This Month's Topic:
Microfilariae: Understanding the Heartworm Life Cycle

A basic understanding of the heartworm life cycle is critical to provide appropriate care for your patients, as illustrated in the following scenario.

You are caring for a 12-week-old MI Lab-mix puppy who you have diagnosed with parvovirus. While examining a blood smear to confirm your patient’s leukocyte count, you notice a small thread-like worm. It is determined to be a heartworm microfilaria (Dirofilaria immitis).

Q. True or False? The patient is infected with adult heartworms.
A. False.

To answer this question, you need to be familiar with the heartworm life cycle. Once a dog is infected, it takes about 6 months before a heartworm reaches maturity and can begin reproducing— that is, producing microfilariae. This puppy is only 3 months old and heartworms cannot be infected with adult heartworms.

Q. Where did this patient get the microfilaria?
1. From the adult heartworms with which it is infected
2. From its mother
3. From a mosquito bite
4. The worm is not really D. immitis, but another kind of microfilaria

Q. What should you tell your client about this microfilaria?
1. Recommend treatment with melarsomine as soon as the puppy has recovered from parvovirus.
2. This microfilaria could grow into an adult heartworm infection, so the puppy needs to be started on heartworm prevention right away to kill the microfilariae.
3. The mother of this puppy has heartworms.

A. The correct answer is 2, the patient got the microfilaria from its mother. Heartworm-positive pregnant female dogs can pass microfilariae through the placenta to their puppies! This also highlights why it’s important to fully understand the heartworm life cycle. The puppy cannot have adult heartworms, because it is not old enough for any heartworms to have matured fully. The puppy also did not get the microfilariae from a mosquito, because when an infected mosquito bites a dog, it deposits third-stage (L3) larvae, not microfilariae.

Q. What should you tell your client about this microfilaria? (select all that apply)
1. Recommend treatment with melarsomine as soon as the puppy has recovered from parvovirus.
2. This microfilaria could grow into an adult heartworm infection, so the puppy needs to be started on heartworm prevention right away to kill the microfilariae.
3. The mother of this puppy has heartworms.

A. The correct answer is 2. The mother of this puppy has heartworms! You should recommend the mother be tested and treated for heartworms.

One more reason why it’s important to understand the heartworm life cycle! As we’ve established, this puppy cannot have adult heartworms— he is too young— so treatment with melarsomine is not appropriate. He got them from his mom, who is the one who actually needs melarsomine! Another key point: your puppy cannot get adult heartworms from this microfilaria. Mosquitoes pick up microfilaria from a dog by biting, and then they infect other dogs when they deposit an adult heartworm. For more detailed information on the heartworm life cycle, check out the American Heartworm Society’s Current Canine Guidelines.

As a veterinary student, you are eligible for a free AHS membership; simply click here to register. Student members receive a free digital subscription to the quarterly AHS Bulletin plus other benefits.