Degenerative Myelopathy Does NOT Occur in French Bulldogs

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This article is written in response to the misinformation and gene pool destructive genetic testing that is currently going on in the French Bulldog breed regarding degenerative myelopathy (DM). DM is a specific genetic disease that causes fatal spinal cord degeneration in older dogs. It has a complex mode of inheritance which requires more than one gene pair having to combine to cause a clinically affected dog. Several different disorders mimic the clinical signs of DM. Therefore, a confirmed diagnosis can only be made through a pathological examination of the spinal cord.

Dr. Joan Coates and her associates at the University of Missouri have conducted clinical and pathological research on DM since 2007. Due to the complex neuropathological changes observed in affected dogs, pathologists from around the world have sent spinal cord slides to UMo. for confirmation of a diagnosis. Sporadic cases have been pathologically confirmed in 34 different breeds and in mixed breed dogs, but the majority of clinical cases occur in only a handful of breeds**. DM has never been pathologically confirmed in the French Bulldog.**

Several peer-reviewed published studies document the neurological disorders present in the French Bulldog breed**. A 2017 study reviewed all French Bulldogs presenting with neurological disease to the Alfort University Veterinary Hospital in France between 2002-2016. No cases of degenerative myelopathy were diagnosed in the breed.** The most common condition *causing neurological signs* in the breed was intervertebral disc disease at 45.5% (5% of all French Bulldogs seen) with two-thirds of the cases involving the hind legs. The rest of the neurological conditions diagnosed included spinal arachnoid diverticula (7.3%), brain tumors (7.2%), compressive spinal cord disease (5.5%), spinal tumors (2.0%) and syringomyelia (1.7%). Other conditions included infectious, toxic, metabolic and ischemic disease. **A study of French Bulldogs in the UK showed similar results with zero dogs being confirmed with DM.** The vast majority of diseases causing neurological signs in the French Bulldog cause similar clinical signs to DM and are **treatable diseases.** Assigning a misdiagnosis of a fatal disease such as DM prevents a proper workup and treatment that can likely **save a dog's life.**

I personally take some blame for the misunderstanding of whether DM exists in this breed. During the 2009 French Bulldog Club of America National Specialty health seminar, I included an analysis of a 2009 FBCA breed health survey. The survey was filled out by owners and 2.3% indicated that their dog was diagnosed with DM. (The PowerPoint with the health survey statistics and a description of DM are still present on the internet.) We now know there are no confirmed French Bulldogs with DM. There are French Bulldog owners who believe that their dogs have DM and have Facebook and other social media pages dedicated to their dogs. On several of these, serial videos of the dogs actually rule out a neurological diagnosis of DM.

The most confusion concerning DM is associated with the genetic test for the *sod1* mutation. In 2008, researchers at the University of Missouri and the Broad Institute identified a recessive mutation in the *sod1* gene that is homozygous (carrying two copies) "at risk" in all

pathologically confirmed DM affected dogs. A genetic test for the *sod1* mutation is available from several dog DNA testing laboratories including the University of Missouri (OFA testing). As DM is a complexly inherited disease, dogs must have a mutation in another (yet unidentified) gene or genes in addition to being homozygous for the *sod1* mutation to become clinically affected. Based on the lack of confirmed cases in the French Bulldog breed it is probable that the breed lacks other causative genes necessary to produce clinical DM.

The *sod1* mutation is an ancient mutation in the dog genome and is **the most frequent mutation identified** in the genetic screening of mixed-breed and purebred dogs. Mars/Genoscoper testing finds that the *sod1* mutation frequency is 7.77% in all mixed-breed dogs tested, and 5.41% in all purebred dogs tested. In several breeds the frequency of the *sod1* mutation is over 90%, but no members of the breed have ever been diagnosed with clinical DM. In worldwide testing of French Bulldogs, 2-5% test homozygous "at risk" for the *sod1* mutation, and 18-33% test as heterozygous carriers. However, **the presence of the *sod1* mutation is of no consequence to any French Bulldog as DM is not a clinical disease in the breed**.

Due to misdiagnoses, misconception and misinterpretation of *sod1* testing, several national French Bulldog parent clubs call for pre-breeding *sod1* testing. **This erroneous call places an enormous pressure to restrict the breeding of healthy, quality French Bulldogs. It severely restricts the genetic diversity of the breed by selecting against up to one-third of all dogs for breeding.** In addition, a *sod1* homozygous "at risk" test result places a significant and unnecessary emotional burden on owners who believe that their family member will develop DM and die from the disease. **Unless and until DM is proven to be a significant clinical disease in the French Bulldog breed, no French Bulldog should be tested for the *sod1* mutation and no breeding decisions should be made based on the results of *sod1* testing.** French Bulldog breeders should concentrate on selecting for quality breeding dogs that are free of validated breed-specific disease liability genes and genetic disorders.

Pertinent References

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