Abstract

Periodontitis is the most significant oral disease worldwide. It is a chronic inflammatory disease caused by bacterial dysbiosis through pathogenic bacteria. If left untreated, periodontal diseases lead to the destruction of the periodontium and to the loss of bone, collagen and attachment up to the loss of teeth. Periodontitis is based on the spreading of pathogenic bacteria on a biofilm that is spread as plaque on the teeth. Biofilm is the accumulation of bacterial families that stabilize each other on surfaces or interfaces.

Periodontitis occurs in two forms. One distinguishes between chronic and aggressive periodontitis. Chronic periodontitis is caused by plaque-induced inflammation of the periodontium. It is characterized by a progressive loss of supporting tissue. Usually, it develops from an untreated gingivitis and occurs mainly in adults. Aggressive periodontitis is characterized by rapid progression of severe periodontal destruction and rapidly progressing attachment loss. It occurs mainly in childhood and adolescence.

There are four stages of periodontitis. They range from the healthy periodont (stage 1) to periodontal root destruction (stage 2 and 3) to severe and complex periodontitis involving tooth loss of more than five teeth (stage 4).

However, the presence of periodontal pathogenic bacteria is not sufficient to trigger periodontitis. Other additional factors, such as genetic or environmental factors, that influence the interactions between the bacterial metabolism and the host's immunological responses, e.g. the presence of diabetes mellitus or other autoimmune diseases, as well as rheumatologic diseases as well as stress or smoking can significantly contribute to the pathogenesis of periodontitis.

In contrast to periodontitis, peri-implantitis is not triggered by periodontal pathogenic bacteria. It is characterized by an inflammatory process seen by redness or swelling of the surrounding tissue of an intra-bony implant, decreased osseointegration, increased pocket formation and mucoparulence.

The treatment of periodontitis and peri-implantitis is periodontal surgery. New regenerative techniques aim to regain periodontal structures, including the regeneration of the periodont, the desmodont and the alveolar bone. In gingival recessions, furcation involvement and intra-bony defects, regenerative materials such as bone graft substitutes, controlled tissue regeneration barriers such as membranes or enamel matrix proteins are in use.