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Magnetic resonance tomographic, computer tomographic, and histological examination of the third interosseus muscle of the pelvic limb of the horse

In this study, 21 rear limbs of horses of different age, sex and breed were examined by magnetic resonance tomography and computer tomography to permit a detailed description of the anatomy of the third interosseus muscle (suspensory ligament). Anatomic specimens and histological examinations were used to verify the findings and to identify tissue. A 1-tesla magnetic resonance tomograph was used to make transverse, sagittal, and frontal section images of the limbs within 36 hours post mortem. The images were then compared with those made with a spiral computer tomograph to discover the possibilities and limits of these imaging procedures, the use of which is new in veterinary medicine. Computer tomography proved to be very useful for the evaluation of transition areas between bone and ligaments such as those in the region of the origin of the suspensory ligament. However, magnetic resonance tomography images contained more detail and more information for the description of soft tissue structures.

A long proximal tendon of the origin of the third interosseus muscle was located that has not previously been described in the literature. This originates on the calcaneus, in the long plantar ligament, and has individual deep fibres on the fourth tarsal bone. Distally, it extends superficially in the lateral origin of the suspensory ligament at the third metatarsal bone.

The body and the origin of the third interosseus muscle at the third metatarsal bone are imbued with characteristic structured muscle fibres, neurovascular structures, connective tissue and fat. These arrangements are strikingly similar to those of the corresponding contralateral limbs.

Both imaging procedures must be considered valuable additions to veterinary diagnostics, but they involve great expense, particularly high-field magnetic resonance tomography. Furthermore, CT and high-field MRT examinations in equine medicine require general anesthesia of the patient. The great value of magnetic resonance tomography on the standing horse was demonstrated from examinations with a modern low-field system in two pathological cases (high suspensory desmitis, fracture of a sesamoidean bone).