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(Article begins on next page)

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A pressure-sensitive glove for standardisation of the force applied during distal forelimb flexion tests in horses

Vittorio Caramello[a] , Gessica Giusto[a], Francesco Comino[a] , Claudio Bellino[a] , Marco Gandini[a]

[a]Department of Veterinary Sciences, University of Turin, Largo P.Braccini 2-5 , Grugliasco (TO), Italy

Lameness evaluations with flexion tests are a routine procedure for equine practitioners and are commonly used in both lame and sound horses [1-6]. The force applied by the surgeon, during a flexion test, has a strong influence on the outcome of this test [2,3,5].The objective of this study wasto verify if a commercially available pressure-sensitive glove could be employed to standardise the force applied in the equine distal forelimbflexion test.Three experienced veterinary surgeons and three final-year students performed bilateral distal forelimb flexion tests on cadaver limbs and on live horses with a pressure-sensitive glove. All participants were asked to apply a constant force for 60 s using the indicator on the glove display while a camera recorded the value on the glove display. The videos were reviewed and the percentage of time for which the correct force was applied was measured.

Nosignificant differences were found between the percentages of time of application of the standard force between experienced and non-experienced operators (P = 0.802). No statistical difference was found between experienced and inexperienced operator either in live horses (P = 0.591) and in the cadaver model (P = 0.797). The difference in the overall percentage between flexion tests performed in the cadaver or live horse model was significant (P = 0.0032).

In conclusion, the pressure-sensitive glove was effective in standardising the force applied during the distal forelimb flexion tests and could become an essential and affordable tool for the equine practitioner, allowing standardisation of the test and an objective assessment during equine lameness investigation.

Reference:

[1] Ramey DW. Prospective Evaluation of Forelimb Flexion Tests in Practice : Clinical Response, Radiographic Correlations, and Predictive Value for Future Lameness. AAEP PROCEEDINGS. Phoenix, December 7 to 10 1997 **,**116-120

[2] Keg PR, Van Weeren PR, Back W, Barneveld A. Influence of the force applied and its period of application on the outcome of the flexion test of the distal forelimb of the horse. VetRec1997;141: 463-466

[3] Keg PR, Van Weeren PR, Schamhardt HC, Barneveld A (1997b) Variations in the force applied to flexion tests of the distal limb of horses. Vet Rec 1997;141:435-438

[4] Verschooten F, Veerbeck J. Flexion test of the metacarpophalangeal and interphalangeal joints and flexion angle of the metacarpophalangeal joint in sound horses. Eq Vet J 1997;29: 50-54

[5] Armentrout AR, Beard WL, White BJ, Lillich JD. A comparitive study of proximal hindlimb flexion in horses: 5 versus 60 seconds. Eq Vet J 2012;44: 420-424

[6] Busschers E, Van Weeren PR. Use of the Flexion Test of the Distal Forelimb in the Sound Horse: Repeatability and Effect of Age, Gender, Weight, Height and Fetlock Joint Range of Motion. J Vet Med 2001;48: 413-427