This study examined the efficacy of using a porous calcium phosphate (Ca-P) cement as a carrier material for a known bone-inducing protein-recombinant human bone morphogenetic protein-2 (rhBMP-2) in a rabbit model. Fifty-four rabbits were separated into 3 groups of 18. In group 1, 1 porous Ca-P disc was inserted subcutaneously in each rabbit. In group 2, Ca-P discs loaded with rhBMP-2 were inserted subcutaneously. In group 3, absorbable collagen sponge (ACS) implants loaded with rhBMP-2 were inserted in the same location as the Ca-P discs. Half of the rabbits were killed at 2 weeks postimplantation; the rest were killed at 10 weeks postimplantation. In the 10-week rabbits, bone-labeling fluorochromes were administered at set intervals in 4 of the rabbits from each group. The specimens were subjected to histologic and histomorphometric analysis. The results indicated that all Ca-P discs received saline. After 30 days, the rats were killed and the tibiae were harvested for histologic and histomorphometric analysis. The results indicated that the bone-to-implant contact was 58.4% ± 5% for the experimental group and 31.7% ± 2.6% for the control group. This difference was statistically significant. In addition, the bone density was found to be significantly greater in the experimental group. The conclusion of the study was that simvastatin increased the level of osseointegration in the rat model.

This study examined the amount of titanium released from dental implants of varying roughness. Two methods were used to detect titanium release: in vitro and in vivo. The in vitro study used 24 pure titanium screws implants with 4 different surfaces: 1 group of 6 implants had machined surfaces and 3 groups of 6 implants had varying degrees of surface roughness (prepared by surface blasting with aluminum oxide with particle sizes of 25, 75, or 250 μm). Three of each type of implant were immersed in either 1% lactic acid aqueous solution or a phosphate-buffered saline solution. After 1 month in solution, the concentration of titanium ions released was obtained with the use of inductively coupled plasma atomic emission spectroscopy. The in vivo study used 16 implants placed in the tibia of rabbits. The 4 implant surfaces used in the in vitro study were used in the in vivo study. The rabbits were sacrificed at either 12 weeks or 1 year after placement. The amount of titanium released was evaluated with either synchrotron radiation X-ray fluorescence spectroscopy (SRXRF) or secondary ion mass spectroscopy (SIMS). The results from the in vitro test demonstrated no difference in ion release. By using SRXRF in the in vivo study, slightly higher amounts of titanium were detected, with the roughest implants at a distance up to 400 μm from the implants, after which there was no difference among the implant types. The SIMS analysis demonstrated no difference in titanium release from the different surfaces. Slightly more titanium was in the bone at 1 year compared with 12 weeks with all implant types. The conclusion of the study was that implants with greater surface roughness do not release more titanium into surrounding tissues.
This study described a method to transfer multiple implants by using a single-visit 2-stage impression technique to create a master cast. The first step is to take a full arch impression with a stock plastic tray and vinyl polysiloxane. At this stage, the implants are covered with healing collars. After the impression is removed, open-tray transfer copings are placed onto the implants (or abutments). The impression tray is modified by removing the silicone and the plastic portion of the tray that covers the implants. The impression tray is reinserted into the mouth and held in place. Impression plaster is injected into the space around the transfer copings, the screw heads are cleaned, and the plaster is allowed to set. After setting, the transfer copings are unscrewed and the plaster and silicone impression is removed with the encased copings. The plaster is evaluated for any cracks, and once the appropriate analogues are attached, a separating medium is painted onto the plaster and the master cast is poured.

This study reported a case of intrusion of a natural tooth that was surrounded by dental implants. A 56-year-old, partially edentulous man had 6 root form implants placed and restored. The right maxilla had a single natural tooth distal (second premolar) to the cuspid. This tooth was restored with a root canal and a crown. Mesial to the tooth was a single tooth implant, and distal to the tooth were 2 implants supporting 2 splinted crowns. Five months after insertion of the prostheses the patient returned, complaining of a space between the maxillary right premolar and the opposing dentition. Clinical examination revealed that a 2.5- to 3-mm space had developed between the maxillary second premolar and the opposing dentition. In addition, the interdental contact between the natural tooth and the adjacent implant prostheses was very tight such that dental floss would not pass. The distal prosthesis was removed. The natural tooth was noted to have class 1 mobility, and the contact between it and the mesial implant crown loosened. The contact was relieved between the distal implant prosthesis and the tooth, and the prosthesis was inserted. The contacts between the implant prostheses and the tooth needed to be reduced over the next few months, and the tooth erupted back into the occlusion. The authors hypothesized that the tightness of the contact between the implant prostheses and the natural tooth caused the tooth intrusion.

**Bone Grafting**


This study examined the effects of adding platelet-rich plasma (PRP) to a β-tricalcium phosphate graft material (Cerasorb, Curasan, Kleinostheim, Germany). Twelve beagle dogs had the mandibular premolars removed bilaterally. On one side the extraction sites were filled with Cerasorb alone; on the other side the sockets were grafted with Cerasorb combined with PRP. By using trephine burs, bone samples were obtained at 6, 12, and 24 weeks postgrafting. The bone cores were subjected to histologic and histomorphometric analysis. The results indicated that at 6 weeks the PRP sites had significantly more bone formation. A much smaller advantage to the PRP sites was noted at 12 weeks. Similar bone formation in both groups was noted at 24 weeks. The conclusion of the study was that the addition of PRP to Cerasorb elicited a greater increase in early bone formation. The authors caution that these results may not apply to humans.


This study examined the effectiveness of using bioresorbable screws (Lactosorb, Walter Lorenz Surgical, Jacksonville, Fla) to fixate onlay bone grafts. Fifteen rabbits had bilateral tibial onlay bone grafts placed in the mandible. Five of the grafts were fixated with titanium fixation screws, 5 were fixated with bioresorbable fixation screws, and 5 were not fixated. After 6 weeks healing, the rabbits were killed and the sites were clinically examined. The grafted areas were then harvested and subjected to microscopic analysis. The results indicated...
that both the titanium and the bioresorbable screw grafts demonstrated good graft consolidation with minimal signs of inflammation. The nonfixated grafts demonstrated poor graft consolidation. No difference was noted in graft thickness when comparing the titanium and bioresorbable screws. The nonfixated groups demonstrated significantly less graft thickness. The conclusion of the study was that the bioresorbable screws behaved in a similar fashion to the titanium screws and were an acceptable alternative for onlay graft fixation.