

Letters to the Editor

Authors' Response:

Conditions at the Implant–Bone Interface

It is understandable that in an in vivo implant–bone system, there are many dynamics that occur at the interface. In our model, we simplified these dynamics due to our limited scope of interest. Also, this research was a pilot study intended to enlighten certain aspects into which we may investigate in the future. By adding in parameters of compressive, shear, and tensile strength into our model, our research team felt that it would have overcomplicated the data. By no means was this implant–bone interface model meant to completely resemble an in vivo situation, but rather to simulate key components.

Concerning the modeling of the interface as being completely osseointegrated, the point of justification is well taken. Since the aim in this study was to provide a simplistic model for preliminary data collection, a highly detailed and node-specific model was passed over.

Material Properties

Dr. Hansson and Mr. Halldin are correct in their observation regarding the properties of titanium. In our study, the value of titanium was reported as modulus of rigidity instead of the correct term modulus of elasticity. In regard to the values for both trabecular and cortical bone, the values were used from previous studies.^{1,2} Thus, we feel that the values used were correct with regard to previous data produced by other authors.

Element Mesh

In regard to publishing data containing the element mesh, it was determined that the printing would not lend to an accurate layout. As this study was a preliminary trial, the point of stress discontinuities is

well taken and will be applied in revised models if future research in this study is warranted.

Microthreads

The microthreads in our study were modeled not to resemble with absolute accuracy any implant system. Rather, we selected one implant model to serve as a template to guide simple design features. It was never implied in our article that the implant model was an exact match.

Our research team greatly appreciates the professional critique of this preliminary study. By no means was this study intended to discredit the promotional or scientific claims made by any specific implant system. However, our team's aim was to enlighten unknowns about certain stress differences between implant systems with and without microthreads. In future studies that investigate more accurate designs of implants, highly detailed models would be desirable.

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