

A Comparison of 3-T Magnetic Resonance Imaging and Computed Tomography Arthrography in Identifying Structural Cartilage Defects in the Equine Fetlock Joint in the horse

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Products

3-Tesla Magnetic Resonance Imaging (3-T MRI) and Computed Tomography Arthrography (CTA)

Hospital / Authors

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Clinical Background

Articular cartilage defects in the fetlock joint are common and can cause lameness. CTA provides precise, efficient detection of cartilage defects, making it essential for equine joint care.

Aim of Study

Compare CTA and 3-T MRI in detecting cartilage defects in the equine fetlock joint, using gross anatomy as the gold standard.

Cohort Study

40 equine distal limbs (20 forelimbs, 20 hindlimbs) were imaged using CTA and 3-T MRI, followed by macroscopic and histological evaluation.

Results

- **CTA demonstrated superior accuracy** with a sensitivity of 82% and specificity of 96%, significantly outperforming MRI in detecting overall cartilage defects.
- **High spatial resolution** (0.20×0.20 mm pixel size) and near-isotropic reconstruction allowed detailed assessment of cartilage surfaces without gaps.
- **Short acquisition time** and high inter- and intra-observer agreement (0.96 and 0.92, respectively) enhanced CTA's reliability in clinical settings.
- MRI, while valuable for soft tissue and subchondral bone assessment, had **lower sensitivity (41%)** and was prone to partial volume artifacts and reduced spatial resolution.

Summary

- **CTA outperformed MRI** in identifying structural cartilage defects, providing superior sensitivity, specificity, and imaging precision.
- **Enhanced resolution and accuracy** make CTA a powerful tool for early detection and intervention in equine fetlock joint pathologies.
- MRI remains useful for complementary evaluation of soft tissues and subchondral bone but is less reliable for detecting superficial cartilage defects.
- CTA establishes a new diagnostic standard for precise, efficient, and reliable assessment of equine joint health.