

[\[Print Version\]](#)

[\[PubMed Citation\]](#) [\[Related Articles in PubMed\]](#)

*The Angle Orthodontist*: Vol. 65, No. 2, pp. 141–150.

## Remodeling mechanisms of transseptal fibers during and after tooth movement

Satoru Tenshin, DDS, PhD;<sup>a</sup> Manabu Tuchihashi, DDS; Kotetu Sou, DDS; Ho-sung Lew, DDS; Hirohito Hayashi, DDS; Ichiro Tanimura, DDS; Terushige Kawata, DDS, PhD

<sup>a</sup>Department of Orthodontics, School of Dentistry, The University of Tokushima, 3-18-15 Kuramoto, Tokushima 770 Japan, Telephone 81-886-31-3111 (Ext. 5292), FAX 81-886-31-4215

### ABSTRACT

The remodeling mechanisms of transseptal fibers during and after tooth movement were investigated histologically. An autoradiographic study was conducted to assess the synthetic response. One hundred fifty male Wistar strain growing rats were divided into three groups—one control and two experimental groups. Animals in the experimental groups were subjected to tooth movement with 25 g and 150 g of force. Maxillary first and second molars were separated and retained mechanically.

Transseptal fibers were stretched in proportion to the amount of force applied for up to 2 days. Dynamic remodeling with proliferation of fibroblasts during tooth movement and slow rearrangement during retention periods occurred in both experimental groups. Collagen phagocytosis within the fibroblasts was observed ultrastructurally during the experimental periods. The number of silver grains in fibroblasts in the collagen fibers increased 160% the first day and 206% during the first 3 days.

Proliferating fibroblasts remodeled the transseptal fibers through the synthesization and degradation of collagen fibers.

S. Tenshin, assistant professor and lecturer, Department of Orthodontics, School of Dentistry, The University of Tokushima

M. Tuchiashashi, assistant professor, Department of Orthodontics, School of Dentistry, The University of Tokushima

K. Sou, assistant professor, Department of Orthodontics, School of Dentistry, The University of Tokushima

H.S. Lew, postgraduate student, Department of Orthodontics, School of Dentistry, The University of Tokushima, He received his DDS from Dankook University, Chonan, Korea, 1987

H. Hayashi, postgraduate student, Department of Orthodontics, School of Dentistry, The University of Tokushima

I. Tanimura, Assistant Professor, Department of Orthodontics, School of Dentistry, The University of Tokushima

T. Kawata, Professor and Chairman, Department of Orthodontics, School of Dentistry, The university of Tokushima

**KEY WORDS:** Remodeling mechanisms, Transseptal fibers, Tooth movement.

---

© [Copyright by E. H. Angle Education and Research Foundation, Inc. 1995](#)