

Metropolitan Veterinary Hospital

Akron Veterinary Internal Medicine/Oncology Practice

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Portosystemic Shunts

Client Handout

Definitions

Porto: Blood flow to and through the liver.

Systemic: Blood flow through the entire body.

Shunt: Any bypass or short-cut around something.

If we put these terms together, a portosystemic shunt is a bypass of the blood flow away from the liver and into the general circulation.

The Disease Process

The bypass is most likely a single, extra blood vessel that is present from birth, although there are patients who have multiple extra vessels. These shunting vessels take blood from the intestine and dump it directly into general circulation, instead of going straight to the liver. The liver acts like a filter and takes out absorbed intestinal toxins, one of which is ammonia, a by product of protein metabolism. However, if blood is not directed to the liver, the toxins are free to damage the brain or other vital organs.

Some of the signs you may be seeing:

Hepatic encephalopathy: This term refers to neurologic abnormalities stemming from liver dysfunction, ie., the result of exposure of the brain to unfiltered intestinal toxins. It is characterized by depression, staggering, falling, or even seizing. However, some dogs will have a shunt and show none of these signs.

Urinary tract changes: Increased frequency of urinations, straining to urinate, or even blood in the urine. When the liver does not filter ammonia it can concentrate in the urinary bladder, leading to an alkaline urine and the formation of ammonium urate crystals or stones. If stones do develop, they may become lodged in the urine outflow tract (urethra) and you may see your pet straining to urinate.

Nonspecific signs: They can be the runt of the litter, or show intermittent vomiting, diarrhea, and anorexia.

How do we make this diagnosis?

History: Is often the first thing that gives us a clue. Are your pet's symptoms more noticeable after a meal? Have they always been undersized, thin, depressed? Do they show unpredictable bouts of aggression or dementia? These are other signs that may lead us to suspect shunt.

Blood tests, Radiographs (x-rays) and Ultrasound: One of the most important blood tests is called a serum bile acids test. Our livers produce bile acids, which aid in the digestive process. Once these bile acids have done their job in the intestine, they ideally travel directly back to the liver for recycling. However, if blood flow from the intestine to the liver is reduced, as is the case with a shunt, these bile acids stay in general circulation and can be detected by a blood test. Radiographs will often show that your pet's liver is smaller than normal. This makes sense if it has not been getting the blood supply, and therefore the nutrients it needs to grow. Ultrasound is often helpful as well. We can image your pet's abdomen and often are able, but not always, to visualize the shunt vessel bypassing the liver and flowing into general circulation.

Treatment

Medical: Some dogs only show mild signs and can do very well on a combination of low protein diet, oral antibiotics, and ammonia binders. Cats, however, do not respond as well to medical management and surgery is their best option, which can be curative.

Surgical: In cases where the clinical signs are too severe and cannot be controlled with diet and medication, surgery is an option and has a variable success rate (can approach of 80-90%) depending on the how many vessels there are, their location, and portal blood pressure pre and post operatively. Surgery involves approaching the abdomen, finding the shunt vessel, and putting an Ameroid Constrictor around it. This is a ring that slowly, over time, constricts the vessel, thereby redirecting blood flow back through the liver.