Aim: To evaluate whether chair-side prepared autologous platelet-rich growth factor (PRGF) in a β-TCP carrier enhances bone formation and implant osseointegration.

Methods: Large box-type defects (10 mm × 6 mm; W × H) were prepared in the edentulated and healed mandibles of six Beagles. An implant (3.25 mm × 11.5 mm; ∅ × L) was placed in the middle of each defect leaving the coronal 6 mm uncovered by bone. The remaining defect space was then filled-out with chair-side prepared autologous PRGF in a β-TCP carrier and covered with a collagen membrane (PRGF + β-TCP + CM) (six sites) or left without a collagen membrane as control (PRGF + β-TCP) (five sites); five sites received only β-TCP with a collagen membrane. Evaluation of the outcome after 3 months of healing was performed histologically, and differences among groups were tested for significance with the Kruskal–Wallis test with P set at 0.05.

Results: Histological analysis showed variable amounts of new lamellar and woven bone formation and residual β-TCP particles within the defect space, as well as osseointegration of the previously uncovered portion of the implants, with no apparent qualitative differences among groups. In one implant in each group, in different animals, no osseointegration in the portion of the implant within the defect was observed. New mineralized bone formation and marrow fraction (%) within the defect was similar among groups and averaged 44.4 ± 9.6, 45.8 ± 14.9, 48.4 ± 7.6 in the PRGF + β-TCP + CM, PRGF + β-TCP, and β-TCP + CM groups, respectively. Relative bone-to-implant contact (%) within the defect space averaged 33.8 ± 14.3 in the PRGF + β-TCP + CM, 44.9 ± 15.7 in the PRGF + β-TCP, and 21.4 ± 8.6 in the β-TCP + CM group, the difference between the two latter groups being significant ($P = 0.004$).

Conclusions and clinical implications: Application of chair-side prepared autologous PRGF in a β-TCP carrier, with or without the use of a collagen membrane, does not enhance bone formation over β-TCP implantation alone in large peri-implant defects, but seems to enhance implant osseointegration. The present study was partially funded by Biomet 3i Inc., Florida, USA.

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A 5-year randomized pilot study with chemically modified SLA implants

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Background: Chemical modification to a sandblasted, large-grit, acid-etched implant surface (SLA) demonstrated significant greater bone-to-implant contact during the first weeks of bone healing in an experimental animal study (Buser et al. 2004). Oates et al. (2007) showed that modified surface (mod-SLA) might enhance healing process and decrease healing time when examining changes in implant stability over 6 weeks after placement. Until now, no study has been performed to compare long-term success rates of implants with mod-SLA and SLA surface.

Aim: (1) To evaluate the 5-year clinical performances of mod-SLA and SLA implants, (2) to compare crestal bone levels around implants.

Methods: This randomized controlled trial was approved by the Ethics Committee of Lausanne University (Switzerland). It was conducted with 14 patients. Each patient received one mod-SLA (SLActive) and one SLA implant (Straumann AG, ∅ 4.1 or 4.8 mm, length 8 or 10 mm) in either posterior mandible or maxilla. Clinical and radiographic parameters allowing success rate evaluation were assessed at 5 years after loading. Crestal bone levels were evaluated at the mesial and distal implant sides using peri-apical radiographs. The distance, parallel to the implant axis, between the implant apex and the most coronal bone–implant contact was measured at 5 years and postoperatively. When the substraction of the two values was negative, it indicated crestal bone loss; when positive, crestal bone gain.

Results: All 28 implants were successfully integrated and restored after 6 weeks of healing. At 5-year control, no patient complained about pain, suppuration or sinus-related pathology. All implants were clinically stable and fulfilled success criteria. Seventeen sides, either mesial or distal or both, of mod-SLA implants showed crestal bone loss (mean 0.81 ± 0.74 mm) and 11 mod-SLA implant sides showed bone gain (mean 0.54 ± 0.22 mm). Also 17 sides of SLA implants displayed bone loss (mean 1.08 ± 0.84 mm) whereas 11 SLA implant sides displayed bone gain (mean 0.54 ± 0.36 mm). The difference in bone loss and gain between mod-SLA and SLA implants was not statistically significant ($P > 0.05$).

Conclusions and clinical implications: This study showed that implants with mod-SLA surface could be placed using an early loading protocol and could achieve tissue integration over a period of 5 years. Crestal bone loss was limited with no significant difference between both implant types. The 5-year success rates were 100% for mod-SLA and SLA implants.

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Ridge preservation following tooth extraction by using PRF (Platelet Rich Fibrin): a pilot study

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Background: The importance of growth factors in enhancing wound healing has become the focus of researches. Platelets contain large number of growth factors that have a key role in bone regeneration and soft tissue maturation.