

## THE TRABECULAR BONE MICROSTRUCTURE OF THE CERVICAL, THORACIC AND LUMBAR SPINE IN JAPANESE MACAQUES (*MACACA FUSCATA*)

H. Chen<sup>1</sup>, T. Nishimura<sup>2</sup>, M. Takai<sup>2</sup>

<sup>1</sup>Gifu University, Gifu, Gifu, Japan, <sup>2</sup>Kyoto University, Inuyama, Aichi, Japan

Presenter's Email: huayue@gifu-u.ac.jp

The purpose of this study is to study skeletal diseases in human by comparing the trabecular microstructure of the cervical, thoracic and lumbar spine in Japanese macaque (*Macaca fuscata*) as nonhuman primate model. We conducted the study on 38 males and 43 females of Japanese macaques (3-26 years of age) housed at the Primate Research Institute of Kyoto University, Inuyama, Japan. Both male and female macaques were divided into 5 age groups: sub-adult (3-5.9 years), young adult (6-9.9 years), middle-age (10-14.9 years), advanced adulthood (15-19.9 years), and aged (20+ years) groups. Vertebral bodies of cervical spine C5, upper thoracic spine T4, lower thoracic spine T10, and lumbar spine L3 were scanned with micro computed tomography. The trabecular bone microstructural property and bone mineral density (BMD) were determined using 3D trabecular bone analysis software. In male and female Japanese macaques, trabecular bone volume fraction (BV/TV) and BMD were highest at C5 and lowest at L3. BV/TV and BMD of all vertebrae increased from sub-adult, reached a peak around 9 years, and then declined from young adult to aged. There was no significant gender difference regarding BV/TV and BMD. The current study indicates that age-related changes of the vertebral trabecular microstructure in Japanese macaques are similar to those of humans. We conclude that Japanese macaque may be a useful model to study at least some aspects of bone loss during human aging.

Keywords: Japanese macaque, Spine, Trabecular microstructure, Micro computed tomography.