



**VETERINARY VOICE:
Tips of the Trade**

Internal Medicine – Protein C	
<p>What is the history of portosystemic vascular anomalies and microvascular dysplasia?</p>	<p>PSVA is estimated to comprise between approximately 0.6 to 2.0% of a specialty hospital patient population. However, microvascular dysplasia (MVD), a genetically related hepatic vascular disorder is far more common (15 to 30 times) compared to the prevalence of PSVA. MVD occurs as a single entity or coexists with PSVA. Unfortunately, discovery of high serum bile acid concentrations in dogs with MVD often leads to expensive and invasive diagnostic assessments for PSVA in pet dogs. Dogs affected only with MVD are typically asymptomatic and their hepatic vascular abnormalities non-progressive. The majorities of dogs affected only with MVD do not need medical treatments as assigned for dogs with symptomatic PSVA and have a normal life expectancy. Many MVD affected dogs are discovered on the basis of high serum bile acid concentrations revealed upon screening or serendipitously at the time of non-related illnesses. A misconception regarding management of MVD has caused confusion among clinicians, breeders of commonly affected small pure breed dogs, and pet dog owners.</p>
<p>Diagnosis of portosystemic shunt using serum bile acids?</p>	<p>Total serum bile acid (TSBA) are routinely used in clinical practice. This test has been rigorously evaluated and proven as a diagnostic test for liver disease and PSS in dogs and cats. TSBA supersedes the utility of ammonia in most practices owing to their stability and convenience for detection of portosystemic vascular anomalies (PSVA). Best utility occurs with paired fasting (FSBA) and 2-hr postprandial (PSBA) samples. Measurement of TSBA has appropriately displaced use of NH₃ for diagnosis of liver disease because of its broader sensitivity for different forms of liver disease and because bile acids are stable in plasma permitting routine laboratory analysis. NH₃ measurements have been repeatedly shown to have poor sensitivity in detecting dogs with hepatobiliary disease not associated with hepatofugal circulation. In house dry chemistry testing is unreliable.</p>
<p>What is Protein C?</p>	<p>Protein C may differentiate between dogs with extrahepatic portosystemic vascular anomalies (PSVA) and microvascular dysplasia (MVD). Protein C (PC), a critical short-lived anticoagulant protein, also known to modulate inflammation and apoptosis, is synthesized in the liver. Because PC deficiency develops in humans with PSS and hepatic atrophy, it was investigated as a clinical marker of liver disease in dogs. Findings show that PC is significantly reduced in dogs with severe liver dysfunction as well as PSVA. Subnormal PC was found in 98% of dogs with PSVA and 30% of dogs with MVD and therefore, low PC concentrations may offer a noninvasive method to help differentiate PSVA from MVD in many dogs. Values ≤ 70% are useful for differentiating PSVA from MVD (most MVD dogs have values > 70%). This cutoff is used to prioritize ultrasound and colorectal imaging studies in dogs with high serum bile acids suspected of having a PSVA.</p>
<p>Questions? Internal Medicine Experts: Robert Vasilopoulos, DVM, MS, DACVIM Michael Matz, DVM, DACVIM</p>	<p>The Veterinary Specialty Center of Tucson has board-certified internists available for questions and consultations on internal medicine conditions during the weekdays. A member of the internal medicine team is on-call 24/7 to provide consultations to VSCT emergency doctors and to perform emergency procedures (endoscopy, ultrasound) for patients seen by the VSCT emergency service. Board-certified internists have four additional years of training and are certified by the American College of Veterinary Internal Medicine (internal medicine) to assure competency in advanced veterinary internal medicine.</p>