

Intra-arterial contrast enhanced computed tomography of the deep digital flexor tendon and palmar veins in the distal forelimb in Jeju horses: Evaluating contrastenhancing factors

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Products

Computed Tomography (CT) for evaluating contrast enhancement in equine distal forelimb structures.

Hospital / Authors

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Clinical Background

Contrast-enhanced CT (CECT) is a valuable tool for assessing the deep digital flexor tendon (DDFT) and palmar veins in equine distal forelimbs. However, optimal contrast media (CM) concentration, injection rate, and scan parameters remain poorly defined.

Aim of Study

To determine the effect of CM concentration, injection volume, rate, and CT voltage on contrast enhancement (CE) of the DDFT and veins in intra-arterial CECT of equine distal forelimbs.

Cohort Study

Six healthy male Jeju horses (aged 3.8 \pm 0.75 years, weight 281 \pm 25.3 kg) underwent 54 CT scans with different CM concentrations (90-150 mg I/mL), injection volumes (50-150 mL), and rates (2-6 mL/s). Two CT voltage settings (80 kV and 120 kV) were compared. Scans were performed with 72-hour intervals to allow CM washout, and data were analyzed to optimize intra-arterial CECT protocols.

Results

- Higher CE of the DDFT was observed at 80 kV and 150 mg l/mL CM (p < 0.05).
- CM concentration was significantly correlated with CE levels (p < 0.001, r = 0.75).
- At **180 mg I/s IDR**, contrast attenuation in **palmar veins** decreased at **30 mg I/mL CM**, **6 mL/s rate, and 150 mL volume**, but still provided sufficient vessel differentiation.
- >900 HU CE allowed clear visualization of veins from adjacent tissues.
- Adjusting **injection rate and volume** could reduce **total iodine dose** while maintaining diagnostic image quality.

Summary

- Low voltage (80 kV) and high CM concentration (150 mg l/mL) enhanced DDFT contrast.
- **CM concentration significantly influenced enhancement** (p < 0.001, r = 0.75).
- At 180 mg I/s IDR, lower CM concentrations (30 mg I/mL) and higher injection rates (6 mL/s) reduced vein contrast.
- CE above 900 HU distinguished vessels from tissues, allowing for reduced iodine dose.
- Findings support **CT as a practical tool** for equine tendon and vascular imaging.

Link to paper