



3D CHARACTERISTICS OF THE SUBCHONDRAL TRABECULAR BONE OF THE MANDIBULAR CONDYLE IN RATS WITH DENTAL OCCLUSAL CHANGE

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Abstract

In this study, we investigated the 3D bone trabecular characteristics of the mandibular condyle of adult rats with dental occlusal change using micro-CT analysis.

Key words:

trabecular bone, morphology, rats.

Introduction

The reduction of masticatory function has been reported when there is a loss of teeth or some occlusal alteration, particularly the posterior teeth¹. This reduction is associated with the function of masticatory muscles and a reduced bite force, which implies a reduction of the forces acting for mandibular condyle. Since bone reacts against a mechanical environment, it is likely that the morphology of the mandibular condyle tends to change. Thus, the aim of this study was evaluated the 3D bone trabecular characteristics of the mandibular condyle of adult rats with dental occlusal change using micro-CT analysis.

Results and Discussion

For the experiments, the dental occlusal change was induced in Wistar rats (n=45) according to 7, 14, 21, and 28 days after application of the resin (unilateral application, in right side, with 1 mm of thickness in occlusal surface of upper molars). For control group, the dentition was normal occlusion. The mandibular condyle of each rat was scanned to computed microtomography on a SkyScan 1174 (SkyScan, Leuven, Belgium) equipment. In quantitative analysis of results, we observed that the trabecular thickness decreased on the 7th day, falling to the 21th day, and on the 28th day, we did not show statistically significant differences (Kruskal-Wallis test, $p < 0.05$) with the control. The number of trabeculae increased in 7 and 14 days, decreasing to levels similar to the control on day 21 and rising on the 28th day. The trabecular separation decreased on day 7 in the control group and tended to remain less than the control in the following periods.

Conclusions

In the experimental situation of dental occlusal change in the molar region, we observed morphological changes in 3D characteristics of the subchondral trabecular bone of mandibular condyles of rats.

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¹ Shimomoto, Y.; Chung, C.J.; Iwasaki-Hayashi, Y.; Muramoto, T.; Soma, K., *J Dent Res.*, **2003**, 6, 168-72.

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