VIRGINIA COOPERATIVE EXTENSION SERVICE

EXTENSION DIVISION - VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY - BLACKSBURG, VIRGINIA 24061

VIRGINIA-MARYLAND
REGIONAL COLLEGE
OF
VETERINARY MEDICINE

VIRGINIA VETERINARY NOTES

November-December, 1987 No. 30

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Extension Veterinarian

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, and September 30, 1977, in cooperation with the U. S. Department of Agriculture. W. R. Van Dresser, Dean, Extension Division, Cooperative Extension Service, Virginia Polytechnic Institute and State University, Blacksburg, Virginia 24061; M. C. Harding, Sr., Administrator, 1890 Extension Program, Virginia State University, Petersburg, Virginia 23803.

EVALUATION OF LUNG LESIONS

Accurate evaluation of the lungs at necropsy is not as simple a task as one might initially suspect. Two of the most important features that must be assessed are the texture of the lung and the distribution of the possible lesion.

"If it's not firm, it's not pneumonia!" (Dr. J.M. King, Cornell University). The best way to examine the lungs is by palpating them. Prosectors are often too easily influenced by color. Redness only indicates the presence of blood in the tissue. Perhaps the animal was lying on its side or back when it died allowing blood to pool in one area of the lung.

There are three major categories of lung lesion distribution. They may overlap or even coexist. Diffuse lesions affect practically all of the lung parenchyma (generally 80-99%). Sometimes this is difficult to appreciate just because so much of the lung is involved. Examples of diffuse lung lesions include proliferative pneumonia (cattle), toxoplasmosis, or heart failure lungs (technically not pneumonia). Locally extensive lesions involve large confluent areas of the parenchyma. Often the lesion extends to involve portions of adjacent lung lobes. Some common locally extensive pneumonias include pasteurellosis (sheep and cattle), Hemophilus sp. pneumonia (swine and cattle), most inhalation pneumonias (any species), most canine distemper pneumonias, and pneumocystosis. The third type of lesion distribution is focal or multifocal. In these lesions there is a single focus or many small discrete foci randomly scattered throughout the lung. The distribution of the lesion may reflect either a vascular or airway route of spread. Embolic shower (either of tumors or abscesses), inhalation of a single foreign body, or fungal spore inhalation usually cause focal or multifocal lung lesions.

Pulmonary congestion and edema is another finding that is frequently misdiagnosed. If a physiological reason for congestion and edema does not exist, then most likely, you are evaluating an artifact. One should ask the question, "Was there more blood or fluid in the lung during life?" If the answer is no, then the "congestion" is a post mortem event. Tracheal or bronchial froth is not an indication of pulmonary edema. Most frequently froth is produced after death as the lung collapses and forces fluid into airways--**Lois Roth, DVM, PhD, DACVP, Assistant Professor of Pathology, VA-MD Regional College of Veterinary Medicine.**

NUTRITION IN VETERINARY MEDICINE

Today, for veterinarians to provide the best possible service to animals and their owners, emphasis should be on prevention of disease first and treatment of disease second. All animals must be properly fed for optimal health, maximal longevity and productivity. The most common question posed to veterinarians is, "what should I feed my pet?". The most common response is, "any good national brand food," which does not necessarily ensure proper nutrition. The proper answer requires a basic understanding of nutrients, a knowledge of the food products available and the appropriate feeding management for the different phases of the life cycle. The nutrient requirements for growth, maintenance, gestation, lactation and old age vary considerably and, therefore, not all good national brand foods may suffice. Proper nutrition plays a key role in not only maintaining health and in the management of many diseases as well.

Hippocrates (500 B.C.) wrote of nutrition as an integral part of therapy in disease states. Undernutrition has a direct relationship to problems such as ineffective wound and fracture healing, inadequate immune responses, decreased tolerance to cancer chemotherapy, muscle weakness and certain organ (heart and liver) dysfunctions. In simple starvation, the metabolic rate decreases with time and an animal in good condition with food deprivation may survive well for 7 to 10 days. In diseased or injured animals, the metabolic rate increases due to the general neuroendocrine responses to stress. Diseased or injured patients that are unable or refuse to consume enough food to meet their increased nutrient needs are actually in an "accelerated form of starvation". Anorexia, in the face of hypermetabolism, is a commonly ignored cause of protein-energy malnutrition in sick animals and may be responsible for a less than optimal response to proper therapy.

Recently, there has been an increasing awareness of nutrition and it's proper role in veterinary medicine due to advances in-patient evaluation, diets and equipment. Clinical veterinary nutritionists are now available to assist veterinarians in nutritional recommendations for the normal healthy pet in all phases of their life cycle. In addition, the veterinary nutritionist may also advise the practitioner in the nutritional support of traumatized, septic or postsurgical anorexic patients, as well as, patients with cancer, heart, renal or gastro-intestinal diseases. Nutrition is an immense, subliminally important and rapidly expanding field with respect to both health and disease. Veterinary nutrition is an emerging AVMA specialty board which will finally draw proper attention to the importance of nutrition in veterinary medicine. **--Rebecca Remillard, DVM, PhD, Research Associate in Veterinary Nutrition, VA-MD Regional College of Veterinary Medicine.**

DIABETIC POLYNEUROPATHY

Recently, cases of clinical and subclinical polyneuropathy have been reported in adult dogs and cats with spontaneous diabetes mellitus. Both acute and insidious onsets of pelvic limb ataxia have been noted. Proprioceptive deficits, muscle atrophy, and reduced spinal reflexes may be present with the deficits more prominent in the pelvic limbs. Cats often have a plantigrade pelvic limb stance (excessive hock flexion).

The clinical signs (polyuria, polydipsia, weight loss), blood chemistry profile (hyperglycemia) and urinalysis (glucosuria, ketonuria) should support the diagnosis of diabetes mellitus. Electrodiagnostic testing in diabetic dogs with and without overt weakness has revealed denervation potentials (fibrillations, positive sharp waves), slow nerve conduction velocities, and decreased amplitudes of evoked muscle action potentials. Thus, a subclinical polyneuropathy may exist in many diabetic dogs. Nerve fiber degeneration, demyelination and remyelination, and axonal regeneration have been observed on nerve biopsies of diabetic dogs with clinical signs of weakness.

The cause of the polyneuropathy is not known. Current theories have focused upon metabolic derangements of Schwann cells and on primary axonal damage. This metabolic dysfunction may represent a dying back neuropathy whereby the distal parts of peripheral nerves are affected first and subsequent degeneration occurs in the direction of the cell body located within the spinal cord.

If the diabetes becomes regulated with insulin therapy or if it resolves, then complete or partial recovery may occur. **--Linda Shell, DVM, Diplomate ACVIM, Assistant Professor of Neurology, VA-MD Regional College of Veterinary Medicine.**

CLINICAL NUTRITION CONSULTATION SERVICE
VIRGINIA-MARYLAND REGIONAL COLLEGE OF VETERINARY MEDICINE

The Clinical Nutrition Consultation Service is a service of the Veterinary Medical Teaching Hospital providing nutritional consultation for all domestic species. The service is available to all areas of the Teaching Hospital to provide nutritional advice. Members of the service also conduct research on relevant nutritional topics.

For Teaching Hospital patients, the impact of nutrition is considered in both normal animals and patients with illnesses of various etiologies. Nutritional management recommendations can range from basic composition and quantity of diet in normal animals, to regimes for forced internal feedings in anorexic animals, to formulation and procedures for administration of total parenteral nutrition in patients unable to eat. The objective in each case is to provide the patient with appropriate nutrients to optimize recovery and the success of therapy.

In addition to in-hospital patients, the service also consults for the Production Management Medicine service with respect to the impact of nutrition on herd health and production problems. Feeding programs are designed to help producers maximize production and to prevent metabolic diseases.

There are currently four clinical veterinarians concerned primarily with nutrition.

Craig D. Thatcher has a DVM from Iowa State University as well as an MS and PhD in nutritional physiology. He is an Associate Professor at VMRCVM, Section Chief of Production Management Medicine and a Clinical Nutritionist.

Rebecca L. Remillard has a PhD from Colorado State University in animal nutrition and a DVM from Tufts University. She is a Research Associate at the College of Veterinary Medicine.

Terry Swecker, DVM and William Burkholder, DVM, both VA-MD Regional College of Veterinary Medicine graduates, are currently in the College's graduate program working toward a PhD in clinical nutrition.

RABIES WORKSHOP

A program on rabies, co-sponsored by the Virginia-Maryland Regional College of Veterinary Medicine and the Virginia Department of Health, Southwest Region, will be presented at the Donaldson Brown Center on the Virginia Tech campus on Wednesday, November 4. Speakers include Peter Eyre, Dean of the Veterinary College, Dr. Suzanne Jenkins, epidemiologist with the Virginia Department of Health, Dr. Gregory Troy, director of the Veterinary Teaching Hospital in Blacksburg and Dr. Donald Stern, director of the Southwest Region, Virginia Department of Health. Dr. Thomas Toth of the veterinary college faculty is program chairman.

The registration fee of $15.00 will include lunch and handouts. Veterinarians, technicians and animal owners are encouraged to attend.

Program brochures and workshop information may be obtained by contacting Kent Roberts, DVM, College of Veterinary Medicine, Blacksburg, VA 24061 (703)961-7666.

THE ASSOCIATION OF VWD AND HYPOTHYROIDISM

Von Willebrand's disease (VWD) is the most common congenital bleeding disorder of dogs. VWD is a deficiency of the von Willebrand factor (VWF), one component of Coagulation Factor VIII. This deficiency of VWF results in defective platelet adhesion to blood vessels; platelet numbers remain normal. The disease is inherited as an autosomal recessive trait in Scottish Terriers and Chesapeake Bay Retrievers and as an incompletely dominant trait in 28 other breeds. Gene frequency of VWD varies from 15-60% in frequently affected breeds such as the German Shepherd, Golden Retriever, Miniature Schnauzer, Doberman, Pembroke Welsh Corgi and Manchester Terrier.

Several breeds (including Dobermans, Golden Retrievers, Scotties, Corgis, and Manchester Terriers) are recognized to have a common occurrence of both VWD and hypothyroidism. In man, hypothyroidism has been recognized to result in reduced platelet function and lowered VWF levels.

Dr. Dodds of the N.Y. State Department of Health has recorded increased frequency and severity of bleeding episodes in VWD-affected Dobermans with concurrent hypothyroidism. Additionally, clinical bleeding is usually controlled in these animals within 48 hours of beginning oral thyroxine supplementation. This improvement in clinical signs is paralleled by an increase in measured levels of VWF activity.--**Deborah Davenport, DVM, MS, Diplomate ACVIM, Assistant Professor, VA-MD Regional College of Veterinary Medicine, Blacksburg, VA 24061.**

MANAGEMENT OF TWIN PREGNANCY

Twinning generally results from double ovulation 2-10 days apart. It is heritable but also more common in barren and maiden mares, with seasonal incidence (6.6% in June vs 3.0-3.6% other months). Diagnosis is based on rectal palpation of bilateral embryonic enlargements or a single abnormally large one and 2 corpora lutea, or by ultrasonography after days 11-15.

Twinning can be prevented by postponement of breeding when multiple preovulatory follicles are present, or breeding 12-24 hr. after the 1st ovulation. Giving HCG IM at 2500 IU ensures ovulation of the 2nd follicle. Success rates have not been evaluated, but the incidence of twins on farms doing this has been similar to that when the mare was bred normally.

Once twin pregnancy has been diagnosed, the embryos may be aborted with prostaglandins, one embryonic vesicle manually ruptured (difficult after day 34) or one may be removed surgically between days 35-74 via laparotomy. Surgical removal is 100% effective but death loss is 25%. Sudden reduction of feed intake has been reported to be 60% successful. Mares also have a natural method of eliminating multiple embryos during embryo migration, which is 59-64% effective by day 40-42.--**W.B. Ley, VA-MD Regional College of Veterinary Medicine, Blacksburg. Vet. Med. 84:354-362, 1986.**

THOUGHT FOR THE MONTH

People don't care how much you know until
they know how much you care.

RETROVIRUS INFECTIONS OF CATS

Cats are hosts to several retroviruses, the best known of which is feline leukemia virus (FeLV). When traumatic injuries are excluded, FeLV-associated diseases become the leading cause of death in pet cats in the United States.

Exogenous retroviruses like FeLV are transmitted horizontally as infectious agents. These retroviruses are often oncogenic and exhibit a consistent pattern of induction of leukemia and/or lymphoma as their primary disease process. Three major FeLV subgroups (A, B and C) are known to occur in nature. Persistent infection with FeLV results in three different clinical syndromes which may occur alone or in combination: (1) uncontrolled proliferation of virally transformed cells, resulting in lymphosarcoma, or leukemia of the erythroid, lymphoid or myeloid cell lines; (2) degeneration of progenitor (blast) cells resulting in nonregenerative anemia, leukopenia and/or thrombocytopenia; and (3) generalized immunosuppression predisposing to intercurrent or opportunistic infections.

A new retrovirus, feline T-lymphotropic lentivirus (FTLV), has been identified in pet cats. FTLV is considered to be a highly species-adapted lentivirus that has existed in cats for some time, and may be widespread in the general feline population. Cats infected with FTLV have clinical signs including chronic rhinitis, cachexia and anemia and have a predisposition to opportunistic infections. Infected cats have tested negative on the immunofluorescent antibody and enzyme-linked immunosorbent assay tests for FeLV.

The clinical importance of FTLV is presently unknown. However, FTLV infections may explain some of the anemias, neurologic signs and chronic infections that are seen in FeLV-negative cats. The immunologic abnormalities in FTLV-infected cats resemble those seen in human beings with acquired immune deficiency syndrome (AIDS), making the cat a useful model for study of this human disease.

Feline syncytium-forming virus (FeSFV) is an exogenous retrovirus which is found in many normal healthy cats, and is also present in a higher than expected percentage of cats with myeloproliferative disorders and chronic progressive polyarthritis. However, there is no evidence that FeSFV causes these disorders by itself.

Endogenous retroviruses, like the feline FD-114 virus, are present as an integral part of the genetic information of all cells of the species, and are transmitted vertically to the next generation. Genes for these viruses are usually repressed, preventing the formation of whole virus particles.

FeLV is an example of a replication nondefective retrovirus, indicating that its RNA is complete, and that it is capable of replicating successfully on its own without the assistance of a helper virus.

Cats are also hosts to a replication defective retrovirus, the feline sarcoma virus (FeSV), which is formed by recombination of the genes of FeLV and the host cell. FeSV, which is isolated relatively rarely as a natural occurrence, cannot synthesize viral envelope proteins and uses the envelope supplied by its helper virus FeLV. FeSV is an acutely transforming retrovirus containing oncogenes, which rapidly causes multiple fibrosarcomas in cats less than 3 years of age, and on rare occasion may induce malignant melanomas. In contrast, FeLV is a chronically transforming retrovirus that induces tumors after a long latency period.

Thus, pet cats are hosts to at least five groups of retroviruses including: (1) the non disease-producing RD-114 virus; (2) FeSFV - a virus of unproven pathogenicity; (3) the leukemogenic FeLV which also causes a variety of noneoplastic diseases; (4) the sarcoma-inducing FeSV; and (5) the newly discovered FTLV. It is likely that other feline retroviruses of importance to the practitioner will be discovered in the future.--**From John R. August, B. Vet. Med., M.S., M.R.C.V.S., Diplomate A.C.V.I.M., Professor and Head, Department of Small Animal Medicine and Surgery, College of Veterinary Medicine, Texas A&M University, College Station, TX., Vet. Quarterly Review, Spring 1987.**

FALL 1987
CONTINUING EDUCATION OPPORTUNITIES

		Contact Hours
November 4	Rabies Workshop - Blacksburg, VA	4
November 4-5	Equine Colic Symposium Equine Medical Center - Leesburg, VA	10
*November 6	Equine Colic Wet Lab Equine Medical Center - Leesburg, VA	6
*November 7	Equine Limb Surgery Lecture/Wet Lab - Blacksburg, VA	6
*November 13-14	Orthopedic Surgery - Canine Hind Limb Lecture/Wet Lab - Blacksburg, VA	10
November 15	Exotic Mammal/Pet Bird Medicine Dr. Fowler/Dr. Rosskopf - Blacksburg, VA	7
November 19	Small Animal Anesthesia Workshop Days Inn - Charlottesville, VA	6
*December 4-5	Practical Surgery of the Eye and Ear Lecture/Wet Lab - Blacksburg, VA	10
*December 11-12	Diagnostic Ultrasound Workshop Small Animal/Large Animal - Blacksburg, VA	10

*Limited enrollment courses

For further information on these CE courses please contact:

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(703)961-7666

Note: Program brochures are normally mailed approximately six weeks prior to the course.

Virginia-Maryland Regional College of Veterinary Medicine Extension Staff:

Dr. J.M. Bowen - Extension Specialist - Equine
Dr. C.T. Larsen - Extension Specialist - Avians
Dr. K.C. Roberts - Extension Specialist - Companion Animals
Dr. C.F. Shipley - Extension Specialist - Swine & Small Ruminants
Dr. W. Dee Whittier - Extension Specialist - Cattle

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