:omparison of Seriousness of Periimplantitis around Hydro-
:yapatite Implant and Titanium Implant.
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Iniversity, School of Dentistry, JAPAN)

.e objective of this study was compared seriousness of two
:plantitis, which were occured around hydroxyapatite
ant(HAP implant) and titanium implant(Ti implant).

nd Methods: HAP implants and Ti implants were inserted
ndibles and periimplantitis was induced by silk ligatures
neck part of implant body. Gingival index, plaque index,
th, amount of exudation from gingival sulcus and histo-
l findings were compared between HAP and Ti implants.

e resorption of alveolar bone around HAP implants was
er than that of Ti implants. On day 180 after induced
itis, alveolar bone resorption around HAP implants was
rizontal resorption, whereas bone resorption around Ti
s seriously vertical resorption.

Periimplatitis around HAP implant was more milder than
implant. This result suggest that the chemical bond of
to the alveolar bone was much more effective to defend
itis development, than that of Ti implant, which has
anical bond.

1658 Histomorphometric Analysis of Bone Cores From Human Sinus Lift Grafts. A. PRICE*, T. VAN DYKE, S. KARATZAS. (Boston University, Boston MA)

A prospective study of sinus lift surgeries was initiated utilizing pre and post-op CAT Scans and vertical bone cores (2.6x13 mm) taken directly from implant sites being prepared for 5-6 mm diameter implants. Sinus lift procedures were performed on 7 subjects utilizing frozen, irradiated, cancellous bone allograft. Eight cores were removed at seven time intervals : 5, 7, 7.5, 9.5, 10, 12.5, and 14 months. Extraction sites were used as controls. Qualitative assessments and histomorphometric analysis were performed on step serial sections stained with hematoxylin and eosin. Measurements of the area occupied by bone trabeculae in a given field were used as a density measurement. Descriptive statistics were utilized for the analysis. Findings suggest complete conversion of graft material by 9.5 months. Conversion appeared to progress by conductive deposition along the smooth surfaces of graft particles with no apparent preceding osteoclastic activity. This pattern of conversion results in a bone density similar to the residual crest density in contrast to the less dense intermediate "cancellous" bone. Comparison of this pattern to extraction site cores showed that extraction sites healed with a pattern of diminishing density from coronal to apical. Highest bone density was observed in bicuspid sites. A phenomenon of "bridging" appeared to be a prelude to the final conversion. A pattern of increased layering on intact smooth surfaces of graft particles was noted in preference to deposition on cut or frayed edges. These results support the use of frozen, irradiated, cancellous bone as a graft material for use in sinus lift procedures.

idy on the fabrication and biocompatibility of titanium/hydroxyapatite functionally graded implant.
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l materials(FGM), a recent development in composite materials, consist of a continuously graded zone
e interface between two component phases. The concept of FGM was applied to biomaterials in this
oth mechanical and biocompatibility requirements, dental implants with FGM structures composed of
ramic hydroxyapatite (HAP) were fabricated and their properties were investigated. Powders of Ti and
t mixing ratios were packed in the mold to make a gradient of concentrations .The mold was then
l isostatic press (CIP) . The compacted powders were sintered at 1300°C for 2hr at10-5torr. FGM
10mm containing up to 20%HAP (Ti/20%HAP) were fabricated by CIP pressure of 400MPa. FGM
ire Ti to 100%HAP could be made by improving molds and increasing of CIP pressures up to
in (0.25mm) thermally contractive vinyl pipe was adopted as the mold. The structure of the FGM
ifirmed from the external appearance and cross-sections.These specimens were also investigated by
ectron probe microanalyzer). The mapping of Ti, Ca, and P clearly showed the gradient concentration
ie Brinell hardness was 71 with 100%Ti and 63 with 100%HAP . These specimens were implanted in
ifteen week-old New Zealand white rabbits to evaluate the biocompatibility. After 4 and 8 weeks of
bbits were sacrificed and tissue blocks containing the specimens were embedded in resin. Observation
lity was performed by both conventional optical microscopy using specimens stained with villanueva
ıd by EPMA mapping using unstained specimens. The observed area of newly formed bone was in
r both the optical microscopy and EPMA mapping. Pure titanium and Ti/20%HAP FGM specimens
aation. Comparing the two specimens , showed FGM to have slightly better biocompatibility. With
!0%HAP area in a FGM , there was very little difference in the new bone formation. The results
mplants satisfy the requirements of both mechanical and biocompatibility properties.

1660 Evaluation of the Mobility of Three Different Endosseous Implant Designs. G. EVANS,* A. MENDEZ, and R. CAUDILL, LSU School of Dentistry, New Orleans, LA, USA.

The objective of this investigation was to accurately assess the mobility of three different commercially available implant designs from placement through 6 months loading. A total of 68 experimental and control commercially pure titanium screws, hydroxylapatite-coated (HA) titanium screws, and HA-coated titanium cylinders were placed in the posterior mandibles of eight mongrel dogs. Implants were allowed to integrate for 4 months prior to exposure. Experimental implants were loaded via 2-unit screw retained fixed partial dentures for up to 6 months. Mobility was evaluated with a Periotest™ instrument at the time of implant placement, exposure, loading, and at 3 and 6 months post-loading. Data were analyzed with two way ANOVA and t-test for significance at the $P<0.05$ level. Periotest™ values (PTV's) at loading and after 6 months function were as follows: (HA screws: -2.1± 1.4 / -2.1± 1.2) (Titanium screws: -1.3± 1.7 / -1.8± 2.5) (HA cylinders: -2.6± 1.8 / -3.9± 0.5). Non-loaded controls at 6 months were (HA screws: -0.8± 3.7) (Titanium screws: -1.3± 1.7) and (HA cylinders: -2.4± 0.5). Results indicate that there were no statistically significant differences among the three experimental groups at placement, at loading, or after 3 or 6 months. There were no significant differences by implant type for loaded vs. non-loaded implants after 3 or 6 months function. Hence, we conclude that there are no significant differences in mobility among the 3 implant designs for loaded and non-loaded groups. This study supported by Implant Innovations, Inc. and the LSUSD Research and Grants Committee.

ri-implant Probing Depths Around Two Implant Types. J.F. DRUMOND*, J.T. DOMINICI
d P.J. SAMMON (Colleges of Dentistry and Medicine, University of Kentucky and
:partment of Veterans Affairs, Lexington, Kentucky USA).

ais study was to compare the peri-implant probing depths between two different types of
commercially available threaded CpTi implants and prototype EDC porous beaded CpTi
rous beaded implants were fabricated by a novel technique known as electro-discharge
:) developed at the University of Kentucky. The EDC method uses a 300 microsecond pulse
igh current density to fuse 150-250μ spherical CpTi beads into rigid cylindrical 4x7 mm
iplants with a 1 mm smooth coronal collar. Implants were thoroughly cleaned, passivated
ır to surgical placement. The mandibular premolar teeth of nine beagle dogs were extracted
:er sixteen weeks of healing, either three threaded or three EDC implants were surgically
e of the mandible (total of 54 implants). Twelve weeks later, the submerged implants were
l with healing abutments for four weeks, after which cast gold prostheses were placed. The
plants received a bridged prosthesis while the anterior implant received a single unit
g depths were measured with a periodontal probe on the mesial, facial distal and lingual
iplant at the time of prosthesis placement (T-0), at three months (T-3) and six months (T-6)
Average probing depths were calculated for each implant at each time point. The results
rage probing depths for the BDC implants at T-0 and T-3 were 1.2 ± 0.1 and 1.5 ± 0.3
or the threaded implants were 1.2 ± 0.3 and 1.3 ± 0.2 respectively. Partial data at T-6 show
epths of 1.6 ± 0.4 for EDC implants and 1.3 ± 0.2 for threaded implants. ANOVA results
:ally significant difference in probing depths between the EDC and threaded implants at
oints and no significant change in probing depths between T-0 and T-3.
)ported by the Department of Veterans Affairs and the University of Kentucky.

1662 Stage II Bone changes Around Two Different Implant Types in Dogs. E. LOY*, J. DOMINICI, J.F. DRUMMOND, P. SAMMON and K. OKAZAKI (Univ of Kentucky Colleges of Medicine, Dentistry and Engineering, and VA Med Ctr, Lexington, KY USA).

The purpose of this study was to evaluate the crestal bone changes around two different types of implants in dogs: a commercially available threaded CpTi implant and a prototype EDC porous beaded CpTi implant. This prototype porous beaded implant was fabricated by a novel technique known as electro-discharge compaction (EDC) developed at the University of Kentucky. Our previous studies (J Oral Implant 21:295, J Dent Res 76:556, 1997) have shown good bone ingrowth with this beaded EDC implant. A smooth attachment collar has been added to this implant to provide a favorable surface for soft tissue adaptation and to facilitate the attachment of the prosthesis. These newly designed implants were fabricated as previously reported by using 150-250 micro spherical CpTi powder to construct 4x7 mm porous surface, solid core cylinders with a 1 mm smooth coronal collar. Implants were passivated and sterilized before surgical placement. Mandibular premolar teeth were extracted bilaterally in twelve beagle dogs. Stage I implant surgery was performed sixteen weeks after extractions. Three of the EDC implants or three commercially available threaded implants were placed bilaterally for a total of 72 implants. Initial measurements of the crestal bone distance from the shoulder of each implant were made at Stage I surgery using a plastic probe. Stage II surgery was performed twelve weeks later, and the crestal bone height was measured again. All implants were firmly anchored at Stage II surgery as measured by the Periotest instrument. Crestal bone changes between Stage I and Stage II surgeries were similar for both types of implants. Both implant types demonstrated bone loss height: threaded implant (0.61 ± 0.08 S.E), and the EDC (0.50 ± 0.08 S.E.). ANOVA results showed no statistical significant difference. In general, bone loss extended within the length of smooth coronal collar on both implant types. These results suggest that both implant types performed comparably during the initial healing period. Implants are now being loaded with fixed prostheses to determine any difference in clinical performance. This work was supported by the Department of Veterans Affairs and the University of Kentucky.

plant Mobility of Two Implant Types in the Canine Mandible. J. DOMINICI*, P.
AMMON, J.F. DRUMMOND, E. LOY and K. OKAZAKI (Dept. of Veterans Affairs and
iiv. of Kentucky Colleges of Medicine, Dentistry and Engineering, Lexington, KY USA).

his study was to evaluate the clinical mobility of two different implant types in dogs:
ilable threaded CpTi implants and prototype EDC porous beaded CpTi implants. The
beaded implants were fabricated by a novel technique known as electro-discharge
:) developed at the University of Kentucky. Our previous studies (J Oral Implant 21:295, J
1997) have shown good bone ingrowth with this beaded EDC implant. EDC implants were
viously reported by using 150-250 micron spherical CpTi powder to construct 4x7mm
olid core cylinders with a 1mm smooth coronal collar. The collar provides a favorable
tissue adaptation and facilitates prosthesis attachment. Implants were passivated and
andibular premolar teeth of ten beagle dogs were extracted bilaterally and after eleven

1664 The role of Bioglass elements in osteogenesis at implant interface *in vivo*. S. AL-BAZIE*, R. GIORDANO, D. COTTRELL, D. NATHANSON and L. CHOU (Departments of Biomaterials and OMFS, Boston University Medical Center, Boston, MA, USA)

In an earlier *in vivo* study (J. Dent. Res. 76:283, 1997) we showed more bone formation induced by PerioGlas® (PG) compared to HA. This study investigated the role of certain elements in PG and Sol-Gel® (SG), a new bioglass material with higher Si content, in the bone formation. The PG and SG implant materials were implanted in the bilateral femoral condyles of eight New Zealand rabbits. After two or eight weeks the bone containing the implant material was harvested. Samples were imbedded in plastic without decalcification and labeled PG2, PG8, SG2 and SG8 for PerioGlas® in two and eight weeks, and Sol-Gel® in two and eight weeks respectively. The respective chemical composition of pure SG and PG, as determined by EDAX is Na (0.3%, 25%), Ca (28%, 20%), P