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Letter to the Editor

Back to the Basics: Mastering Probing Techniques for Comprehensive Periodontal Assessment

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1. Introduction

In a high-level technological world, with many innovations[1,2], instruments, and techniques[3-5], as well as new clinical approaches[6-8], it is more important than ever that dental professionals develop, maintain, and enhance their clinical skills. Studies show that experienced dental professionals, new graduates, and students are often challenged when probing periodontal/peri-implant pockets or gingival/peri-implant sulcus. Using inadequate probing techniques can lead to errors. While it is not possible to achieve 100% correctness in all cases, one should expect an accuracy level of at least 85% from a highly skilled clinician. Thus, the goal of this editorial is to return to basic concepts in periodontics to improve and clarify how to probe teeth during a periodontal assessment.

A periodontal probe (PP) is a calibrated instrument used to evaluate the health of periodontal tissues during a comprehensive periodontal exam (Figures 1-2). The PP measures the distance from the free gingival margin (or gingival margin [GM]) to the gingival sulcus or periodontal pocket base. This measure is referred to as periodontal pocket depth (PD). The PP can also be used to measure the distance from the cementoenamel junction (CEJ), a fixed-point reference, instead of the GM, to help determine the level of clinical attachment loss (CAL).

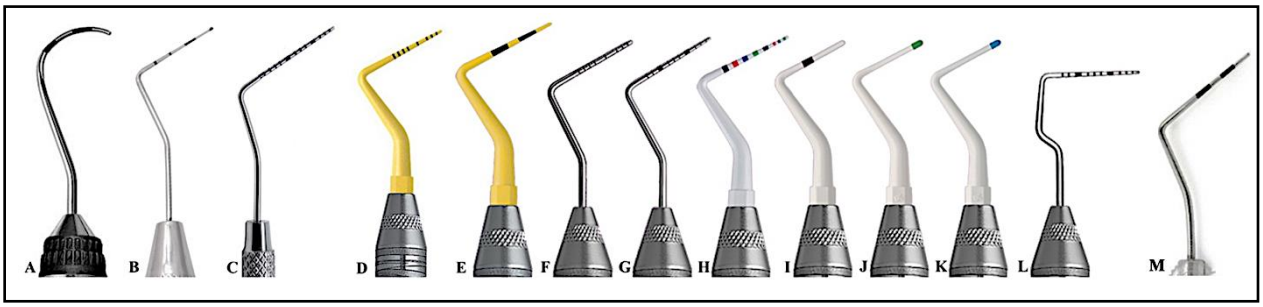

Figure 1 A. Nabers probe (0-3-6-9-12mm); **B.** WHO probe (0.5-3.5-5.5-8.5-11.5mm); **C.** UNC-15 (1mm by 1mm, until 15mm); **D,E,H,I,J,K.** Plastic probes (typically used to probe dental implants); **F.** Williams probe (1-2-3-5-7-8-9-10mm); **G** and **L.** CP-12 probe (1mm by 1mm, until 12mm); **M.** CP-11 probe (3-6-8-11mm).

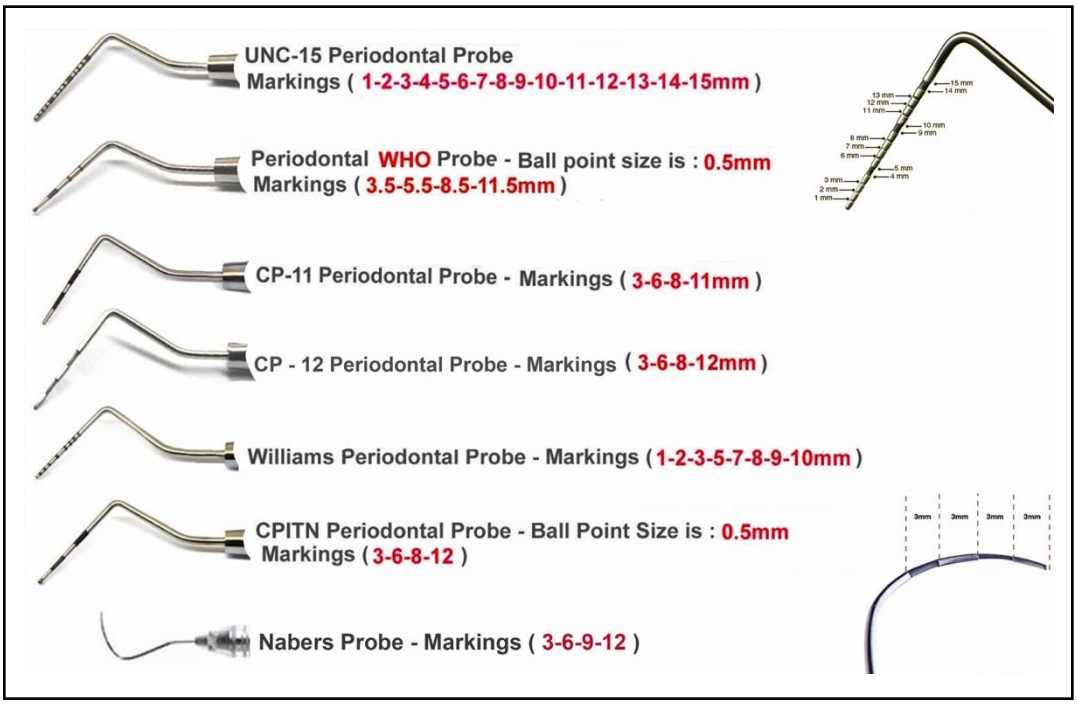

Figure 2. Periodontal probes and their markings.

Clinicians must use PPs effectively by following correct techniques while considering tip design, correct angulation, and adaptation (Figures 3-4), as well as the appropriate amount of pressure exerted. One must also pay close attention to the movement of the tip as the probe is walked around the circumference of the tooth in an effort to determine the deepest pockets in six zones on a tooth (three on the facial/buccal surface: mesiofacial/mesiobuccal, facial/buccal and distofacial/distobuccal points; and three on the lingual surface: mesiolingual, lingual and distolingual points). Findings from a study[9] suggested that pressure exceeding 0.15N (15.29g) should not be exerted, and it is recommended to wait 5-10 seconds after probing to assess for bleeding visually. The acceptable and recommended pressure is between 15-25 grams[10].

An accurate probing technique requires that the clinician walks the probe in 1 mm increments, utilizing bobbing strokes (walking stroke technique) (Figure 3) within the sulcus surrounding the tooth while keeping the tip parallel to the long axis of the tooth and aligned with the root surface. The tip is initially inserted into the sulcus until resistance is felt at the site of the junctional epithelium. It is essential to use appropriate pressure.

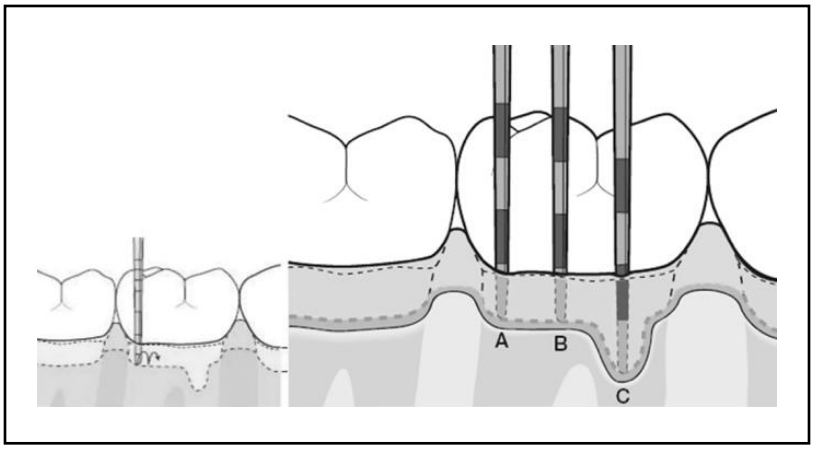

Figure 3. The walking stroke technique was demonstrated. **A** similar scenario was observed when probing areas, **A** and **B**, while the depth differed when probing a bone defect in **C**.

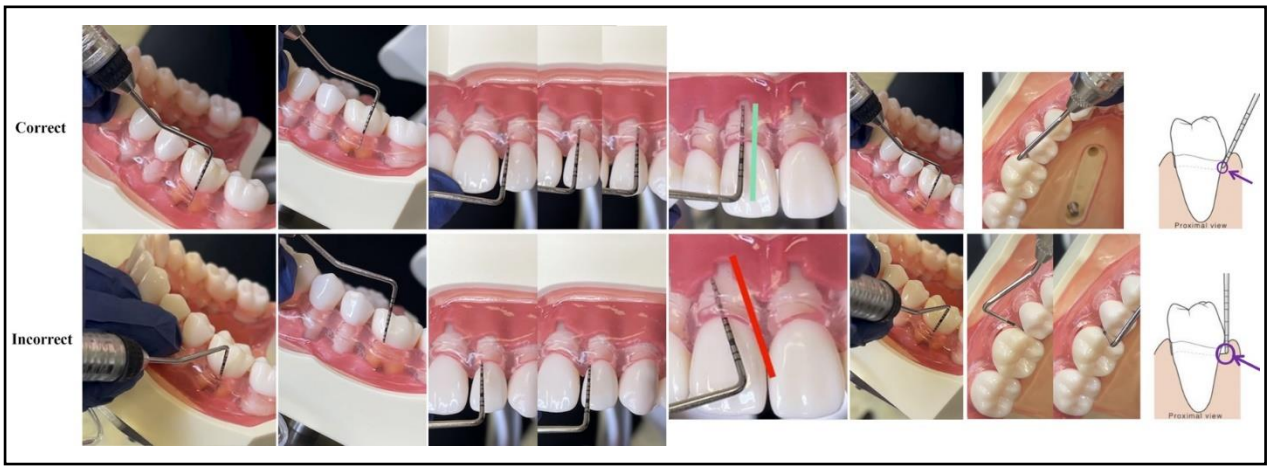

Figure 4. Correct (top) techniques and incorrect use (bottom) of the periodontal probe (PP) related to angulation and adaptation. All pictures observed here demonstrate the correct (top) and incorrect (bottom) angulation when using the PP.

2. Step-by-step technique

2.1 Insertion

Gently insert the PP into the gingival sulcus or periodontal pocket, keeping it parallel to the long axis of the tooth and maintaining light pressure; continue to slowly push the probe into the sulcus until mild resistance is felt, signifying that you have reached the epithelial attachment. To determine buccal PD, walk the probe tip in 1mm increments from the distofacial to the mesiofacial line angle. Record the deepest reading on the periodontal chart. Repeat the same technique on the lingual surface of the tooth to determine the deepest reading on the lingual. To finalize an intermediary measure using the PP, i.e., between 3.1mm and 3.5mm, it is recommended to round down to 3.0mm. On the other hand, when the gingival margin is located past 3.5mm, it is recommended to round up the PD to 4.0mm.

2.2 Moving the PP

Move the PP around the tooth's circumference, measuring PD at each of the six sites. It is important to note that if the probe tip is not “walked” around the tooth’s circumference but left in the sulcus as it is moved, this can damage the gingival attachment. Instead, use a “walking” motion, as mentioned above, where you withdraw the tip, move it about 1mm long, and re-insert it with gentle pressure, repeating the sequence around the entire tooth.

2.3 Interproximal Probing

For the interproximal readings, when measuring the distofacial PD, walk the probe from the distofacial (DF) line angle to the DF contact, withdraw the probe tip from the sulcus while maintaining contact with the tooth, angle the tip into the col area, and insert into the sulcus, until the junctional epithelium is reached (Figure 5). Record the distofacial PD on a periodontal chart and proceed to measure the distolingual, mesiolingual, and mesiofacial PD. Notably, the interproximal angulation of the probe tip differs as the anatomical lingual buccal width of the tooth varies (Figure 5, panel B-D).

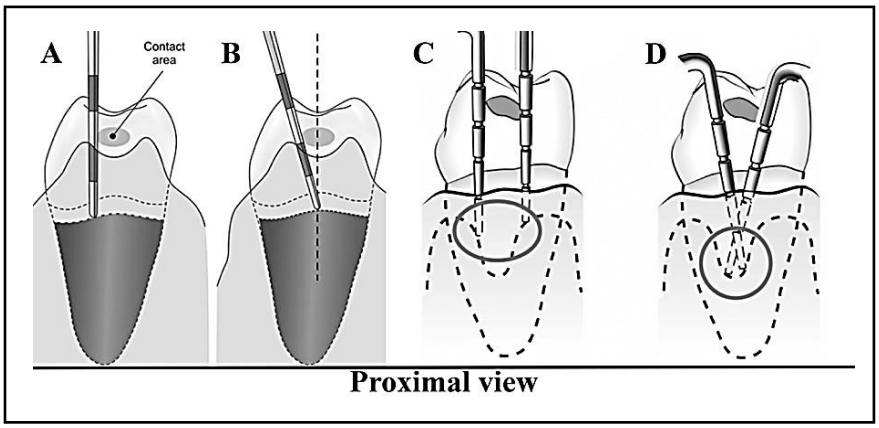

Figure 5 A. Probing the interproximal area respecting the contact point. **B.** Therefore, it is necessary to tilt the PP to reach the deepest interproximal space while respecting the boundary of the imaginary line that divides the tooth into buccal and lingual sections. **C.** Presence of a defect in the COL area, which was incorrectly probed (circle). **D.** Probing the bone defect, where it is necessary to observe midline boundaries to avoid invading the adjacent space (e.g., probing the buccal area with excessive angulation can enter the lingual area, resulting in a higher PD); bone defect correctly probed (circle).

It is essential to remember that when the GM is at the CEJ, CAL is equal to PD. It is important to remember that the GM's normal position is between 1 and 2mm above the CEJ. If the GM has receded (gingival recession), you can determine CAL by measuring the distance between the GM and the CEJ and adding it to the PD. Additional details and information can be found in Fernandes & Fernandes' article.[11]

2.4 Furcation

Probing the furcation area can be challenging. Nevertheless, it is mandatory to check all the furcations when a tooth is multirooted (Figure 6). Moreover, attention to the tooth's anatomy is necessary to avoid errors in classifying furcation involvement.

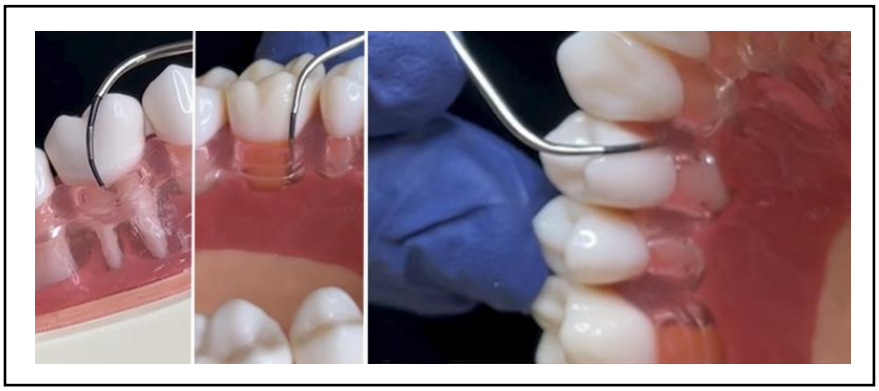

Figure 6. Demonstration of the furcation probing in multirooted teeth. In a tooth with two roots, the clinician must check both sides of access to the furcation area; in a tooth with more than two roots, all points of access must be verified, as demonstrated.

One of the most critical clinical signs of gingival disease is bleeding on probing (BoP), which can be an important indicator of inflammation.[12] However, this is not always a reliable indicator. For example, BoP can be induced with probing pressure greater than 25g[13] or occur more readily if the patient just performed oral hygiene.[14] While some BoPs can be seen immediately, in some cases, the blood may take a while to reach the gingival margin. Therefore, it is recommended to wait 5-10 seconds after probing to register any signs of bleeding.

3. Periodontal Probing Tips

Some tips for performing periodontal probing:

- **Gentle touch**: use as little force as possible. Pressure above 25g can cause the gums to bleed;
- **Insert the probe correctly**: gently insert the probe into the gingival sulcus parallel to the root surface. The probe tip should be at a 0° angle to the root surface, and the rest should be about 10°;
- **Probe around the tooth**: "Walk" the probe around the gingival margin in 1 mm increments. This technique allows assessment of the entire pocket base, including the deepest areas;
- **Take measurements at multiple points**: it is recommended to probe at six points per tooth;
- **Use radiographs**: combine probing with radiographs to ensure accuracy (complementary method of assessment);
- **Adjust for calculus or braces**: if calculus is present, probe after removing heavier deposits, and in the case of braces, look for the best tip position that facilitates the correct technique;
- **Adjust for multirooted teeth**: adjust the probe between each root; and
- I**ncrease the angle for furcation**: when roots diverge, increase the insertion angle to 45° to detect furcation.

4. Conclusions

Three elements affect the accuracy of periodontal probing: tools, technique, and the patient. Applying a standardized technique to probe, such as using the same probe type, exerting consistent pressure, and working through the same sequence every time, is good practice. This promotes a consistent standard of care for every patient and helps ensure that measurements related to disease progression or current status, which will be obtained similarly. An accurate measure helps to achieve an adequate diagnosis, and hence a correct treatment plan. An inaccurate probing will differ from the radiographic assessment, resulting in a wrong diagnosis; furthermore, it has been the recurrent problem of rejections by insurance companies. Patients often find periodontal probing uncomfortable due to sensitivity and inflammation, making a thorough examination difficult. Always attempt to provide the most comfortable experience for the patient by being gentle and, if necessary, using anesthesia.

Abbreviations

PP	Periodontal Probe
GM	Gingival Margin
PD	Pocket Depth
CEJ	Cement-Enamel Junction
CAL	Clinical Attachment Loss
DF	Distofacial
BOP	Bleeding on Probing

Declarations:

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