Intrusion of multiradicular teeth and related root resorption with mini-screw implant anchorage: A radiographic evaluation

Roberto Carrillo, P, Emilie Basserouw, Pedro F, France, Lynne A, Opperman, Peter H, Buschang

Received: March 20, 2006; Received in revised form: July 21, 2006; Accepted: August 16, 2006;

DOI: http://dx.doi.org/10.1016/j.ajo.2006.08.017

Abstract

Introduction: Mini-screw implants (MSIs) hold great potential for enhancing intrusive mechanics applied to multiradicular teeth. This experimental study used various force magnitudes to evaluate (1) the stability of immediately loaded MSIs, (2) the amounts of teeth intrusion produced, and (3) the amounts of root resorption produced. Methods: By using a split-mouth repeated-measures design, intrusive forces were applied for 98 days to the mandibular second (LPM2), third (LPM3), and fourth (LPM4) premolars of 8 mature beagle dogs (ages, 20–24 months). With 12 MSIs (IMTEG, Ardmore, Okla) placed in the buccal and buccal cortical plates of each dog, Sentalloy coil springs (GAC International, Bohemia, NY) applied constant intrusive forces of 50, 100, or 200 g per tooth. The intrusive forces were randomly assigned between pairs of teeth; LPM2 was loaded with 50 or 100 g, LPM3 with 100 or 200 g, and LPM4 with 50 or 200 g. Multilevel statistical procedures were used to model tooth movements and root resorption, based on 64 standardized radiographs per tooth taken at 14-day intervals. Results: Only 1 of the 96 immediately loaded MSIs failed. Significant (P < .05) amounts of intrusion, from 1.2 to 3.3 mm, were obtained after 96 days of force application. The statistical models showed no significant differences in the amounts of tooth movement between pairs of teeth loaded with different force magnitudes. Root resorption at the furcation and apices was 0.1 mm or less. Conclusion: Constant intrusive forces from 50 to 200 g produce clinically significant amounts of intrusion with little or no root resorption, suggesting that immediately loaded MSIs hold great promise as fixed anchorage devices for intruding multiradicular teeth.

To access this article, please choose from the options below

Log In

Purchase access to this article

You must be logged in to purchase this article.

Claim Access

If you are a current subscriber with Society Membership or an Account Number, claim your access now.

Subscribe to this title

Purchase a subscription to gain access to this and all other articles in this journal.

Institutional Access

Visit ScienceDirect to see if you have access via your institution.

This project was partially funded by the Robert E. Gaylord Endowed Chair in Orthodontics and the Texas Association of Orthodontists. © 2007 American Association of Orthodontists. Published by Elsevier Inc. All rights reserved.