



tissuecare: the influence of platform-switching on crestal bone

Science Update – Information on current studies from DENTSPLY Friadent

| Jörg Nonhoff | Georgios E. Romanos

Confirming clinical observations, in order to be in a position to translate them into a clinical statement, forms the basis for predictable treatment success. According to this principle, Professor Georgios E. Romanos from the Eastman Institute for Oral Health in Rochester (USA) is currently conducting a prospective, randomized and controlled study aimed at identifying the reasons for the exceptional clinical success of Ankylos. This investigation is the first in a series of studies on the clinical performance of Ankylos.

Direct comparison with a competitor product makes the data survey in this study design particularly exciting. In the preparatory phase and during the further course of the study it was especially important to comply with regulatory and scientific standards. Besides thorough planning, training in the GCP guidelines (Good Clinical Practice) and the subsequent regular monitoring of study site by a study monitor are examples of indispensable components.

The investigation presented here focuses on the platform-switching concept, whereby, as is widely known, the implant is fitted with an abutment whose diameter is smaller than that of the implant shoulder. The resulting central displacement of

the connecting area appears to reduce crestal bone resorption following implant placement.¹ The results of certain current investigations suggest that the magnitude of the horizontal shift correlates with bone stability.² Soft tissue also appears to be favorably influenced.³ But not all studies confirm these results.⁴ The principle of platform-switching was realized in the Ankylos implant system since its conception in the mid 1980s. However, scientific discussion only began around 2005. The first important publication on this subject appeared at that time. The implant system described therein is similar to the Prevail implant used in this study and originates from the same manufacturer (Biomet 3i, Palm Beach Gardens, FL/USA).⁵

Interestingly, the various established types of implant with different implant-abutment connections have not been systematically compared with one another to this day. The influence of certain configurations and designs on the clinical benefit of platform-switching is therefore unknown. In this study the attempt is made to answer this question by comparing two different implant systems available on the market for a long time.

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1a_



1b_



2a_



2b_



3_

STUDY DESIGN

19 patients each had six implants inserted interforaminally on epicrestally in the edentulous mandible. The allocation of the implants was randomized.

This means that the two types of implant (Ankylos/DENTSPLY Friadent or Certain Extended Platform Prevail/Biomet 3i) were randomly allocated to one of the two halves of the jaw respectively. The experimental set-up with which both, the test group as well as a control group, were tested in the same mouth in different halves of the jaw is known as the split mouth design (Figs. 1a and 1b).

The implants were fitted with final abutments and a fixed temporary composite bridge (immediate loading) on the day of insertion (Figs. 2a and 2b). The final restoration followed three months later; the abutments were no longer replaced during the entire observation period.

The primary result parameters were the crestal bone level (standardized X-rays, evaluation according to Gómez-Román)⁶ and soft tissue stability (measured from cast models). The measured data were acquired after 6, 12 and 24 months respectively (Fig. 3).

PRELIMINARY RESULTS

Subject to the final statistical analysis of all results, greater crestal bone resorption was clinically observed for the control implants (Certain Prevail) than for the Ankylos implants (test implants). Figures 4a and 4b show characteristic examples for bony changes around both types of implant. The evaluation of the cast models for determining the soft tissue changes will be performed by an independent investigator following the study.

1a_ Implant placement in the split-mouth design (3rd quadrant: Ankylos, 4th quadrant: Certain Prevail)

1b_ Occlusal image of epicrestally positioned implants

2a_ Insertion of the final abutments (same patient as in Figures 1a and 1b)

2b_ Temporary immediate restoration with a composite bridge directly after fixation of the abutments

3_ Two years after immediate loading, stable soft tissues with no signs of inflammation (same patient as in Figures 1 and 2).

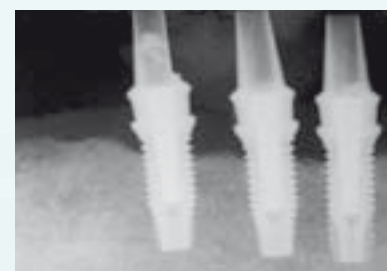
In contrast to the Certain-Prevail implant, which is equipped with classical internally positionable abutment geometry, the Ankylos keyed and friction-locked tapered connection appeared to prevent relative micromovements.

Accordingly, after screwing, the implant and abutment act biomechanically like a one-piece implant. At the same time, the long, accurately manufactured joining surfaces ensure maximum sealing.

The interaction of different factors, together with the horizontal shift (platform-switching) have the effect that hard and soft tissue remain stable (TissueCare Concept). In the ideal case, the bone grows beyond the implant shoulder and the soft tissue sealing to the oral cavity is ideally supported beyond the abutting surface of the implant by a defined microroughness. These effects and the long-term clinical stability of Ankylos have been verified in a series of studies.⁷⁻⁹ The role played by the individual factors in the TissueCare Concept will be investigated in further studies.

The preliminary results of the investigation presented here also confirm that immediate loading of Ankylos is successful in terms of the long-term prognosis for the implants and the peri-implant tissue stability. This is not the case for the Certain Prevail implants (subject to the final evaluation), although they also have platform-switching, i.e. abutments with a smaller diameter. So the question arises here too, which other factors also play a role besides the horizontal shift. ■

References available on www.dentsply-friadent.com/identity



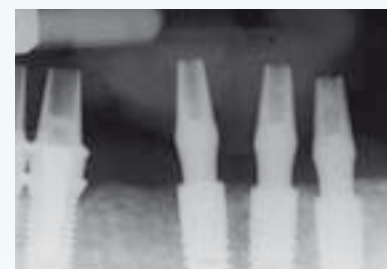
4a_



4b_



5a_



5b_

4a_ Radiological presentation of the bone resorption around the implants with "extended platform" (Certain Prevail), two years after immediate loading

4b_ Radiologically visible crestal bone stability around the implants with inherent platform-switching (Ankylos), two years after immediate loading (same patient as in Figure 4a)

5a_ Peri-implant bone resorption around implants with extended platform, two years after immediate loading (for another patient)

5b_ Crestal bone stability around the Ankylos implants, two years after immediate loading (same patient as in Figure 5a)

Smartphone:
PDF of the study
with references



References

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Literaturverzeichnis

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