Ultrasound of the Suspensory Ligament Using Perpendicular and Oblique Beam Angles for Identification of Anatomy With Comparison With MRI

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Ultrasound of the fore suspensory ligament using multiple beam angles with the limb in a flexed non–weight-bearing position improves identification of the anatomy and should be part of the comprehensive examination. Authors’ addresses: Gail Holmes Equine Orthopaedic Research Center, Colorado State University, 300 West Drake, Fort Collins, CO 80523 (Werpy, McIlwraith, and Frisbie); and Cirale, USC INRA-ENVA, 14430 Goustranville, France (Denoix); e-mail: nmwerpy@colostate.edu. *Corresponding author. © 2011 AAEP.

1. Introduction
Ultrasound of the suspensory ligament (SL) is challenging, because the standard method does not show important anatomic features of the ligament. In the SL, a perpendicular ultrasound beam produces echogenic fibers that decrease in echogenicity with an oblique angle. The remaining tissues behave differently with changes in beam angle. Contrast enhancement technique (CET) uses perpendicular and oblique beam angles to identify different tissue types. We hypothesized that using CET would facilitate distinguishing between fibers versus areas of fat and muscle.

2. Materials and Methods
The SL in 20 forelimbs was examined using the standard technique (ST; weight-bearing and perpendicular beam), CET (perpendicular and oblique beam with limb flexed), and magnetic resonance imaging (MRI). Circumferential area of the ligament, ligament fibers, muscle, and adipose tissue was measured on all images. The SL lobe size and tissue distribution in the right and left limbs of each horse were compared and subjectively graded (0–4) for asymmetry.

3. Results
CET improves differentiation of fibers from the remaining tissue types and allows identification of the peripheral ligament margin. The circumferential area of SLs was not significantly different when comparing right and left limbs or imaging modalities. There was no significant difference in asymmetry scores between modalities. The asymmetry scores at certain levels of the right and left forelimbs...
4. Discussion
This CET technique has limitations compared with MRI. However, it provides essential information not available with the ST, and it is part of our routine examination of the SL.

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