BACKGROUND: To address the effect of platform-switching on marginal bone preservation, definitive data from long-term, prospectively randomized-controlled clinical studies are necessary. The objective of this study is to generate crestal bone data for platform-switched implants in comparison to matched-abutment implants with a follow-up of 3 years.

MATERIALS AND METHODS: Study implants are cp-Ti straight-walled, self-tapping, wide diameter, with external-thread connections. The dual acid-etched Osseotite surface (BIOMET 3i, Palm Beach Gardens, FL) extends from the platform to the crestal bone level. Platform sites are randomized to one of two treatment groups: platform-switch (test) or matched-abutment control. A 2-stage surgical protocol, implants heal submerged for 2-4 months in mandibles and 3-7 months in maxillae until temporization. Permanent prosthesis are inserted about 6 months thereafter.

RESULTS: A total of 96 patients were enrolled at 5 private practice clinics in Switzerland. 212 implants were placed (110 test, 102 control). A total 117 cases includes single-tooth replacements, 74 short-span and 8 long-span prosthesis. Implants are equally distributed in both jaws, and <90% are located in posterior regions. For the test group, one implant was declared a failure resulting in a 3-year cumulative survival rate of 99.1%. All control implants were deemed successful. Crestal bone outcomes are reported at each interval as the change from bone levels at baseline (implant placement). The graph shows marginal bone results illustrating the differences between groups at each interval. At the time of permanent prosthesis insertion, the difference in crestal bone outcomes between the test and control groups was statistically significant. After 3-years of follow-up data, the difference is approximately 0.5 mm (P<.05).

CONCLUSION: Results from the present randomized, controlled clinical study suggest that platform-switching is an effective means for preserving crestal bone. The periapical radiographs and crestal bone levels at the apical third of the implant demonstrate excellent bone-to-implant contact and maintenance of bone levels over a 3 year period. The study data show a significant difference in marginal bone regeneration for platform-switched implants in comparison to matched-abutment implants when placed in mandible regions.

KEY: Standard Deviations are in parentheses lunar means.

ABUT= abutment connection
PERM = permanent prosthetic insertion
FU = follow-up in months

At three years, the cumulative survival rate is 99.1% (one implant failure) for the platform-switched implant group and 100% for the matched-abutment group. A significant improvement in crestal bone preservation is depicted in Figure 2. At the one-year follow-up, marginal bone regeneration for platform-switched implants is 0.55 mm (SD: 0.68) compared to 0.85 mm (SD:0.74) for the control group (P<0.05).

A Three Year Prospective, Multicenter, Randomized-Controlled Study Evaluating Platform-Switching for the Preservation of Peri-Implant Bone Levels

Nicolas Boitel, DMD; Claude Andreoni, DMD; Ueli Grander, DMD; Roger Naef, DMD; Konrad Meyenberg, DMD

ABSTRACT

BACKGROUND: Platform-switching is the technique of using an abutment of smaller diameter diameter below the crestal bone level, with the intent of preserving crestal bone. The randomized controlled trial is designed to evaluate the bone level changes that occur when an Osseotite implant is interfaced with a platform of lesser diameter.

RESULTS: The objective of this study is to generate crestal bone data for platform-switched implants in comparison to matched-abutment implants with a follow-up of 3 years.

MATERIALS AND METHODS: Study implants are cp-Ti straight-walled, self-tapping, wide diameter, with external-thread connections. The dual acid-etched Osseotite surface (BIOMET 3i, Palm Beach Gardens, FL) extends from the platform to the crestal bone level. Platform sites are randomized to one of two treatment groups: platform-switch (test) or matched-abutment control. A 2-stage surgical protocol, implants heal submerged for 2-4 months in mandibles and 3-7 months in maxillae until temporization. Permanent prosthesis are inserted about 6 months thereafter.

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CONCLUSION: Results from the present randomized, controlled clinical study suggest that platform-switching is an effective means for preserving crestal bone. The periapical radiographs and crestal bone levels at the apical third of the implant demonstrate excellent bone-to-implant contact and maintenance of bone levels over a 3 year period. The study data show a significant difference in marginal bone regeneration for platform-switched implants in comparison to matched-abutment implants when placed in mandible regions.

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CONCLUSION: Results from the present randomized, controlled clinical study suggest that platform-switching is an effective means for preserving crestal bone. The periapical radiographs and crestal bone levels at the apical third of the implant demonstrate excellent bone-to-implant contact and maintenance of bone levels over a 3 year period. The study data show a significant difference in marginal bone regeneration for platform-switched implants in comparison to matched-abutment implants when placed in mandible regions.

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