Neurology the Fun Way Video Case Presentations (Dogs)

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"A picture is worth a thousand words". The purpose of this presentation is to review and discuss the clinical presentations of movement disorders in cats and dogs, with an emphasis on tremors and fasciculations, using video case presentations.

It can be difficult to determine the neuro-anatomical origin and etiology of movement disorders in dogs and cats. A range of underlying toxic, neuro-pathological, and neuro-degenerative processes, and normal behaviors, may result in movements that range from benign sleep-related muscle twitches to generalized tremors.

Abnormal involuntary movements include a variety of muscle jerks, twitches, postures, and oscillations, that have been classified in human neurology using terms such as tic, chorea, tremor, dystonia and myoclonus. Uncontrolled muscle contractions may be of muscle or neuronal origin.

Movement disorders may be broadly classified as: (1) those characterized by excess movements (hyperkinesias), (2) those characterized by reduced movements (bradykinesias), and (3) those characterized by paroxysmal abnormal involuntary movements.

Classification of movement disorders

- I. Hyperkinetic abnormal voluntary movements resulting from neuromuscular disorders include:
 - Myotonia
 - Tetany and tremor (hypocalcemia)
 - Benign fasciculations (exercise, stress)
 - Toxicity
 - Metabolic disorders (hypercalcemia)
 - (Other) Causes of neuropathy
- II. Hyperkinetic abnormal voluntary movements resulting from central nervous system disorders include:
 - Myoclonus (spinal, proprioceptive, epileptic, toxic)
 - Tetanus
 - Tremor (essential, toxic, idiosyncratic drug-induced, metabolic [hypoglycemia, hepatic or uremic encephalopathy], degenerative diseases)
 - Cerebellar-related tremor disorders (hypoplasia, malformation, granuloprival degeneration, hypodysmyelinogenesis, axonopathy, abiotrophy)
 - Lysosomal storage diseases
 - Acquired disorders (inflammatory, infectious, immune-mediated, neoplastic, vascular, traumatic, toxic and idiopathic)
 - Hypokinetic abnormal involuntary movements include:
 - Primary basal nuclei disorders
 - Secondary (drug reaction)
- IV. Paroxysmal abnormal involuntary movements include:
 - Convulsions due to epilepsy or other causes
 - Sleep-related movements.

Hyperkinetic movement disorders

I. Myotonia

III.

- Sustained muscle contraction with delayed relaxation caused by a failure of normal myocyte chloride conductance.
- II. Tetanus & Tetany
 - Continuous sustained extensor muscle contraction caused by the tetanus toxin released by *Clostridium tetani* bacterial infection.
- III. Myoclonus
 - Sudden, rapid, involuntary muscle movement of short duration.
- IV. Fasciculations & Myokymia
 - Spontaneous contraction of muscle fibers within a motor unit arising from ectopic electrical activity in the distal axon.

Tremor syndromes

Tremor is classified according to its anatomical distribution, as well as its frequency during rest, postural maintenance, movement, intention, and the performance of specific tasks.

Essential tremors

A clinical syndrome characterized by progressive action tremor of pelvic limbs that worsens with activity or excitement.

Tremor associated with neuromuscular disease

Dogs with advanced peripheral neuropathies may present with a pelvic limb tremor.

Drug-induced tremors

Drug-induced tremors have been reported in dogs and cats.

Cerebellar tremors

The most common cause of tremors in small animals is cerebellar dysfunction.

Hypokinetic movement disorders

Parkinson disease, a neurodegenerative disorder of the nigrostriatal dopaminergic system, is frequently seen in humans, but has not been reported in non-primate species.

Paroxysmal movement disorders

Epileptic seizures

Partial and generalized seizure disorders may result in paroxysmal disorders of movement.

Non-epileptic seizures

Compulsive behaviors, such as tail-chasing or repetitive licking, may occur and end suddenly. In addition, syncope of cardiac origin, metabolic disturbances, toxicities, acute vestibular disturbances, and narcolepsy may be included in this category.

References

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