The Angle Orthodontist: **Vol. 69, No. 4, pp. 365–371.**

Influence of dietary n-3 polyunsaturated fatty acid on experimental tooth movement in rats

Y. Iwami-Morimoto, DDS, PhD;[a] K. Yamaguchi, DDS, PhD;[b] K. Tanne, DDS, PhD[c]

[a]Yuko Iwami-Morimoto, DDS, PhD, Department of Orthodontics, Hiroshima University School of Dentistry, 2-3 Kasumi 1-chome, Minami-ku, Hiroshima 734-8553, JAPAN. Yuko Iwami-Morimoto, assistant professor, Department of Orthodontics, Hiroshima University, School of Dentistry, Hiroshima, Japan. E-mail: yiwami@ipc.hiroshima-u.ac.jp

[b]Kazunori Yamaguchi, associate professor, Department of Orthodontics, Hiroshima University, School of Dentistry, Hiroshima, Japan.

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

ABSTRACT

This study was conducted to investigate the influence of dietary n-3 polyunsaturated fatty acid on experimental tooth movement. This acid substantially reduces the production of arachidonic acid. Sixty 4-week-old male Wistar strain rats were divided into experimental and control groups. Animals in the experimental group were fed a purified diet containing 10% refined fish oil (rich in n-3 fatty acid); control animals were fed a diet containing 10% corn oil (rich in n-6 fatty acid). After 6 weeks, the maxillary first molars were moved buccally with an initial force of 20 g for periods of 0,3, 7, or 14 days. Tooth movement in the experimental group was 80% of that seen in the controls. The number of osteoclasts on the pressure side during tooth movement was nearly 60% of that seen in controls, and the degree of bone resorption was 80%. The data suggest that a diet enriched with fish oil reduces osteoclastic activity and subsequent alveolar bone resorption that is the key to experimental tooth movement.

KEY WORDS: Arachidonic acid, Bone resorption, n-3 polyunsaturated fatty acid, Experimental tooth movement, Prostaglandins.

Submitted: April 1998
Accepted: July 1998.