



## HEMANGIOSARCOMA

### What is hemangiosarcoma?

Hemangiosarcoma (HSA) is a malignant tumor of the cells that form blood vessels. Hemangiosarcoma occurs most frequently in large breed dogs, especially German shepherd dogs, Labrador retrievers, and Golden retrievers. In dogs, the most common primary site is the spleen. Other potential primary sites include liver, heart, bone, muscle, subcutaneous tissues, and skin. Ultimately, hemangiosarcoma can form in essentially any organ, since blood vessels are present throughout the body. Hemangiosarcoma of most organs is a very aggressive cancer, with high potential for widespread early metastases to other tissues, especially liver, lungs, and abdominal cavity. Hemangiosarcoma of the skin (see below) seems to be a somewhat different disease process. It is thought to be induced by ultraviolet damage to the skin and typically is less rapidly aggressive than other forms of hemangiosarcoma.

### What are the symptoms?

Clinical signs of hemangiosarcoma are often related to rupture and hemorrhage of the tumor, including weakness, abdominal distension, pale mucous membranes, difficulty breathing, and collapse. Some patients may suffer sudden death due to rupture of a mass in a critical location or to 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.

Hemangiosarcoma may occur as subcutaneous masses (under the skin) or deep masses involving the muscle. Masses within these locations 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 hemangiosarcoma will present to the veterinarian for rupture of the tumor and bleeding within the abdomen. In that case, an abdominal tap will usually reveal free blood that does not clot. Abdominal ultrasound is useful in identifying the splenic mass and in preliminary evaluation for the presence of liver metastases. Depending on the ultrasonographic appearance of splenic masses, aspirates of these masses often reveal only blood and are diagnostic of cancer in only a small percentage of cases. Surgical removal of the spleen (splenectomy) and its associated masses with evaluation by a pathologist is necessary for diagnosis. Chest X-rays are needed to look for metastasis to the lungs, and echocardiography is often recommended to evaluate for heart masses. Patients with hemangiosarcoma may suffer



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from clotting abnormalities, anemia, or low platelets; therefore bloodwork is needed and may include clotting times as well as more routine cell counts and chemistry values.

As with splenic hemangiosarcoma, diagnostic tests for hemangiosarcoma of other sites typically include a tissue sample to diagnose the disease itself and other tests to look for metastasis to other organs.

## **How is it treated?**

### Surgery

Surgery remains the primary treatment method for hemangiosarcoma. The surgery should be as aggressive as possible to remove all locally affected tissue. For splenic hemangiosarcoma, 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 (heart base) hemangiosarcoma, surgical exploration of the chest cavity may be considered, but this is a more invasive surgery and most cardiac hemangiosarcomas are not amenable to complete surgical removal. For hemangiosarcoma of bone or subcutaneous hemangiosarcoma involving the leg muscles, amputation of the limb may be necessary. Patients with HSA may be prone to bleeding and blood transfusions may be necessary in some cases. Heart arrhythmias are also a concern in some cases; anti-arrhythmic drugs may be needed before, during, or after surgery.

### Chemotherapy

Because of the high potential for metastatic disease, chemotherapy is generally recommended as a follow-up to surgery. Combination chemotherapy using a doxorubicin-based protocol is most commonly recommended. While chemotherapy may extend disease-free intervals, long-term control rates remain very low.

### Radiation therapy

Radiation therapy has not been extensively studied for treatment of hemangiosarcoma. Radiation therapy may be considered after surgery for subcutaneous or intramuscular hemangiosarcomas if adequate surgical margins were not obtainable. A shorter course of palliative radiation therapy could be considered to try to decrease symptoms of external masses. Radiation therapy, like surgery, is a local treatment which will only have an impact on cancer in the specific body region where the treatment is given.

## **What is the prognosis?**

Prognosis for canine hemangiosarcoma has been most extensively studied for splenic hemangiosarcoma. For these tumors, reported median survival times with surgery alone are



generally about 2 to 4 months. With surgery plus doxorubicin-based chemotherapy, median survival times are more typically around 6 months.

Behavior of hemangiosarcoma in other internal organs has been less well studied, but is generally considered similar to splenic hemangiosarcoma. Hemangiosarcoma of subcutaneous or intramuscular sites may also behave with similar aggressiveness, although in some cases hemangiosarcoma of these sites seems to progress more slowly.

Hemangiosarcoma of the skin seems to be have considerably less aggressively than hemangiosarcoma of other sites, at least initially (see below).

### **Dermal solar induced hemangiosarcomas**

Hemangiosarcoma involving the skin is seen most commonly in short-haired, poorly-pigmented breeds such as Dalmatians, whippets, and bulldogs and appears to be caused by solar damage to the skin. The most common sites are the ventral abdomen and inner hind limbs, where the hair is often sparse. Typically, multiple lesions appear over time and develop as red or dark purple plaques or raised nodules. Lesions usually do not invade under the superficial skin into the subcutaneous tissues at first, but may do so over time; once this happens, they seem to behave more aggressively, as described above for hemangiosarcomas of other locations. Surgical removal of superficial skin lesions usually offers long term control; however, most patients will make additional tumors, even if their sun exposure is discontinued. 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, may happen many years from initial diagnosis, unlike the typical behavior of other forms of hemangiosarcoma.