



Neurotransmitter

Chloe's Story

W Bush, VMD, DACVIM (Neurology)

PRESENTING COMPLAINT

- Collapse
- Frequent sitting
- Weak on the pelvic limbs, especially with exercise
- Slower to eat
- Excess salivation

HISTORY

6 weeks ago – infrequent sitting during walks, slower with stairs

3 weeks ago – eating less, slower to eat, occasionally salivating

5 days ago – progressively frequent sitting while walking

Today – collapsed on a walk and unwilling to get up

MEET CHLOE

Chloe is a four-year-old female spayed, mixed breed who presented to BVNS with frequent sitting, collapse, slower to eat, weakness, and excess salivation.



Our team performed a full neurologic exam.

NEUROLOGICAL EXAM

- Mentation: Normal to slightly dull
- Posture: Weak on the pelvic limbs
- Gait: No ataxia, exercise intolerant
- Postural Responses: Normal
- Reflex: Normal
- Cranial Nerves: Subtle delay in palpebral response, worse with repeated stimulation
- Hyperesthesia: None / not painful
- Normal orthopedic exam

GENERAL EXAM

- BCS 6/9
- Normal orthopedic exam
- No heart murmur, strong, synchronous pulses

WHAT IS LOCALIZATION?

Nerve/Muscle based on weakness without ataxia, postural deficit, or back pain. More specifically, normal reflex and fatigue of palpebral reflex suggest nerve-muscle junction disease.

WHAT ARE THE TOP DIFFERENTIALS?

Immune / infectious / metabolic disease of the muscle / nerve or junction.

WHAT IS THE SEQUENCE OF RECOMMENDED TESTING?

CBC
Chemistry
Creatine Phosphokinase (CPK)
Thoracic radiographs
Neostigmine Response Testing
+/- Acetylcholine Antibody Testing
+/- Thyroid and Adrenal Testing
+/- Protozoal Testing (Toxoplasmosis gondi or Neospora caninum)

INITIAL DIAGNOSTIC RESULTS

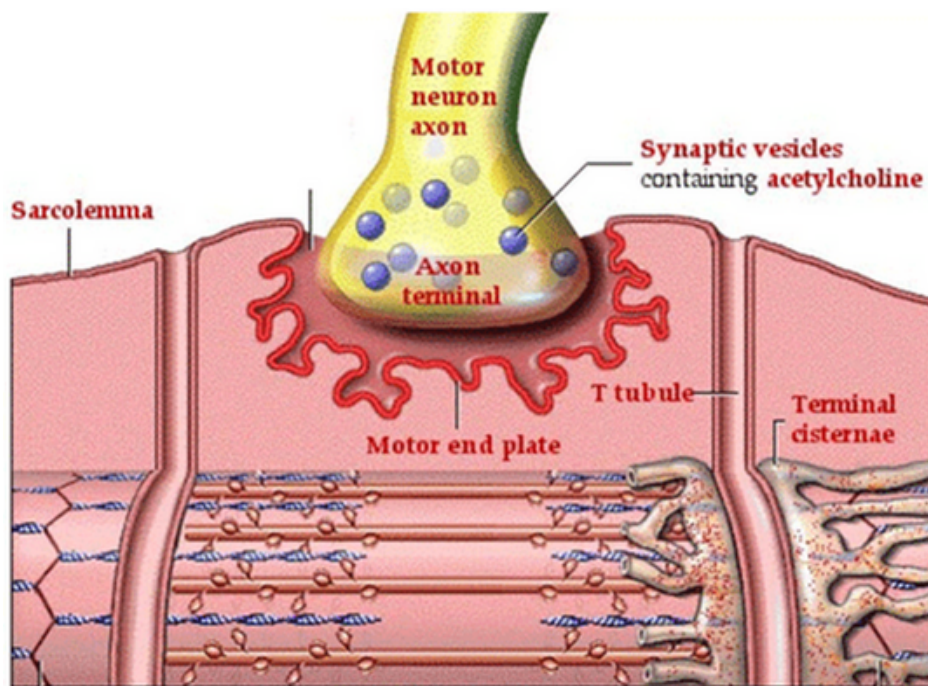
CBC – normal
Chemistry – normal
T4 – low normal
CPK – normal
Thoracic Radiographs – non-remarkable – no megaesophagus

Next Step – Investigate Myasthenia Gravis



MYASTHENIA GRAVIS TESTING

- In Myasthenia gravis antibodies bind to acetylcholine (ACH) receptors on the muscle endplate preventing muscle contraction.
- Acetylcholinesterase breaks down ACH. Inhibition of synaptic acetylcholinesterase, increases acetylcholine, and improves muscle contraction and strength with MG.
- Oral acetylcholinesterase inhibitor with Mestinon (Pyridostigmine) is a useful treatment for MG. IV injection of a short acting acetylcholinesterase inhibitor can test for MG
- Gold standard testing is the ACH receptor antibody test – results back in about 1 week



SAFETY FACTOR

Normally there is 3-5 times the amount of ACH needed to bind post-synaptic membrane, trigger an action potential and then muscle contraction. In MG there is an insufficient concentration of ACH.

NEOSTIGMINE CHALLENGE TEST (NCT)

- Neostigmine Dose 0.02, IV, observe for improved gait and prolonged ability to walk before becoming weak – typical response time is 2 minutes (range of 1-20 mins)
- Possible side-effects from increased ACH
 - Muscarinic receptor binding can cause hypersalivation (and less commonly vomiting, diarrhea, bronchoconstriction, AV block). Atropine will block the muscarinic receptor and reduce these side effects.
 - Nicotinic receptor binding can cause muscle fasciculation (and theoretically flaccid paralysis and respiratory failure). Atropine will not block nicotinic receptor and prevent respiratory failure.
- When performing neostigmine challenge test (NCT):
 - Closely observe for 30 minutes
 - Consider pre- or post-treatment with atropine 0.02 mg/kg, IV
 - ET tube ready for intubation from respiratory failure

CHLOE'S OUTCOME

ACH Antibody Test Result:

ACH antibody test – 0.08 (positive is > 0.05 nmol/L)

Treatment:

- Mestinon 1 mg/kg, BID resolved clinical signs but was increased to TID because she was weak prior to next dose
- Cyclosporine 6 mg/kg, BID was NOT started because of low titer and relatively mild signs
- Prednisone is contraindicated because can cause neuromuscular weakness and muscle atrophy

Prognosis:

- Among all dogs with MG about 65% survive. Chloe's prognosis was considered good because of relatively low titer, absence of megaesophagus/regurgitation/pneumonia, and younger age.

Outcome:

- Normal at 6-month and 12-month follow-up, Mestinon was then successfully tapered and eliminated.



What you should expect from BVNS when you refer a case:

- Faxed Referral Letter (with call to confirm receipt).
- Desire to discuss any case, whether it is a referred case or a consultation.
- Dedication to provide superior service to you and your clients.

For more information on services offered, please visit us at www.bvns.net