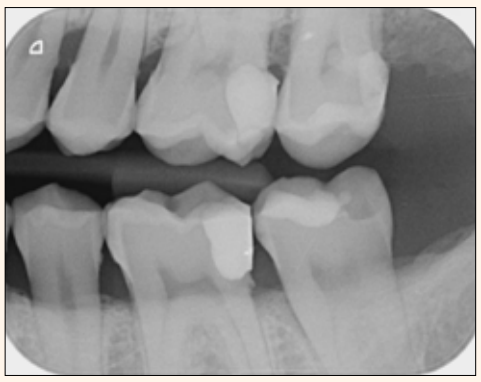
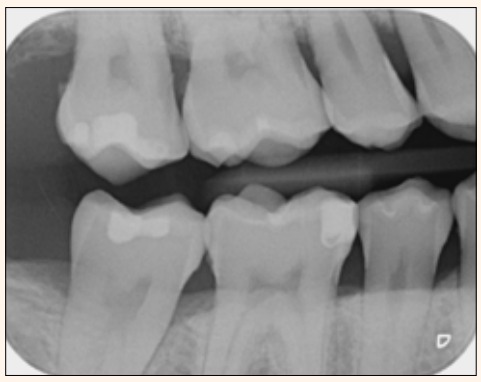
Great results in treating periodontitis using the SiroLaser Blue

By Dr Michael Krech, Germany

Periodontitis, an inflammatory disease affecting the tissues supporting the teeth, is triggered by bacterial biofilms on root surfaces and/or mineralized deposits in gingival pockets. Treatment thus focuses primarily on removing periopathogenic bacteria, generally mechanically by cleaning the teeth and gingival pockets. Dr. Michael Krech, a dentist from Marburg, presents a case history to describe how the additional use of a laser can prove advantageous when pocket depths are greater.



Left bitewing



Right bitewing

Orthopantomogram

In most cases, periodontitis becomes a chronic disease that damages the tissues supporting the teeth. The inflammatory reactions by the immune system are triggered by bacteria. Depending on the kind of periodontitis, various species of bacteria can be found in the inflamed areas. In chronic periodontitis, for example, Aggregatibacter actinomycetemcomitans, Porphyromonas gingivalis, and Prevotella intermedia can be found. In acute periodontitis, Fusobacterium nucleatum and Capnocytophaga are also present. Porphyromonas bacteria in particular are responsible for severe damage. They prevent certain defense cells (neutrophil granulocytes) from functioning. Aggregatibacter species that can penetrate the soft tissue are also significant.

Case history

The treatment of a patient with periodontitis is described below, where the SiroLaser Blue (Dentsply Sirona, Bensheim) was also used in addition to classic periodontitis treatment, scaling & root planing.

The patient (male, 36 years old) came to our practice in September 2017 for a check-up and tooth cleaning. The periodontal screening index (PSI) was carried out at this time. Periopathogenic bacteria were identified in all four quadrants. A gradual deterioration of the PSI was seen over time. The patient had had no previous periodontal treatment.

The patient's medical history was unremarkable; he was healthy, a non-smoker, and reported an occasional metallic taste in his mouth. The dentition showed no sign of caries, there were composite fillings in teeth 37, 36, 26, 17, 46, 47, 25, and 21.

The X-ray showed plaques in the approximal areas (API 45%) and periodontal anomalies in the upper jaw. The periodontal diagnosis showed generalized horizontal bone loss with a bleeding index of more than half the measured gingival pockets (52%). However, there was no indication of aggressive periodontitis.

The patient's teeth were cleaned at this appointment and he was given detailed oral hygiene instructions. We took this opportunity to take a saliva sample to determine the bacteria present. The analysis indicated an increased bacterial load, such as increased levels of "green" streptococci. They can destroy erythrocytes (red blood cells) by breaking down the hemoglobin, resulting in greenish products.

Periodontal pre-treatment was carried out, the teeth were dyed again, and oral hygiene was checked. The patient showed good compliance and the API had dropped to below 20%. Two appointments were made two weeks later for the actual periodontal treatment; subgingival cleaning and root planing were performed under local anesthesia (appointment 1: right quadrants, appointment 2: left quadrants). At the follow-up one week later, all the gingival pockets with a probing depth of > 5.5 mm were also irradiated with the SiroLaser Blue using the continuous wave mode (blue light, wavelength 445 nm at 0.6 W) for 10 seconds on each root surface affected by periodontitis. Simultaneous use during subgingival cleaning is contraindicated if there is heavy bleeding as the blood coagulates during treatment and hampers the energy input for killing the bacteria.

At the periodontal follow-up appointment two weeks later, the patient reported irritated gingiva due to the treatment for one or two days after therapy; however, he soon experienced rapid improvement. The patient's oral hygiene was considerably improved. The gingiva was a light shade of pink and unremarkable; the number of bleeding points upon probing was halved. The result of a second bacteria test confirmed the visual and intraoral healing process – none of the bacteria detected exceeded a critical limit. The patient had a positive attitude and was highly motivated to maintain this result through appropriate oral hygiene.

A recall interval of 3 months was agreed (supportive periodontal therapy) Good oral hygiene practices were evident at the first appointment – the API was 16% and the BOP 15%. The periodontal status indicated considerably reduced pocket depths. The patient reported that the metallic taste was gone.

Discussion

Successful treatment of periodontitis can be ensured only with the patient's cooperation. With suitable treatment in the dental practice and good compliance on the part of the patient, periodontitis can be virtually healed.

Experience from my practice has shown that instrumental treatment can be effectively supported with laser therapy. In this case, it was important to wait after instrumentation before use of the 445 nm laser due to the bleeding seen following subgingival instrumentation.

I am currently involved in a study under the supervision of Prof. Dr. Andreas Braun (University of Marburg) to examine the effect of the SiroLaser Blue on periodontitis treatment, the results of which will be published. Of the five patients examined and treated in my practice thus far, three have reported a rapid improvement of symptoms in the quadrants treated with laser. The laser may also have a positive effect on wound healing. The laser contributes significantly to reducing bacteria. Bacteria tests at different times suggest that the laser makes an important contribution to reducing the amount of periopathogenic bacteria. DT