



# Interpretation of Study Design on Marginal Bone Loss in Implant Dentistry: Evidence-Based Science Versus Clinical-Based Experience

In science, the quality of the evidence is determined by the robustness of the study design. In the hierarchy of evidence, systematic reviews that include meta-analysis should be considered the “best evidence.” These reviews analyze selected randomized clinical trials (RCTs) to determine the answer to a focused question. It is known that RCTs are the most appropriate study design for assessing the efficacy of certain products or procedures. This is because a specific group of patients are randomly selected and possible confounding factors are controlled, providing a reliable assessment of the tested product or procedure. While there is no perfectly executed RCT, their outcomes still constitute the best available evidence. Retrospective cohort studies, on the other hand, evaluate procedures that have already occurred. As such, factors that may influence the results of the sought-for outcome cannot be controlled; hence, the results may be biased.

Marginal bone loss (MBL) around dental implants is one of the parameters used to determine implant success rates. With modifications in design on the macroscopic and microscopic levels, previous criteria for implant success (eg, less than 0.2 mm of MBL per year after the first year of loading, or progressive bone loss) are no longer acceptable. Many factors have been documented to influence the outcome of MBL,<sup>1</sup> for example, implant diameter (narrow vs wide); implant crest thread design (microthreads vs regular threads, smooth vs rough surface collar); implant positioning (slightly lingual, slightly apical); and implant prosthetic designs (concave vs convex abutment and crown, platform switching or not). RCTs can be designed to evaluate the influence of single or multiple factor(s) on MBL while controlling other influencing factors.

Evidence-based science aims to provide an accurate source of information to make decisions about patient care.<sup>2</sup> Accordingly, the key question is: Should we limit ourselves to evidence-based RCTs when assessing MBL? It is of critical importance to understand the study’s method. In fact, analysis of methodology might help us determine when to apply concepts relevant to everyday implant dentistry. MBL results from cohort studies might give more realistic evidence than RCTs, since more placement variations are included that may be more representative of daily implant practice. Therefore, retrospective evaluations of MBL may offer a good balance of science tempered by clinical reality, as opposed to idealized research designs that emphasize artificial and unrealistic clinical scenarios.

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