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Original Articles

Regulation of the Response of the Adult Rat Condyle to Intermaxillary Asymmetric Force by the RANKL-OPG System

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Abstract

Objective: To test the hypothesis that the RANKL-OPG system in the subchondral bone of adult rat condyles does not vary in response to different values of intermaxillary asymmetrical forces.

Materials and Methods: The mandibular rami of 160 Sprague-Dawley rats (3 months old) were subjected to unilateral traction in the anterior-superior direction using an elastic force. We used 120 g and 40 g as the initial elastic forces, and then removed the traction after 28 days. The expression of RANKL and OPG in the subchondral bone of the condyles was analyzed by semiquantitative immunohistochemistry.

Results: Different force levels induced similar changes in the expression of the OPG protein by 28 days. However, the effect of a 120-g elastic force on the expression of RANKL was stronger than that of a 40-g force. Because of the asynchrony of RANKL responses to external forces of different values, the values of RANKL/OPG ratio showed characteristic variation. The RANKL/OPG ratio in the side treated with heavy force showed a distinct negative correlation with the value obtained when a light force was used.

Conclusions: The hypothesis is rejected. Different values or traction force cause a variation of the RANKL/OPG ratio through the expression of RANKL protein, modulating the activities of bone remodeling in the subchondral bone of condyle.

Keywords: [Traction](#), [Temporomandibular joint](#), [Osteoclasts](#), [RANKL](#), [Osteoprotegerin](#), [Bone turnover marker](#)

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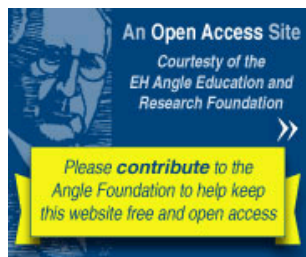
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