methylene blue for 24 hours, and sectioned. Enamel and dentin margins were analyzed on a scale of 0(no leakage) to 3(3/3 of wall). Kruscal-Wallis One way analysis and Mann-Whitney U-test were used to analyze the results. Results: There was no significant difference among 6 composites in both enamel and dentin margins of G1 and G2. Load cycling did affect dentin margins restored with Revolution only ($p<0.05$).

	Z-250	Denfil	Heliomolar RO	Micronew	AeliteFlo	Revolution
G1/E	0.07 (0.26)	0	0	0	0.13 (0.35)	0
G1/D	1.27 (1.03)	1.33 (0.82)	1.27 (0.80)	1.33 (0.62)	1.4 (0.99)	1.47 (0.74)
G2/E	0.33 (0.82)	0.6 (0.83)	0.27 (0.80)	0.07 (0.26)	0.07 (0.26)	0.07 (0.26)
G2/D	1.87 (0.99)	2 (1.13)	1.73 (1.03)	1.73 (1.10)	1.73 (0.88)	2.4 (0.83)