Dr. Clemens Walter & Dr. Beate Mohr Switzerland

The primary goal of periodontal-therapeutic methods is to introduce a need-oriented individual oral hygiene and to enable and maintain perfect supra-gingival plaque control. After systematic sub-gingival instrumentation of the diseased periodontium, regular mechanical removal of the sub-gingival biofilm by a dentist or a dental hygienist is required. This combination is considered the ‘gold standard’ in periodontal treatment and with consistent application can maintain periodontal health over several decades.

A basic condition for the formation and progression of periodontal disease is an opportunistic infection that is mostly poly-microbial with pathogenic micro-organisms of the oral biofilm. Biofilm is an organised microbial accumulation on a humid surface (Fig. 1). This multi-layered structure protects bacteria from the immune system of their host and from anti-microbial agents, such as local and systemic antibiotics.

No scientifically proven alternatives to the mechanical removal of oral biofilm have been found to date. The organised bacteria do not only operate directly. Damage to the periodontium is inflicted, without bacterial invasion, in the corresponding compartments of the periodontal apparatus through the host’s immune reaction to the bacterial stimulus.

The progression of the disease, which varies from individual to individual, is determined by genetic, acquired and partly-modifiable risk factors.

During initial sub-gingival instrumentation, all concretions and calculi should be removed as far as possible. Supportive periodontal therapy (SPT) of the periodontium entails removal of the biofilm. Accordingly, minimally invasive and patient-friendly procedures like biofilm management are favoured in SPT (Fig. 3).

Air-abrasive polishers in periodontal therapy

In recent years, scientific interest has centred around the development of air-abrasive polishers for supra- and sub-gingival application. These systems use a mixture of an abrasive powder and water blasted onto the surface of the tooth. Application angles vary depending on the type of unit.

Initial variants using sodium bicarbonate or aluminium oxide powder were not approved for sub-gingival instrumentation. The application of sodium bicarbonate with a grain size of 250 µm resulted in massive dentine and cementum damage. In addition, trauma of the gingiva was observed.

The high degree of abrasiveness of these materials required the development of
Micro Lamination Technique

Simple and fast technique producing a strong and aesthetic fluoride-releasing restoration

Micro Lamination restorations blend brawn and beauty in perfection

For more information on how Micro Lamination technique can help to optimise your Fuji IX GP EXTRA restorations please log on to http://www.gcasia.info/mlt.pdf

OR visit us at our booth, O11-O18 during FDI Singapore 2009!!!
new air-powder polishers, especially for sub-gingival application in periodontal therapy. The development of new air polishers focused on the reduction of the grain size and sub-gingival application through a special attachment.

The new generation of air-abrasive polishers

The recently launched glycerine-based powder Air-Flow Powder Perio (EMS, Switzerland) with a grain size of approximately 25 µm (d 50) allows sub-gingival instrumentation without damage to the cementum or gingiva. The powder-air mixture and rinse water are introduced sub-gingivally with a fine, flexible attachment. The triple-injector system causes spinning at the application site, which extends the effective range (Fig. 4). A follow-up polishing of the instrumented surfaces with rubber cups is often unnecessary, owing to this powder’s reduced abrasiveness. The nozzle is for single use only.

Options for supra-gingival and sub-gingival application have been combined into one single device (Air-Flow Master, EMS, Fig. 5). Based on indication and the required abrasion, users can select various powder grain sizes:

- A Sodium bicarbonate-based powder (Air-Flow Powder Classic) with a grain size of approximately 65 µm (d 50) and rounded particles with a smooth surface is recommended for the supragingival removal of stains as well as before bleaching fissure sealing sessions.
- A glycerine-based powder (Air-Flow Powder Soft) with a grain size of approximately 65 µm (d 50) is recommended by the manufacturer for supra-gingival cleaning and in cases of difficult access due to an orthodontic appliance.

Evidence and first personal experiences

A recently published clinical study has shown promising results regarding the efficiency of Air-Flow applications containing glycine in SPT. According to the results, gentle and quick removal of the sub-gingival biofilm is possible up to a pocket depth of 4 mm. Significant irritation of the marginal gingiva was not observed. Surprisingly, patients found the instrumentation using air abrasion a more pleasant experience than instrumentation using traditional methods.

The first clinical experiences in Basel confirmed a high acceptance rate amongst patients. The procedure with minimally abrasive glycine powder is especially recommended for patients diagnosed with periodontitis with minor dental calculus formation. Closed or open peri-implantitis therapy is a further indication for treatment (Fig. 6).

Before treatment, the patient should be protected with safety glasses, protective attire and a sufficient layer of Vaseline on the lips. A prudent suction of the aerosols by the dental assistant further protects the patient and facilitates treatment. Access to higher pocket depths is critical and could be improved with the introduction of a more gracile and rigid nozzle.

To summarise, it can concluded that at present minimally abrasive powder-air mixtures are a good alternative for SPT, owing to their low damage potential for periodontal tissue and high patient acceptance rate.

This article first appeared in Dental Tribune Switzerland No. 11, Vol. 6, 2008. Translation was provided by Annemarie Fischer, Germany.

Dr Clemens Walter is assistant medical director of the Clinic for Periodontology, Endodontology and Cariology at the University of Basel in Switzerland. He can be contacted at clemens.walter@unibas.ch.