

Portosystemic Shunts

ABOUT THE DIAGNOSIS

Portosystemic shunts are defects of the blood's circulation through the liver. They cause symptoms of poor growth and neurologic dysfunction, and the best form of treatment for portosystemic shunts that have been present since birth (the majority) is usually via surgery.

Portosystemic shunts result from abnormal blood vessels that connect the portal system of the liver with the veins of the rest of the body. The portal system is a division of the blood circulation that collects blood from the intestines and carries it to the liver, where toxins and nutrients are removed before it enters the general circulation. Normally, intestinal bacteria produce toxic substances, such as ammonia, that are absorbed into the blood and then detoxified in the liver. When this blood bypasses the liver through a portosystemic shunt, these toxins that are normally removed by the liver are allowed to circulate in the bloodstream. Most portosystemic shunts are *congenital*, that is, they are abnormalities that develop during fetal growth and are present at birth. As a result of the lack of normal blood flow from the portal system, the liver does not develop properly in these pets and remains abnormally small. Occasionally, portosystemic shunts develop later in life due to chronic, advanced liver disease.

Most pets with congenital portosystemic shunts show symptoms within the first 6 months of life. Almost all show symptoms before 2 years of age, but a few are not detected until later in life. Toxins in the bloodstream can cause a variety of the nervous system symptoms that first indicate the possible presence of a portosystemic shunt. These symptoms can include poor appetite, lethargy, disorientation, pacing and circling, seizures, coma, and other changes in behavior. Excessive drooling can also occur jointly with these symptoms and is especially common in cats with portosystemic shunts. These symptoms usually wax and wane. The pet may be stunted in growth or fail to gain weight. Diarrhea or vomiting may occur intermittently. Affected pets may drink and urinate more than normal. Pets with portosystemic shunts are also prone to developing a type of kidney and bladder stones. Symptoms of uroliths (urinary tract stones) include straining to urinate, frequent urination, or bloody urine. A common scenario that leads to suspicion of portosystemic shunt is delayed recovery from anesthesia, such as after neutering. Any difficult or delayed anesthesia recovery in a young dog or cat should prompt the consideration of portosystemic shunt.

There are many other types of diseases that can produce symptoms that are easily mistaken for symptoms of portosystemic shunts. Therefore, it is necessary to perform certain tests to confirm the diagnosis of portosystemic shunt; an examination alone is not sufficient to be sure that a portosystemic shunt is or is not present. Routine blood tests and urinalysis are necessary, and they may show some changes that indicate poor liver function but generally these tests are more valuable for screening for other, "impostor" diseases with symptoms that mimic portosystemic shunts. Specialized tests of liver function will almost always be abnormal. The most common of these is a blood test for the measurement of serum bile acids. Radiographs (x-rays) may indicate an abnormally small liver. Abdominal ultrasound examinations can allow visualization of the portosystemic shunt in some patients.

Radiographic techniques using special dyes administered during surgery are needed to locate the portosystemic shunts in other pets.

LIVING WITH THE DIAGNOSIS

Successful surgical treatment of congenital portosystemic shunts can lead to the pet living a normal life. Without surgery, some dogs can be managed with medication alone for months to years, while in others, the medication is not sufficient to control the problem. Cats are less likely to have their symptoms controlled by medication alone.

When portosystemic shunts first arise later in life (*acquired* portosystemic shunts), they do so as a result of chronic liver disease such as cirrhosis. In such cases, surgical closure of the shunts is not performed, and the priority rests on treatment of the underlying problem, usually with medications chosen based on a liver biopsy result.

TREATMENT

In most cases of congenital portosystemic shunts, the treatment of choice is surgery. Many affected pets will have complete resolution/disappearance of symptoms after the portosystemic shunt is permanently closed during surgery. The shunt cannot always be corrected surgically, however. Some are in locations, such as within the liver tissue, where they cannot be reached. Others cannot be closed off completely because the blood pressure in the portal system becomes too high. Prior to surgery or in pets that cannot be treated surgically, medications may be adequate to control symptoms for months to years. Such treatment includes feeding a protein-optimized diet, giving antibiotics to reduce bacterial toxins originating from the intestinal tract, and giving lactulose to reduce the absorption of ammonia.

DOs

- Continue medications and protein-optimized food after surgery until instructed to stop by your veterinarian.
- Restrict your pet's exercise until sutures (skin stitches) are removed.

DON'Ts

- Avoid feeding high-protein diets or snacks, especially meat-based foods and treats.
- Do not bathe your pet until skin sutures (stitches) have been removed.

WHEN TO CALL YOUR VETERINARIAN

- If your pet's symptoms worsen (see [Signs to Watch For](#), below).

SIGNS TO WATCH FOR

- Changes in behavior, lethargy, or lack of appetite.
- Straining to urinate, frequent urination, or blood in the urine.
- Vomiting, diarrhea, excessive drinking or urination.

ROUTINE FOLLOW-UP

- After surgery several visits will be needed to monitor your pet's response.

ADDITIONAL INFORMATION

- Portosystemic shunts are more common in purebred dogs than mixed-breed dogs, with miniature schnauzers, Yorkshire terriers, Maltese terriers, and Havanese dogs particularly overrepresented. Purebred cats are at lower risk than mixed-breed cats.

Other information that may be useful in some cases: "How-To" Client Education Sheet:

- How to Manage a Dog or Cat That Is Having Seizures

Practice Stamp or Name & Address