READER'S FORUM

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**Three-dimensional finite element analysis
for determining the stress distribution after
loading the bone surface with two-component
mini-implants of varying length.**

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- Q1.** This study examined the effect of length of mini-screw head on surrounding bone tissue. What could be the advantage of using various lengths of the head component and also what was its clinical significance in terms of its effect on the bone tissue?
- Q2.** Authors examined the force distribution on the miniscrew surface by signed von Mises stress test. How should clinicians interpret the results from this test?

Questioned by

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- A1.** The temporary skeletal anchorage device used in this study, C-implant, requires higher removal torque compared to other orthodontic mini-implants because of its greater osseointegration potential. It also means that the C-implant allows application of multi-directional force system such as retraction combined with intrusion by concurrent use of intra- and intermaxillary elastics. In such cases clinicians are encouraged to use longer head parts for ease of engaging multiple elastic modules to the

miniscrews. However, it also could raise concerns since increasing overall length of the miniscrews might add more pressure on the contact surface. Therefore, the objective of this study was to evaluate the effect of different length of the head components on the amount of compressive stress in the cortical bone surrounding orthodontic mini implants. The results showed that compressive stress was indeed increased but still within clinically acceptable range.

- A2.** Finite element analysis is a tool often used in engineering to evaluate physically vulnerable parts and to reinforce them in design of machinery. Stress distribution has been used in this context in previous investigations. Signed von Mises test analysis indicates direction of the applied force by means of sign, which then can visually illustrate which force between the compressive and tensile stress is higher in magnitude.

Replied by

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