Guest Editorial *Tapered Tips to Think About*

There has been much debate regarding the significance of the implant-abutment interface on threaded cylindrical implants and its effects on bone resorption to the first thread. It has been suggested that the presence and location of the microgap may not be the principal cause of this phenomenon, but that its occurrence is due to the presence of a larger cut-back between the crown and the implant abutment/platform. Indeed, the interface may actually be located within the biologic width. Regardless of the presence or absence of the interface, a biologic width of some dimension is necessary for the presence of an epithelial attachment and underlying zone of connective tissue adhesion coronal to the crest of bone surrounding an integrated implant. This dimension, in many instances, is related to the dimension of the machined collar.

A radiographic analysis of a variety of implant systems using varying designs has yielded yet another explanation for initial peri-implant bone resorption. In studies on the effect of the abutment-implant interface on the resulting bone level, the interface usually exhibited a gap of less than 100 μm.[1] Current implant systems typically have connections on the order of less than a few microns to almost a flush fit between the implant components.[2] It has been our experience that bone typically resorbs to the first point on the implant where the taper changes to being positive. A *positive taper* can be defined as the coronal slope of the thread, while *negative taper* is the apical slope of the thread. For most straight and tapered implants, the tip of the first thread is coincident with the extent of the positive taper.

For some implant systems, bone level has been shown to remain at the level of the implant platform regardless of the presence of an abutment-implant interface at this location. In these systems, the coronal rim of the implant is designed with a slight bevel, producing a positive taper, with the occlusal platform slightly narrower than the body of the implant.[3] A logical explanation for this retention of bone level can be proposed. It may be related to an altered stress distribution pattern with peak stresses concentrating at a more apical bone level.[4] The presence of a widening or diverging cross-section such as that found at the top of the first thread, or at the platform edge of some beveled implant systems, may be the key to bone retention at these sites. In an attempt to simulate this configuration in practice, abutments narrower than the implant platforms have been used for restorations (ie, platform-switching). The resulting outer edge of the platform is exposed, allowing bone to overlap during healing. This may be more apparent if the implant is submerged below the osseous crest during placement.

There may be other factors that influence the crestal bone level around implants; therefore, further investigation is warranted. However, the factors that determine the crestal bone level may be different than those factors that determine the dimension of the biologic width. Indeed, they may be relatively independent of each other.

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References

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