Zirconia implants with zirconia crowns

Metal-free reconstruction - a world first!

Bioenergetically processed ceramic implants using the QUANTEC® method

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1 Implants YES - Titanium NO?

Bridges to replace teeth usually mean grinding down healthy teeth, overloading the abutment teeth and reduced chewing comfort for the patient. Today, bridges of any span can be made from all-ceramic zirconia. However, the prerequisite for this is stable teeth bordering the gap.
Dentures are used when there are no stable teeth in the appropriate positions. Dentures always contain large amounts of metal, damage the abutment teeth and lead to degradation of the alveolar ridge. In addition, chewing ability is reduced and comfort is severely restricted.
For this reason, the treatment of gaps with implants has increased in recent years.
The number of restorations has exploded in the last 20 years, as any gap can be permanently restored without the need to grind down teeth. The original situation is completely reconstructed and the patient not only regains the perfect chewing sensation, but also benefits from a restoration that is as durable as their own teeth.
However, all current implant systems are based on titanium - a generally very good, biocompatible and safe material. Nevertheless, individual cases of incompatibility with titanium are repeatedly found in material tests and many patients would like to be treated without metal to ensure that there are no oral currents or transmitter/receiver effects in the electromagnetic (e.g. mobile phone) field.

Prof. Schulte / Tübingen developed implants made of aluminum oxide ceramics around 20 years ago, but these had an extremely high loss rate and are no longer used.
About 10 years ago, the idea of metal-free implants was taken up again: however, the zirconium-ceramic implants from Prof. Sandhaus / Geneva were not successful either.
Through significantly improved material properties and a design trick, Dr. Ulrich Volz / Bodensee Zahnklinik Meersburg was able to develop and patent the first implant with a stability comparable to titanium. In recent years, implants from the
"VOLZIRKON 1 and VOLZIRKON 2
The latest design "*VOLZIRKON* 3" has been approved by the ethics committee for clinical trials.
The interest shown by the industry, dentists and patients is overwhelming and leads to the conclusion that the zirconium implant could replace the titanium implant in the coming decades.

2 Titanium: possible faults

Today, it is not only patients and dentists with a complementary, naturopathic approach who want implants with minimal toxicity. In specialist and patient circles, which are critical of metals, titanium is also being discussed critically.
Titanium has been used in the medical field for around 30 years. It

is characterized by high compatibility and very good corrosion behaviour, as an inert oxide layer immediately forms on the surface of the highly reactive metal [4].
Nevertheless, there is evidence for non-specific immunomodulation by titanium particles as well as for a specific titanium-protein interaction with the possibility of sensitization. With refined immunological in vitro test procedures such as lymphocyte transformation test (LTT), cellular sensitization to titanium can be detected in individual cases, although their clinical relevance cannot yet be conclusively assessed [7]. Titanium is also discussed to be involved in the induction of autoimmune reactions [13]. In individual cases, even severe sensitization to titanium is reported in the LTT (lymphocyte transformation test) after implantation of titanium screws [8]. Human immune cells can be activated by TiO_2 , resulting in the formation of free radicals [3,12] Changes in the intracellular calcium concentration have been reported in the presence of TiO_2 [10]. Furthermore, metal intoxication by titanium is discussed. Elevated titanium levels in the vicinity of implants were determined in an animal study [1] and also found in two case studies in nail samples in "yellow fingernail syndrome", which is a very rare syndrome that developed after the insertion of titanium knee implants and titanium dental implants. and titanium dental implants [6]. Furthermore, titanium was detected in the regional lymph nodes after implant insertion [16].
It has also been shown that fibroblasts in direct contact with titanium reduce their growth [2].

However, metal intoxication can also occur as a result of oral currents and potential differences. This occurs when titanium is in direct contact with other metals and alloys. Due to the position of titanium in the voltage series of metals, it primarily dissolves and is also said to be responsible for implant losses [5]. Other Researchers have shown that there is weak but detectable corrosion between titanium and dental alloys [9]. Titanium can also corrode through other processes. Increased corrosion behavior of titanium by contact with fluoride has been reported [11,14].
Photocatalytic properties of TiO_2 can also lead to oxidative damage to nucleic acids [15] and provoke skin damage.

The extent to which these literature references are clinically relevant cannot be assessed at this time. However, these scientific studies show that titanium can have negative biological effects. For these reasons, the demand for metal-free dental implants as an additional alternative.

3 Bioenergetic support with QUANTEC®

"The zirconium oxide implants were treated with QUANTEC® after sterilization before being used on the patient in order to improve the regulatory behaviour in the implanted jaw area on the one hand and to increase and accelerate the healing quality on the other.
For this purpose, the implants in their sterile packaging have been informed with the vibrations of the following entries: Arnica D4, Symphytum D3, Bone Compacta D2, Harmonic Regulation LM 50. Apart from this, a program determined by the diode with white noise runs every 4 hours for 10 seconds in the continuous program with the following entries:

1) The implant heals perfectly in every patient and remains stable for a lifetime
2) Homeopathy - Calcium
3) Mineral - Zircon
4) Alphabet of success - Deepening friendships
5) Alphabet of success - Balance, harmony
6) Detoxification - Removing heavy metals - alkaline nutrition
7) Bach Flowers - Oak
8) Chi flow improvement 30%

Entry 1) was freely formulated, entries 2) to 8) represent a selection of 31 entries determined by QUANTEC® , which were considered useful for a long-term consignment. Of particular interest was entry 3) Zircon, which was the only entry in the "Minerals" data set to be determined independently by the diode with white noise from a database containing 254 entries!

The healing behavior, stability and previous success rate are very promising - particularly interesting is the fact that healthy gums have grown up the zirconium implants like a guide rail, which we have not been able to observe to this extent on natural teeth or titanium implants and which is a great advantage for aesthetics. (see Fig. 5)

4 Case presentation

This case presentation describes a patient case that was reconstructed in our practice with zirconia implants and, after a healing period of 6 months, with zirconia crowns completely metal-free.
The patient came to our practice with a number of root-treated and impacted teeth. At this time, the patient was severely energetically weakened and suffered primarily from gastrointestinal weakness with candida, hair loss and cycle disorders with infertility.
After the root-treated and impacted teeth had been removed in advance, all the above-mentioned diseases had already healed completely.
As the patient had lost several teeth alio loco following crown and bridge preparations, she came with the clear requirement that she would tolerate neither bridges nor removable or metal-containing dentures.
After informing the patient about alternatives, risks and complications, the patient gave her written consent for treatment with zirconium oxide implants. These were custom-made according to a design provided by the concept developed by the author and filed for patent.
The aim was to find an implant shape that combines demonstrably high tissue compatibility with maximum stability in order to offer the patient a predictable, safe result over the long term. One-piece implants were therefore developed, which compensate for the temporary disadvantage of the need for consistent unloading during the healing phase with the long-term advantage of outstanding stability.
An analysis by the Frauenhofer Institute in Freiburg confirmed the stability of this type of implant. Three zirconium dioxide implants were loaded one million times using a testing machine. No damage was detected on any of the implants.
With the patient's consent, 8 zirconium oxide implants were fabricated and placed in April 2002. The restoration - again metal-free - with zirconium oxide crowns was carried out 6 months later. During implant placement, a maxillary sinus elevation was performed simultaneously in region 15/16. All 8 implants showed primary stability upon insertion, none were lost. During the 6-month healing phase, the patient wore
A protective splint is worn continuously for 24 hours in the upper and lower jaw to prevent stress on the implants. At the time of uncovery, impression taking, integration and after a six-month loading phase, all
8 implants are stable and show a positive tapping sound and no mobility.

In the 1st quadrant, 3 implants were placed in regions 14, 15 and 16 (see Figure 1) - note the prosthetically correct positions, which are a smaller distance for implants 14 and 15 and a smaller distance for implant
16 as a molar allow a greater distance.
Further implants were inserted in regions 36, 35, 34, 45 and 46. The prosthetically planned positions were also optimally realized here.

Figure 1
Orthopantomogram directly after implantation

After 6 months, the surrounding soft tissue, which had developed very well around the zirconium implants, was remodeled. In general, a significant amount of gingiva had to be removed with the electrosurgical unit, which had "grown up" around the zirconium implant. Figures 2 to 6 show the individual steps of the prosthetic restoration with the optimal esthetic result, also from a gingival point of view (see Figure 6).

Figure 2
The zirconia implants in the 1st quadrant after exposure and modeling with the electrosurgical unit. Note the perfect positioning and optimal parallelism - only implant 14 required some vestibular preparation.

Figure 3
The zirconium oxide crowns from occlusal on the master model

Figure 4
The zirconia crowns are cemented in the mouth.

Figure 5
The implant posts from the side - note the healthy gums actively growing up the implant posts.

Figure 6
The zirconia crowns cemented from the side. Note the optimal filling in the interdental area.

The restoration in the lower jaw was carried out at the same time as the restoration in the upper jaw.

Figure 7
The implant positions in the lower jaw. Optimal parallelism is also achieved here, which did not require any grinding.

Figure 8
Lower jaw with integrated zirconium oxide crowns.

5 Results

The implants could be implanted perfectly in the prosthetic positions due to the sufficient bone supply. Complete osseointegration was achieved with positive tapping sound and absolutely irritation-free gingival conditions. Exposure, preparation and impression taking were easier than with a natural tooth - the possibility of errors can be practically ruled out at this stage.

The firmly cemented superstructure shows an outstanding esthetic, biologically highly compatible and very comfortable final result.

There has been no deterioration in any area of health as a result of the implantation. The improvements in health that occurred after extraction of the root-treated and impacted teeth have also continued to improve.

stabilized and the patient is now in a completely complication-free pregnancy.

6 Discussion

Zirconium oxide is not only used in dentistry for the production of crowns, bridges and pin abutments, but also in other specialist areas for the replacement of joints and bones. Previous animal studies have shown a biocompatibility that is absolutely comparable, if not superior, to that of titanium. superior if not superior. The load tests at the Fraunhofer Institute confirm the logical concept of a single-phase zirconium oxide implant, which offers maximum stability thanks to its solid form.

Two-piece implants may also provide sufficient stability over a longer period of time.

The case description shows that, according to current knowledge, it is quite possible to achieve an esthetically, clinically and periodontologically excellent result in metal-sensitive patients with completely metal-free restorations without provoking new health problems. However, clinical studies over a longer period of time with high case numbers must show that the one-piece zirconium oxide implant concept developed by the author and for which a patent application has been filed dev eloped and patented by the author can meet the recognized success criteria of implantology. A corresponding study is in preparation.

6 Literature

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The original version of the case study can be downloaded at www.zirkonimplantate-online.de.