OAKLAND VETERINARY REFERRAL SERVICES

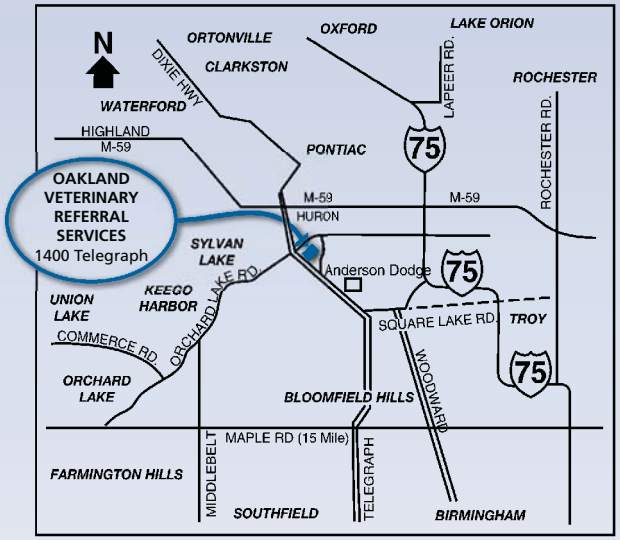
Postoperative Expectations

Life-threatening postoperative complications are rare but all patients need to be monitored very closely in the hospital for several days. Postoperative seizures and portal hypertension (caused by the inability of the intestines to handle the increased pressure) are the most serious complications. Some dogs develop fluid accumulation in the abdomen which may or may not require treatment and generally resolves in a few weeks. Dogs need to remain on medication until the shunt has closed and the liver is functioning well (usually 4-6 weeks). Most PSS patients treated surgically can discontinue medical management at 6 weeks. Some patients have slightly elevated bile acids for life but have no clinical signs.

Specialty veterinary medicine is a relatively new advancement in pet care. Similar to human medicine specialists, board-certified veterinary specialists focus their education and services in one specific area.

Have you been referred? Things to bring at the time of your consultation:

- **Recent radiographs and blood work**
- **A current list of your pet's medications**



1400 Telegraph Road
Bloomfield Hills, MI 48302
(248) 334-6877
Fax: 248-334-3693
Email: info@ovrs.com

OAKLAND VETERINARY REFERRAL SERVICES

Oakland Veterinary Referral Services

SURGERY

Portosystemic Shunts

What is a Portosystemic Shunt?

Portosystemic shunts (PSS), also known as liver shunts, are vascular abnormalities that permit blood flow to bypass the liver and directly enter the blood stream. Portosystemic shunts occur when an embryonic vessel (the ductus venosus) does not close after birth. Portosystemic shunts may be located either intrahepatic (inside the liver) or extrahepatic (outside the liver). Animals may develop portosystemic shunts at birth (congenital) or later in life secondary to an underlying liver disease (acquired). Acquired shunts always involve multiple vessels bypassing the liver. Portosystemic shunts can be found in dogs, and less frequently in cats. Yorkshire terriers are reported to have a higher than normal incidence of liver shunts.

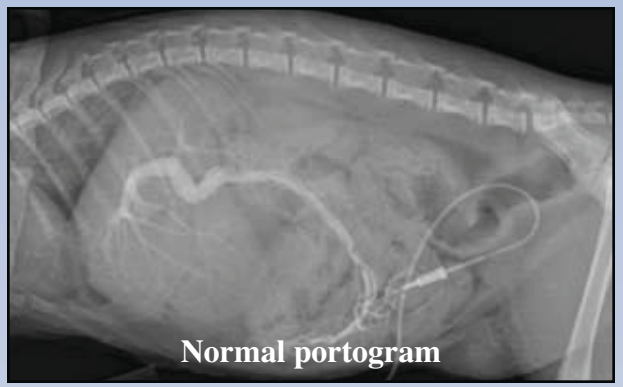
Circulating byproducts of digested foods normally pass directly into the liver for detoxification via the portal vein. When a portosystemic shunt prevents blood from being filtered by the liver, these substances (e.g., ammonia) enter directly back into the main blood stream and can adversely affect many other body organs. Many of the substances released from the break-down of proteins in the food are absorbed by and affect brain function if they are not removed by the liver. In addition, liver size is directly proportional to blood flow. Because shunts allow blood to bypass the liver, it fails to grow in size and its function is impaired.

What Are the Symptoms?

Most dogs with a congenital PSS are much smaller than their littermates. Other symptoms are variable and primarily involve the digestive tract (salivation, vomiting, diarrhea and poor appetite) and central nervous system (depression, balance problems or walking in circles, head pressing, transient blindness, seizures). These patients are also predisposed to developing bladder stones. Patients with PSS are very sensitive to sedatives such as valium. Symptoms may be worse after eating, especially high protein meals. Clinical signs generally tend to worsen in severity and frequency with time and may progress to coma and death.

How is a PSS Diagnosed?

Most dogs and cats will be diagnosed with a liver shunt at less than 1 year of age. Diagnosis is based on clinical signs and characteristic changes in blood and urine tests. Liver function tests (bile acids) are used to confirm the diagnosis. Abdominal ultrasonography is often used to identify bladder stones, identify the location of the shunt (inside or outside the liver), and assess the liver size. More intensive testing such as contrast portography (see images above), or nuclear scintigraphy may be used in some cases.



What is the Treatment for a PSS?

Early surgical treatment is recommended and carries an excellent prognosis in dogs with uncomplicated congenital PSS. Medical management, including a low protein diet, antibiotics, and/or lactulose is required for several weeks prior to surgery to strengthen debilitated patients and reduce the risks of postoperative seizures. Anti-convulsants may be required to control seizures if diet and medication fails to do so. Medical management without surgery may control clinical signs until liver failure occurs but the life-span is dramatically shortened in these patients as compared to those undergoing surgical correction of the PSS. Acquired shunts are not amendable to surgical treatment as they develop to relieve pressure in the portal system secondary to liver disease. Some dogs require surgery to confirm the diagnosis and to obtain a liver biopsy in order to treat the underlying disease.

Surgical treatment of a PSS involves placing either an ameroid ring or cellophane band around the shunt. These materials slowly close the shunt over a period of 4-6 weeks, thereby allowing the liver time to adapt to the increase in blood flow and pressure. A liver biopsy is also obtained at the time of surgery to ensure there is no other concurrent liver disease. These patients are at an increased anesthetic risk due to their small size and poor liver function. They are also prone to hypothermia (cold), hypotension (low blood pressure) and hypoglycemia (low blood sugar) and often require intensive care.