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[\[PDF \(747K\)\]](#) [\[References\]](#)**Development of Three-dimensional FE Modeling System from the Limited Cone Beam CT Images for Orthodontic Tipping Tooth Movement**

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Abstract:

Previously, numerous three-dimensional finite element (FE) models of the dentoalveolar complex have been developed and stress analyses of orthodontic tooth movements were reported. Most of the models were, however, developed based on average anatomical data, but not on individual data. The aim of this study, therefore, was to investigate dentoalveolar stress distribution by lingual and distal tipping tooth movements using FE models of individual teeth based on the limited cone beam CT (3DX) images. Three extracted teeth (lower canine, upper molar, and lower molar) were used to test the three-dimensional reconstruction procedure in terms of accuracy and reproducibility in linear

dimensions and sizes. From the stress analysis of the three different models, the equivalent stress in tipping movement concentrated at the cervical region of the PDL and bone crest in all teeth. It was suggested that the FE modeling technique based on 3DX in this study is recommended for the individual determination of optimal orthodontic force for effective tooth movement.

Key words:

[Three-dimensional FE model](#), [Orthodontic tooth movement](#), [Limited cone beam CT](#)



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