

Sensory Neuropathy in Border Collies

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We were recently examined a Border Collie with poor coordination and foot wounds that may have been self-inflicted. On examination, it was noticed that the puppy's joints were quite lax and he felt no pain when his toes were pinched firmly. Electrical nerve testing revealed that the puppy had decreased sensory function in the peripheral nerves but motor function was predominantly intact. A post-mortem examination confirmed a sensory neuropathy. This condition has been reported in juvenile Border Collies in the veterinary literature. Through outreach with other neurologists we have identified the disease in six other unrelated Border Collies. The purpose of this article is to provide information about the condition so that breeders can be alert to any future cases and help us find the cause of this condition.

What is a sensory neuropathy?

The peripheral nervous system (PNS) is comprised of the nerves that emerge from the brain and spinal cord to supply sensation to the skin and control the muscles. Disturbances of the PNS can be solely sensory, motor or both. Sensory neuropathies, or diseases of the sensory nerves, are rare and manifest as loss of coordination, joint laxity, loss of proprioception (inability to know where the limbs are in space), and inability to perceive pain. Animals with sensory neuropathies will often self-mutilate their limbs. Although we can't be sure exactly why, human's with similar conditions often describe a tingling or burning sensations in their fingers and toes. Dogs may perceive a similar tingling or pain which causes them to chew at their toes.



The puppy here displays misplaced limbs and laxity of the joints. Self inflicted wounds can also be noted on his left hind limb.

Sensory Neuropathy in the Border Collie.

The disease has been reported in veterinary journals, afflicting puppies between the ages of 5 and 7 months with the signs described above. The disease was confirmed by electrical testing and evaluation of biopsied nerves. All affected dogs were eventually euthanized because of progression of the disease including incontinence and more severe self mutilation.

What else can look like Border Collie Sensory neuropathy?

This disease can be misinterpreted as spinal cord disease in the neck which can cause loss of coordination and pain perception. It is different from a disease of the spinal cord because of changes in the reflexes, and it is rare for spinal cord disease to cause lack of pain perception when the dog can still walk. The other consideration would be an infectious disease, such as Toxoplasmosis or Neosporosis that can affect the peripheral nerves. This can be differentiated with blood tests performed by a veterinarian. Lastly, this disease has been mistaken for loss of blood flow to the feet or simply a skin disease.

Is this a hereditary disease?

Since it runs within the breed line, this is likely a heritable disease. The sire and dam of all documented cases have been clinically normal as have all known littermates. This would suggest an autosomal recessive pattern of inheritance. In other words, the parents are likely carriers of the causative genetic mutation and both defective genes must be passed on for a puppy to be affected.

How do we find the gene responsible?

The goal in dealing with hereditary diseases is to identify the gene responsible. Then we can develop a DNA test that will aid breeders in avoiding the disease in the future. Genes contain the genetic code that programs everything about an animal from the color of their coat to how their brains develop. Genetic disease occurs when a mutation interferes with the ability of a gene to function normally. Each dog has an estimated 20,000 individual genes, any one of which could contain a mutation that causes the Sensory Neuropathy in the Border Collie. In the past, the cause of the neuropathy has gone undetermined because the technology to identify genetic diseases was not available. We now have the tools, however, to find the mutation responsible for such diseases.

How can I help?

If you have a litter with a pup you believe might be affected, please contact us. We can help your veterinarian in determining whether or not this is the problem in your pup. In return, we would ask your help in collecting the samples and information necessary to continue searching for the gene responsible for this disease. Your continuing support will be necessary to achieve our goal.

Any information provided to us will be kept strictly confidential

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