

SPLENIC MASSES IN DOGS (SPLENECTOMY)

The spleen is an oblong organ - some would say it is tongue-shaped - seated just below the stomach. Its consistency is similar to that of the liver. While one can live perfectly well without a spleen, the spleen does provide some helpful services to the body.

The spleen contains lots of long, winding, narrow blood vessels full of hair-pin turns that circulating red blood cells have to make. This means there are a lot of red blood cells working their way gradually through the spleen at any given time, effectively making the spleen a storage area for blood. If one has a severe hemorrhage and needs extra blood, the involuntary muscles of the spleen contract, squirting forth a fresh supply of blood. The spleen provides nature's blood transfusion, if you will.

Older red blood cells become more brittle than their younger counterparts. As they attempt the tortuous route through the spleen, many older red cells do not make it out the other side. These cells rupture trying to make the tight turns and their iron is captured and recycled by the spleen. The spleen thus helps remove old red blood cells from the circulation, and acts sort of as a clean-up function.

The spleen also performs a function called pitting where it is able to bite off sections of the red blood cells passing through. The sections to bite or pit are those marked by the immune system. In this way the spleen can remove red blood cell parasites from the circulating red blood cells, helping keep cells functioning that otherwise might become damaged if their infection is allowed to persist. Sometimes entire red cells are removed from the circulation in this way, thus preventing the spread of the red cell parasite inside. This sounds like a good thing but it can get out of hand. For example, in <http://www.VeterinaryPartner.com> feline infectious anemia, the spleen commonly removes so many red blood cell portions that the infection is difficult to detect, plus the patient becomes dangerously anemic (not from the actual parasite but because the spleen is removing large numbers of infected red blood cells). In severe cases of this condition, the spleen may have to be removed.

The above functions are part of what is called the red pulp of the spleen. The spleen also contains white pulp. The white pulp is essentially part of the lymphatic system, sort of like a lymph node. It serves the same functions as a lymph node but is connected through the circulatory system. Lymph nodes are centers of activity for the immune system, especially antibody-producing lymphocytes. Material from the local area of the body drains to the lymph node via the lymph vessels and the lymphocytes may or may not become stimulated into reacting, depending on what sort of material is in the lymph node. A reactive lymph node enlarges (the obvious example is the nodes that swell when one has a sore throat). The white of the spleen sees material from the circulatory system rather than material from the local lymphatics. Lymphocytes circulate through the splenic white pulp just as they do through the lymphatic vessels, carrying messages involved in the war against body invaders (bacteria, viruses etc.)

Why are Splenic Masses Bad?

Occasionally spleens grow masses. These are generally either benign tumors (hemangiomas) or malignant tumors ([<http://www.VeterinaryPartner.com>] /Content.plx?P=A&A=1449&S=<%= SpeciesID %>&EVetID=<%= EVetID %>hemangiosarcomas grow from the red pulp, mast cell tumors and [<http://www.VeterinaryPartner.com>] /Content.plx?P=A&A=592&S=<%= SpeciesID %>&EVetID=<%= EVetID %>lymphosarcomas arise from the white pulp.) In dogs, most splenic masses are either hemangiomas or hemangiosarcomas, while in cats they are usually either mast cell tumors or lymphosarcomas.

Since we are concerning ourselves with the dog today, we will review the hemangioma and hemangiosarcoma. Both these tumors arise from the blood vessels of the red pulp and amount to a bunch of wildly proliferating abnormal blood vessels. Eventually the growth ruptures and the spleen bleeds. When a vascular organ like the spleen bleeds, a life-threatening blood loss can result. Usually the patient is suddenly weak. The patient may be obviously cold. The gums will be pale in color. If the bleed stops on its own, the patient will be dramatically better the next day or even a few hours later.

Unfortunately, the splenic mass is certain to bleed again and if the spleen is not removed, eventually the patient will bleed to death.

If the splenic tumor is benign, removing the spleen is curative provided that the patient has not lost too much blood to survive the surgery. Ideally, the splenic mass is detected before it has ever bled and the spleen is removed at a time when the mass is not actively bleeding. Of course, if the splenic mass IS actively bleeding and cannot be stopped with pressure wraps, removing the spleen becomes an emergency surgery; it is not appropriate to try to wait until the bleeding has stopped.

If the splenic tumor is a malignant hemangiosarcoma, the spleen can still be removed to control the bleeding, but the problem is that hemangiosarcoma is an aggressive cancer. With the removal of the spleen and primary tumor, the patient is probably spared death by bleeding to death only to eventually succumb to cancer.

How Do We Detect Splenic Masses?

There are several ways to determine if a dog has a splenic mass. The first way is by physical examination. A large firm mass in the area of the spleen may be palpable (able to be felt with the hands) during a routine physical examination. From there, radiographs are taken of the belly to see if the mass appears to be on the spleen, and radiographs of the chest are taken to see if there is evidence of cancer spread. Based on these findings, plus basic blood work, a decision for or against spleen removal can be made. Unfortunately, many large dogs are simply too well muscled for splenic masses to be detected in this way.

Another method of detecting a splenic tumor comes on the basic blood panel. An unexplained responsive anemia is discovered. A responsive anemia is one typical of bleeding (as opposed to an anemia of chronic disease where red blood cells simply are inadequately produced). An older large breed dog with an unexplained bleed is highly suggestive of a splenic tumor. The next step would be radiographs to see if a mass is apparent followed by chest radiographs for tumor spread as above. These findings on the blood panel are especially suggestive of a splenic mass if there has been a history of sudden weakness or collapse typical of a recent bleed. Splenic tumors tend to bleed chronically and slowly - and usually insignificantly - prior to a large bleed that produces obvious symptoms. These smaller bleeds are generally enough to alter the blood panel. If blood work is suggestive of a splenic mass, radiographs can be taken to confirm a mass.

It can be difficult to determine from the radiograph if the mass is coming from the liver or from the spleen.

Is it Benign or Malignant?

This is not always clear prior to surgery. If there is evidence of tumor spread on a chest radiographs, then one can be quite sure that the tumor is malignant. In this case it is likely too late to effect meaningful treatment, though removing the spleen can at least prevent sudden bleeds.

If there is no evidence of tumor spread, the mass may be benign, or it may simply have produced tumor spread too small to see. In this case, one may simply proceed with splenectomy understanding that tumor spread may be obvious in the abdomen once the belly has been opened. Alternatively, one can have ultrasound performed on the belly to get a better idea of whether or not there is evidence of tumor spread.

If the spleen can be removed and minimal spread has occurred, then chemotherapy is a reasonable treatment option for maximizing quality life span.

If You Choose not to Remove the Spleen

Unfortunately, eventually the dog will have a bleed from which he cannot recover. If you think your dog is having a bleed at home, you can apply an ace bandage around the belly in a snug manner to essentially apply pressure to the bleed. This is surprisingly effective and may stave off the inevitable.

Chemotherapy is not an option if the primary splenic tumor is left behind; however, since a large percentage of splenic tumors are benign and splenectomy is curative in this situation, we recommend reconsidering surgery.

Other Reasons to Remove the Spleen

We have already mentioned the splenic mass as well as excessive red blood cell removal by the spleen as reasons for splenectomy. There are some other situations where splenectomy may be needed. Bloat (Gastric Dilatation and Volvulus) In this condition, the stomach bloats with gas and twists on its axis effectively cutting off its circulation. This is a huge emergency usually requiring surgery. The issue with the spleen is that the spleen rides just below the stomach so that when the stomach twists, the spleen twists along with it. Frequently the spleen must be removed or partly removed.

Traumatic Rupture of the Spleen

If the patient suffers blunt trauma to the abdomen, such as getting kicked by livestock or being hit by a car, the spleen may rupture and bleed dangerously. If a tear in the spleen is small, it may be repaired (sewn together) but if the rupture is severe, it may be easiest to simply remove the whole spleen.

Splenectomy

When a dog with a splenic mass is going to have the spleen removed (splenectomy) there are some issues to understand. The spleen may begin bleeding at any time up until it is actually removed. If this occurs, blood transfusion is likely going to be needed, either with artificial blood or whole blood, depending on what is available. It is possible that multiple transfusions will be needed. A parameter called the PCV (packed cell volume) will be monitored to make sure the amount of circulating red blood cells does not fall dangerously low. If one is lucky, the spleen will not be bleeding at any time during surgery. Some patients must receive blood transfusions prior to splenectomy to ensure they have a reserve of red blood cells in case of surgical bleeding.

It may not be known prior to surgery if the tumor is benign or malignant. There is a good chance this will become immediately obvious once the belly is opened. If the tumor is obviously malignant, will you want your dog euthanized at that point? Will you want the spleen removed so that you can consider chemotherapy? Will you want the incision simply closed and your dog awakened? These questions should be answered prior to surgery so that your veterinarian will know what to do should this situation arise. The spleen and its large blood clots are likely to weigh 5 to 10 lbs in a large dog.

The dog having a splenectomy because of a splenic mass will appear substantially thinner after surgery. There will be a long incision to accommodate this large organ and perhaps a bandage to control any leaking of blood from the incision.

Most dogs go home a day or two after surgery. An iron supplement may be needed to help the body recover from any blood loss. Antibiotics will likely be prescribed as will some sort of pain relief for the recovery period.

THE MOST COMMON COMPLICATION OF SPLENECTOMY IS HEMORRHAGE (BLEEDING

The spleen is supplied by numerous blood vessels that must be tied off (ligated) or sealed in order for the spleen to be removed.

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