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Enhanced implant stability with a chemically modified SLA surface

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Implant surface chemistry modifications offer a unique opportunity to improve osseointegration and impact clinical protocols. Recently, chemical modifications to a sand-blasted, acid-etched implant surface (SLActives, Straumann) were shown to enhance bone to-implant contact during early healing. The goal of the present study was to extend these findings to patients by examining the changes in clinical stability for implants with the chemically modified surface during the initial integration period. A two centered, randomized controlled trial was conducted with 31 partially edentulous adult patients, each patient receiving two implants having the same physical properties, but with one having the standard SLA surface (control) and one with the modified surface (test). Resonance frequency analysis, the primary outcome measure for implant stability, was assessed weekly over the first 6 weeks following implant placement. Abutment placement (35Ncm) and restoration were performed at the 6-week visit.
Implant success/failure and complications were evaluated as secondary outcomes. All implants proved clinically successful allowing for restoration. The most common complication noted, rotational mobility, was found in seven of the 62 implants, with five of these implants in the control group. With most implants placed in themandible (50 of 62), the shift in implant stability from one of decreasing stability to one of increasing stability ($P < 0.0001$) occurred after 2 weeks for the test implants and after 4 weeks for the control implants. This study provides clinical support for the chemical modification of the SLA implant surface to enhance early implant healing and stabilization. (Study supported by Institut Straumann AG.)