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Original Article

Effects of Mandibular Advancement plus Prohibition of Lower Incisor Movement on Mandibular Growth in Rats

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Abstract

Introduction: To test the hypothesis that mandibular advancement with the use of a fixed functional appliance combined with prohibition of labial movement of the lower incisors will have no effect on mandibular growth in growing rats.

Materials and Methods: Fifteen 4-week-old male rats were divided into fixed, unfixed, and control groups (n = 5, each). Bite-jumping appliances were used in the fixed and unfixed groups. Sites of bone perforation and the lower incisors were connected with ligature wires in the fixed group. The ramus height, mandibular length, and inclination of lower incisors were examined for 4 weeks, and those values were compared among five intervals and three groups by through one-way analysis of variance models and the Bonferroni multiple comparison test for post hoc comparison.

Results: Increases in ramus height and mandibular length during the experimental period were 1.5 mm and 2.5 mm in the fixed group, 1 mm and 1.5 mm in the unfixed group, and 1.2 mm and 1.9 mm in the control group, respectively. Growth of ramus height and growth of mandibular length in the fixed group were greater than in the unfixed and control groups during the experimental period. The inclination of lower incisors in the unfixed group was increased 8.0 degrees throughout the experimental period, which differed from results obtained in the other groups.

Conclusions: Mandibular growth was accelerated effectively before and during the pubertal period in rats by mandibular advancement with a fixed functional appliance combined with prohibition of labial movement of the lower incisor.

Keywords: [Fixed functional appliance](#), [Acceleration of mandibular growth](#), [Skeletal anchorage](#)

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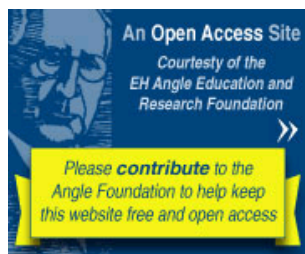
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