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Morphologic and morphometric study of the lumbosacral vertebrae in guinea pig (*Cavia porcellus*) based on CT scan images

Elaheh Goli[1], Siamak Alizadeh[2*] and Mohammadreza Hosseinchi[3]

[1] DVM Graduate, Faculty of Veterinary Medicine, Ur. C., Islamic Azad University, Urmia, Iran
[2] Assistant Professor, Department of Clinical Sciences, Faculty of Veterinary Medicine, Nag. C., Islamic Azad University, Naghadeh, Iran
[3] Assistant Professor, Department of Basic Sciences, Faculty of Veterinary Medicine, Ur. C., Islamic Azad University, Urmia, Iran

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Abstract

Computed tomography (CT) is an accurate diagnostic imaging technique used to evaluate the vertebral column in exotic and small animals. The present study aimed to investigate the morphology and morphometric of the normal lumbosacral vertebrae in guinea pigs (Cavia porcellus) using CT scan images. This cross-sectional descriptive study utilized 10 healthy adult guinea pigs (*Cavia Porcellus*) (5 males and 5 females) with a mean age of 12 ± 1.20 months and an average weight of 1.04 ± 0.15 kg. Following anesthetization with a cocktail of xylazine (4 mg/kg) and ketamine (60 mg/kg), CT scans of the lumbosacral vertebrae were performed in the sagittal, transverse, and dorsal planes, from the cranial part of the first lumbar vertebra to the caudal extremity of the sacrum. Based on the results of this study, all parts of the lumbosacral vertebrae and intervertebral joints of guinea pig (*Cavia porcellus*) can be observed and evaluated in computed tomography images. The spinous process of the lumbar vertebrae in the sagittal plane and the cranial and caudal articular processes in the sagittal and transverse reconstruction planes were more identifiable. The mammillary processes and the cranial and caudal vertebral notches were better observed in the dorsal plan. Two lateral recesses were visible in the caudal vertebral foramina of L_6 at the junction of the pedicle and the vertebral body, a feature reported here for the first time. The interarcuate spaces of guinea pig lumbar vertebrae were very narrow, but this space was wide and large between the L_6 and S_1 vertebrae. For epidural anesthesia, surgeons can perform cerebrospinal fluid puncture and anesthetic drugs injection from this location. In this study, morphometric measurements of different parts of the lumbosacral vertebrae were subjected to statistical analysis. The results of this research can be employed in teaching computed tomographic anatomy of lumbosacral vertebrae, interpretation of CT scan images, as well as in clinical and treatment decisions of guinea pig (*Cavia porcellus*).

Key words: Computed tomography, Guinea pig (*Cavia porcellus*), Lumbosacral vertebrae, Morphology, Morphometric

[*] **Corresponding Author**: Siamak Alizadeh, Assistant Professor, Department of Clinical Sciences, Faculty of Veterinary Medicine, Nag. C., Islamic Azad University, Naghadeh, Iran
E-mail: si.alizadeh@iau.ac.ir

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