



**Veterinary Emergency  
+ Referral Center**  
of Hawaii

**Ettinger: Textbook of  
Veterinary Internal Medicine, 7th Edition  
Hemangiosarcoma  
Philip J. Bergman**

**What is hemangiosarcoma?**

Hemangiosarcoma (HSA; angiosarcoma or malignant hemangioendothelioma) is an extremely aggressive tumor of blood vessel origin. Because blood vessels are present throughout the body, virtually any site in the body can have HSA. HSA occurs most frequently in dogs (approximately 2% of all tumors) and the most common site is the spleen. However, additional common sites include the heart, liver, muscle, lung skin, bones, kidney, brain, abdomen, and oral cavity.

In three large canine splenic disease studies encompassing approximately 2000 dogs, a "rule of two thirds" was found suggesting that approximately two thirds of dogs with a splenic mass have a cancer (therefore one third are not malignant) and two thirds of the malignant tumors of the spleen are HSA. HSA is a disease generally of older dogs and cats with an average onset of 9 to 10 years; however, there are reports of extremely young dogs and cats with this disease (5 to 6 months to a few years of age). German shepherd dogs are most commonly diagnosed with HSA; however, other large breed dogs such as golden retrievers and Labrador retrievers may also be overrepresented. In cats, the most common breed is the domestic shorthair.

The cause of HSA in dogs and cats is presently unknown. Exposures to toxins such as chemicals, insecticides, and radiation have been reported in humans to be associated with HSA. Ultraviolet light exposure from the sun may be a potential cause of HSA in dogs, as HSAs of the skin are commonly seen in dogs with light hair and poor pigmentation (e.g., Salukis, Whippets, and white Bulldogs).

**What are the signs of hemangiosarcoma?**

HSA can be found in dogs or cats in almost any location and therefore the history and clinical signs can be extremely variable and dependent on where the tumor is located. At the most extreme, HSA can cause sudden death due to tumor rupture and/or dramatic blood loss. At the other end of the spectrum, nonspecific signs may include the following:

- Decreased appetite
- Vomiting
- Lethargy

Commonly pets may have episodes of one or more of the following:

- Weakness
- White/pale mucous membranes
- Collapse
- Distended abdomen
- Difficulty breathing
- Weight loss

Episodes of weakness and collapse can last for minutes to hours with recovery from the episode being a common feature. Most likely the weakness, white/pale mucous membranes, and collapse are due to rupture of the tumor and blood loss, whereas the recovery is likely due to a combination of the blood loss stopping and lost blood being resorbed back into the circulation. However, an additional problem associated with this blood loss is the dissemination (spread) of cancer cells into areas that contact the lost blood (inside the abdomen or chest, or via the bloodstream). This propensity to spread is what makes treatment of this cancer so particularly difficult.

When HSA is present in the heart, blood loss can result in fluid surrounding the heart or lungs. This can cause difficulty breathing and problems with the heart being able to pump effectively. When HSA is present in the brain, it can cause a variety of neurologic signs including convulsions. The skin form of HSA can cause skin masses that are firm, raised, and dark purple to red in color.

### **What tests are needed?**

When HSA is diagnosed or highly suspected, your veterinarian will recommend performing a number of "staging tests" to determine the degree of spread. This will help him to guide you toward making informed decisions regarding treatment. These tests may include the following:

- Blood work
- Urinalysis
- Coagulation/bleeding panel
- X-rays
- Ultrasound
- Needle aspiration

### **What treatment is needed?**

Surgery continues to be the best treatment for dogs and cats with HSA. Treatment for this cancer has two main considerations: 1) local tumor control, or what surgery can address, and 2) systemic tumor control, or metastasis; what surgery cannot address. Therefore although surgery remains the best treatment for HSA, it is almost always used in concert with some systemic therapy such as chemotherapy.

Unfortunately, the average survival time for dogs with HSA (all but the skin-only cases) treated with surgery alone (no systemic therapy) is only 1 to 3 months, with most dogs dying of metastasis (spreading of cancer cells). Cats share this poor prognosis with dogs; the average survival time for cats undergoing removal of the spleen for HSA was only 20 weeks. Surgery should be utilized as aggressively as possible for HSA to remove all diseased tissue whenever possible.

In contrast, dogs who are treated with surgery AND systemic therapy such as chemotherapy average an 8- to 9-month survival time post-surgery, assuming no overt evidence of metastasis at the time of surgery. Chemotherapy slows the growth of tumors, and to help the patient enjoy a high quality of life in spite of the progression of the disease. Dogs and cats tend to handle chemotherapy remarkably well. The psychologic stress of a cancer diagnosis is not an issue for dogs and cats, and the dosage of chemotherapy medications can be lowered if physical side effects are noted, as the goal of chemotherapy in veterinary medicine is to increase *quality*, not *quantity* of life.

At present, the chemotherapy drug of choice is a drug called doxorubicin (Adriamycin). Unfortunately, the use of this drug does not lead to a cure and it is used to try to slow the tumor and provide a good quality of life. Instead of the aforementioned 1 to 3 months survival with surgery alone, recent studies

suggest an average of 8 to 9 months with surgery and chemotherapy as long as there is no overt evidence of spread at the time of surgery.

HSA of the superficial skin of dogs appears to be a less aggressive variant of HSA. The average survival time of dogs with superficial skin HSA treated with surgery was approximately 2 years. Cats with HSA of the skin treated with surgery had an average survival time of approximately 1 year.

### **What treatment is the prognosis?**

Doctors that have studied HSA have found the following factors to be associated with pets doing more poorly than the average:

- Younger age
- More aggressive looking tumor under the microscope ("grade")
- Incomplete tumor removal
- Visible evidence of metastasis (spread)
- History of tumor rupture leading to dissemination of cancer cells inside the abdomen, chest, or any other site the tumor ruptured into

It therefore appears that the use of chemotherapy after surgery is most beneficial in dogs with HSA caught early that has not ruptured and is completely surgically removed. Veterinary oncologists and veterinary oncology researchers are continually investigating new types of treatments for this and other extremely aggressive tumors in the hopes of providing the maximal amount of good quality life.