Portosystemic Shunt (PSS)

Veterinary Surgical Centers

What is a portosystemic shunt?

Normally, the blood supply draining the intestines travels through the portal vein into the liver, where it is filtered, then returns to the heart via the caudal vena cava. A portosystemic shunt (PSS) is an abnormal vein connecting the blood supply returning from the intestines to the vein returning blood to the heart, bypassing the liver (shunting). Portosystemic shunts can be either congenital (present at birth) or acquired. Acquired PSS can develop in pets that have progressive liver dysfunction. Congenital PSS can be found within the liver (intrahepatic) or before the liver (extrahepatic). Intrahepatic shunts are more commonly found in large-breed dogs such as German Shepherds, Labrador Retrievers, Golden Retrievers, Irish Setters, Doberman Pinschers, and Irish Wolfhounds. Extrahepatic shunts are more commonly found in miniature- and toy-breed dogs, such as Yorkshire Terriers, Miniature Schnauzers, Poodles, Lhasa Apsos, and Pekingese, as well as cats.

What are the symptoms?

A patient with a portosystemic shunt (PSS) can show symptoms, such as poor weight gain, increased thirst and urination, increased salivation (more common in cats), vomiting, diarrhea, straining or difficulty urinating due to bladder stone development, and neurological symptoms, such as dementia, circling, blindness, and seizures. The animal may also be the “runt” of the litter. Occasionally, no symptoms are seen at all.

What is the diagnosis?

Diagnosis of a portosystemic shunt (PSS) can be made from bloodwork, urinalysis, abdominal ultrasound, and other modalities, such as contrast enhanced X-Rays, computed tomography (CT) scan, MRI, and nuclear scintigraphy. Often, the definitive diagnosis will be made at the time of surgery.

What are the goals of surgery for extrahepatic portosystemic shunts?

Abdominal surgery is common and is considered the treatment of choice for extrahepatic portosystemic shunts (PSS). In surgery, the goal is to locate and place an ameroid constrictor around the blood vessel to allow gradual occlusion. An ameroid constrictor is a stainless-steel ring surrounding a casein center. Casein is a material that will gradually swell in the body fluids, allowing slow occlusion of the shunt. Gradual occlusion allows the liver to adapt to the increased blood flow. In rare instances, the PSS can be completely ligated (tied-off) at the time of surgery.

What are the goals of surgery for intrahepatic portosystemic shunts?

Although an intrahepatic shunt can be addressed as an abdominal surgery, the risks and complications during and after surgery are higher. Exposing these shunts may require dissection into the liver, and they tend to be larger, making it more difficult to occlude.

Therefore, newer procedures have been developed to allow occlusion of the shunt through minimally invasive techniques, with the aid of catheters and interventional radiology. Most of these procedures are currently being performed at academic institutions, such as the University of Pennsylvania.

What is the surgical outcome?

Based on the current literature and professional experience, 85 percent of dogs with an extrahepatic portosystemic shunt will have an excellent outcome. About 10 percent of dogs will have a recurrence of signs and will require continued medical management. About 7 percent of dogs will have severe problems, such as seizures or other systemic problems, after surgery that may result in death.

What is the post-operative care?

Once your pet is home, it's important to watch him or her for signs of complications, including abdominal swelling and more. Your surgeon will provide you with a complete list of signs to look for.