

NON-SURGICAL PERIODONTAL THERAPY

by Dr. Marisa Roncati

Non-surgical periodontal instrumentation is required for both the initial treatment and maintenance of any plaque-induced inflammatory disease. The diagnostic phase is always crucial and is followed by an adequate causal treatment comprising two essential elements: **home hygiene** and **professional equipment**. Both elements carry specific strategies and protocols that can solve numerous periodontal problems if properly implemented.



The primary objective of professional hygiene is to reduce pathogenic bacteria to counteract the progression of inflammation and disease recurrence.^{1,3}

Today, periodontal philosophies have significantly changed. In the past, scaling and root planing were performed for efficient removal of bacterial products (i.e., lipopolysaccharides and endotoxins). However, in-vitro studies have determined that bacterial endotoxins weakly adhere onto the root surface and can actually be eliminated by ultrasonic scaling. Therefore, it is not absolutely necessary to remove the so-called “contaminated” cementum.⁴ Root planing is therefore an “overtreatment”. For biofilm/tartar removal, non-surgical periodontal instrumentation is necessary, with only a gentle amount of pressure involved: one that is adequate enough to remove detected pathogenic noxa but respects the biological integrity of tissues.⁶

The removal of calcified deposits is essential as this encourages biofilm retention. On the contrary, intentional removal of root substance and contaminated cementum is absolutely not recommended.² Therefore, instead

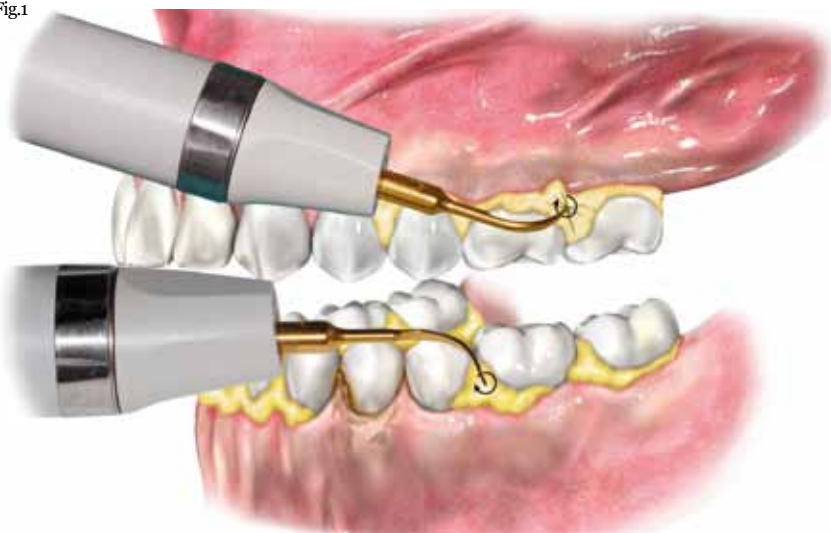
of “root planing”, “debridement”⁴ (i.e., non-surgical periodontal instrumentation) should be performed.⁶

Supragingival instrumentation

In the case of heavy supragingival calcular deposits, the use of ultrasonic instruments with standard-sized inserts is recommended for quick removal of the deposits.

The insert can be initially positioned at the tip, as shown in Fig. 1. It is highly suggested to always operate the ultrasonic insert with an oscillatory movement before activating the foot control to ensure patient comfort.

Fig.1



The tartar “bulwark” should then shatter after a few movements.

Power adjustments must also be made accordingly:

- Medium/high mode (heavy cases)
- Medium/low mode (localised deposits and/or patient sensitivity)

Small oscillatory movements must be carried out (mesial-distal, distal-mesial, apical-coronal and coronal-apical directions) with the insert tip pointing towards the apex of the tooth and in the coronal direction especially for removing deposits below the interdental contact areas.

Pressure should be subtle yet strong enough to securely hold the unit. No amount of force must be applied on deposits (remember that the calculus deposit is removed by *ultrasonic vibration* and not by the pressure of movement). When removing calcular deposits, it is important to move along the entire dentition and not to stick to one area at a time. In doing so, residual deposits are subsequently removed, resulting in a more thorough finish. Debridement performed with ultrasonic equipment allows for quick removal of heavy calcular deposits in the supragingival area. After completing ultrasonic debridement, it is essential to perform a diagnostic assessment of pocket depths using the tip of a probe (Fig. 2, box 1) prior to starting subgingival instrumentation to detect subgingival calcular deposits (Fig. 2, box 2).⁶ While the equipment is turned off, the ultrasonic insert detects the deposits (Fig. 3, box 1), which can be removed when the tip is already activated (Fig. 3, box 2).⁶

Fig.2

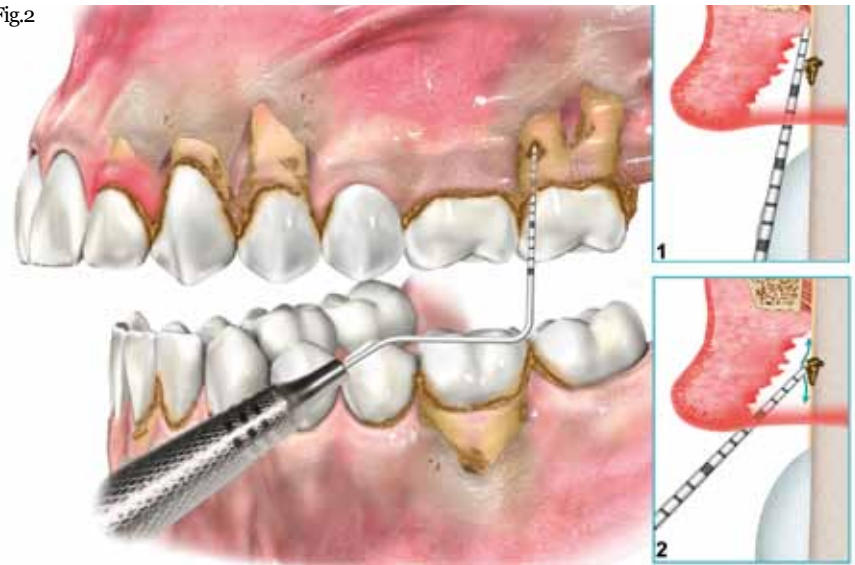
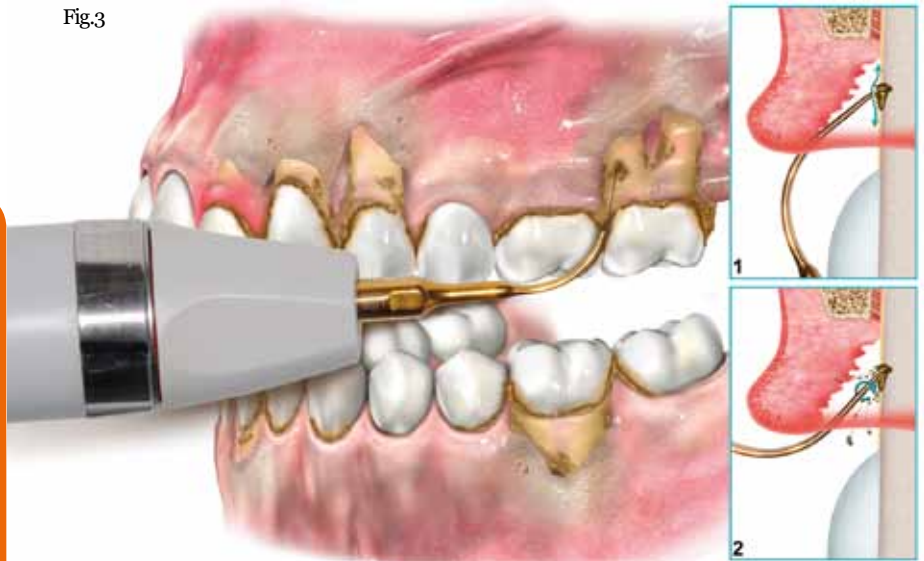


Fig.3



Initially, the ultrasonic instrument must be used while still turned off, moving in an “exploratory” direction (as indicated by the arrows in Fig. 3, box 1). Activated motion then ensures to produce an ablative effect (Fig. 3, box 2). Debridement is constantly guided by the use of the periodontal probe, which evaluates the effectiveness of the treatment performed, detects any residual calculus and reveals the exact target of the next instrument, which shall continue until periodontal probing reveals a deposit-free surface.⁵

Subgingival instrumentation

Periodontal probing is essential for the detection of subgingival deposits. The probe must be held in an oblique position with respect to the vertical axis of the tooth. The probe is then slipped in the apical-coronal/coronal-apical direction with gradual movements to identify all remaining deposits and to carefully study their morphology and distribution, collecting as much information as possible, in order to plan better for the next instrumentation. For subgingival deposits, the insert tip or side must be initially positioned

against the deposit prior to performing an oscillatory movement/activation of equipment. This is advisable to ensure patient comfort. It is crucial to avoid applying static pressure as this would have a nagging “hammer effect” that might result in soreness and pain.



Frequent deactivation of the foot control is suggested to avoid overheating the instrument. In *soft mode*, insert movement is gentler but no less effective – the frequency is the same but the oscillations are less extensive. The insert tip is more efficient in its end section (approximately the first 4mm starting from the insert apical tip). For deposits in very deep pockets, it is necessary to apply the insert at multiple levels to apply suitable instrumentation on the different dimensions of the lesion. The residual deposits would suggest if further debridement is necessary using a periodontal probe. The operator can use both ultrasonic

instruments with thin inserts and manual tools, as well as those that are particularly suitable for treating bifurcations. The operator's position must also be taken into consideration: it should vary frequently to facilitate proper movement and a comfortable posture. Ultrasonic instrumentation is particularly suitable on the line angle, a transition area between surfaces (lingual/palatal and distal or lingual/palatal and mesial). These areas are frequently omitted or inadvertently "skipped" during manual instrumentation. In the line angle areas, the insert tip must be pointed towards the apex of the tooth and movements are mainly vertical, with apical-coronal/coronal-apical directions as well. Alternate use of the periodontal probe and ultrasonic instrument is recommended in order to verify the effectiveness of the instrumentation performed and to evaluate the presence of residual deposits, especially if deeply localised.

Ultrasonic instrumentation must be selective, specific and targeted at the deposits and extended use is not recommended to avoid "overtreatment". (Periodontal probing can ensure full effectiveness of ultrasonic instrumentation.)

Prosthesis prophylaxis

Implant-supported dentures require the use of a specific insert with a conical terminal (made of PEEK) and 10mm



working length, as this is particularly suitable for titanium surfaces. The insert is held obliquely against the vertical axis of the implant to gently penetrate the peri-implant pocket. Movement must be slow, cautious and never static, and must be focused on cleaning the subgingival area without traumatising the surrounding soft tissues.

Thanks to the wide range of inserts available to date, Mectron's multipiezo multifunctional ultrasonic equipment is able to manage endodontic applications such as root canal disinfection and preparation, exposure and removal of root pins, removal of calcification in the coronal third of the root and of fractured root inserts, in addition to the non-surgical periodontal treatment previously described.

It may also be utilised for conservative applications, e.g., preparation and finishing of subgingival margins, in cavity preparations, and in extractions.

Thanks to the special Pulse mode function

dedicated to the latter applications, high performance in prosthetics and extraction, as well as maximum treatment safety and patient comfort are guaranteed. **DA**

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About the Author



Marisa Roncati, BS, RDH, DDS graduated as a Registered Dental Hygienist from the Forsyth School in Boston, Massachusetts, USA in 1984. Dr. Roncati

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Dr. Roncati became an assistant professor in the following universities: School of Dental Hygiene, University of Bologna (1991 to 2002); University of Ferrara (2002 to 2006); and School of Dental Hygiene, Marche Politecnic University, Ancona, Italy (2008 to present). She is also a visiting professor at the Parma University, Italy (2013 to present), where she obtained her Master's Degree in Oral Surgery and Pathology.

Dr. Roncati has been the co-author of several textbooks in dental hygiene and periodontology. She has also produced several DVDs on periodontics.

