Abstracts

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96 - Anatomy of the normal equine brain: a cross-sectional and 3T magnetic resonance imaging comparative study

Sophie Monteil[1]*, Fabrice Audigié[2,3], Hélène Gros[4], Patrice Peran[4], Sophie Pradier[1,5], Alexandra Deviers[1,4] and Giovanni Mogicato[1,4]

[1]Université de Toulouse, INP, ENVT, Toulouse, France [2]Center of Imaging and Research on Locomotor Affections in Equines, Ecole Nationale Vétérinaire d'Alfort, Université Paris-Est Créteil, Goustranville, France [3]INRA, USC BPLC 957, Maisons-Alfort, France [4]Toulouse NeuroImaging Center, Université de Toulouse, Inserm, UPS, France [5]INRA, UMR 1225, Interactions Hôtes Agents Pathogènes, Toulouse, France

Introduction: Magnetic resonance imaging (MRI) is the reference imaging technique for investigating pathologies of the central nervous system in human patients as well as in animals. As the use of 3T MRI devices is expanding in equine neuroimaging research (Cavalleri et al. BMC Veterinary Research 2013; 9:105), baseline MRI data acquired at this power field are necessary to identify and interpret lesions. MRI anatomy of the normal equine brain has already been published, but these imaging data were either acquired at lower-power field (Arencibia et al. Vet Radiol Ultrasound 2001, 42(5):405-408) or do not comprise more than five slices (Stuckenschneider et al. Pferdeheilkunde 2014; 30: 657-6701). Therefore, the aim of this study was to build an updtated MRI equine brain atlas using a compilation of anatomic cross-sections and corresponding 3T MR images.

Materials and Methods: With two flexible surface coils, 3T MR images of a cadaver horse head were acquired using 3D T1-weighted (T1W) Turbo Field Echo sequence (1 mm isotropic resolution) and 3D T2-weighted (T2W) Volume Isotropic Turbo Spin Echo Acquisition sequence (1.5 mm isotropic resolution). Furthermore, three forma-lin-fixed normal equine brains were cut in transversal, dorsal and median planes (one brain per plane) and 14 slices were selected for correlation with corresponding T1W and T2W MRI slice.

Results: Fifty-nine intracranial structures were identified thanks to good anatomical detail provided by 3D isotropic MR images and a proper correspondence between MRI and macroscopic sections. Labeling of these structures was achieved on one median slice (T2W), ten transverse slices (both T1W and T2W) and three dorsal slices (both T1W and T2W).

Conclusion: This comparative study supplies a 3T MRI and anatomic atlas of the equine brain as a guide for evaluating neurologic disease and also provides 3D MRI protocols yielding good image quality with a short acquisition time.