Ultrasonography and low-field magnetic resonance imaging of the common calcanean tendon in a rabbit model for tendinopathy research: a descriptive study of normal anatomy

A. Skalec¹, P. Przyborowska-Zhalniarovich², I. Janus³, K. Kirstein¹, M. Mieszkowska², Z. Adamiak², A. Chrószcz¹, M. Janeczek¹

¹ Department of Animal Physiology and Biostructure, Faculty of Veterinary Medicine, Wroclaw University of Environmental and Life Sciences, Kożuchowska 1/3, 51-631 Wroclaw, Poland
² Department of Surgery and Radiology, Faculty of Veterinary Medicine, University of Warmia and Mazury, Olsztyn, Poland
³ Department of Pathology, Faculty of Veterinary Medicine, Wroclaw University of Environmental and Life Sciences, Poland

Abstract

In spite of recent advances in treatment protocols, tendinopathies continue to challenge orthopaedists and surgeons. Due to the complexity of both tendon injuries and the healing processes, animal models are essential for addressing fundamental questions in tendinopathy research. Diagnostic imaging could contribute to the evaluation of animal models, thus providing information, which could be translated to human tendinopathies. The objective of our study was to evaluate in situ appearance of the rabbit common calcanean tendon with ultrasonography and magnetic resonance imaging. Additionally, we sought to assess and compare the feasibility and usefulness of these techniques in a rabbit model while focusing on the imaging of the particular structures involved in calcaneal tendon disorders. Eight California rabbits were used for post-mortem sonographic and low-field magnetic resonance examination. Morphometry was performed on longitudinal sonograms and sagittal MRI scans. The craniocaudal diameter of the tendon was measured at four points of interest. Ultrasonography and magnetic resonance provided good visualisation of the tendon origin, the paratenon and the pre-Achilles fat pad. Magnetic resonance images presented in more detail the structure of the calcaneal insertion. Both modalities failed to visualise the individual components of the common calcanean tendon and the bursa of the calcaneal tendon. Statistical analysis of measurements obtained showed that the craniocaudal diameter of the common calcanean tendon in a rabbit increases significantly with a growing length from the calcaneal tuber. Both magnetic resonance and ultrasonography are feasible, and should be considered complementary, not alternative imaging techniques in a rabbit common calcanean tendon model.

Key words: animal model, rabbit, anatomy, MRI, ultrasonography, common calcanean tendon

Correspondence to: A. Skalec, e-mail: skalec.aleksandra@gmail.com