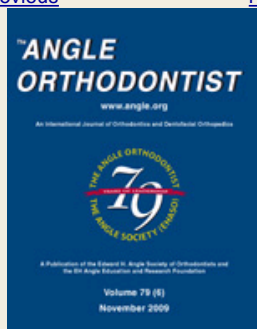


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Original Articles

Expression of Nitric Oxide Synthases in Orthodontic Tooth Movement

Dorri Nilforoushan^a and Morris Frank Manolson^b

Abstract

Objective: To investigate differential expression of NOS isoforms in periodontal ligament (PDL) and bone in tension and pressure sides using a rat model of orthodontic tooth movement (OTM).

Materials and Methods: Immunohistochemistry with NOS isoform (iNOS, eNOS, and nNOS) antibodies was performed on horizontal sections of the first maxillary molars subjected to 3 and 24 hours of OTM. The PDL and adjacent osteocytes of the distopalatal root at pressure and tension areas were analyzed for expression of these proteins. The contralateral molar served as a control. Results were analyzed with one-way ANOVA and with two-way ANOVA.

Results: Expression of all isoforms was increased in the tension side. iNOS and nNOS expression in the pressure side with cell-free zone was decreased but in the pressure side without cell-free zone was increased. The number of eNOS-positive cells did not change, but the intensity of the staining was visibly increased in the tension side. Duration of OTM changed only the pattern of nNOS expression. Osteocyte NOS expression did not change significantly in response to OTM.

Conclusions: All NOS isoforms are involved in OTM with different expression patterns between tension and pressure sides, with nNOS being more involved in early OTM events. NOS expression did not change in osteocytes, suggesting that PDL cells rather than osteocytes are the mechanosensors in early OTM events with regard to NO signaling.

Keywords: [Nitric oxide synthase](#), [Force](#), [Osteocyte](#)

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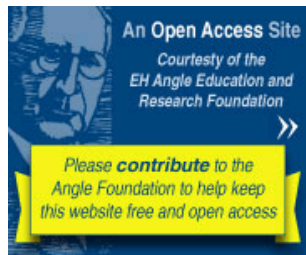
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