

## Editorial

# Response to "On Crestal/Marginal Bone Loss Around Dental Implants"

This letter is in response to the recent "collective analysis and clinical experience" published under the title of "On Crestal/Marginal Bone Loss Around Dental Implants" in *The International Journal of Periodontics & Restorative Dentistry*, volume 33, no. 1, pages 9 to 11. While we agree with most of the 19 conclusions cited, we are nevertheless concerned that the overall direction of the collective analysis may in fact lead to false assumptions, underdiagnosis, and inadequate treatment of a serious implant problem and false confidence concerning the percentage of cases with crestal/marginal bone loss around implants. The reference to the body of literature as "these responses are popularly referred to as an escalating disease entity" and the use of the terms "so-called peri-implantitis" implies that this entity may be an occasional occurrence but is not a serious risk to implant success and survival. On the contrary, the following conclusions of the "collective analysis" should concern any clinician placing or restoring implants:

1. Conclusion no. 8, that the term peri-implantitis should be narrowly defined as an infection with suppuration and therapeutic intervention only necessary when combined with crestal bone loss, is contrary to much published data. Peri-implantitis, which has been defined as an inflammation in the peri-implant mucosa accompanied by bone loss does not require that suppuration be present. Similarly, active bone loss around a tooth with periodontitis is often seen without suppuration. Many experienced clinicians believe that bleeding on probing and increasing probing depths in conjunction with crestal bone loss beyond physiologic normal adaptive changes are diagnostic for peri-implantitis.<sup>1-3</sup> As Fransson et al<sup>4</sup> reported, bone loss with peri-implantitis is not linear (similar to the progressive bone loss with periodontitis), with periods of activity alternating with those of quiescence. Moreover, from a clinical standpoint, suppuration may be difficult to distinguish from pocket exudate. Active periodontitis may or may not display suppuration and, even without suppuration, bleeding on probing, probing depth increases, and crestal bone loss should be treated at the earliest detection. Clearly, an inflammatory disease is not defined by the presence or absence of suppuration. On the contrary, suppuration, if present, may indeed be a sign of an infection that is quite severe and in a late stage of development. Why would this differ in cases with peri-implantitis?
2. Conclusion no. 17 states that when oral implants are placed and restored according to current established protocols, an implant success rate above 95% over 10 years has been reported in numerous studies. This is certainly true of studies with machined surfaced implants. However, with implant companies rapidly changing surfaces, almost all of the currently available implant systems do not have similar 10-year success rates with comparable number of implants available. Moreover, the limited long-term studies that have been conducted and published on current surfaces were authored by a very small number of experts reporting on one specific implant system they predominantly used with protocols that included strict inclusion, placement, and restoration criteria. With the increasing number of implants being placed without standardized maintenance follow-up by clinicians with significantly less surgical training and clinical experience than the group of 12 experts who authored the collective analysis, should we not expect lower success rates and

more complications? Moreover, many of these implants are being placed with more aggressive protocols in patients with less than ideal oral hygiene compliance. The study group recognized this in conclusion no. 16 stating that: "These evaluations depend upon a large number of variables including patient follow-up and examination over long periods of time. For these reasons, the percentage of success in the populations may vary widely." It may be more accurate to view a 10-year 95% success rate as a goal rather than the mean.

3. To state that the incidence for peri-implantitis or implant failure is less than 5% under such conditions may be true, but "such conditions" usually do not exist for the majority of implants being placed today. Therefore, the prevalence of peri-implantitis reported in peer-reviewed published studies has ranged from 6.6% to 43% of implant sites and in 11.3% to 47.1% of subjects in multiple human studies.<sup>1,4,5,6</sup> It should also be mentioned that some of the popular surfaces previously used, eg, hydroxyapatite and TPS, that were placed by highly experienced clinicians following manufacturers' guidelines are no longer used nor were they reported on in the conference due to their unacceptably high failure rates, which, indeed, were related to peri-implantitis/crestal bone loss.<sup>7,8</sup>
4. Even were one to assume that the percentage cited by the

study group (5%) is correct, then it would be safe to estimate that more than 10,000 implants per year would present with this disease in the United States alone (based on the estimate that in the United States there are approximately 200,000 implants placed per year). Moreover, given the additional factors cited about the variety of implants, patient compliance, and diverse populations, the number of implants with peri-implant disease would most certainly be higher. Our fear is that by minimizing the problem we risk (1) a lack of diagnosis and adequate treatment; (2) a delay of the necessary treatment, which would certainly be unfortunate, as a number of studies<sup>9,10</sup> have suggested improved outcomes with early treatment; and (3) the dental implant industry will perceive no justification to support research for materials and techniques which would be effective in treating this problem, treatment that could avoid the ravages of untreated peri-implantitis and crestal bone loss that ultimately could lead to loss of the implant. This latter point is one where everyone loses—the patient, the surgeon, the restoring dentist, and implant companies as a whole.

5. Any responsible clinician and implant company should fear underdiagnosis and undertreatment of peri-implantitis if this ultimately leads to loss of or the necessity for removing an implant, since this usually results in

(1) ridge defects that require extensive surgical reconstruction, if indeed this is even possible, and (2) a second or third implant replacement, which has significantly lower success rates.<sup>11,12</sup> This again could be avoided by early recognition and treatment of implants with peri-implantitis.

6. We agree with conclusion no. 7: "Peri-implantitis is an unsuitable term to describe all crestal bone loss." However, certainly it is not an insignificant disease entity and should be on the radar of any clinician responsible for the maintenance of implant-supported restorations. Moreover, peri-implantitis risk factors, eg, smoking, poor plaque control, retained cement associated with cement-retained restorations, are well documented in the literature and should be considered at every recall maintenance visit for patients with implant restorations. Any implant with bleeding on light probing, increased probing depths, and radiographic evidence of increased loss of crestal bone should be differentially diagnosed with peri-implantitis and treated accordingly. Treatment goals should include infection control, decreased bleeding on probing, and a reduction in probing depths. This, we submit, should be the protocol followed whether or not suppuration accompanies the aforementioned symptoms. Recently, an article co-authored by Tomas Albrektsson,<sup>13</sup> a member of the study group, stated that "irre-

spective of the original reason for the failure being adverse loading or inflammation/infection, the end result with bone resorption and inflammation may be very similar." Mouhyi et al discuss four possible triggering factors for peri-implantitis and conclude that: "peri-implantitis is a general term dependent on a synergy of several factors" resulting in loss of osseointegration. They certainly do not minimize the overall importance of peri-implantitis related to crestal bone levels. In fact, neither do many of the dental companies, as evidenced by the fact that more than one of the implant companies that sponsored the collective analysis is producing products and currently supporting research specifically to prevent and treat bone loss caused by peri-implantitis around implants.

Moreover, the concepts osseosufficiency and osseoseparation, while cited as alternative considerations for marginal bone loss,<sup>14</sup> have far less clinical data and scientific support than the concepts of bone loss caused by an inflammatory disease (peri-implantitis).

We compliment the study group for sharing their insights on crestal/marginal bone loss and for emphasizing this important topic; however, we feel that more data and evidence are needed to confirm the conclusions cited in their commentary. Moreover, as clinicians encounter a greater number of implants with peri-implant bone

loss associated with bleeding on probing and increased probing depth, both in both private practices and dental clinics, we feel it is essential for dentists, dental students, patients, and implant companies to recognize the importance of diagnosis and treatment of peri-implantitis, especially in light of the number of implants being placed.

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