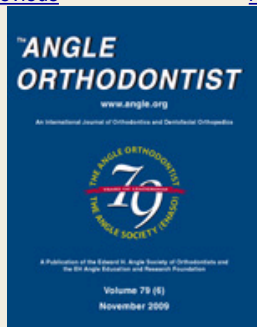


Volume 79, Issue 6
(November 2009)[◀ Previous Article](#)[Volume 79, Issue 6 \(November 2009\)](#)[Next Article ▶](#)[< Previous](#)[Next >](#)
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Original Article

Orthodontic Treatment of Malocclusion Improves Impaired Skillfulness of Masticatory Jaw Movements

Wakako Tome^a, Kohtaro Yashiro^b, and Kenji Takada^c

Abstract

Objective: To investigate whether individuals with malocclusion show less skillfulness, as represented by kinematic parameters that characterize masticatory jaw movement, compared with those having normal occlusion and, if so, to examine whether more skilled movements are achieved after completion of orthodontic treatment.

Materials and Methods: Lower incisor point movement in space during gum chewing was recorded, and the kinematic traits of such movement were compared among four subject groups: a Control Group (36 females with good occlusion), a Malocclusion Group (24 females with dental malocclusions), an Extraction Group (31 females who had received orthodontic treatment with premolar extraction) and a Nonextraction Group (27 females who had been treated orthodontically without tooth extraction). Before treatment, all subjects in the three experimental groups exhibited dental malocclusions and skeletal class I jaw-base relationship.

Results: Compared with the Malocclusion Group, the lower normalized jerk-cost, the shorter phase durations, the more symmetric property of the velocity profile, and the smaller variance of lateral jaw-closing trajectories near the tooth intercuspation position were determined in the Extraction Group and the Nonextraction Group as well as in the Control Group.

Conclusions: As measured by kinematic parameters such as normalized jerk-costs, velocity profile, and variance of movement trajectories near the endpoint of movement, dental malocclusions were associated with significantly lower skillfulness of masticatory jaw motion, whereas good occlusion and orthodontically improved occlusion (either with or without premolar extraction) were both associated with more skillful motion.

Keywords: [Kinematics](#), [Mastication](#), [Jerk-cost](#), [Tooth extraction](#), [Malocclusion](#), [Jaw motion](#)

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^a Assistant Professor, Department of Orthodontics and Dentofacial Orthopedics, Graduate School of Dentistry, Osaka University, Osaka, Japan

^b Associate Professor, Department of Orthodontics and Dentofacial Orthopedics and Center for Advanced Medical Engineering and Informatics, Osaka University, Osaka, Japan

^c Professor and Department Chair, Department of Orthodontics and Dentofacial Orthopedics, Graduate School of Dentistry and Center for Advanced Medical Engineering and Informatics, Osaka University, Osaka, Japan

Corresponding author: Kenji Takada, DDS, PhD, Graduate School of Dentistry, Osaka University, 1-8 Yamadaoka, Suita, Japan (opam@dent.osaka-u.ac.jp)



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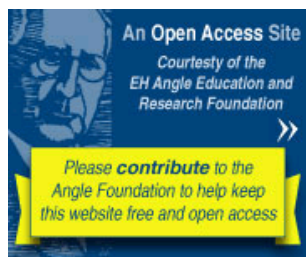
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