

Informed Consent

Portosystemic Shunt Usually Congenital (Birth Defect), Extrahepatic (Outside of the Liver)

Your pet has been presumptively diagnosed with a problem within the blood supply within the abdomen. This problem is called a portosystemic shunt (PSS) and this occurs when there is a blood vessel that diverts blood from the tissues and organs in the abdomen to the heart and lungs without first going to the liver, like it is supposed to. The liver's job is to "filter" the blood, and when the body's blood is not delivered to the liver, there begins to be a buildup of toxins (bile products and ammonia) in the blood and in addition, the liver doesn't get the blood flow it needs to sustain itself, so it begins to dysfunction (which causes low blood sugar, low blood protein, and others). The goal of surgery is to explore the abdomen to look for the offending vessel (called a shunt) and seal it. The blood supply within the shunt vessel is not usually ligated completely in surgery, because the liver cannot handle the sudden increase in blood flow that it hasn't been receiving. The best thing to do is to slowly occlude the vessel, and this is usually accomplished using a vessel occluder called an ameroid constrictor. There are risks with both general abdominal surgery and specifically with shunt attenuation, and they will both be discussed separately below. The prognosis long-term is generally excellent and complication rate after shunt surgery is generally low, about 10%, however some complications (post operative portal hypertension) can be life-threatening. If you have any questions or concerns, please let us know.

Abdominal Surgery Risks

Skin incision infection- this is a risk with any surgery, and usually treatable with oral antibiotic therapy

Damage to abdominal structures- this could cause bleeding, or contamination by contents of the intestines

Adhesion formation (scar tissue formation in the abdomen)- scar tissue can impact the tissues in the abdomen in the future

Peritonitis- this is a rare but serious infection within the abdomen. If this occurs, additional therapies may likely be recommended.

Abdominal wall dehiscence (opening)- this can occur when the incision line used to close the abdominal wall fails. At first, the abdominal contents may stay covered by skin and subcutaneous tissue and revision is recommended. If they are not covered, emergency intervention is required.

Abdominal foreign body- very rarely, sponges or even instruments can be left in the abdominal cavity during surgery. We take precautions to ensure this doesn't happen, but it is possible.

Attenuation of Shunt

Presence of intrahepatic shunt-the shunt is a congenital anomaly and can occur anywhere, including within the liver itself. These shunts require more pin-point imaging because we cannot just see them from the outside. If there is an intrahepatic shunt, we will not be able to find it in surgery and additional imaging and further surgery may be needed.

Presence of multiple shunting vessels-sometimes there isn't one large shunt, but very many small ones. In this case, they cannot possibly be ligated and we find out in surgery that surgery will not be effective. In these cases, medical therapies are the only option to treat the shunt.

Hemorrhage (bleeding)- this is rare, but could be life-threatening. If the hemorrhage occurs from the shunt and warrants a ligation to cease blood flow, but the liver cannot handle all the blood flow, there is no good solution.

Failure to find or identify the shunt- usually the shunt is large and easy to find, but they can be anywhere and if we cannot find it in surgery, imaging studies and repeat surgery may be needed.

Failure of the ligation device to occlude- this is quite common, but manageable in many cases. Usually the device occludes most of the blood flow through the shunt. We monitor the success of surgery with blood tests in the weeks to months following surgery. If we discover there is still blood flow through the shunt, a decision can be made if additional surgery may be needed, or if monitoring and some medical therapies are more appropriate.

Post op acquired shunts- sometimes the liver cannot handle the blood flow even with a gradual occlusion of the shunt. In these cases, additional vessels may form in response and contribute to the same clinical scenario as was present prior to surgery, in these cases, no additional surgery is recommended, but many of the signs can be managed medically.

Systemic problems during surgery- given the irregular blood flow and the role of the liver, the presence of a shunt can affect things like blood pressure, blood sugar, blood proteins and these abnormalities can affect the anesthetic episode and your pet's condition in the recovery period as well.

Portal hypertension- as mentioned, the liver cannot usually handle a sudden increase to its normal blood flow, so we use means to occlude the vessel slowly. However, rarely, the device shifts or adjusts after surgery and could suddenly cause complete obstruction, and portal hypertension (high blood pressure in the liver vessels). This is life-threatening and revision surgery is likely indicated.

Since the shunt cannot usually be ligated completely, the abnormalities present prior to surgery may exist still after surgery (though hopefully they improve or resolve with time), and these include seizures, stones within the urinary tract, etc and these patients are at increased risk for clot formation (a rare but life-threatening situation).

Infection of the ameroid constrictor- this is very rare. If this occurs, revision surgery may be needed.