

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.

Material and 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, Ø 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 post-operatively. When the subtraction of the 2 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: 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.