17th BDIZ EDI Expert Symposium: Risk factor periodontal diseases

Covering a wide field

The classic question – to preserve or to implant? – has been driving dentistry for many years. The topic of the 17th Expert Symposium, "Periodontal disease as a risk factor – tooth preservation or implantology?" not only provided interdisciplinary answers to many open questions but also presented new approaches worth discussing. The symposium – live in Cologne again after the Coronavirus hiatus – was moderated by Prof. Joachim E. Zöller.

Periodontal rehabilitation with All-on-4 – Prof. Dr Jörg Neugebauer

Prof. Dr Jörg Neugebauer, Secretary General of BDIZ EDI, delivered the presentation (originally to be held by Dr Wolfgang Bolz, who could not attend owing to illness) on periodontal restoration with All-on-4: edentulism as an opportunity or a risk. The presenter certainly had more than ample experience to highlight the issue, given the several hundred cases treated with this concept at his Landsberg practice that used all common implant systems, provided the appropriate abutments had been inserted. Prof. Neugebauer addressed the topic of how this prosthetic concept performed in periodontally damaged dentitions – How much surgery? How many implants? – by citing several of his own cases. He also took up the question of whether to provide fixed or removable restorations, referring to the 2016 Guideline of the 11th European Consensus Conference of BDIZ EDI that makes recommendations on restorations with short, angulated and reduced-diameter implants. Provided that the specific treatment parameters are observed, this minimally invasive implant approach can be a reliable treatment option in sites with reduced bone volume given the risks associated with the use of standard-dimension implants in combination with augmentation procedures. The All-on-4 and All-on-6 concepts now facilitate fixed restorations on a reduced number of implants. This has the advantage that patients now have to perform oral hygiene for only three interdental spaces instead of ten or twelve. In Neugebauer's view, the following factors are important for all periodontal restorations with All-on-4: the reduction of periodontal risk factors; a standardised procedure that provides stable long-term results; patient motivation and guidance; and an active network consisting of the oral surgeon, the prosthodontist, and the dental hygienist.

Minimally invasive implant treatment for partially edentulous perio patients – Prof. Dr Stefan Fickl

Prof. Dr Stefan Fickl (Würzburg) discussed the interface between periodontology and implantology. Does minimally invasive implant treatment make sense at all in perio patients? Fickl, himself both a periodontist and an implantologist, answered this question in great detail. While implants are a well-documented method for restoring the dentitions of partially edentulous patients, he said, it is known that patients who had lost teeth to periodontitis are at greater risk for implant loss or inflammation around implants. "As clinicians, we very often find ourselves in a position where we have to weigh alternatives, because many of the teeth that are lost these days are lost to severe periodontitis," said Fickl. "We have to decide: are implants feasible in these situations or might conventional prosthetic concepts be preferable?" In partial support of his view, he cited data from a Swedish study by Karlsson et al., who had followed 598 implant patients over 9 years and found that 42% of them had experienced complications. The risk is 1.6 times higher in periodontitis patients, and up to four times higher in partial-arch and full-arch patients. For Fickl himself, one insight had emerged in recent years: "With a high-risk patient, try to be as conservative as possible, try to delay implants – because you are bound to face problems!" – Having presented several additional studies that supported the risk of implantation in periodontitis patients and shared some of his implant cases, Fickl proffered these take-home messages: Biological complications are common in perio patients. Tooth preservation should be preferred where possible. Strict requirements for implant dentistry must be carefully considered. If implants are to be placed, they should be small fixtures with sufficient bone and soft-tissue support, and the implant system chosen also plays a crucial role.

Recession coverage on implants – Prof. Dr Dr Anton Sculean, MS

Prof. Dr Dr Anton Sculean (Bern), attending remotely, talked about options and limitations when covering implant recessions. Citing the differences in biological anchorage between natural teeth and implants, he explained that implants are in direct contact with the bone and that the soft tissue surrounding them is less vascularised than that around teeth, which has to be taken account in soft-tissue surgery. According to Sculean, there are two components to the mucosal seal – connective-tissue integration and the epithelial layer. The former in particular is of major importance if infections arise in this area. Aetiological factors of any soft-tissue recession at implants primarily include incorrect implant placement – too far buccally or labially or, conversely, too far palatally or lingually. Other aetiological factors include the absence of a bony envelope and excessive implant diameters relative to the existing bone supply; an excessive number of implants; insufficient distance between implants, causing the loss of the interimplant papilla; insufficient distance between implants and natural teeth; insufficient mucosal thickness or insufficient attached keratinized mucosa; and, of course, peri-implant mucositis and peri-implantitis. The only appropriate comment if implants are placed too far outside the bony envelope, said Sculean, would be "Mission Impossible" – here the only possible action would be to remove the implant or implants altogether. – What kind of tissue recession, then, remains amenable to coverage around implants? Sculean believes that successful treatment is possible if the dehiscence is no deeper than 2–3 mm, 4 mm at the very most, or if the implant is reasonably firmly positioned within the bony envelope. He then proceeded to present some of his cases using the modified (MCAT) and lateral (LCT) tunnelling techniques. The idea, he said, is not to separate the papillae but to expose this area as part of a mucoperiosteal tunnelling procedure, so that new tissue – such as a connective-tissue graft – can be introduced to reinforce the tissue. The important thing here is tension-free preparation. – For Sculean, tunnelling techniques are a good option for addressing small mucosal defects, as long as the implant is not too far outside the bony envelope, as pointed out previously.

Fig. 1: BDIZ EDI President Christian Berger welcoming the audience. **Fig. 2:** Prof. Joachim Zöller hosting and moderating the 17th Expert Symposium.

Prevention of peri-implant inflammation – Prof. Dr Johannes Einwag

Prof. Dr Johannes Einwag (Stuttgart) reminded his audience that caries, gingivitis and periodontitis are all biofilm-induced diseases. Each bacterium has its ecological niche, and the oral cavity is an ecosystem of its own: "We need to think in biological terms." Einwag believes that a biological equilibrium between the biofilm attack and the immune defence would make sense. Unfortunately, our limited knowledge hampers the possibilities of targeted immune-defence strengthening. What nevertheless remains possible is clear to him: "We must focus on prophylaxis and, hence, on efficient biofilm management. Either strengthen the defences or reduce the attack! In other words: the biofilm must be removed before it becomes pathogenic." – But does periodontitis prophylaxis also apply to implants? Not until 2010 – at a time when implantology was certainly no longer in its infancy – did periodontists discover that yes, peri-implant disease is in fact also biofilm-induced. Einwag deplored the fact that "we have been placing implants for 40 years, yet we had no standard protocol until 2012, or even 2018!" It has now been established that the formation of biofilm on implant surfaces is different from biofilm formation on tooth root surfaces, being intensified by rough implant surfaces. The problem with establishing the prevalence of peri-implantitis, he said, is that there was not even any clear definition until 2018 or 2019. The risk of peri-implantitis in perio patients is elevated by a factor of 5.5 (Schwarz et al., 2021). While the inflammatory reaction does not differ between gingivitis and mucositis (7th European Workshop on Periodontology 2010), given that the sulcus and the marginal epithelium are the same, the situation is completely different for periodontitis vs peri-implantitis, according to Einwag. In periodontitis, the body's own defence mechanisms are triggered via the supporting periodontal tissue, which is absent in peri-implant inflammation. Mechanical biofilm management makes sense if disease can be prevented already at the mucositis stage. Therefore, timely professional tooth cleaning is advisable, rather than waiting until it is time for supportive periodontal therapy. – While Einwag believes that it is advisable to adopt the successful prophylaxis strategies established for natural teeth, he thinks that modifications in detail are required, from interdental space cleaning to using the air/powder/water jet.

Nutritional counselling in the dental setting – Dr Maximilian Gärtner

How does nutrition affect inflammatory reactions? Dr Maximilian Gärtner (Freiburg/Breisgau), a dentist and nutritionist, noted that dietary patterns are considered the greatest risk factor for non-communicable diseases such as diabetes and cardiovascular disease/stroke – ahead of smoking and physical inactivity. As with periodontitis, these are ultimately chronic inflammatory diseases. Gärtner mentioned an overwhelming number of studies looking at the impact of nutrition. All those studies showed that simple carbohydrates – sugars, but also starches – increase oxidative stress. And Germans tend to eat a very starchy diet. Gärtner also examined periodontal parameters. Carbohydrates in particular promote the formation of plaque and the onset and further course of gingivitis, while fats, proteins, fibres, trace elements and antioxidants have the opposite effect. Gärtner's doctoral thesis focused on the effects of a diet optimised for oral health on oral and systemic inflammatory parameters in 30 subjects. The experimental and the control groups both initially had the same plaque values and performed no interdental hygiene. While the control group ate a diet high in carbohydrates, the experimental group ate a diet higher in fibre with nuts, raw vegetables, and vegetables from week 2 (of 8 in total). After 8 weeks, the experimental group showed a shift in macronutrients (protein, carbohydrates, fats) towards less carbohydrates and instead ate more fat and protein, which resulted in a 30% reduction in caloric intake and a significant increase in micronutrients such as vitamin E, K, B6, C, folic acid, and magnesium, and a reduction in salt intake by 70%. There was a 40% reduction in gingivitis in the experimental group, with the control group also achieving a reduction of 20%. To compare with conventional therapy, flossing has no benefit (Bercher et al., 2008), interdental brushing succeeded in reducing gingivitis by 34% (Poktepovic et al., 2013), and the optimal prevention approach shows a 50% improvement (Huguson et al., 2007). The latter study addressed the plaque index, yielding a reduction of 60–80%. "We did not even a 20% plaque reduction," Gärtner said. He therefore questions the "milestone" study by Löe and Theilade that states that if we did not brush our teeth for two weeks, we would get plaque and more inflammation. His dissertation reportedly even made it into the *New York Times*. – Gärtner pointed out that physicians could "prescribe" nutrition therapy. Through interdisciplinary collaboration, patients get a chance to make lasting changes to their diet, given expert support and sufficient time. "In this way, we as dentists – in addition to providing conventional perio therapy – can help our patients view their oral affliction as an opportunity to work on preventing other chronic inflammatory diseases." Gärtner is in contact with health insurers and the German Dental Association (BZÄK) to promote this new approach.

Conclusion

From periodontal rehabilitation to recession coverage and minimally invasive treatment, from prevention of peri-implant inflammation to nutrition as a new topic in the dental practice, the 17th Expert Symposium covered a lot of ground. This highly interesting continuing-education event truly succeeded in captivating its audience while addressing many new aspects of periodontal disease and its causes and treatments, with special reference to implantology.

The updated Cologne ABC Risk Score, as part of the presentation of the 17th Guideline of BDIZ EDI, can be found elsewhere in this issue.

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Preview:

The 18th Expert Symposium will again be held in Cologne, on 19 February 2023. Topic: Update short, diameter-reduced and angulated implants. For more information on the topic, programme and registration, visit the BDIZ EDI website at www.bdizedi.org.