

LM-ProPower

applies the latest research findings and technologies for the periodontal treatment

LM

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difference

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*The LM-ProPower device is
an ultrasonic and polisher
combined in one casing.*

Ultrasonic Dimension

The mechanical dispersion and removal of the supra and subgingival biofilm has a central role in the anti-infective periodontal basic care, as well as in the follow-up of the periodontal treatment. For cleaning of tooth surfaces, there is a very wide variety of hand instruments and equipment that produce ultrasonic and sound frequency vibrations to the instrument tip. Studies show that the clinical results from devices vibrating at the sound frequency and ultrasonic frequency do not differ significantly from each other and from the clinical results of hand-held instruments (Drisco et al., 2000). When choosing devices, however, it is good to know that the devices vibrating at the ultra-frequency cause less damage to the dental tissues than devices vibrating at the sound frequency (Drisco et al., 2000).



Several different types of thin and slender instrument tips, especially designed for subgingival periodontal work can be attached to the LM-ProPower ultrasonic handpiece. The thin and slender tips have a better penetration depth on subgingival tooth surfaces than the penetration depth of hand instruments (Drisco et al., 2000). Barendregt et al., (2008) reported in his study that the tips of the ultrasonic device for subgingival use enter deeper into the pockets of parodontitis patients than a hand instrument or a periodontal probe used with standard force. The authors noted, however, that this is not of great significance to the final clinical result. When using a hand instrument on the other hand, it is not enough to reach the desired location on the tooth surface, but the instrument needs in addition to be activated by moving it. The use of an ultrasonic device is a good complement for hand instruments, particularly on narrow tooth surfaces and in furcations of multi-rooted teeth.

The tank volume of LM-ProPower is enough for treatment of one patient's dentition. If necessary, antiseptics such as chlorhexidine or polyvidone iodide can be used as the liquid instead of tap water, (note the patient's potential iodine allergy!). Furthermore, the device can be equipped with the LM-ProPower SteriKit sterile water system, if necessary.

Air polishing in periodontal treatment

Also air polishers can be used in periodontal treatment for the dispersion or mechanical removal of the biofilm from tooth surfaces. The polishers use small particles, usually either sodium bicarbonate (soda) or glycine, which effectively purify surfaces of teeth and fixed dental prostheses when blown by compressed air.

The polishers can cause considerable damage to the soft tissues and the tooth root surface, if the necessary caution is not applied (Jost-Brinkmann, 1998). The abrasive impact of the polisher's powder jet depends on the water and powder ratio, the distance between the nozzle and tooth, and the time the instrument is used per surface area. In the reported studies, a standardized thin powder jet was targeted perpendicularly to the tooth surface for 20 seconds. Such treatment can cause damage up to 160 µm in depth on the exposed dentin of the root surface. When working with a patient, the jet from the polisher's nozzle has to be kept in constant motion on tooth surfaces, and should not be directed straight towards the soft tissue. In the continued periodontal treatment, a five-second treatment of the tooth surface has been proven to be long enough to disperse and remove most of the subgingival biofilm (Flemmig et al., 2007). When using a polisher, it is recommended to protect the lingual mucous

membrane and the opening duct of the parotid salivary gland, for example by parotis sheets. Patients also experience that a thin layer of petroleum jelly spread to protect the lips as pleasant, because the lips then do not dry during the treatment. A local anaesthesia of the gingival margins makes the treatment still easier for the patient. It is also good to keep a finger or a mouth mirror behind the tooth to be cleaned, in order to prevent the powder jet from hitting through the teeth gaps directly onto the mucous of the tongue, lip, cheek or palate. Irritation to the mouth floor, soft palate and pharynx by the polisher jet should be especially avoided. Using efficient suction near the tooth to be treated effectively prevents undesired effects. The jet from the nozzle of the LM-ProPower polisher is significantly reduced and narrower compared with other devices. It is easy to target and to limit it to the desired area, while the soft tissue damage, as well as drifting of the powder dust outside the mouth, is also reduced. The LED light in the LM-ProPower handpiece improves the visibility in the working area and thereby simplifies the task.

Particles in the glycine cleaning powder are spherical shape, and its use has been proven to cause less damage to the tooth and gum tissue than the powder containing more angular sodium bicarbonate crystals. (Petersilka et al., 2003a, 2003b). Most damage to the soft tissue surrounding the

teeth was caused by using hand instruments. A recently published study showed that with the use of hand instruments or polisher - using either sodium bicarbonate or glycine particles - the lesions caused in the soft gum tissue improved within one week. After two weeks the histologic soft tissue samples no longer had any visible sign of tissue damage (Petersilka et al., 2008).

Studies show that a polisher can remove the biofilm from the subgingival tooth surface for up to 5 mm in depth. Removal of the subgingival biofilm by using a polisher reduced the micro flora that can be cultured in the pockets significantly more effectively than when using manual instruments (Petersilka and others 2003c, 2003d).

By using the LM-ProPower device the supportive periodontal treatment can be done efficiently, and based on patient reports, in a relatively pleasant manner. In addition to periodontal maintenance treatment, the device is suitable for use in periodontal anti-infectious basic care. By using a polisher, the soft bacteria surfaces can be effectively removed from tooth surfaces. Patients seem to appreciate the fact that after the treatment teeth feel clean and slippery, which promotes treatment compliance and improves the patient's own perception of the periodontal treatment.

Other areas of use

In addition to the actual periodontal treatment, the LM-ProPower device has further application areas related to mouth hygiene. Prior to surgical treatments in the mouth, it is beneficial to reduce the mouth bacteria that prevent the wound from healing. Cleaning the dentition by using a polisher will in this respect create as good preconditions as possible for healing the surgical wound.

LM-ProPower polisher is an excellent tool for cleaning the abutments of implants. Cleansing efficiency can be adjusted by changing the nozzle distance from the surface to be cleaned, so that

the extension parts of the implants, or prostheses mounted to the extensions, are not caused any unnecessary harm.

Versatile usage comfort

The ultrasonic equipment adjustments have been made easy by means of pre-settings. The user selects – among a very comprehensive variety - the most suitable tip, and then by one press of a button the settings valid for the chosen tip. While working, the power can be adjusted between the water flushing only and the maximum power that can be selected in the basic settings by using a foot pedal. The use of the foot pedal requires some familiarization and training. The volume of cooling water for the ultrasonic device is adjustable by using the control wheel in the handpiece. The control wheel is placed on the handpiece in such a way that an unintentional alteration of its adjustment is possible while working. This requires special attention.

A stand-alone device such as the LM-ProPower can easily be moved from one treatment room to another, if necessary. It must be noted, however, that the use of the polisher requires a compressed air connection.

All the fine mechanical devices require regular daily maintenance in order to work properly. The daily maintenance of the LM-ProPower ultrasonic device and polisher is easy and simple. The device has an automatic cleaning function. The patient-specific maintenance function of the polisher is easy to use. After each treatment session, air is blown through the channels, thereby preventing the formation of obstructions.

The LM-ProPower device is an ultrasonic and polisher combined in one casing. The package supports very well the periodontal treatment given by the dentist and dental hygienists very well, whether dealing with an untreated periodontal patient or a follow-up periodontal patient. The

polisher introduces a new dimension in choosing a method for tooth cleaning in the preventive and maintenance treatment of implants. The potentially contaminated aerosols and powder dust generated by the equipment restrict its use for patients that could cause infection risk.



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Bibliography

Barendregt DS, van der Velden U, Timmerman MF, van der Weijden F. (2008) Penetration depths with an ultrasonic mini insert compared with a conventional curette in patients with periodontitis and in periodontal maintenance. *Journal of Clinical Periodontology*; 35; 31-36.

Drisco CL, Cochran DL, Blieden T, Bouwsma OJ, Cohen RE, Damoulis P, Fine JB, Greenstein G, Hinrichs J, Somerman MJ, Iacono V, Genco RJ. (2000) Position paper: sonic and ultrasonic scalers in periodontics. Research, Science and Therapy Committee of the American Academy of Periodontology. *Journal of Periodontology* 71; 1792-1801.

Flemmig TF, Hetzel M, Topoll H, Gerss J, Haeberlein I, Petersilka G. (2007) Subgingival debridement efficacy of glycine power air polishing. *Journal of Periodontology* 78; 1002-1010.

Jost-Brinkmann P-G. (1998) The influence of air polishers on tooth enamel. An in vitro study. *Journal of Orofacial Orthopedics* 59; 1-16.

Petersilka GJ, Bell M, Haeberlein I, Mehl A, Hickel R, Flemmig TF. (2003a) In vitro evaluation of novel low abrasive air-polishing powders. *Journal of Clinical Periodontology* 30; 9-13.

Petersilka GJ, Bell M, Mehl A, Hickel R, Flemmig TF. (2003b) Root defects following air-polishing. An in vitro study on the effects of working parameters. *Journal of Clinical Periodontology* 30; 165-170.

Petersilka GJ, Steinmann D, Haeberlein I, Heinecke A, Flemmig TF. (2003c) Subgingival plaque removal in buccal and lingual sites using a novel low-abrasive air-polishing powder. *Journal of Clinical Periodontology* 30; 328-333.

Petersilka GJ, Tunkel J, Barakos K, Heinecke A, Haeberlein I, Flemmig TF. (2003d) Subgingival plaque removal at interdental sites using a low-abrasive air-polishing powder. *Journal of Periodontology* 74; 307-311.

Petersilka G, Faggion Jr. CM, Stratmann U, Gerss J, Ehmke B, Haeberlein I, Flemmig TF. (2008) Effect of glycine powder air polishing on the gingiva. *Journal of Clinical Periodontology* 35; 324-332.