Also, the surgical results are not always stable in the long term, since the augmentation materials used have not proven as stable in terms of absorption kinetics as we had initially assumed.

In addition to the material aspects, are there any patient-specific factors that favour the occurrence of peri-implantitis?

The microbiological load is certainly the main problem that results in manifest peri-implantitis. Inflammation can only occur if the physiological oral environment is off balance. In a periodontally compromised dentition, the microbiological load is higher than in a healthy oral environment. Combined with an implant material frequently associated with peri-implantitis, unstable augmentation materials or an inadequate surgical technique, this may favour the occurrence of peri-implantitis.

But here it becomes evident once again that there is no single causative factor for the occurrence of peri-implant inflammation. Immunological aspects have been discussed, but their mechanism has not been clearly demonstrated.

What about the diagnosis of peri-implantitis and, hence, its prognosis?

Ideally, peri-implantitis or the risk of peri-implantitis should be detected before any clinical signs appear. Here, methods of genetic analysis have increasingly been used over the past few years to identify and treat peri-implantitis in its initial stage. This implies that a sample of the peri-implant tissue fluid is taken and then tested for destructive markers using a PCR (polymerase chain reaction) method.

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So is the risk of peri-implantitis exclusively a matter of genetic predisposition?

Our genes certainly have an influence on the preservation of implants. But we still know rela-
tively little about this today, since most cases of peri-implantitis are not treated until well past the initial mucositis stage and a significant bone loss has been diagnosed clinically or radiologically.

**Does this mean that relatively early mucositis treatment may prevent the progression of the disease?**

As already called for in the initial clinical studies, a close recall appointment scheme should be a part of any high-quality implant treatment so as to detect any destructive parameters at an early stage and so that a timely intervention becomes possible.

**Must an antibiotic be given as soon as inflammation is present with slight peri-implant bleeding?**

Antibiotic therapy is the treatment of choice to save patients’ lives in connection with many life-threatening inflammatory diseases. However, recent years have shown more and more antibiotic resistance, which increasingly restricts the options for providing antibiotic therapy for internal diseases. Therefore, as recommended not least in periodontology and implantology, low-dose antibiotic therapy should be avoided if possible, due to the increased risk of sensitization or resistance.

Various methods of physico-chemical disinfection have been established in recent years. But these alternative methods are not recognized by conventional medicine and therefore not covered by dental insurance; this despite the fact that there have been numerous studies demonstrating the effectiveness of individual methods. However, it is important to remember that the market of adjuvant methods is full of offerings without any clinical-scientific evaluation – not every method has been duly tested. Private health insurers now reimburse patients for selected procedures with well-defined application parameters, because they are less costly than local antibiotic therapies and at the same time more effective.

**What if it is already too late and a pronounced bone defect has formed?**

What can and needs to be done would have to be discussed with the patient, depending on the situation. Exploration is certainly always the easiest method to eliminate peri-implantitis. But for the patient this means the loss of the retaining or supporting elements, maybe “just” a single-tooth implant but possibly even the abutments for a complete denture. Depending on the type of resulting defect, extensive augmentation may then be necessary for a new implant-supported rehabilitation. Since not all patients will be willing to go that route, different strategies for eliminating the inflammation have again been propagated. As only limited long-term results for these therapies are available today, the industry recommends all kinds of different materials. However, it is becoming apparent that autologous bone still has higher success rates than synthetic materials.

**What should the dentist do if the patient experiences peri-implantitis?**

Honesty is always the best and most successful approach. The sooner the patient is told that a complication has occurred in relation to an implant, the earlier can it be treated. And the more timely and the more targeted the therapy commences – even if it requires a somewhat strenuous surgical intervention – the greater the probability that a stable long-term result will be achieved.

*Dr Neugebauer, thank you very much for your highly informative answers.*