Editorial

Dental Implants: Inserted and Loaded, But do not Forget to Follow-up

Dental implants have been a very popular alternative in the oral rehabilitation of tooth loss after the introduction of osseointegration.[1] Osseointegration and dental implants are one of the leading figures in implant dentistry to provide a wide range of projections on the treatment modality that has revolutionized modern dentistry. Dental implant therapy is now well established and provides excellent long-term results for different indications. Accordingly, dental implants may be the most favorable tooth replacement solution that our patients are looking for. The successful outcome of any implant procedure involves a series of patient-related and procedure-dependent parameters. One important factor for long-term success is the regular maintenance of the implants. Periodical evaluation of dental implant sites has great importance for considering long-term survival, success and complication rates. As early recognition of any peri-implant pathology, including peri-implant soft tissue inflammation is vital for long-term proper functioning of dental implants.

The development of simple and reliable diagnostic tools for early detection of initial peri-implant inflammatory processes and prevention of any irreversible host reactions, such as destructive peri-implant disease, may be of particular importance. For the evaluation/monitoring of endosseous implants, clinicians seem to use simultaneously a variety of the clinical, image-based and laboratory measurements, probably because of the fact that each of these measures is likely to provide important information regarding the complex series of events at the implant sites. However, currently no measure is suggested to be valid and sensitive for monitoring of peri-implant conditions at the desired level. Peri-implant clinical parameters (e.g. probing depths, extent of plaque accumulation, bleeding on probing, inflammatory status) and image-based measures (e.g. conventional radiographic examination, computerized tomography) are among the frequently applied parameters. Peri-implant clinical parameters, marginal bone levels around implants and implant stability measurements are noninvasive methods that can be used for routine periodical evaluations of dental implants. In recent years, the crestal bone level changes frequently observed at titanium implants exposed to the oral environment have become a topic of growing interest. A useful tool for evaluating dental implant success is the assessment of changes in crestal bone level over time. Another tool is implant stability that is determined by resonance frequency analysis (RFA) technique described by Meredith et al.[2] The most recent version of RFA is wireless, where a metal rod (a peg) is connected to the implant by means of a screw connection. The peg has a small magnet attached to its top, which is excited by magnetic pulses from a handheld computer. The results are presented as implant stability quotient (ISQ). The ISQ unit is based on the underlying resonance frequency and ranges from 1 (lowest stability) to 100 (highest stability). In addition to the evaluation of clinical measures, recent years, research has also focused on the features of the molecular mechanisms of the inflammatory process of peri-implant tissues. As confirmed by many studies, analysis of gingival crevicular fluid (GCF) samples is an accepted method for evaluation of the clinical periodontal status of the natural dentition and for a better understanding of the pathogenesis of periodontal diseases. Like GCF, there is increased interest in peri-implant sulcus fluid (PISF), an osmotically mediated transudate/inflammatory exudate around dental implants.[3] Volumetric features and ingredients of PISF are of particular interest to detect the early inflammatory status around dental implants. When endosseous implants are considered, emphasis needs to be placed on the PISF. Although PISF-related measures do not provide a means for the routine assessment of dental implants, this biologic fluid is believed to have a considerable amount of diagnostic potential; thus, some of the assessment parameters are the components of this biologic fluid. PISF is unique for us; because it gives information about what has started to happen at molecular level prior to the complication may take place. Analysis of various PISF components, e.g. flow rate, myeloperoxidase, nitric oxide, calprotectin, cathepsin-K levels and cross-linked N-terminal telopeptides, essentially aim to clarify the molecular mechanisms at dental implant sites. The nature and extent of the associations between various parameters showed particular patterns. Concerning the relationship of implant-related measures, the impact of the complex process of soft and hard tissue healing and bone remodeling and the involvement of numerous molecular mechanisms also need to be considered. Unlike teeth, implants cannot get tooth decay. However, they can suffer from gum problems and require good daily oral hygiene.

To discover the problem during a routine maintenance visit before that an implant has failed or is failing, further analysis of the potential associations among different peri-implant parameters, including PISF, may assist the clinician in choosing the most efficient parameters for a more efficient diagnosis and follow-up. The vision of periodontics has been the very early diagnosis of potential destructive period prior to its initial start by using a chairside test, which would be easy to use and objective to make a perfect diagnosis for the last three decades. Implant dentistry is in the same line with periodontal diagnostic studies regarding early diagnosis of peri-implant disease prior to its visualization at peri-apical radiology which will be difficult to treat. By timely detection of the possible disease status, the practitioner may have the opportunity to avoid the destructive period, make simple and cost-effective treatments and save the implant.[4]

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