

## Abstract

According to the fifth „Mundgesundheitsstudie“ which was undertaken in Germany, periodontitis is a disease which is still frequently represented in our population and which will even increase due to the fact that people are getting older than in the past.

Periodontopathogenic bacteria are able to trigger an inflammatory process which can lead to a loss of periodontal structures and in a final stage to a loss of one or more teeth.

With a non-surgical approach we want to get rid of the biofilm and calculus which is causing the periodontal disease. We want to establish a microbial flora which does not lead to an immune response and consequently to a destruction of periodontal tissue by the host.

Which are nowadays the methods used in non-surgical periodontal therapy to eliminate the biofilm and mineralized bacterial plaque effectively while being gentle to the tooth surface?

In fact hand instruments still represent the goldstandard in the nonoperative periodontal treatment. In the meantime sonic and ultrasonic instruments have been added to perform the mechanical debridement. They achieve the same goals such as a reduction of the pocket depth, attachment gain and a reduction of bleeding on probing while being equally effective than hand scalers and curettes. Nonetheless, whether with hand instruments nor with sonic or ultrasonic scalers we are able to completely remove all the deposits of calculus and plaque on the root surface. Are laser therefore maybe a good alternative in order to get rid of all the mineralized bacterial plaque on the root surface?

Studies have shown that the single use of the Erbium YAG laser provides equal effectiveness than the debridement with ultrasonic, sonic or hand instrumentation. The use of the Er:YAG laser in the periodontal therapy also leads to improved clinical parameters and even shows antibacterial effects. Nevertheless, no superiority can be claimed for the single use of the Er:YAG laser compared to the conventional methods used in the antiinfectious mechanical therapy.

All the other existing lasers like the CO<sub>2</sub> laser, the diode laser or the Nd:YAG laser can only be used adjunctive to the conventional methods. Those lasers cannot be used as an alternative method because whether they are not able of removing the mineralized bacterial plaque nor are they capable of preventing heat damage to the tooth surface. Moreover the application of gels or mouth rinsing solutions into the pocket, the use of antibiotics or probiotics as well as the photodynamic therapy can only be used additionally to the conventional scaling and root planing because they are not capable of eliminating periodontitis effectively when they are used alone.

Therefore more long-term studies need to be accomplished in order to achieve more evidence between the different treatment options. Furthermore, research should be done that one day, one can fight more effectively against periodontitis or that periodontitis even may be

completely eradicated. One prospectus could be to evaluate new methods which may prevent the biofilm to be build or to install a microbial flora in the oral cavity which inhibits the periodontopathogenic bacteria to settle down and to provoke an immune response and consequently a periodontal breakdown. We need to await further developments in order to see if one day periodontitis can be completely eradicated.