READER'S FORUM

Oh HJ, Cha JY, Yu HS, Hwang CJ

Histomorphometric evaluation of the bone surrounding orthodontic miniscrews according to their adjacent root proximity.

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I would like to express my gratitude to the authors for their excellent work. Miniscrews are now one of the main tools in everyday orthodontics and therefore research articles on the topic, such as this, can be very helpful to the clinicians.

Q1. Root proximity or root invasion of the miniscrews related with the failure rate has been discussed in many studies. To my knowledge, most of them have reported that root proximity was one of the major factors for miniscrew failure. However, the result of this study indicated only one miniscrew failed among 12 in the high root proximity group and this failure rate is much lower than what was reported in other articles. Please briefly summarize the possible reasons for this low failure rate in the present study.

Q2. In the discussion section the authors cited four references that the self-drilling insertion method was superior to the self-tapping method in the perspective of decreasing failure rate from root contact. Please describe briefly the mechanism of reduction in the failure rate. Do the authors recommend use of the self-drilling method if close root proximity is anticipated?

Q3. It has been reported that surface treated miniscrews could survive better despite their proximity

to the dental roots.¹ Surface treatment can affect the bone-implant contact (BIC) by promoting osseointegration. Were the miniscrews used in this study surface treated? Please express authors' opinion on the surface treatment and the failure rate associated with the high root proximity of miniscrews.

Questioned by

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Thank you very much for your interest in our research. The following are our answers to your questions.

A1. BIC was defined as bone or osteoid in actual contact with the mini-implant surface at microscopic level. Although there is no clear consensus regarding the minimum amount of bone contact required for a successful orthodontic mini-implant, some level of BIC is necessary for miniscrew stability. In our study, one failed miniscrew showed no BIC (BIC = 0) and the average BIC of the high root proximity group was 31.61 ± 14.09 %. However, the failure rate of miniscrews for 12 to 16 weeks could be slightly higher than the rate of those for initial 6 weeks due to factors such as dog's heavy biting force, consistent orthodontic force, and so on.

A2. In the case of dense bones such as the mandible of the adult beagle, the self-drilling method could increase initial grip or initial holding strength between the bone and miniscrew more than the self-tapping method. Also, we think that self-drilling insertion method is safer than self-tapping when the interradicular septum is very narrow and the surgical stent is not used.

A3. The miniscrews used in our study were not surface treated. In addition, there could be a difference following surface treatment of mini-implants regarding the BIC and failure rate of the mini-implants in cases of different root proximity, insertion sites, drilling methods and other host factors such as bone quality.

Answered by

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References

1. Kim SH, Kang SM, Choi YS, Kook YA, Chung KR, Huang JC. Cone-beam computed tomography evaluation of mini-implants after placement: Is root proximity a major risk factor for failure? *Am J Orthod Dentofacial Orthop* 2010;138:264-276.

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