

TissueCareNEWS



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EDITORIAL

How do you measure implant success? From our point of view, it is a matter of whether hard and soft tissues are successfully stabilized in the long term. For example, when an implant has to be inserted in the aesthetic region below the alveolar bone margin: in this case, close and lasting contact between implant surface, bone and connective tissue is especially important. Ideally bone should be deposited on the horizontal shoulder surface (front) of the implant. We can see these results with ANKYLOS®.

As well as platform switching, optimal microroughness, extending from implant neck over the shoulder onto the horizontal implant face, is a precondition. Another key factor is the connection: only if it is really movement-free and micro-tight – as with the TissueCare connection – will the bone stay put in the long term.

We know that carefully documented success is required to build confidence. When it comes to ANKYLOS® and the genuine TissueCare concept, there is comprehensive data, from fundamental research through to prospective clinical trials. In this Newsletter we will show you how you can benefit from our knowledge in your daily practice.

We hope you enjoy reading our Newsletter
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Subcrestal placement and maintaining aesthetics

How soft tissues and bone remain stable even above the implant shoulder

Weng, D, Nagata, MJ, Bell, M, et al.: Influence of microgap location and configuration on the periimplant bone morphology in submerged implants. An experimental study in dogs. Clin Oral Implants Res; 2008, 19 (11): 1141-1147



Microrough to beyond the implant shoulder

Why the bone remains stable with the TissueCare concept

Can the peri-implant tissue be tightly sealed from the oral cavity? Is this seal just as tight as with natural teeth? The answer is “yes-and-no”. The soft tissue collar forms around implants as it does around teeth – but only if the surface structure and position of the implant are correct.⁹ In the long term bone and soft tissue remain stable if, in addition, the abutment connection is shifted horizontally, is stable and bacteria-proof.

The neck area of implants is usually polished and appears visually smooth. Compared with rough, structured surfaces, the advantage is that less plaque is deposited on smooth surfaces.¹⁴ That is important especially in the region of emergence through the soft tissue and hence it relates primarily to the abutment. The less plaque can be deposited, the easier it is to avoid infection of the gingival sulcus. This also ensures that the junctional gingival epithelium, the connective tissue attachment and the underlying bone are protected – preventing peri-implantitis.

However, polished or machined titanium surfaces also result in bone cells not being deposited perfectly.¹ The bone contact rate is significantly lower than with modern microstructured surfaces, such as the grit-blasted and etched FRIADENT® plus⁶ (Fig. 1). Smooth surfaces make bone deposition difficult in the neck area, whereas slight microroughness satisfies the requirements of osteogenic cells more effectively.¹²

Slightly microrough surfaces have a beneficial effect on the deposition of connective tissue cells.⁹ Furthermore, when plaque is deposited on microrough surfaces, the tendency toward inflammation is no greater than with smooth surfaces.¹⁶ This may be significant in the case of peri-implantitis if the inflammation has penetrated to the height of the implant shoulder.

Microrough to beyond the shoulder

This is why for many years XiVE® and FRIALIT® implants have already had a section with reduced surface roughness below the short polished neck. At 0.6 µm this lies between the polished and the blasted-etched section. Since the introduction of the FRIADENT® plus surface in 2005, ANKYLOS® implants also have a microrough-etched section (Fig. 2 and 3). Its structure promotes the deposition of both bone and connective tissue cells. The new ANKYLOS® C/X implants, with which an indexed prosthetic restoration is a possible option, also have a microrough neck and shoulder area and all the other features of the TissueCare connection.

As a special and unique feature, the microrough-etched surface of ANKYLOS® extends beyond the implant shoulder and also encompasses the horizontal implant face. This would not be feasible with systems that have a flush transition between implant and abutment because the implant face forms the prosthetic platform. A microrough implant face would also be of little help with systems involving conventional

platform switching. This is because the horizontal switching of the interface between implant and abutment can only become fully effective if the connection is both stable and micro-tight (platform shifting).

Successfully preventing bone resorption

The TissueCare connection of ANKYLOS® satisfies all these conditions. It prevents micromovements and hence pumping effects which encourage microbial colonization on the inside of implants and peri-implant tissue.¹⁵ The consequence can be the familiar bowl-shaped bone loss around the implant shoulder. With ANKYLOS®, however, bone and connective tissue remain stable in the long term (Fig. 6).⁸

This property becomes particularly significant when an implant is placed slightly subcrestally in the aesthetic region. Especially with a thin gingival biotype and delicate bone structures, even slight bone resorption can lead to gingival recession and hence cause aesthetic problems. This is where all the advantages of the TissueCare connection come to the fore. It was shown in a human histology study that bone and connective tissue remain stable over the front side of a subcrestally placed implant (Abb. 4).³ This was the case even though it had been immediately loaded.

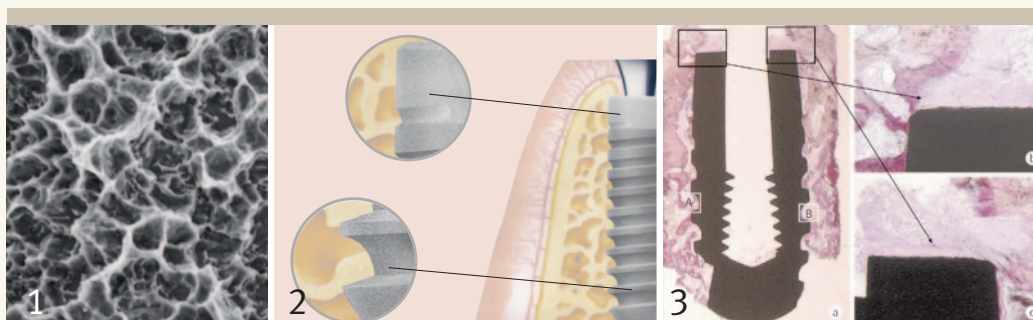


Fig. 1 | SEM (3000 x) of the FRIADENT® plus surface structure. Magnification shows micropores of 0.5–1 µm diameter and 3–5 µm depth.

Fig. 2 | With ANKYLOS® the bone can remain stable not only above the shoulder but even be deposited on the implant face of the implant as a result of the perfectly adjusted microroughness.

Firm and healthy connective tissue adheres in the other areas. As a result, the emergence of the abutment through the soft tissue remains permanently stable and tight.

Fig. 3 | An immediately loaded ANKYLOS® implant had been explanted after one month at the patient's request. This histological image shows that bone

and connective tissue had grown over the shoulder onto the horizontal implant face of the implant (top right: magnified section of image showing active osteoblast border). (Case study and histological work-up: Degidi M, Iezzi G, Scarano A, Piattelli A, Chieti University, Italy)

References
Fig. 1-2 | DENTSPLY Friadent
Fig. 3 | Degidi, M., et al. Immediately loaded titanium implant ... ("beyond platform switch") ... Clin Oral Implants Res 2008; 19(3): 276-282 / p. 279, Fig. 3

Fig. 4a | Positioning of ANKYLOS® in relation to the bone crest: the ANKYLOS® C/X implant at position 24 has reached its final subcrestal position (placement head from pilot user phase). The bottom edge of the placement head corresponds to the recommended depth of one millimeter. The placement head of a classic ANKYLOS® plus implant can be seen at position 27. (Case: Dr. Krzysztof Chmielewski, Gdansk, PL)

Fig. 4b | The subcrestal position of both implants can be clearly seen in the top view (region 24: ANKYLOS® C/X implant without cover screw; region 27: classic ANKYLOS® plus implant with integrated cover screw).

Fig. 4c | The subcrestal position of both implants is also clear on the radiograph. Sinus augmentation was necessary in region 27.

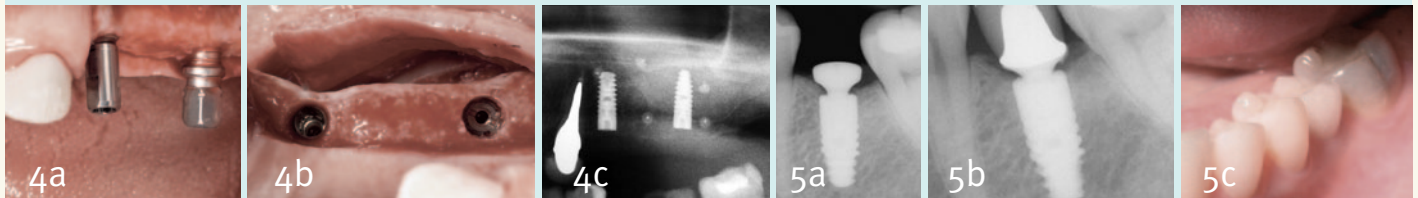


Fig. 5a | Implant region 35 after uncover and fixation of a gingiva former: the implant position is clearly subcrestal (case: Dr. Nigel Saynor, Stockport, UK).

Fig. 5b | Situation 4 years after prosthetic restoration with an all-ceramic crown on a regular titanium abutment: the bone is stable coronal to the shoulder.

Fig. 5c | The clinical result shows that the soft tissues have also remained unchanged in the long term (implant region 35).

References

Fig. 4a-4c | Article Dr. Krzysztof Chmielewski, "Index option meets elegant surgery", iDENTiTY 1-09, pages 16 and 17;
Fig. 5a-5c | Implanting Brilliancy brochure, page 5 bottom, Fig. 1, 3 and 4

Recommendations on implant position

How an implant is positioned in relation to the bone has major repercussions for aesthetics. Stabilization of the bone, even above the horizontal shoulder part of ANKYLOS® implants, is a clinically important advantage over conventional two-part implant systems.

In systems with an externally flush interface and micromovement, a subcrestal position causes the bone to be resorbed within the biological width. This may result in soft tissue recession and corresponding aesthetic problems. This is particularly relevant where there are small distances between adjacent implants because the bowl-shaped defects coalesce and bone resorption takes full effect.¹³

This problem seems to have been overcome with ANKYLOS®. In preclinical trials, for instance, it became clear that the bone – and consequently the papillae between implant-supported crowns – remain even more stable with subcrestal implant positioning than with epicrestal positioning, i.e. at the height of the surrounding bone.¹¹ In earlier studies it had already been ascertained that a reduced horizontal distance of two or even one millimeter between two implants does not significantly increase bone resorption.^{2,10}

Position easy to identify with ANKYLOS® C/X

Based on outlined research results, ANKYLOS® implants should be placed 1.0 millimeters subcrestally. The insertion depth can conveniently be deduced with the newly designed placement head with ANKYLOS® C/X implants. If an epicrestal position is necessary for anatomical reasons, the specifically designed microroughness also allows problem-free deposition of soft tissue in these cases. The usual recommendations of at least 3.0 millimeters between two implants and 2.0 millimeters between implant and tooth (when implanting in healed jawbone) apply to the horizontal distance. As a result of the high tissue stability associated with TissueCare, however, smaller gaps seem to be less problematic than with conventional implants (Fig. 5a and 5b). In practice, this is important when there are narrow gaps between individual teeth or when two adjacent implants have to be placed with too little distance between them.

Transgingival support for soft tissue structure

These distance recommendations apply, irrespective of whether submerged or transgingival healing is selected. Owing to the special tissue-stabilizing properties of the TissueCare connection, immediate fixation of a gingiva former or a temporary crown will be stabilized from the outset and aesthetically favorable gingival architecture is able to develop. This applies particularly if the implant is immediately fitted with a restoration.^{4,5} A procedure in which a screw-retained definitive abutment fitted immediately after implantation is not changed again ("one abutment, one time") has proved particularly atraumatic. As the bone supply needs to be measured accurately in advance for this method, in most cases it is only applicable in conjunction with three-dimensional diagnostic techniques (for example with ExpertEase™) and the procedure requires carefully coordinated teamwork.

The near future will show how valuable these time-saving, minimally invasive techniques prove in daily practice. ANKYLOS® and the TissueCare connection perfectly satisfy the requirements from the technical, biological and dentistry point of view (Fig. 6).

Fig. 6a | Tooth 46 is no longer worth preserving (case: Dr. Howard Gluckman, Cape Town, South Africa).

Fig. 6b | Immediately after extraction, an ANKYLOS® implant is inserted. The bone in the furcation provides enough volume for an implant 3,5 mm in diameter.

Fig. 6c | The implant is placed 1 mm below the edge of the furcation bone and undergoes open healing.

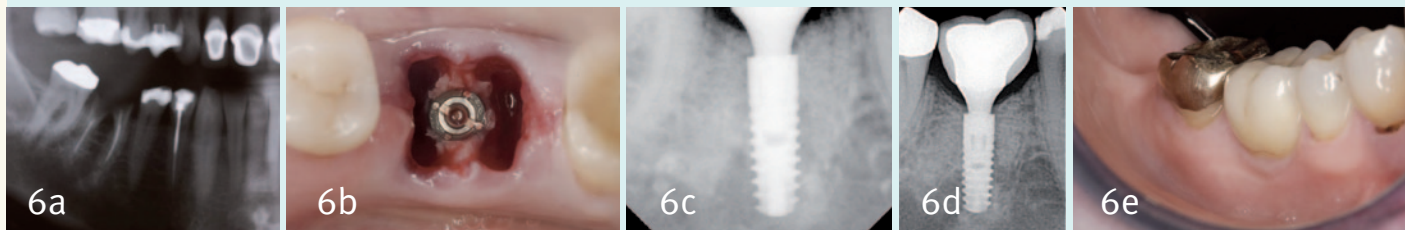
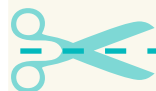


Fig. 6d and 6e | The radiograph after 24 months and the clinical outcome illustrate the success of the treatment method and the effectiveness of the TissueCare concept. The bone has grown over the implant shoulder (d). Note the excellent emergence profile of the crown (e).

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Fig. 6a-6e | Article Dr. Howard Gluckman, "Shorter treatment time", iDENTITY 2_09, pages 40-43.

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