LIVER SHUNT

By: Nilda Dorini

Congenital portosystemic shunt

What is a portosystemic shunt? A liver shunt is a blood vessel that carries blood around the liver instead of through it. In some animals a liver shunt is a birth defect (“congenital portosystemic shunt”)

One important function of the liver is to clear toxins, many of which are by-products of protein digestion, from the blood.

The shunt most likely develops because a fetal duct fails to close after birth.

In PSS, these toxins are not cleared, and circulate in the body.

Under normal circumstances, blood passes through the liver to be detoxified. When one eats, many by-products of digestion are formed in the blood -- some of these by-products are beneficial, but some are not. Amongst the liver's many functions its role is in detoxifying the blood of the bad by-products, excess bile acids, ammonia, and other substances. In Portosystemic Shunt, the blood that would normally go to the liver to be detoxified bypasses the liver, toxins build up in the blood and the pup usually dies if the situation is uncorrected. Toxins build up in the blood affect the brain, which leads to changes in behavior and severe lethargy, depression, and weakness.

Large dogs tend to have shunts inside the liver (intrahepatic) - while small dogs will have them outside the liver (extrahepatic)
Shunts can be present at birth or acquired later in life as a result of disease process. Approx. 75% of shunts are present at birth.

Acquired shunts are not hereditary in nature. They are a result of progressive liver disease. Dogs suffering from cirrhosis, hepatitis or congestive heart failure can have increased pressure inside their livers.

**Signs of Liver Shunts include:**

- Poor weight gain, *Your pup may appear to be growing very slowly*
- Head pressing (pushing the head against a solid object), *Salivation,*
- Vomiting, *Poor appetite,*
- Increased drinking and urinating, or tranquilizer intolerance *Anesthetic*

Failure of the liver to clear ammonia means that there will be increased excretion in the urine. This commonly leads to urolithiasis - kidney, bladder or urethral calculi or stones due to the build-up of mineral salts.

A condition known as hepatic encephalopathy, arises shortly after eating and may appear as
depression, muscular incoordination, coma, and seizures—signs caused by ammonia (by-product of protein digestion) reaching the brain, not being cleared by the liver.

**How is a congenital portosystemic shunt treated?** Surgery appears to be the only cure for portosystemic shunts at this time. Many of the clinical signs associated with PSS can be improved by medical management. Since circulating ammonia is one of the main causes of hepatic encephalopathy, and ammonia is derived from eating meat, a low-protein diet is an essential component of medical therapy for PSS.

While medical treatment will improve the clinical signs temporarily, surgery to tie off the shunt is required to correct the condition for the long term. Ligation (tying-off) of the shunt may be partial or complete. This type of surgery is used to ligate the shunt flow that will redirect the blood through the liver. Your veterinarian may suggest your dog go to a referral centre, both because the procedure is best performed by an *experienced* surgeon and because close monitoring is required post-operatively.

**Is there a genetic predisposition toward Porto-Systemic shunts?** At the present time, according to the experts, yes, most definitely the origin of the disease is considered to be congenital; indicating an hereditary origin.

**Tests to diagnose a LIVER SHUNT**

**Bile Acid Test** - Bile acids are produced by the liver and are involved in fat breakdown. A bile acid test is used to evaluate the function of the liver and the blood flow to the liver. Patients with abnormal blood flow to the liver, a condition known as portosystemic shunt will have abnormal levels of bile acids. The bile acid test measures a fasting blood sample and a blood sample two hours after eating. Acid levels are extremely important in the diagnostic screening of symptomatic potential shunts. Breeders in other breeds report spending thousands of dollars on sophisticated neurological tests only to find that the simple fifty dollar test, the bile acid test, provides them with a direction for diagnosis of their sick puppy.

**Routine Lab Work** - Routine performed serum chemistries are fairly nonspecific toward
confirming the diagnosis of porto-systemic shunts, but there may be a decreased total protein (primarily albumin), decreased blood glucose, decreased cholesterol, & decreased blood urea nitrogen (BUN).

**RADIOGRAPHY** - Radiography is one of the most important methods of establishing a diagnosis of porto-systemic shunt, and is currently the only universally accepted method of confirming a shunt.

**REFERENCE**

*Dr. Karen Tobias, DVM, MS, Diplomate American College of Veterinary Surgeons at the Washington State University*

*Dr. Jennifer Brinson, a veterinarian who specializes in internal medicine at the University of Illinois College of Veterinary Medicine Teaching Hospital in Urbana.*

*California Davis Veterinarian School*


*Maddison J.E. (1988). Department Veterinary Clinical Studies, the University of Sydney New South Wales 2006.*