

## Ceramic implants

"Ceramic implants impress with their biocompatibility and excellent esthetics."



Our goal is always to achieve maximum health and quality of life for our patients. To achieve this, biocompatibility, esthetics and sustainability of the materials used are essential.

Since both metal implants via titanium incompatibilities and released titanium microparticles and dead teeth via so-called dental toxins (thioethers, mercaptans) have been proven to trigger undesirable immunological reactions that can be associated with chronic diseases, we only use metal-free ceramic implants made of the high-performance material zirconium oxide.

Important: it is essential that implants are placed in healthy bone of high quality to exclude immunological irritations. Therefore, an ultrasound examination (CaviTau) is necessary in advance in many cases i to plan the intervention correctly and to optimize the bone quality with special bone augmentation and regeneration measures.

### Advantages of ceramic implants

#### Aesthetics

"Oral soft tissues love ceramics!"

Since the material ceramic is very compatible with the oral mucosa, the gum grows irritation-free and bacteria-proof to the implant and thus perfectly closes the "immunological door" to the bone. This has the great advantage not only in the visible area that the gums in the implant look healthy and pink. The bacteria-proof connection ("sealing") also offers enormous advantages over metallic materials in terms of longevity, sustainability and health of the surrounding tissues.

## **Biocompatibility**

Because zirconia is a precipitated material, it is electrically neutral. Therefore, it cannot interact undesirably with the environment. Immunological reactions triggered by charge exchange ("biocorrosion") and electromagnetic fields ("antenna effect") are thus excluded, in contrast to metal implants made of titanium. This property is therefore also referred to as "bioinert" and "biocompatible", which is optimal from a health perspective.

## **Patient comfort, immediate implants**

Specially developed treatment protocols often allow ceramic implants to be placed on the day of tooth extraction.

This offers numerous advantages for the patient. The number of surgeries and treatment time can be reduced and the surrounding tissue is supported from the beginning.

Complicated bone and soft tissue augmentations with high complication risks are cleverly avoided. Particularly elegant: a tooth-colored temporary denture can often be attached to the implant on the day of implant placement. This means that the patient leaves the practice on the day of the operation with great esthetics in the visible area.

## **Bone Healing Protocol**

Ceramic implants heal only in healthy bone.

This makes it necessary after extraction of dead teeth or titanium implants to clean the bone from any inflammation (detectable by ultrasound, cavitau) and to treat and activate it with special protocols (ozone, PRF).

Therefore, such treatment should be performed only by specially trained surgeons.

## **Sustainability, longevity**

Thanks to new and specially developed high-performance materials and specially designed geometries with high layer thicknesses, the new generation of ceramic implants is fracture-resistant, stable and durable. Implant fractures, as they are often said to occur with ceramic implants, are thus a thing of the past when our specially developed surgical as well as prosthetic protocols are adhered to.

More information can be found here:  
<https://www.swissdentalsolutions.com/patienten>

## **Bone augmentation**

If the bone supply is insufficient in quality (Cavitau) or quantity (3D X-ray) to anchor a ceramic implant stably and sustainably, bone augmentation may be necessary.

Thanks to special minimally invasive surgical techniques (tentpole brushing technique), this can often be done in the same session as the implant placement.  
We use only autologous materials for this.

Carefully and safely collected autologous bone (Safescraper) and autologous blood concentrates (PRF) are the most important building blocks here (Bone Healing Protocol).

In this way, we avoid undesirable immunological foreign body reactions, such as can occur with conventional bone augmentation materials of animal or artificial origin, and at the same time optimize the quality of the resulting bone.

It is essential to respect the limits of biology and not to violate them to generate maximum safety.

### Immediate implantation

In many cases it is possible to anchor an immediate implant in the healthy bone directly after extraction of the tooth and thorough removal of existing inflammations in the bone. After thorough disinfection and oxygen activation with ozone, the resulting cavities between the local bone and the immediate implant are filled with the patient's own blood concentrate (PRF) (Bone Healing Protocol).

In the "healing chamber" created in this way, the bone is supported in its biological-functional regeneration.

With this technique, the existing tissue is immediately supported and preserved.

Expensive "large" bone and soft tissue augmentations and transplants can thus be avoided in many cases.

Since the number of interventions for the patient is reduced to a minimum in this case, this technique offers a high level of comfort with relatively low risk for the patient at the same time.

### Slow Implant Concept

If the patient's individual regulatory and compensatory capacity does not allow it at the time of extraction, a two-stage procedure is preferable to immediate implant placement.

In this case, the bone is first completely healed without an implant using our Bone Healing Protocol and the implant is placed at an individual later time.

### Special case sinus lift

Since the maxillary sinus is located in direct anatomical proximity to the root tips of the posterior teeth, it may be necessary to "lift" the floor of the maxillary sinus upwards.

Here, too, we keep the risk of complications as low as possible thanks to minimally invasive and gentle surgical techniques (piezosurgery, internal sinus lift) and the use of autologous materials (autologous bone, PRF). Of course, we also perform external elevation of the maxillary sinus floor in cases of severely advanced bone loss.

Here, too, it is essential to observe the limits of biology to avoid undesirable immunological complication reactions.

## Soft tissue regeneration

In addition to a healthy bone bed, it is important for the long-term preservation of ceramic implants and teeth to have a tight gingival/connective tissue that protects the bone from bacterial penetration "sealing".

If there is too little tight gum/connective tissue, soft tissue regeneration may be necessary. By means of minimally invasive surgical techniques ("vestibuloplasty") and the use of autologous connective tissue grafts, missing and weakened gums are thus built up, and regenerated without causing immunological foreign body reactions.

## **Dead teeth.**

"Getting to the root of the problem."



*Figure 1: In contrast: dead tooth next to healthy teeth*

### **What is actually a "dead" tooth?**

A healthy tooth, like other organs of the body, has a blood vessel system, a nervous system and lymphatic drainage inside it. During a root canal treatment, the inside of the tooth is removed, disinfected and filled with root canal filling material. What is left behind is the "dead" tooth substance as well as the artificial root filling material.

### **What is the problem?**

The problem is that even the best root canal treatment does not manage to get the tooth free of bacteria (1-5). The bacteria hide in the depths of this root canal system and dentinal tubules and are no longer accessible to the immune system after the blood and lymphatic vessels have been removed during root canal treatment.

Metabolic products of the remaining bacteria (thioethers and mercaptans) are highly toxic and are released into the environment, for example, during chewing.

### **Where is the link: oral – overall health**

These "dental toxins" can inhibit important enzymes and can lead to systemic problems and diseases in the body. For example, ATP production in the mitochondria can be reduced in this way (6).

In addition, immunological processes around a dead tooth and excess root filling material can lead to problems in the surrounding bone tissue (increased cytokine levels, RANTES/CCL5), which may be associated with chronic systemic disease patterns.

In our view, root canal treatments should therefore be critically scrutinized.



*Figure 2: Removed dead teeth with cysts and excess root filling material*

### ***Removed dead teeth with cysts and excess root filling material***

So why does a dead tooth often not hurt?

In many cases, these are chronic forms of "silent inflammation" that do not necessarily cause pain, but nevertheless burden the body.

Only special diagnostic methods such as 3D X-ray imaging (DVT) (7), local tooth toxin measurement (Orotox) and ultrasound measurement (Cavita) can detect these silent forms of inflammation that burden the immune system.

### **And how can the problem be solved?**

If a tooth is bacterially contaminated and this causes problems, the only option is often extraction and thorough removal of the affected parts of the bone.

The focus is on biological-functional regeneration (Bone Healing Protocol).

Biocompatible ceramic implants and all-ceramic dentures are available to replace the resulting gap. We work exclusively with immunologically well-tolerated, metal-free materials that do not cause any new problems and are also highly esthetic.



Figure 3: In this case, a biocompatible ceramic implant with healthy soft tissue replaces the bacteria-contaminated dead tooth.

## Titanium implant removal

The mechanical longevity of titanium implants is undisputed. However, often too little attention is paid to the health aspect in this purely functional consideration. Here are some influencing factors.

### Toxic stress

Titanium not only has no function in the human organism, current studies also show cytotoxic and even DNA-damaging potential of released titanium particles, thus their negative influence on general health (8,9).

(8) Lechner, J.; Noubissi, S.; von Baehr, V. Titanium Implants and Silent Inflammation in Jawbone—a Critical Interplay of Dissolved Titanium Particles and Cytokines TNF- $\alpha$  and RANTES/CCL5 on Overall Health? *EPMA J* 2018, 9, 331–343, doi:10.1007/s13167-018-0138-6.

(9) He, X.; Reichl, F.-X.; Milz, S.; Michalke, B.; Wu, X.; Sprecher, C.M.; Yang, Y.; Gahlert, M.; Röhling, S.; Kniha, H.; et al. Titanium and Zirconium Release from Titanium- and Zirconia Implants in Mini Pig Maxillae and Their Toxicity in Vitro. *Dent Mater* 2020, 36, 402–412, doi:10.1016/j.dental.2020.01.013.

### Immunological stress

Thanks to new immunological LTT tests (see IMD Berlin), intolerance reactions to the material titanium can also be detected. Titanium implants can therefore cause immunological stress. Peri-implantitis (inflammatory reactions around the implant and implant loss) can quickly be the result.

### FDOJ (Fatty Degenerative Osteonecrosis of the Jawbone)

Permanent immunological reactions to titanium particles in the adjacent bone tissue can lead to osteolysis and silent inflammation in the jawbone (fatty degenerative osteolysis of the jawbone, FDOJ with significantly elevated cytokine levels (RANTES/CCL5) (8).

RANTES/CCL5 is associated with various chronic systemic diseases (10). This condition can be diagnosed without radiation using Cavitau.

## Electrical stress

In an environment with different electromagnetic radiation (mobile communications, 5G, radio, W-LAN), a metallic foreign body such as a titanium implant is constantly interacting. It acts here as a small antenna with transmitter and receiver function.

Effects on the equally electrically controlled human nervous system and a heating of the surrounding tissue as well as a possible increased release of titanium particles are thus uncontrollable.

Electrosensitive people can react very sensitively to electrical stress.

## Ceramic implants as a biocompatible alternative

Since ceramic implants are fully reacted and therefore uncharged (no free electrons), they do not interact with electromagnetic radiation and are therefore the more biocompatible alternative to metal implants.

## Supporting the body's own detoxification process

After removal of titanium implants, we therefore also use special detoxification protocols to provide maximum support for the body's ability to detoxify.



Figure 4: Removed titanium implant with osteolytic, fatty bone

## Important questions:

### 1. What should be observed after the procedure?

Ceramic implants must not be loaded during the healing period. Every impulse on the freshly placed implant makes healing more difficult: you should therefore keep chewing and tongue pressure to an absolute minimum and take maximum care of the implants, especially in the first 6 weeks after surgery.

You should nevertheless keep the surgical area hygienically clean; careful cleaning with a soft manual toothbrush to reduce bacteria in the wound area is possible and important.

In addition, you can rinse gently with anti-inflammatory mouthwashes. Here we recommend natural, less aggressive rinses that do not stress your oral flora and microbiome too much during the healing period. (Kamillosan, sage or rinses based on oxygen).

### 2. When are the stitches removed?

Stitches are usually removed 14 days after surgery.

We use absorbable sutures in most cases, so that ingrown sutures will have dissolved completely on their own after about 6 weeks.

This also has advantages if you have a long way to travel. If the threads do not bother you, it is not a problem if they dissolve or fall off by themselves.

### 3. When can the implants be loaded?

As a rule, implants are healed into the bone after 3 months.

With special stability tests (Periotest) we ensure the healing of the implants before loading.

If the values of the stability test do not exceed the necessary threshold, additional measures may be necessary: Torque increase of the implant or placement of a new implant.

### 4. How to protect the one-piece implants during the healing period?

If you have received a tooth-colored temporary restoration in the esthetically important area immediately after the surgery, you must keep in mind that this is only for esthetics, not for function. You should therefore avoid stress caused by chewing and tongue pressure at all costs.

In some cases it is necessary to work with a retention splint/aesthetic splint/healing splint.

You should clean this well every day to keep the surgical area hygienically clean.

The retention splint is used to prevent tooth tilting, especially of teeth "behind" the implants. It should be worn at night.

The esthetic splint is used exclusively for esthetic protection in the anterior region. It can be worn in everyday life to hide the white ceramic implant, for example, when laughing.

The healing splint is thicker and therefore suitable for chewing. It is used mainly for major surgery and various surgical sites on both sides to ensure chewing function and bite retention.

### 5. How are the implants treated after healing?

Since the immunological relief and your general health are the focus here as well, we exclusively use metal-free, all-ceramic dentures and plastic-free cements for cementation.

This has the additional advantage that we can work in an esthetically perfect and tooth-colored manner and ensure optimally healthy, inflammation-free gums.

Implants that are placed side by side are connected to each other (except via bony growth plates, symphyses) to provide even greater stability and sustainability.

However, an implant is not connected to a tooth, because the tooth has its own mobility, but not the implant.



## 6. What are the current success statistics for Ceramic implants?

The new generation of ceramic implants used by us has very good success statistics due to the use of high-performance materials and high layer and wall thicknesses. Therefore, fractures do not occur.

## 7. Is the implant made of one piece?

There are one-piece and two-piece implants, whereas the two-piece implant is pseudo-two-piece, because the ceramic tooth crown is also placed on the first part.

The advantage of this is that there are no micro-movements and crevices (as in the case of screw-retained metal implants), which can cause bacterial migration and inflammation. Another advantage for the ceramic implants!

## 8. Is an antibiotic necessary?

In most cases, we completely avoid the administration of oral antibiotics.

In complex procedures, it is sometimes necessary to give antibiotics via so-called single-shots (one-time administration) through an intravenous line.

This is very well tolerated and much gentler on your microbiome, which we also need for optimal healing success.

## 9. How much does a ceramic implant cost?

A high-quality ceramic implant from the premium manufacturer Swiss Dental Solutions (SDS) costs approximately 650€ plus VAT to procure.

The cost of the procedure following our Bone Healing Protocol and varies depending on the case and necessary surgical techniques.

A general cost estimate is therefore not possible at this point.

**Important:** The choice of materials is essential for a sustainable and healthy treatment.

That is why we only use products of the highest quality. For us, there is no compromise when it comes to your health.

### Did you know?

The implants we use are certified and awarded by the Clean Implant Foundation for a particularly pure and clean surface.

So you have every reason to look forward to your metal-free restoration with ceramic implants.

Never lose sight of the goal of optimal health and quality of life, which is always our focus.

We look forward to welcoming you for treatment at the practice clinic,

Your team of dental medical doctors, Praxisklinik Ganzheitliche ZahnMedizin, Munich

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