

Ceramic implants account for 50% of implants we use

An interview with Prof. Michael Gahlert & Dr Stefan Röhling, Germany



Dr Stefan Röhling (left) and Prof. Michael Gahlert are experts in two-piece ceramic implants.

Experts in the field of two-piece ceramic implants, Prof. Michael Gahlert and Dr Stefan Röhling together run an oral surgery practice in Munich. In this interview with **ceramic implants**, they discuss the advantages of ceramic implants and provide a scientific update on the topic. In addition, the implantologists, being pioneers in the field of modern ceramic implants, share their experience of zirconia implants and consider the significance for clinicians of the statement by the European Society for Ceramic Implantology on the clinical application of two-piece zirconia implants and what the future holds for ceramic implantology.

Dr Röhling, together with Prof. Gahlert and other colleagues, you received the 2020 André Schroeder Prize for Preclinical Research for your study titled “Ligature-induced peri-implant bone loss around

loaded zirconia and titanium implants”. What exactly did you investigate in that research?

Dr Röhling: In this experimental study, we investigated for the very first time the occurrence and onset of ligature-induced peri-implantitis around ceramic implants in direct comparison with titanium implants. In the joint project with Prof. David Cochran of the University of Texas Health Science Center at San Antonio School of Dentistry in the US, we were able to show that during active and spontaneous progression of inflammation there was significantly less bone loss around ceramic implants than around titanium implants.

There is clinical evidence that ceramic implants offer superior biocompatibility. Does this have an impact on the lower tendency to develop peri-implantitis?

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Dr Röhling: The development of peri-implantitis depends on multiple factors. However, the accumulation of bacteria on the implant surface in the form of biofilm can clearly be observed to be one of the main causes of the development of peri-implant inflammation. This formation of biofilm depends not only on the physical (surface roughness) and chemical (surface energy and surface tension) properties of the surface but also on the type of biomaterial used (titanium versus ceramic). Scientific studies have shown that less biofilm accumulates on ceramic than on titanium for implants with similar surface

“There is now sufficient scientific data to support reliable clinical use of ceramic implants of zirconia.”

topography. The results of our experimental study are even more concrete. Based on the currently available data, it can certainly be assumed that the biocompatibility has an impact on the development of peri-implantitis. However, whether ceramic implants truly have a lower tendency to develop peri-implant infections over the long term is very difficult to say based on the current data. The research data obtained to date is very promising nonetheless.

Prof. Gahlert, you are currently working on a retrospective follow-up study of Zeramex two-piece ceramic implants. Do you already have initial results to share?

Prof. Gahlert: We conducted a retrospective follow-up examination of 21 patients with one of our doctoral students and the University of Basel. This involved re-examination of 36 two-piece ceramic implants of the type Zeramex XT. In addition to measuring clinical parameters, the study considered abutment-implant connection by means of a carbon screw, which did not lead to complaints in any of the cases we re-examined. The average loading phase of the ceramic implants was 2.1 years, and the survival and success rates were the same as for comparable and established titanium implants.

Of the implants placed in your practice, what percentage are ceramic implants?

Prof. Gahlert: Looking back at the last ten years, the proportion of ceramic implants placed at our practice has risen continuously alongside the use of titanium implants. Today, especially at our practice, I would put the share of ordinary ceramic implants at 50%.

There are hardly any one-piece titanium implants. What role do one-piece ceramic implants play in clinical practice?

Dr Röhling: One-piece ceramic implants are definitely a niche product that is only routinely used by a few practitioners. Many clinicians are sceptical about the surgical and prosthetic handling as well as the fact that the superstructures can only be cemented. The two-piece ceramic implant designs are closer to what the majority of dental surgeons would like to use, since the clinical handling is comparable with that of titanium implants. At our practice, however, one-piece ceramic implants are an important factor in everyday clinical work because excellent results can be achieved with regard to the red-white aesthetics, especially in the aesthetically critical area of the anterior teeth.

In which cases do you prefer two-piece, screw-retained ceramic implants?

Prof. Gahlert: For larger prosthetic restorations, the two-piece implants offer greater prosthetic flexibility. Plus, as implantologists, we prefer it when the implants heal subgingivally or epigingivally because this poses a lower risk of early or improper loading caused by projecting implant stumps. This problem remains with one-piece implants, especially if patients wear removable temporary dentures during the healing phase.

The current trend in titanium implants is bone-level design. Does this also apply to ceramic implants?

Dr Röhling: Looking at the international market for titanium implants, we see more bone-level designs in use than tissue-level designs. This development can definitely be attributed to increased prosthetic flexibility. To further establish ceramic implants on the market and make them of interest to more clinicians, it is absolutely essential for reversible, screw-retained, two-piece bone-level ceramic implant designs to be available to permit the creation of individual abutments. The discussion surrounding bone-level versus tissue-level designs, however, should not be limited to the factor of prosthetic flexibility. The underlying biological principles should be considered as well. This makes it clear that there certainly still are justifications for a tissue-level design in regular clinical practice today.

Is the interest in ceramic implants reflected in your patients?

Prof. Gahlert: We are repeatedly amazed at the range of information which new patients looking for implant restoration have when they arrive at our practice. The Internet has a wealth of information to offer on this topic. Many patients also come because ceramic implants have now opened up new options for them that would not be achievable with titanium from the patient's perspective.

Not all dentists use ceramic implants yet. What do you think keeps them from doing so?

Dr Röhling: Unfortunately, many practitioners still don't trust the products that are available. This can be attributed to a lack of knowledge and marketing communication deficits with regard to the material properties and reliability. Another factor is prejudice against ceramic implants. Negative reports from the past involving ceramic implants of alumina often play a role here. However, it must be considered that modern ceramic implants are made of zirconia and have significantly better biomechanical properties than ceramic implants of alumina, which have not been available on the market since the mid-1990s. This makes such prejudices outdated: there is now sufficient scientific data to support reliable clinical use of ceramic implants of zirconia.

What would you advise your peers working in private practice with regard to the advantages of ceramic implants?

Dr Röhling: Ceramic implants expand the treatment spectrum of a practice and offer patients a dependable alternative to titanium. This fact is all the more important given that the demand for ceramic implants by patients has continued to increase. In a study conducted by our research group, we showed that tooth-coloured ceramic implants are more attractive to patients than are grey implants of titanium. In addition, ceramic

implants offer advantages for challenging aesthetic indications and compromised soft-tissue conditions. In many clinical cases over the last decade, we have observed a rapid and stable adaptation of the peri-implant mucosa without irritation.

Are there any specific cases in which you prefer ceramic implants, such as for anterior teeth?

Prof. Gahlert: In addition to the highly aesthetic restoration options of ceramic implants in the maxillary anterior area, as a periodontist I am particularly drawn to using ceramic implants in patients with past periodontal disease resulting from genetic causes. Because ceramic implants have lower bacterial affinity than do titanium implants, they are my first choice for tooth replacement in these special cases.

How do you see the future of ceramic implants compared with titanium implants?

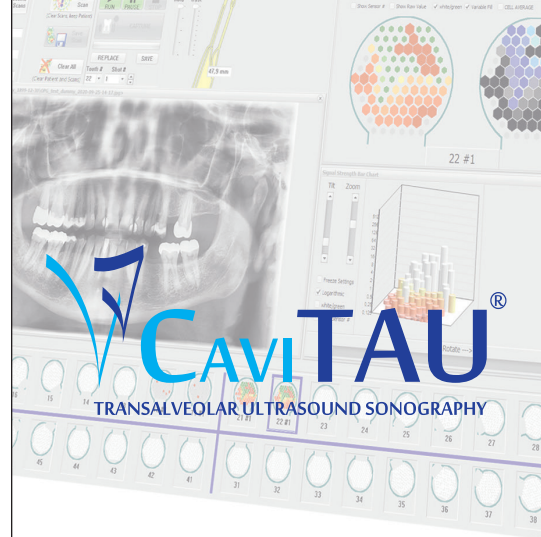
Prof. Gahlert: One of the most important aspects will be greater recognition of ceramic implants than is currently the case. Although a robust movement in favour of ceramic implants is taking shape around the world, there are still too many gaps in the data. My prediction is that in five years, after scientific confirmation of ten years of serious long-term data from a variety of study groups and continued positive clinical performance, ceramic implants will have found a permanent place alongside titanium ones.



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