Comparison of Six Techniques for a Lateral Approach to the Coffin Joint

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The likelihood for an exclusive injection of the coffin joint was optimized when a lateral approach was performed with a 1-in. (2.54 cm) 20-gauge needle and with the limb in a standing square position. Authors’ address: Veterinary Medical Teaching Hospital (de Mercado) and J. D. Wheat Veterinary Orthopedic Research Laboratory (Stover), School of Veterinary Medicine, University of California at Davis, Davis, CA 95616. © 1998 AAEP.

1. Introduction

Arthropuncture of the coffin joint is indicated for diagnostic intra-articular analgesia, synoviocentesis, intra-articular therapy, and through-and-through lavage. The dorsal approach was demonstrated to be more specific for arthropuncture of the coffin joint alone than a reported lateral approach. However, the dorsal approach had a lower synovial fluid yield and has been reported to be difficult to perform by some practitioners. Because the landmarks for the lateral approach are discrete and facilitate coffin joint entry, the objectives of this study were to evaluate limb position and needle length to enhance exclusive coffin joint penetration.

2. Material and Methods

A paired study design was used in each of three groups of randomly allocated paired forelimbs (ten pairs; n = 20 per group) differing by limb position: group 1, the horse was in a standing square position, as if it were bearing weight with the cannon bone perpendicular to the ground (fetlock dorsal angle, or FA = 145°); group 2, the hoof was positioned caudally (FA = 155°); and group 3, the limb was flexed (FA = 235°). The needle length (1.5 in. (3.8 cm) or 1 in. (2.54 cm)) differed between contralateral limbs within each group.

Cadaveric forelimbs were harvested within 24 h of euthanasia from adult horses (mixed breeds, 2–35 years of age). A lateral approach to the proximopalmar pouch of the coffin joint was used in all limbs for the injection of 8 ml of radio-opaque material. Within 15 min of injection, dorsopalmar and lateromedial positive-contrast arthrograms (high-detailed screens, 500 mA, 0.02 s, 80 kV, with a 40-cm focal film distance) were taken to allow the determination of synovial structures containing radio-opaque material.

3. Results

Use of a 1.5-in. 19-gauge needle was associated with the deposition of contrast material exclusively in the coffin joint in only 40% of the limbs in the standing square position, 60% of the limbs in the caudal position, and 70% of the flexed limbs. Contrast material was present in the coffin joint and navicular bursa in 20%, 40%, and 20% of the limbs in the square, caudal, and flexed positions, respectively.
The remaining limbs had contrast material in either the navicular bursa, digital flexor tendon sheath, subcutaneous tissues, or the palmar digital vessels. The use of a 1-in. 20-gauge needle was associated with the deposition of contrast material exclusively in the coffin joint in 100% of the limbs in the standing square position, 90% of the limbs in the caudal position, and 40% of the flexed limbs. The remaining 10% of the caudally positioned limbs had contrast material in both the coffin joint and navicular bursa. The other limbs in the flexed group had contrast material in either the digital flexor tendon sheath, navicular bursa, or subcutaneous tissues.

4. Discussion
This project was undertaken to further refine a lateral approach to the coffin joint.\(^1\) The lateral approach was considered easy to perform; however, it was associated with the frequent inadvertent injection of other synovial structures. With the knowledge that equine practitioners commonly utilize variations of this technique to access the coffin joint, the effects of limb positioning and needle length on the likelihood for exclusive injection of the coffin joint were investigated. Findings from this study indicate that limb position and needle length are significant factors associated with exclusive entry of the coffin joint. A 1.5-in. needle was unreliable for exclusive coffin joint entry regardless of limb position. A 1-in. needle resulted in 100% and 90% exclusive coffin joint injections in standing square and caudal positions, respectively.

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References and Footnotes
\(^{a}\)Renografin 76, Bristol-Meyers Squibb Company, Princeton, NJ 08543.
\(^{b}\)Microvision C, Dupont Medical Products, 112 Clifton Court, Folsom, CA 95630.