

High Resolution T2-Weighted Magnetic Resonance Imaging of the Canine Brain at 7 Tesla: A Comparison Study with 1.5 Tesla

Kijin Ko¹, Byeongteck Kang¹, Dongpyo Jang², Chaeyoung Lim¹, Jaeyong Han², Eungje Woo³,
Zanghee Cho³ and Heemyung Park^{1,*}

¹*BK21 Basic & Diagnostic Veterinary Specialist Program for Animal Diseases and Department of Veterinary Internal Medicine, College of Veterinary Medicine, Konkuk University, Seoul, Korea*

²*Neuroscience Research Institute, Gachon University of Medicine and Science, Incheon, Korea*

³*College of Electronics and Information, Kyunghee University, Yongin-si, Korea*

Purpose: This study was performed to describe the relevant canine brain structures using magnetic resonance imaging (MRI) at 7 T on T2-weighted images and to compare the results with 1.5 T.

Materials and Methods: T2-weighted imaging was performed on 5 healthy laboratory beagle dogs using 1.5 and 7 T clinical scanners. Image quality and conspicuity of anatomic structures were qualitatively evaluated by direct comparison of the images obtained from the 2 different magnetic fields. The signal-to-noise ratio (SNR) and contrast-to-noise ratio (CNR) were calculated and compared between 1.5 and 7 T.

Results: The T2-weighted images at 7 T provided good spatial and contrast resolution for the identification of the clinically relevant brain anatomy; these images provided better delineation and conspicuity of the brain stem and cerebellar structures, which were difficult to unequivocally identify at 1.5 T. However frontal and parietal lobe and trigeminal nerve were difficult to identify at 7 T due to susceptibility artifact. The SNR and CNR of the images at 7 T were significantly increased up to 318% and 715% compared to the 1.5 T images.

Conclusion: Only if some disadvantages, such as susceptibility artifacts, technical difficulties, and high cost, can be corrected, 7 T clinical MRI could provide a good experimental and diagnostic tool for the evaluation of canine brain disorders.

Key words: brain, dog, magnetic resonance imaging, 7 T

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*Corresponding author: parkhee@konkuk.ac.kr