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Morphohistological Change and Expression of HSP70, Osteopontin and Osteocalcin mRNAs in Rat Dental Pulp Cells with Orthodontic Tooth Movement

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Abstract: Morphological change and expression of osteopontin, osteocalcin, and HSP70 mRNAs in rat dental pulp cells with experimental orthodontic tooth movement were investigated. Elastic rubber blocks, 0.65 mm in thickness, were inserted between the maxillary first and second molars in rats. In addition to morphological observations of HE staining and TUNEL staining at days 3, 7, 14 and 28 after insertion of elastic rubber blocks, expression of HSP70, osteopontin and osteocalcin mRNAs was also analyzed using quantitative RT-PCR with a LightCycler™. Morphologically, proliferation and vasodilation of capillaries was evident in the pulp at days 3 and 7, and a sparse odontoblast layer and apoptosis in the pulp were observed at days 7 and 14 after rubber block insertion. Expression of HSP70, osteopontin and osteocalcin mRNAs in the experimental groups was higher than that in the control group at all time points. This suggests that orthodontic tooth movement causes degenerative changes and apoptosis in pulp cells, while pulp homeostasis is maintained at the genetic level.

Key words: [Tooth movement](#), [HSP70](#), [Osteopontin](#), [Osteocalcin](#), [mRNA](#)



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