♦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