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Dr. Akol graduated from UC Davis in 1987 with a Doctorate in Veterinary Medicine. Her internship at Coast Pet Clinic in Hermosa Beach followed and was completed in 1988. Dr. Akol then pursued residency training in internal medicine at University of Pennsylvania (1988-1990). She became board certified in internal medicine in 1992. She has published articles in the area of diabetes mellitus, pancreatitis and lipidosis. Dr. Akol has a special interest in feline medicine as well as the sub-specialties of gastroenterology, endocrinology and diseases of the respiratory system. In her free time she competes in ballroom dance competitions and enjoys spending time with her son, two dogs and two cats.

Scottish Terrier Degenerative Vacuolar Hepatopathy

Vacuolar hepatopathy (VH) is a relatively common canine syndrome that accompanies many systemic illnesses including inflammatory, neoplastic, infectious, endocrine, primary and secondary hepatopathies. It is usually characterized by increased serum ALP, accumulation of excessive cytosolic glycogen leading to cell distention and cellular fragility. Although many cases are clinically benign, it can lead to diffuse hepatic remodeling, nodularity, intrasinusoidal and splanchnic hypertension resulting in acquired portosystemic shunts, ascites, and, ultimately, hepatic failure.

In a retrospective study of 97 liver biopsies from Scottish Terriers, 70% had marked vacuolar hepatopathy. Of these dogs with VH, 10% also had copper-associated hepatopathy and 30% had hepatocellular carcinoma (single or multiple sites).

Elevation of serum ALP is usually recognized by 3-4 years of age. There is not necessarily any progression of these values over time. Most dogs have normal to increased liver size with hyperechoic hepatic parenchyma contrasting against hypoechoic nodules in the liver ranging in size from 3-15 mm in diameter. Ultrasound findings in later stages may show reduction of liver size, nodular surface change, shunt vessels and ascites. In addition, 23% had adrenomegally or asymmetric nodular lesions. Clinical features of hyperadrenocorticism are inconsistent or lacking in these patients. Likewise, tests for Cushings syndrome commonly employed (low dose dex suppression, ACTH stimulation test, urine cortisol to creatinine ratio) rarely demonstrate overproduction of cortisol. Evaluation of expanded adrenocortical hormones pre and post ACTH revealed elevations in more than one analyte in every dog. Elevation of androstenedione and 17-hydroprogesterone were elevated in most.

The elevations in ALP and degenerative VH in Scotties is likely due to a genetic defect in steroidogenesis. It may also explain the prostatomegaly common in this breed. Hepatocellular carcinoma may also be associated with chronically increased androgens. Treatment with Lysodren, Trilostane and ketoconazole is ineffective and may lead to illness, hypoadrenocorticism or death.

Approximately 25% of Scotties with degenerative VH will progressively develop severe hepatic remodeling and slowly progress to liver failure. This is associated with jaundice, bleeding, portal hypertension, ascites and lobular collapse. This can occur as early as 6 years of age, but more commonly observed in dogs greater than or equal to 10 years of age. Other dogs may be able to maintain quality of life throughout a normal life expectancy. There are no values that appear to be predictive about which path an individual will follow. Dietary protein modification/restriction has no role in management unless there is encephalopathy. The subset of dogs co-affected by copper storage disease should be treated as usual with copper restricted diet, anti-oxidants and D-penicillamine. Scotty dog with degenerative VH will tolerate modest doses of glucocorticoids to manage other diseases that may warrant that treatment without exaggerated adverse effects. Spectulatively, VH may benefit from antioxidant therapy. This syndrome is not highly fibrotic, so anti-fibrotic medication is not likely to be beneficial. Elevation of total serum bile acids is a late stage manifestation. At that stage ursodexoycholate may be advantageous. Mucocoels are independently associated with steroidogenic states. Ultrasound surveillance should be used regularly to evaluate for mucocoels and liver mass lesions. Surgery may be appropriate for the excision of these lesions when identified.

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About Our Organization

PVSES was founded to provide high quality, specialized medical care to companion animal patients. Our practice is dedicated to serving the veterinary community as a partner in total patient care. We offer comprehensive specialized services including endoscopy, Doppler ultrasound, surgery, 24-hour ICU care, and emergency and critical care. Our staff is committed to providing compassionate and thorough medical care that meets the needs of the patient, client, and referring veterinarian.

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