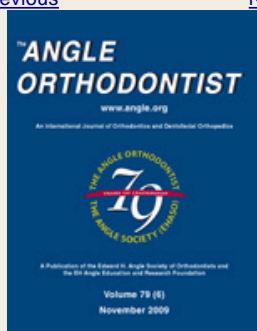


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Original Article

Changes of Caspase-1 after the Application of Orthodontic Forces in the Periodontal Tissues of Rats

Xiulin Yan^a, Jiang Chen^b, Yuquan Hao^c, Yan Wang^d, and Li Zhu^e

Abstract

Objective: To investigate the changes of caspase-1 in orthodontic tooth movement and to determine whether the changes are phase-specific.

Materials and Methods: Eighty Wistar rats were included in this study. Sentalloy closed-coil springs were placed to induce a mesial traction force on the lower right first molar. The animals were killed after 1, 3, 7, and 14 days (n = 20 at each time point). The mandibles of 10 rats were sampled for histomorphometric analysis and immunohistochemical assay, and the periodontal tissues of 10 other rats were sampled for detecting caspase-1 mRNA and protein by real-time RT-PCR and by Western blotting, respectively.

Results: The inflammatory reaction was evident in paraffin sections with hematoxylin-eosin staining. The immunohistochemical assay showed that orthodontic forces significantly increased the number of caspase-1-positive cells in the periodontal ligament (PDL). Mechanical force triggered an increase of caspase-1 mRNA in periodontal tissues. The expression of caspase-1 mRNA increased from day 1, reached the peak on day 3, and then decreased. The results of Western blotting indicated that the levels of both procaspase-1 and P20 subunit significantly increased after the application of orthodontic forces, compared with those in controls ($P < .05$).

Conclusion: Caspase-1 level increases during orthodontic tooth movement and changes with different phases, which might play a significant role in orthodontic tooth movement.

Keywords: [Orthodontics](#), [Rats](#), [Caspase-1](#), [Western blotting](#), [Messenger RNA](#)

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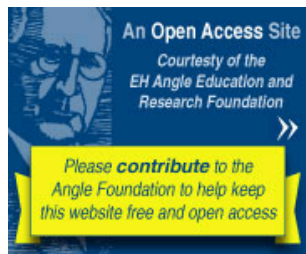
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