The Angle Orthodontist: **Vol. 67, No. 1, pp. 67–72.**

Influences of aging changes in proliferative rate of PDL cells during experimental tooth movement in rats

Shingo Kyomen, DDS, PhD;[a, c] Kazuo Tanne, DDS, PhD[b, d]

[a]Shingo Kyomen, DDS, PhD, Department of Orthodontics, Hiroshima University School of Dentistry, 1-2-3 Kasumi, Minami-ku, Hiroshima 734, Japan, (082)257-5686, (082)257-5687

[b]Kazuo Tanne, DDS, PhD, Department of Orthodontics, Hiroshima University School of Dentistry, 1-2-3 Kasumi, Minami-ku, Hiroshima 734, Japan, (082)257-5686, (082)257-5687

[c]Shingo Kyomen, assistant professor, Department of Orthodontics, Hiroshima University, School of Dentistry, Hiroshima, Japan.

[d]Kazuo Tanne, professor and chairman, Department of Orthodontics, Hiroshima University, School of Dentistry, Hiroshima, Japan.

ABSTRACT

This study was designed to investigate the influences of aging changes in the proliferative activity of PDL cells during experimental tooth movement in rats. Young (6-week-old) and adult (14-week-old) Wistar strain rats were used as experimental animals. Light (10g) or heavy forces (40g) were applied to the maxillary first molars for periods of 1, 3, 7, or 14 days. Proliferative activity of the PDL cells was evaluated immunohistochemically in terms of the ratio of the number of labeled cells to the total number of PDL cells (labeling index) or the number of labeled cells. In the controls, cellular activity was significantly greater in the young than in the adult group ($P<0.05$). Significant differences in the proliferative activity between young and adult groups were found in the tension and pressure areas during early stage of tooth movement ($P<0.05$), which indicated a delay of biologic responses to orthodontic stimuli in adult rats. It is shown that aging changes substantially influence proliferative activity of the PDL cells and subsequent tooth movement during the initial phase in particular.

KEY WORDS: Aging, Tooth movement, Periodontal ligament, Bromodeoxyuridine, Immunohistochemistry.

Submitted: November 1995
Accepted: March 1996.