Supplemental Methods

Electrodiagnostics

Electromyography

A Nicolet Viking™ IV evoked potential system (Nicolet Biomedical Inc., Madison, WI, USA) was used to perform electromyography (EMG) in Cases 1-3 and a Cadwell Sierra Wave (Cadwell Industries, Kennewick, WA, USA) in Case 4. A concentric EMG needle electrode and a subdermal ground electrode (Natus Medical Instruments Inc., Middleton, WI, USA) were used to survey numerous had, cervical, paraspinal, and appendicular muscles following University of California, Davis protocols[1]. The EMG frequency bandwidth was 20 Hz to 10 kHz with a sensitivity of 50 μV/div and sweep speed of 10 ms/div. Insertional and spontaneous activity were examined and graded for each muscle according to a published scoring system[2].

Motor and sensory nerve conduction

Polyteflon-coated monopolar stainless-steel electrodes of various lengths were used for both stimulation and recording. A subdermal needle electrode was used as ground. Bandwidths were 2 Hz to 10 kHz but sensitivities, sweep speeds, and stimulus intensities were adjusted to optimize the potential recorded. For motor nerve conduction studies, latency was measured at the onset of the CMAP (compound muscle action potential), and amplitude was measured from the baseline to the negative peak. SNAP (sensory nerve action potential) latency was measured from the initial positive peak, and amplitude was

measured from positive peak to the largest negative peak. Nerve conduction velocities (NCV) were determined by dividing the difference in distance between electrodes (sets of stimulation electrodes for motor, and stimulating and recording for sensory) by the difference in latency. The dogs' core body temperature during recording was maintained between 37 and 37.7°C. Studies were performed as described in the literature[1,3–5]. Age was a consideration in comparing NCV values[6].

Repetitive nerve stimulation

Repetitive supramaximal stimulation of the peroneal nerve was performed at frequencies of 1, 3, 5, 10, 20, 30 and 50 Hz in Cases 2 and 3. Trains of 10 stimuli used for each stimulus repetition rate. A minimum of 1 minute of recovery time elapsed between trains of stimuli to allow equilibrium of the neuromuscular junction. Compound muscle action potential amplitude and area under the curve were compared between the first and subsequent potentials to assess incremental or decremental responses[2,7,8].

Late waves

Late waves recording for F ratio calculations were attempted for the peroneal and ulnar nerves in Cases 1-3[9]. A series of 32 potentials were obtained for each recording with the latency for the split in sensitivity adjusted to optimize visualization of both the M wave

(CMAP) and late wave(s). No attempts were made to calculate F ratios, as reference values were only available for the tibial nerve.

References

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