



## HEMANGIOSARCOMA

### What is hemangiosarcoma?

Hemangiosarcoma (HSA) is a malignant tumor of the cells that line blood vessels. It is much more common in dogs than other species. HSA occurs most frequently in large breed dogs, especially German shepherd dogs, Labrador retrievers, and Golden retrievers. In dogs, the primary site is usually the spleen. Other sites include liver, heart, kidneys, bladder, muscle, and subcutaneous tissues. HSA is a very aggressive cancer, with high potential for wide spread and early metastases to other tissues, especially liver, lungs, and peritoneum. The cause of HSA is unknown.

### What are the symptoms?

Clinical signs of HSA are often related to rupture and hemorrhage of the tumor, including weakness, abdominal distension, pale mucous membranes, and collapse. Some patients may suffer sudden death due to rupture of a mass in a critical location or severe and acute blood loss into a body cavity. Dogs with tumors involving the right atrium of the heart may present with arrhythmias, muffled heart sounds, and signs of heart failure. Some patients may have intermittent episodes of weakness with recovery within hours to days.

Cutaneous HSA may present as discrete firm, raised dark red to purple papules on the surface of the skin or as subcutaneous blood-filled masses. HSA invading more deeply into the muscle may cause lameness, a hard swelling within the muscle, or edema of the affected region.

### How is it diagnosed?

Many dogs with the splenic form of HSA will present to the veterinarian for rupture of the tumor and bleeding within the abdomen. An abdominal tap will usually reveal free blood that does not clot. Abdominal ultrasound is useful in evaluating the presence of liver metastases prior to consideration of surgery. Aspirates of splenic masses often reveal only blood and are diagnostic of cancer in only a small percentage of cases. Ultrasound guided splenic biopsies in patients with suspected HSA is often considered risky and not typically performed. Surgical removal of the spleen (splenectomy) and associated masses with histological evaluation is necessary for diagnosis. Echocardiography is recommended to evaluate for heart masses. Approximately 25% of dogs with splenic HSA will have right atrial involvement. Diagnosis of cutaneous and subcutaneous HSA requires a tissue biopsy.

Chest X-rays are important in the evaluation of possible lung metastases prior to consideration of surgery. Additionally, many patients with HA suffer from clotting abnormalities, anemia, and low platelets; therefore assessment of blood work, including clotting times is imperative before surgery.

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## **How is it treated?**

### **Surgery**

Surgery remains the primary method of treatment for HSA. The surgery should be as aggressive as possible to remove all locally affected tissue. For splenic HSA, splenectomy is required. At the time of splenectomy, all suspicious lesions within the liver or elsewhere within the abdominal cavity should be biopsied. In dogs with atrial HSA, surgical exploration of the chest cavity may be considered, but most cardiac HSA are not amenable to complete surgical removal. For HSA of bone or subcutaneous HSA involving the leg muscles, amputation of the limb may be necessary. Many patients with HSA are prone to arrhythmias and bleeding during the surgery. Blood transfusions and anti-arrhythmic drugs are often necessary during and immediately after surgery.

### **Chemotherapy**

Because of the high potential for metastatic disease, chemotherapy has been considered an appropriate adjuvant to surgery; however, long term results have been disappointing. Combination chemotherapy using a doxorubicin-based protocol is most commonly used. At our practice, a combination protocol of doxorubicin and cyclophosphamide administered every 3 weeks for 5 total treatments is most commonly used.

Very few studies have been conducted to evaluate immunologic or biologic therapy in HSA.

### **Radiation therapy**

Radiation therapy is rarely utilized to treat HSA due to anatomic sites and high metastatic rate. Palliative radiation therapy may help decrease symptoms of external masses, but may not improve survival

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

The long term prognosis of HSA in dogs is very poor. For dogs with splenic HSA, splenectomy alone yields an average survival time of 3 weeks to 3 months. Chemotherapy may increase the average survival time to 5-7 months; however, the long term survival is low with only 10% of patients surviving 1 year post diagnosis. Most dogs will die or be euthanized due to metastatic disease. Symptoms of metastatic disease may be similar to initial symptoms due to rupture and bleeding of secondary liver and other intra-abdominal tumors. Dogs with lung metastases will often develop a cough, shortness of breath, and labored breathing. Rupture and hemorrhage of metastatic lesions can result in sudden death.

Cutaneous HSA with invasion into subcutaneous areas or muscle have an average survival time between 6-11 months. Invasive cutaneous tumors warrant adjuvant chemotherapy; however, there are no published studies on chemotherapy for cutaneous HSA. However, results are expected to be similar to splenic HSA.

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## **Dermal solar induced hemangiosarcomas**

Hemangiosarcoma involving the dermis is seen most commonly in short-haired, poorly-pigmented breeds such as Dalmatians, whippets, and bull dogs and may be associated with sun exposure. The most common site is the ventral abdomen and preputial skin where the hair is often sparse. Lesions may be single or multiple and appear as red or dark purple plaques or raised nodules. Lesions do not invade into the subcutaneous tissues initially, but may behave aggressively if not addressed. Surgical removal usually offers long term control; however, most patients will make additional tumors. Small lesions may be addressed with cryotherapy. It is not unusual for some patients to require regular cryotherapy of new lesions every 4-6 months. Metastasis, when it occurs, happens many years after initial diagnosis (unlike other forms of HSA).

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