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## Original article

# Comparative evaluation of accuracy of periodontal probing depth and attachment levels using a Florida probe versus traditional probes



Maj Nitin Gupta<sup>a,\*</sup>, Col S.K. Rath<sup>b</sup>, Maj Parul Lohra<sup>c</sup>

<sup>a</sup> Graded Specialist (Periodontics), Command Military Dental Center (EC), Alipore road, Kolkata-27

<sup>b</sup> Senior Advisor (Periodontics), Army Dental Center (R&R), Delhi Cantt-10, India

<sup>c</sup> Graded Specialist (Periodontics), 333 Field Hospital, C/o 56 APO

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## ABSTRACT

**Background:** The current interest in the assessment of Clinical attachment level (CAL) has stimulated recent introduction of novel periodontal probes. CAL is currently the gold standard for diagnosis and monitoring of periodontal disease. The errors inherent to the use of a periodontal probe are variation in probing force, visual errors in identifying the cemento–enamel junction (CEJ), relative attachment level landmarks, fluctuations in gingival inflammation and misrecording measurements. The present study has been undertaken to compare the accuracy of measuring probing depth (PD) and CAL using Florida probe and Williams probe. **Methods:** After random selection of sixty subjects PD and CAL were measured at mandibular first molars region using Williams probe, Florida probe and CEJ probe by two different examiners. The measurements recorded by using three probes were subjected to statistical analysis for comparison of accuracy and reproducibility.

**Results:** Difference in mean PD with Williams probe and Florida probe were statistically significant with  $p$  value of .000. Similarly the CAL measurement achieved by Williams probe and CEJ probe showed significant different results. More consistent results were seen with Florida probe and CEJ probe when the measurements of PD and CAL were done by two different examiners. **Conclusion:** Florida probe and CEJ probe have been shown to be more accurate and were found to be more consistent which were reproducible by two independent examiners.

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## Introduction

The methods of diagnosis of periodontal disease is evaluated by presence of inflammation, specific bacteria, gingival crevicular fluid flow and periodontal probing demonstrate lack of

sensitivity and objectivity to be totally reliable criteria for clinicians.<sup>1,2</sup> Currently, PD, loss of connective tissue attachment and bleeding on probing are generally used to estimate severity of inflammation and response to treatment which needs the use of the periodontal probe.<sup>1</sup> One of the more reliable and convenient way of detecting, measuring and assessing the

\* Corresponding author.

E-mail address: [drnitingupta2000@yahoo.com](mailto:drnitingupta2000@yahoo.com) (N. Gupta).

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status of periodontal disease activity is through the use of periodontal probes. It has been a goal to find out the most suitable periodontal probe, with the most accurate recording of PD and CAL with maximum comfort for the patients.<sup>3</sup>

Williams periodontal probe was invented in 1936 by Charles H.M. Williams, which is the prototype or benchmark for all first-generation probes (Fig. 1).<sup>4</sup> Common disadvantages of conventional probing are variation in probing force, visual errors in identifying the CEJ, relative attachment level landmarks, fluctuations in gingival inflammation and misrecording of measurements. Earlier pressure sensitive probes have been designed by Amitage in 1977 and Vander Velden in 1978 to standardize the insertion pressure. Subsequently, it was modified with a displacement transducer for electronic pocket-depth reading.<sup>5</sup>

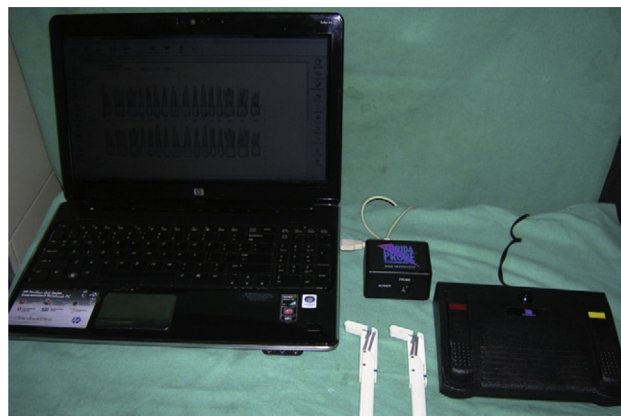
The Florida Probe® (Florida Probe Corp, Gainesville, FL) was devised by Gibbs et al in 1988 consisting of a probe hand piece and sleeve, a displacement transducer, a foot switch, and a computer interface/personal computer. The hemispheric probe tip has a diameter of .45 mm and the sleeve has a diameter of .97 mm (Figs. 1 and 2). Constant probing pressure of 15 g is provided by coil springs inside the handpiece. The edge of the sleeve is the reference from which measurements are made and the probe has Williams' markings, however actual measurement of the pocket depth is made electronically and transferred automatically to the computer when the foot switch is pressed.<sup>6</sup>

The Florida probe also can record missing teeth, recession, pocket depth, bleeding, suppuration, furcation involvement, mobility and plaque assessment.<sup>7</sup> Each measurement is recorded with potentially .2-mm accuracy. Comparison to previous data can be made more quickly and accurately (The system shows black arrows for changes between 1 mm and 2 mm and red arrows are used for changes >2 mm). Also, there is a chart showing diseased sites which can be used in patient education. The Florida Probe does have some disadvantages which include, underestimating deep probing depths and a lack of tactile sensitivity. Also, clinicians need to be trained to operate these probes.<sup>8</sup>

Aim of this study was to assess and compare the accuracy of the Florida probe and Williams periodontal probe



**Fig. 1 – From top to bottom, cemento enamel junction probe, Florida probe, Williams periodontal probe.**



**Fig. 2 – Florida probe equipment consist of computer/laptop, USB interface, foot controls and probes (Florida probe & cemento enamel junction probe).**

in determining the periodontal pocket depth and clinical attachment level. The objectives of study was to determine whether Florida probe is better in determining periodontal pocket depth when compared with Williams periodontal probe and also to determine whether CEJ probe (a component of Florida probe system) is better in determining CAL when compared with Williams periodontal probe. Objective also includes to find out the reliability of two periodontal probes when used by two different examiners.

## Materials & methods

A clinical study was carried out amongst the patients attending the Central OPD of Dept of Dental Surgery, AFMC, Pune. A total of 60 subjects were selected according to the undermentioned inclusion and exclusion criteria. An informed consent was taken from all the subjects.

### Inclusion criteria

Total of 60 Subjects included were in age group of 35–60 years with more than 14 teeth present in the mouth including mandibular first molars. Thirty cases were with clinical diagnosis of generalized severe chronic periodontitis with probing depth  $\geq 5$  mm in more than 1/3rd of total teeth present and thirty with healthy periodontium were subsequently randomly examined.

### Exclusion criteria

Patients with history of bleeding disorders, on medication interfering with blood coagulation, with history of severe systemic disease eg. cardiovascular, renal, hepatic or immunologic disorder and patients requiring antibiotic prophylaxis prior to any invasive dental care were excluded in the study.

### Procedure

Tooth examined in each patient were mandibular first molars 36 and 46. Probing pocket depth was recorded at six sites in each

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