



Beaucaniche Standard Poodles thanks Purina for this article.

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Health Testing for Atrial Septal Defect Is Key in Standard Poodles

When her veterinarian detected a congenital heart defect, patent ductus arteriosus, in her 8-week-old male Standard Poodle puppy, "Tiger," during a routine examination, Guinette Peebles was shocked.

Peebles, who lives in Houston, was referred to a board-certified veterinary cardiologist, Sonya Gordon, D.V.M., DVSc., DACVIM, assistant professor of cardiology at Texas A&M University College of Veterinary Medicine. Gordon confirmed the diagnosis of PDA and discovered that the puppy also suffered from mild mitral dysplasia and pulmonic stenosis, both congenital heart defects. Gordon recommended a noninvasive catheter procedure to repair the PDA.

Though the heart repair procedure was successful, Tiger's long-term prognosis was uncertain, and he would need ongoing veterinary care. Gordon, who had grown fond of the Poodle puppy, offered to keep Tiger and provide the specialized care he would need. Peebles agreed.

"Tiger stole our hearts and started my addiction to Poodles," Gordon says.

One year later, Peebles awaited the delivery of a litter out of her 4-year-old Standard Poodle, CH Cabaret Far Too Modest ("Haley"). Three puppies were whelped. Over the weekend Haley became ill. Peebles took Haley to an emergency clinic, where an X-ray was taken that showed she had an enlarged heart.

Peebles immediately took Haley to

Texas A&M University. When they arrived, Haley was sick and weak. Gordon examined Haley and diagnosed an inoperable malignant tumor, leaving Peebles no alternative but to have Haley euthanized.

While evaluating Haley, Gordon performed an echocardiogram and found that Haley had an atrial septal defect (ASD), a hole in the atrial septum, the muscular wall separating the right and left sides of the top chambers of the heart. Though common in humans, ASD is considered rare in dogs.

Anxious to learn whether any of Haley's puppies from this litter or previous litters had an ASD, Peebles had echocardiograms performed. She learned one of Haley's puppies had an ASD. The healthy puppies were spayed and neutered and sold to pet homes. Peebles kept the one with an ASD, named "Peschi."

When Haley's half sister, "Heiress," was scheduled to be bred, Peebles decided to first have an echocardiogram performed. As it turned out, Heiress also had an ASD, so instead of breeding her, Peebles had her spayed.

Intrigued by the commonality of ASD in Peebles' Standard Poodles, Gordon offered to look at related dogs.

"I called the owners of every pup I bred to inform them of the defect and the need to echocardiogram test their dogs," says Peebles. "I offered to take their dogs to Texas A&M for Dr. Gordon to evaluate them."

Initially Peebles took 10 dogs to Gordon for echocardiogram testing. "All four of Tiger's littermates had ASD as well as some of his aunts, including Haley and Heiress, and some cousins," Gordon says.

Peebles decided to tell other Standard Poodle breeders that she had a problem with ASD in her dogs. In time, breeders began to share similar experiences about their Standards from pedigrees not closely affiliated with Peebles' bloodline.

Highfalutin' Poodles breeder Maggie Laney of Applegate, Calif., became concerned about ASD when a significant nickel-sized hole was discovered in her show champion, AM/CAN CH Highfalutin' Holiday on Ice ("Brie"), prior to minor eye surgery. Laney, who owned Brie's sire and dam, had both dogs tested for the condition and learned that the sire had a small ASD.

"I began to research ASD and ran across an article Dr. Gordon wrote about Peschi. I became concerned about the potential of this defect," Laney says. "Brie was very healthy. I was unprepared to have this happen."

Laney became an advocate for testing for ASD on online Poodle chat rooms. She shared what she had learned about Gordon's efforts to test and treat Poodles with ASD.

Meanwhile, Gordon wanted to screen other Standard Poodles to see if she could learn how prevalent ASD was in other bloodlines. With funding from the Poodle Club of America Foundation and the AKC Canine Health Foundation, Gordon and a team of cardiologists have now tested more than 400 Standard Poodles for ASD.

Laney helped organize the ASD health testing at the 2007 PCA National Specialty, where 241 Standards were evaluated, and ASD was found in 11 dogs. "One owner was particularly grateful. She had never heard of ASD before," says Laney. "A significant hole was found in her 6-year-old female, and she later had surgery to repair the defect. She told us we saved her dog's life."

Testing was also performed at the 2008 PCA National Specialty. Ninety-

Signs of Atrial Septal Defect

Atrial septal defect, a rare congenital heart disease commonly known as a hole in the heart, affects about 5 percent of Standard Poodles. Some bloodlines may have 20 percent to 40 percent of ASD-affected dogs. The condition is difficult to diagnose in dogs partly because many do not show signs, such as a heart murmur, which is often picked up in humans with the condition.

Owners whose Standard Poodles show the following signs of ASD are encouraged to have them tested by echocardiogram for the condition:

- Exercise intolerance;
- Weakness or exercise tiredness;
- Breathing difficulty;
- Coughing;
- Unsteady gait; and
- Sudden collapse.

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Atrial Septal Defect

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two Standards were evaluated, and two were found to have an ASD. Satellite screening clinics have been held in California and Dallas, and more are planned.

"Based on current information, we believe that approximately 5 percent of Standard Poodles may have atrial septal defect," Gordon says. "In some familial lines, such as Tiger's, the incident rate may range from 20 percent to 40 percent."

Seeking a Genetic Marker

Wanting to better understand the genetic mutation causing ASD in Standard Poodles, Gordon began collaborating with Kathryn M. Meurs, D.V.M., PH.D, the Richard L. Ott Professor of Small Animal Medicine and Research at Washington State University School of Veterinary Medicine. Meurs, well-known for her work in deciphering the genetics behind inherited heart disease, began looking for a genetic marker for canine ASD.

Meurs compared the DNA from blood samples of ASD-affected Poodles with three genes known to be involved in the inheritance of ASD in humans. "The initial hope was that the same genes that cause ASD in humans may be responsible for ASD in dogs, too, but that hasn't been the case," Meurs says. "The mutations are not the same. We have not yet identified any DNA mutations in Poodles with ASD."

Atrial septal defect in humans is typically diagnosed after signs of a heart murmur are detected during a routine examination. In contrast, a heart murmur is seldom audible in dogs with ASD, thus the condition often is missed during a routine veterinary visit.

An echocardiogram, or ultrasound of the heart, is the most effective way for determining ASD. Puppies can be tested as early as 6 weeks of age. A painless, noninvasive procedure, an echocardiogram is used to help evaluate the structure of the heart. When an ASD is present, an echocardiogram shows blood crossing through the hole in the atrial septum to the right side of the heart. The right side of heart must pump harder as a result of the extra blood flow. In time, the heart becomes enlarged.

Common signs of ASD are exercise intolerance, weakness or excessive tiredness, failure to thrive, breathing difficulty, coughing, unsteady gait, and sudden collapse. Many dogs, however, show no signs.

"A dog with ASD may start behaving as though he does not feel well," says Gordon. "They also may stop exercising and begin having breathing difficulty. These are nonspecific signs of many forms of heart disease including ASD."

While a small hole less than 4 millimeters may not require surgical repair because it does not significantly affect a dog's health, a large hole

will stress the heart and eventually cause death if not repaired. Just as in humans with ASD, the traditional method for repairing an atrial septal defect in dogs is open-heart surgery. An expensive, complicated procedure in which the heart is stopped while a dog is connected to a heart bypass machine, open-heart surgery allows a surgeon to suture a patch over the hole. Recovery for dogs is often long and uncomfortable, and few veterinary clinics are able to provide the surgery.

A new, less-invasive method is a trans-catheter implant. This procedure does not require opening the chest cavity to repair the hole in the heart. Rather, the technique involves positioning a special occluder device in the opening of the defect to block the hole. The occluder device is inserted through a catheter running from a blood vessel in a dog's neck.

Gordon and the Texas A&M University team were the second group to use the trans-catheter Amplatzer® ASD occluder in dogs, though the procedure had already been successful in humans. Including Peschi, 12 dogs from across the country have had the procedure performed at Texas A&M University, more than at any other institution. Three additional dogs currently are scheduled for an ASD trans-catheter procedure, which costs significantly less than open-heart surgery.

Peschi was the first patient at Texas A&M. Working with Ronald Grifka, M.D., a pediatric cardiologist at Baylor College of Medicine, Gordon maneuvered the occluder device, consisting of two flat titanium alloy mesh disks, into Peschi's heart and closed the hole. As the heart heals, tissue grows over the disks and the occluder device becomes part of Peschi's heart. Most importantly, blood circulates correctly through the heart, no longer crossing over to the right side.

During the surgery, Gordon had to determine the exact size of the hole in Peschi's heart. She inserted a balloon through a catheter to measure the hole. Viewing the heart through a fluoroscope and transesophageal ultrasound, Gordon was able to determine the size of the defect. The information also helped the cardiologists to determine whether enough rim tissue existed to support the occluder device. If an ASD is too large, the occluder device technique is not effective, leaving open-heart surgery as the only choice. Because the implant surgery had only been performed on humans, adjustments had to be made to catheters to customize the technology for dogs.

Peschi's surgery took six hours. Subsequent surgeries have taken far less time. All have been successful, with minimal complications, says Gordon.

"All the Poodles are healthy and active today," says Gordon. "You would never know they were born with this condition that could have potentially cut short their lives."

Laney's Poodle Brie had the surgery

in March 2007. Laney watched the one-and-a-half-hour procedure from a monitor. "It went very well," she says.

After the surgery Brie was in the veterinary hospital for two days. Back home in California, Laney limited Brie's activities for one week to allow time for the incision to heal.

"She never missed a beat," Laney says. "I never thought she had ASD before it was randomly discovered, but in hindsight, I did notice a sort of franticness that was gone after surgery. Perhaps that was a manifestation of how hard her heart was working. She is much more calm and comfortable now."

Importance of Testing for ASD

While Poodles with an atrial septal defect can potentially have surgery to repair the hole in their hearts, these dogs should not be bred, says Gordon. "Poodles with even a small ASD should not be bred," she says. "Only some Poodles with ASD have a defect large enough to cause health problems for the dog, but because we do not know the mode of inheritance, it is best to not breed any dogs with ASD. Breeders should test their potential breeding stock for ASD by having an echocardiogram performed."

Peebles eventually bought a new puppy. "I found a litter from parents with excellent health clearances," she says.

Her new puppy, CH Meledee Femme Fatale ("Taylor"), is now 3 years old and has received Canine Health Information Center (CHIC) certification for seven genetic diseases. One was an optional cardiac evaluation for ASD. Reflecting on her experiences with ASD, Peebles says it was hard to go through, but she has learned a great deal.

"I encourage all breeders to test their dams prior to breeding to be sure they are clear of ASD and to only breed to sires that also are clear for ASD," Peebles says. "In our quest for the perfect show dog, we must not lose sight of the importance of selective breeding to genetically tested stock. This includes echocardiogram heart testing." ■

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