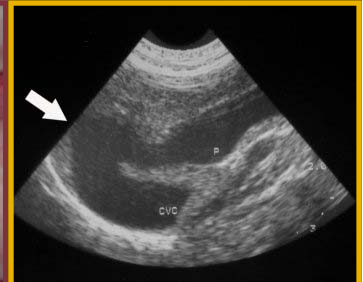
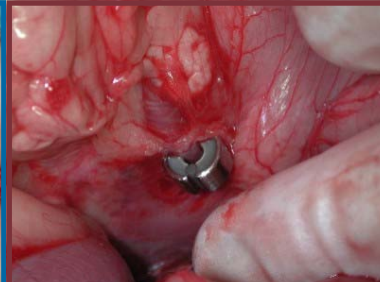
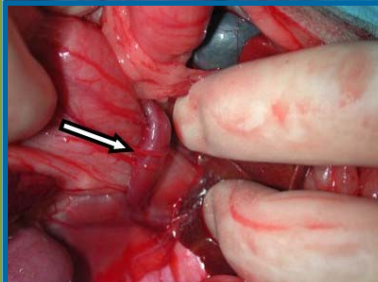




Wheat Ridge  
Veterinary Specialists



internal medicine

surgery

emergency & critical care

dermatology

radiology, ultrasound & CT scan

# Portosystemic Shunts

**PORTOSYSTEMIC SHUNTS(PSS)** are anomalous vessels that allow normal portal blood drainage from the stomach, intestines, pancreas and spleen to bypass the liver and flow directly into the systemic circulation. Congenital shunts can typically be divided into two main categories (intrahepatic and extrahepatic) based on where the shunting vessel occurs. Intrahepatic portosystemic shunts occur within the liver and are typically found in large breed dogs. Extrahepatic shunts occur outside the liver and are most common in small breeds.

**SIGNS AND CONSEQUENCES OF PSS** When portal blood bypasses the liver, toxins that are normally deactivated by the liver are circulated to the rest of the body, The results may affect many body systems, most seriously the nervous system. Due to several factors associated with PSS, neurologic dysfunction ranging from severe sedation to blindness and uncontrollable seizures may occur in affected dogs. This is referred to as hepatic encephalopathy. These signs are often seen following a high protein meal. Urinary disorders can also occur from urinary stone formation.

### SIGNS OF PSS

- Small body stature
- Failure to grow
- Behavior changes
- Circling and head pressing
- Sedation
- Vomiting
- Diarrhea
- Increased thirst
- Increased urination
- Poor anesthetic recovery
- Urinary dysfunction

nosis requires either nuclear scintigraphy or a portogram. Nuclear Scintigraphy is performed by giving a radioactive enema and evaluating the percentage of absorption to the liver. A portogram is a direct injection of contrast within the portal drainage system. This is most commonly performed during surgery, however, non-invasive portography can be performed with CT (computed tomography) scans.

**PORTOSYSTEMIC SHUNT TREATMENT** Though it is possible to manage shunts medically, without surgical correction, the prognosis is guarded with a median survival of approximately 2 years. Surgical closure of the shunt is the treatment of choice and may allow for a normal life span without the need for further treatment. Since most dogs with PSS have small livers unable to handle the normal portal blood flow, shunt attenuation must be performed gradually to prevent fatal portal hypertension (increased blood pressure within the portal system). Multiple surgical techniques exist to allow for gradual occlusion of a PSS and are often dependent on the type (intrahepatic or extrahepatic) and size of the shunting vessel. The prognosis for surgical correction of PSS varies depending on the type of shunt, age of animal and clinical signs prior to shunt occlusion. In general a good to excellent outcome can be achieved in 80-95% of patients. Potential postoperative complications include: hemorrhage; portal hypertension; the development of multiple acquired shunts; seizures; intractable seizures and death.

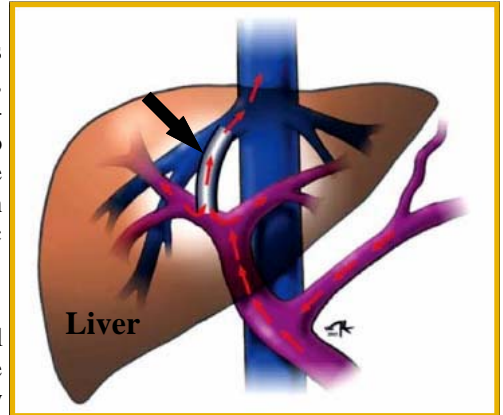
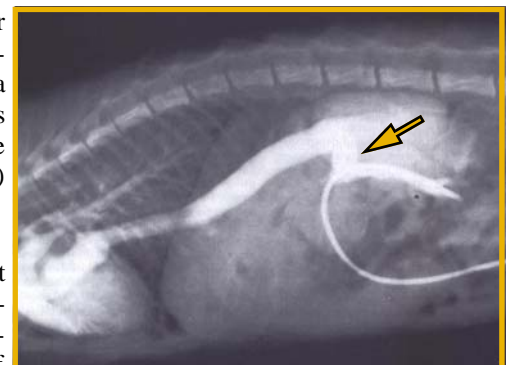


Diagram of an intrahepatic shunt. The purple vessels depict the normal portal system leading to the liver. The black arrow shows the abnormal connection between the portal and systemic vascular systems (blue vessel).



Diagnostic portogram for the definitive diagnosis of a portosystemic shunt. The yellow arrow shows the PSS