

The European Journal of Orthodontics, Volume 18, Issue 1: January 1996.

## **Growth and type-II collagen expression in the glenoid fossa of the temporomandibular joint during altered loading: a study in the rat**

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### **ABSTRACT**

The aim of this study was to measure changes in growth of the glenoid fossa and its articular eminence after decreased loading. A further aim was to evaluate the role of mechanical forces in relation to the existence of a cartilage layer, by determining type-II collagen secretion. A total of 99 Wistar rats were used: 48 animals were fed whole pellets and 51 were fed ground pellets. At age 21 days, after weaning, the upper and lower incisors of the soft-diet group were shortened by cutting them, twice a week. Ten animals fed whole pellets and 10 fed ground pellets were injected i.p. with Alizarin red (200 mg/kg) at ages 22, 30 and 40 days, and killed at ages 30, 40 and 50 days respectively. The heads were freed from the soft tissue and the zygomatic process cut sagittally at the deepest point of the greatest transversal concavity of the eminence. Bone apposition was measured. The other animals were used for studies involving collagen II immunostaining. Bone growth decreased in the group fed ground pellets except in the anterior-most part of the glenoid fossa at 50 days. Immunohistochemical analysis revealed larger areas of anti-collagen II staining in the group fed whole pellets, most markedly in the posterior part of the glenoid fossa. Growth of the articulation surface of the temporal component of the temporomandibular joint appears to depend on mechanical factors, such as the condyle. The underlying mechanics seem likely to be different. The presence of type-II collagen is obviously not regulated only by compressive forces but probably also by tension loading.

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Last modification: 6 November 1997.

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