

Portosystemic Shunts

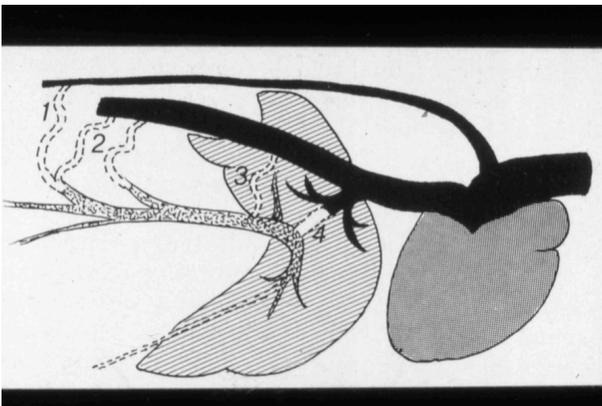
Anatomy and pathophysiology:

The portal vein normally supplies the liver with blood coming from the gastrointestinal tract, pancreas, and spleen. An important function of the liver is to clear toxins from this blood. When a portosystemic shunt occurs, an aberrant vessel bypasses the liver and enters directly into the systemic circulation. When portal blood bypasses the liver, the toxins that are normally cleared in the liver enter the systemic circulation. This creates the symptom known as Hepatic Encephalopathy.



Portosystemic shunts can be congenital (present at birth) or acquired. Two types of congenital portosystemic shunts are intrahepatic (within the liver, numbers 3 and 4 below) and extrahepatic (outside of the liver, numbers 1 and 2 below). Portosystemic shunts can occur in both dogs and cats, with Yorkshire terriers being the most common dog breed for extrahepatic shunts. Intrahepatic shunts are generally found in large breed dogs.

Most animals are diagnosed with a congenital portosystemic shunt by the time they are 12 months of age. Multiple acquired extrahepatic shunts are usually diagnosed in older patients (>7 years). Acquired portosystemic shunts are extrahepatic in nature and there are usually multiple aberrant vessels. These shunts are secondary to severe liver disease, and there is no surgical treatment.

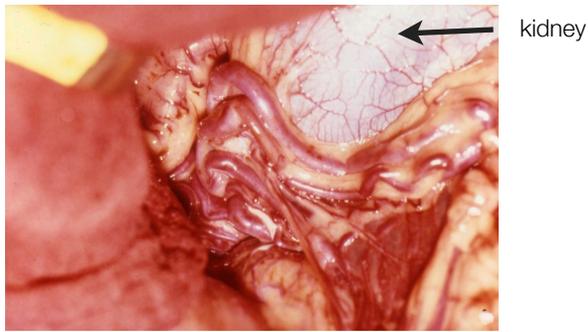


Types of congenial portosystemic shunts:

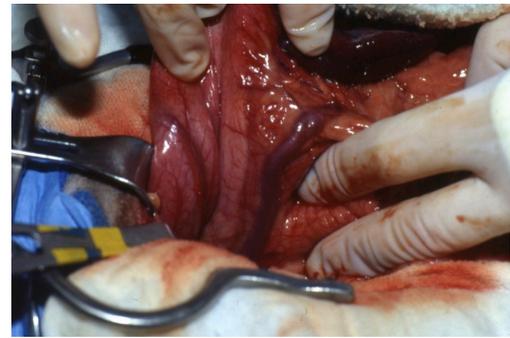
1. Portoazygous
2. Portocaval
3. Intrahepatic
4. Patent ductus venosus

Clinical signs and Diagnosis

Signs associated with a portosystemic shunts include neurologic abnormalities (hepatic encephalopathy), lethargy, poor growth, weight loss, vomiting and/or diarrhea, and urinary tract dysfunction. Animals affected with a portosystemic shunt may be prone to urate stones in the urinary bladder. Some dogs with acquired shunts may develop ascites (fluid in the abdomen). The diagnosis of a portosystemic shunt is confirmed by ultrasound, nuclear imaging, or contrast radiographic studies (portogram). Most animals will have abnormally high bile acid levels in the blood.



Multiple extrahepatic shunt vessels (arrow) seen at surgery near the kidney.



Single extrahepatic shunt vessel seen at surgery

Treatment:

Surgical treatment is advised for animals with a congenital portosystemic shunt that are presented with clinical signs related to the shunt. Ligation of the shunt involves an exploratory laparotomy to place a ligature or an ameroid constrictor around the shunt vessel to redirect blood back through the liver. An ameroid constrictor placement is the preferred method in most cases since it slowly occludes the vessel over a period of several weeks, thus reducing the incidence of complications. Intrahepatic shunts are extremely challenging due to the difficulty of finding the vessel within the liver parenchyma. The most concerning complication is portal hypertension. Portal hypertension can develop if the shunt vessel closes rapidly or prior to the liver functioning normally to handle the new blood flow.

Left untreated, portosystemic shunts are often fatal within months to years. Most dogs (approximately 85%) will recover from surgery and be cured. The liver can regenerate and resume normal function once the blood has been redirected.

This surgery is best performed by a Board Certified Surgeon.