

Volume 79, Issue 6  
(November 2009)
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Angelo Leone, Annamaria Mauro, Giovanni Francesco Spatola, Salvatore Provenzano, Carola Caradonna, Aldo Gerbino, Maria Buscemi (2009) MMP-2, MMP-9, and iNOS Expression in Human Dental Pulp Subjected to Orthodontic Traction. The Angle Orthodontist: Vol. 79, No. 6, pp. 1119-1125.

Original Article

## MMP-2, MMP-9, and iNOS Expression in Human Dental Pulp Subjected to Orthodontic Traction

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### Abstract

**Objective:** To test the hypothesis that some metalloproteinases (MMP-2, MMP-9) and inducible nitric oxide synthetase (iNOS) enzymes in dental pulp samples do not vary when subjected to orthodontic treatment.

**Materials and Methods:** Human dental pulps were taken from male and female patients (N=10; age 10–14 years). A straight wire technique was used with nickel-titanium or steel archwires. The increase of pressure applied on teeth was gradual. Five patients were subjected to premolar extractions after 14 months of treatment and one after 24 months. Samples were Bouin-fixed, paraffin-embedded, and afterwards processed for immunohistochemistry using anti-MMP-2, anti-MMP-9, and anti-iNOS antibodies.

**Results:** A reduction of MMP-2, MMP-9, and iNOS expression occurred in treated samples. This became more evident with increased treatment time.

**Conclusion:** The hypothesis is rejected. The reduction of expression of those proteins revealed a time-dependent relationship.

**Keywords:** [Immunohistochemistry](#), [Dental pulp](#), [MMP-2](#), [MMP-9](#), [iNOS](#)

Accepted: November 2008;

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