

Cardiomyopathy in Toy Manchester Terrier Puppies

Etienne Côté DVM, DACVIM (Cardiology, SAIM)
Shannon Martinson DVM
Amanda Kelly

Departments of Companion Animals (Côté) and Pathology (Martinson)
Atlantic Veterinary College
University of Prince Edward Island
Charlottetown, PEI, Canada
vetcardio@upei.ca

Since 2005, our team has been working with the Canadian and American Manchester Terrier Clubs to study an emerging type of heart disease that appears to be unique to Toy Manchester terriers. Thanks to concerned owners and breeders, veterinarians are identifying a type of cardiomyopathy that has been detected in several TMTs from multiple breedings and multiple families.

At this time, we have complete information on 8 puppies that have died of this disease, with an additional 4 possible cases. It should be noted that 3 of the 10 cases noted above have occurred over the past 12 months, demonstrating that a recent rise in breeder and owner awareness has provided valuable information.

We have prepared this report to help Manchester breeders keep abreast of what information is known, what is not known, and where the study will go from here.

What is Cardiomyopathy?

The term “cardiomyopathy” refers to an inherent disease (*pathy*) within the muscle tissue (*myo*) of the heart (*cardio*). Cardiomyopathies can be very serious or even life-threatening if they are severe enough to compromise the heart’s output of blood to the vital organs. Just as in humans, there are different types of cardiomyopathies in dogs. Most are caused by a defect in the heart muscle tissue. The defect often is genetically transmitted within closed populations (such as the gene pool of a pure breed).

As an example, dilated cardiomyopathy in Doberman Pinschers is the best-known form of cardiomyopathy in dogs. It produces a longstanding, gradually progressive weakening of the heart muscle tissue, such that the heart chambers become bloated and ineffective at pumping the blood to the body. This process differs from the cardiomyopathy we are observing in TMTs in that the TMT version appears to develop acutely and in juvenile dogs- that is, the symptoms are very sudden and fatal, and they occur in pups. These features are in sharp contrast to the lingering ill health and adult age of onset that are major characteristics of Doberman cardiomyopathy.

Several types of cardiomyopathy are recognized in dogs, but our preliminary research indicates that cardiomyopathy found in TMTs does not match any of these. While we

initially theorized that the problems seen in Toy Manchesters might be related to juvenile cardiomyopathy of Portuguese Water Dogs because both forms occur in puppies, careful microscopic evaluation of heart tissue indicates that these two diseases likely differ.

In summary, our findings indicate the emergence of a new type of cardiomyopathy altogether.

Cardiomyopathy in Toy Manchesters

The specific features of the cardiomyopathy found in Toy Manchesters are most apparent through microscopic evaluation of heart muscle tissue taken at necropsy (autopsy) in pups that have succumbed to the disease. Characteristics of heart tissue from affected pups include multiple small areas of degeneration and necrosis (tissue death) of the heart muscle in both the left and right ventricles with replacement by loose connective tissue (early scar tissue). These changes are accompanied by the accumulation of a small amount of fluid in the lungs (acute pulmonary edema).

The source of this problem remains unknown.

What we do know:

- This is a disorder that appears to affect puppies predominantly: all dogs have been younger than 1 year of age.
- The disease strikes without forewarning: all pups known to have this disease have seemed healthy and fit until a fatal event occurred when the pup emitted a sudden cry or shriek and collapsed in cardiac arrest, or was simply found dead. No successful resuscitations have been documented- the disease has been uniformly fatal to date.
- Males and females appear to be affected equally
- There is no evidence to point to either the dam or the sire as being more likely to be responsible for transmitting the disease
- Several deaths have occurred during or immediately after general anesthesia for routine surgical procedures, suggesting that the minor degree of additional strain that general anesthesia places on the heart and circulation may trigger a fatal event in dogs that have asymptomatic cardiomyopathy

What we don't know:

- The suddenness of fatal symptoms suggests that the terminal event is a severe cardiac arrhythmia, but knowing exactly what kind of arrhythmia and why it occurs requires further study
- Whether there is an association between cardiomyopathy and other forms of birth defects also is unknown. An initial suspicion of a link to cryptorchidism in males (undescended testicles) remains unproven.

- Until more analysis of pedigree information can be completed, genetic transmission and mode of inheritance (i.e., recessive, sex linked, incomplete penetrance, etc.) are unknown. There are many ways for diseases to be passed on, so it is important for us to be objective in evaluating familial relationships based on as large a pool as possible.

Our Research

Breeders and owners can play a pivotal role in solving the mystery that is this disease. In working to eliminate this disease, we must first understand it. Understanding it requires information. It is therefore critically important for the study team to continue to amass as much data as possible so that we can gain a greater understanding of the characteristics of this disease and how it behaves (physiologically and genetically). Please know that we take the anonymity of the survey very seriously. If you are concerned in any way about this aspect of our research or wish to submit information anonymously, we encourage you to contact us (Dr. Martinson or Dr. Cote) directly.

Necropsies (autopsies)

To this end, the primary way we are compiling data is by performing autopsies on dogs that may have died of the disease. With this in mind, if you own or are aware of a TMT that dies unexpectedly and for no apparent reason (examples: anesthetic death, death during sleep), please arrange for the body to be shipped to UPEI or the University of Pennsylvania so that we may examine the tissues and build an understanding of the characteristics of this disease. Eventually, we hope to be in a position to apply for funding that will also assist in this capacity, though we require more information (read: autopsies) before we will be in a position to do so.

Where Do We Go From Here?

The information presented here is new. When a new disease emerges, it is natural to want to do everything possible to prevent it. Frankly, it is reassuring and encouraging when concerned owners, breeders and veterinarians respond with this kind of constructive, can-do approach. This is a tremendously positive and helpful reaction, as long as it does not translate into premature or drastic actions.

Inappropriate actions have actually been a setback in the understanding of new illnesses in the past. For example, blaming individual dogs or groups of dogs, being in denial about cases, or voicing suspicions, are all disastrous measures that ultimately sabotage the true efforts to help the breed. Jumping to conclusions prematurely is a particularly troubling problem as it leads to frustration and counterproductive actions. Much harm can be done by seizing a small amount of information – such as this article - and using it as grounds for making breeding decisions or other unjustified actions. At this time, not enough is known to make definitive breeding decisions, and no changes to current breeding schemes are justified by our preliminary findings. This is the beginning, and the first step is to identify affected individuals to try to better characterize the disease itself.

Unexpected death is extremely delicate and emotionally intense on its own, let alone adding discussions of autopsies. Nevertheless, for many individuals this can be something that makes them feel the dog contributed to future generations -- or that he/she didn't die in vain.

It is critical that we work together to determine the cause and, ultimately, the best screening, treatment and prevention. The most constructive actions are to realize that the tragic and emotionally devastating death of a single dog can help the entire breed if a proper autopsy is performed and results communicated to our groups at UPEI (Charlottetown, PE, Canada) and UPenn (Philadelphia, PA, USA). We thank you in advance for your participation and help in pursuing this new and devastating disease.