

Probing for Answers: A Commentary on Clinical and Transgingival Measurements in Chronic Periodontitis

To the Editor,

I found the original article by Sah et al., [1] titled “Comparison between Measurements of Clinical Attachment Level and Transgingival Probing with Alveolar Bone Crest Level in Chronic Periodontitis Patients,” published in the Journal of BP Koirala Institute of Health Sciences, to be highly engaging. This research tackles a significant topic regarding the precise evaluation of periodontal damage, especially the correlation between clinical and surgical measurements of attachment and bone levels, as well as the dimensions of clinical biologic width (CBW) in patients with chronic periodontitis.

The study’s aim to evaluate the relationship between clinical attachment level (CAL), transgingival bone probing level (TBL), and surgically measured alveolar bone crest level (ABCL), as well as to assess CBW, is highly pertinent to daily periodontal practice. Accurate diagnosis and monitoring are fundamental to effective periodontal therapy, and the reliability of various diagnostic tools is a subject of ongoing discussion and research. The use of a customized acrylic stent for a fixed reference point (FRP) is a commendable methodological choice, aiming to minimize measurement variability, a common challenge in periodontal research. However, a critical appraisal of the methodology and interpretation of the findings reveals several points that warrant further discussion and clarification, which could enhance the robustness and generalizability of the study’s conclusions.

Firstly, the study design has been described as an analytical cross-sectional study. While the study design in this case is suitable for the assessment of associations at a given time, it has the drawback of not being able to ascertain causality or follow-up over time, particularly on how periodontal disease can evolve or improve. The inclusion criterion of residual 5-8 mm pocket depth after four weeks of non-surgical treatment reflects some stage of the disease. It would be desirable to know if and how the duration and type of non-surgical treatment might influence measured parameters since they could have confounding effects. Future longitudinal studies might reveal the dynamic type of change in these parameters with treatment.

Sample size estimation appears appropriate to the primary objectives. However, the study was conducted in 238 periodontal sites from 25 patients. As the site number is

considerable, the comparatively low patient number (n=25) poses threats to possible clustering effects and external validity to the overall chronic periodontitis population. A larger patient group with more heterogeneity in disease severities would strengthen the external validity of the results.

The authors employed a manual UNC-15 probe for all of their measurements. Even though a standard clinical device, there are inherent limitations with manual probing. The awareness that “the tip of the probe might have passed beyond the base of the pocket” is the most important acknowledgment. This potential over-probing systematically over-estimates CAL and TBL measurements, and thus their correlation with the true ABCL. The use of controlled-force electronic probes that were found to be more reproducible and accurate could have overcome this drawback. Assuming the same author took all measurements to reduce inter-examiner variability, intra-examiner variability would remain a problem.

One of the interesting findings is the extremely high positive correlation between CAL and ABCL ($r=0.858$) and TBL and ABCL ($r=0.930$) supported by previous studies. [2] This justifies the use of TBL as an effective indicator of



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Declarations

The author declares that he has no conflict of interest.

ABCL. The predictive equations provided for RABCL from RAL ($R^2=0.78$) and RTBL ($R^2=0.9$) are effective. The R^2 values suggest that 78% and 90% of the variance in RABCL are accounted for by RAL and RTBL, respectively. While high, the unexplained variance suggests other variables not covered in this model influence ABCL too. Further research might explore these other influencing variables to develop more comprehensive predictive models.

The discussion regarding clinical biologic width (CBW) is particularly relevant. The mean CBW (3.06 ± 0.634 mm) is greater than the historically reported histological norm of 2.04 mm by Gargiulo et al. [3] There are several reasons for this difference as per the authors, including differences in measurement technique (autopsy jaws vs clinical measurement), periodontal status, progression of disease, and ethnic variation in BW among the Nepalese population. This finding emphasizes the concept that the “biologic width” is not a stable anatomical feature but an adaptive structure established by a variety of variables, including the condition of inflammation of periodontium. [4] The notion that CBW in chronic periodontitis patients could be increased due to the inflammatory process and subsequent remodeling of tissue is a valuable concept. Further studies linking CBW with inflammatory markers and histological results in living subjects would be beneficial to define this association more definitively.

The authors' recommendation to use the cemento-enamel junction (CEJ) as a fixed reference point for CAL measurement instead of the stent margin is well-founded.

The CEJ is indeed a more stable anatomical landmark, and its use would enhance the comparability of results across different studies and clinical settings. While the stent was used to minimize variability from a coronal reference, the inherent unpredictability of the gingival margin in periodontitis makes the CEJ a more biologically sound reference for attachment level measurements. This point highlights a potential area for improvement in future studies.

Another shortcoming is the lack of consideration to 2017 World Workshop on the Classification of Periodontal and Peri-Implant Diseases and Conditions. [5] Even though using one examiner reduces inter-examiner variation, strict intra-examiner calibration and testing for reliability would have strengthened methodological rigor and confidence in uniformity of measurements.

Finally, this research provides interesting data on the correlation between the clinical and surgical periodontal measurements within a specific population of patients. [1] Findings validate the use of transgingival probing as a signifier for the evaluation of the alveolar bone crest level and the interpretation of clinical biologic width measurements in chronic periodontitis. To the methodological issues raised above, such as patient numbers being increased, controlled-force probing being incorporated, and being in agreement with existing classification systems, would definitely enhance the generalizability and impact of subsequent studies in this very significant field of periodontology.

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