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Bellwether 15

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Treatment of Canine Lymphoma

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On a cool September evening last year seven perfectly groomed dogs, representing the different groups of AKC recognized breeds, made a final trip around the ring before the judge pointed to the winner, a red brindle Afghan hound. Similar scenes are seen weekend after weekend at the more than 1,000 dog shows held annually in the nation. To the observer this was just another best in show win. But unknown to the spectators, there was something special about this win and the dog, Ch. Jamica's Seyrief of Jeheran. The dog was battling a deadly disease and was at the show only because of recent advances in veterinary medicine.

Just two months earlier Chuck, as the dog is called by his owner, Joy Mauro-Behr, had been diagnosed as having canine lymphoma. Not too many years ago such a diagnosis meant death within a few weeks; now chemoimmunotherapy can bring the cancer into remission and the dog's life can be extended.

"In July, while being shown in the group, Chuck suddenly gagged," explained Joy Mauro-Behr. "I checked him, he seemed o.k. though the lymph nodes in the neck could be felt. The next day I took him to the veterinarian and she suspected that he might have lymphoma." An appointment was made to see Dr. K. Ann Jeglum at the School of Veterinary Medicine of the University of Pennsylvania. Diagnostic tests there confirmed the veterinarian's suspicions. Chuck had lymphoma.

"Lymphoma is a most common tumor in the oncology clinic here," said Dr. Jeglum. "It is most readily diagnosed and it is the most treatable cancer. We have developed a treatment program which combines chemotherapy with immunotherapy and we have had good success." A treatment protocol was initiated and Chuck began his visits to VHUP. "Lymphoma is a rapidly progressing fatal disease," Dr. Jeglum said. "Left untreated, the animal will die four to six weeks from the time of diagnosis. It is a systemically immunosuppressive disease." In the past dogs with lymphoma were treated with chemotherapy and their lives could be prolonged by about six to eight months. "Dogs had to be given cytotoxic drugs regularly," Dr. Jeglum said. "Eventually they would develop a resistance to the drugs, relapse would occur and the animal would die."

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The protocol employed by Dr. Jeglum uses chemotherapy to bring on remission of the lymphoma. "Before treating with the vaccine we have to reduce the tumor burden," she said. "The animal has to be in remission before the vaccine can work." When remission is achieved, the dog is treated with a vaccine to stimulate the immune system so the body will fight the disease. "We produce the vaccine here," she said. "It is prepared from tumor tissue taken from the animal and it is specific for each patient. We prepare a quantity and store it frozen."

"Chuck received four chemotherapy treatments," explained Mrs. Mauro-Behr. "He had no side effects from the drugs, ate like a horse and was active and eager and did well at the shows." After these treatments the dog was in remission and a bi-monthly vaccination program was begun. He received the vaccine through March of this year when his lymph nodes again increased in size. Another cycle of chemotherapy was administered. The disease went into remission and the dog is now back on the vaccine schedule. "He is in excellent condition," said Mrs. Mauro-Behr. "We run three miles with him every day, and then he romps in the large paddock with our other dogs. His haircoat is good and his spirit is excellent. He does pine when we go to a show without him. This dog just loves the show ring and the excitement and we may show him from time to time."

A recent study conducted here at the School closely examined the treatment of canine lymphoma with chemoimmunotherapy. The work was supported by funds from the American Kennel Club. "We studied 30 dogs with confirmed lymphoma," said Dr. Jeglum. The dogs represented a variety of breeds, a number were mixed breeds. The age range was from three to 14 years, the median age was 7.5 years. There were 15 males and 15 females in the study. Of the males four were castrated and of the females nine were spayed.

A complete medical work-up was done for each animal and the extent of the disease was recorded using the World Health Organization clinical staging system for tumors in domestic animals. A lymph node was removed for histopathology and for vaccine preparation.

The dogs received two cycles of combination chemotherapy," said Dr. Jeglum. "Each cycle lasted four weeks with a different single drug given each of the four weeks. By using different drugs the chances of drug resistance occurring were minimized." There was a two to three week rest between the cycles. The treatment caused remission of the disease in all animals. The dogs then received the vaccine This vaccine was made specifically for each animal from its own tumor. Other vaccines have been used to trigger a general immune response; they do not work as efficiently as the specific vaccine.

Dr. Jeglum injects the vaccine directly into the lymphatic system rather than under the skin. "By giving it directly into a lymphatic vessel, the vaccine is delivered quickly to the lymph nodes," she said. "They are the sites for generating a positive response to tumor antigens and they are important in the initiation of system immunity." The procedure is simple. The animal is sedated, a small incision is made in the foot and the lymphatic vessel is isolated. By means of a dye this tiny vessel is dilated and then the vaccine is slowly administered. The incision is stitched and the dog is up and around a few minutes later.

In the study three vaccinations were given initially. The first two were injected two weeks apart and the third one month after the second. The animals were examined for relapse every two weeks. While in remission the dogs received vaccine boosts every four to six weeks. If a relapse occurred, a four week cycle of chemotherapy was given. Upon remission the vaccine protocol was resumed.

"We found that we could use the chemotherapy cycles repeatedly and that remission would occur," Dr. Jeglum said. "The immunotherapy significantly prolongs the remission duration and it enables the animal to respond to repeated chemotherapy. Drug resistance may be altered by the immunotherapy."

The median survival rate for the dogs in the study was 13 months which is a significant increase over the survival rate of animals treated with either chemotherapy or immunotherapy alone. Dr. Jeglum pointed out that a number of dogs from the study are still alive and are doing well.

It was found that the vaccine did not have side effects or cause a toxic reaction in the animals. "In the long run the vaccine is less expensive than drugs," said Dr. Jeglum.

By employing chemoimmunotherapy the researchers were able to obtain a remission rate longer than seen with either chemotherapy or immunotherapy alone. They found that animals receiving chemoimmunotherapy had a much greater median survival rate than previously seen.

Dr. Jeglum and her colleagues currently are investigating immunity in canine lymphoma. They found that the antibody levels against purified lymphoma antigens correlate with response to therapy in individual dogs. Animals with the highest antibody level have the longest survival rate. This study is continuing.

The treatment offers hope to the countless dog owners who face losing their dogs to lymphoma each year. As research continues, further advancement in treatment will no doubt be made.

"We are grateful," said Mrs. Mauro-Behr. "Chuck is alive and he leads a normal life. The therapy did not affect his show career, he continued to win. We know the disease cannot be cured. It will always be there, but the therapy keeps it in remission. Let's hope his battle with lymphoma has shown dog owners that the prognosis for a dog with lymphoma need not be poor. There is help and a canine companion with this disease can live many months, even years, because of chemoimmunotherapy."

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