VET NEWS

SUMMER 2010

Leaders in Specialty Care

Dear Colleagues:

Welcome to our Summer 2010 newsletter. In this issue, we have included articles written by Dr. Ellen Davison, Dr. Robert Peiffer, and Dr. Salvador Galindo. Our goal is to keep you updated on medical topics, as well as new services being offered at Valley Central Veterinary Referral Center as a part of our ongoing commitment to our clients and the veterinary community.

The doctors and staff at Valley Central Veterinary Referral Center want to thank you for your sustained and continued support. Our goal is to provide the highest standards of veterinary care for your clients. We understand that our success as a referral hospital is directly linked to your confidence in our veterinary service for your clients and patients. Please do not hesitate to contact any doctor or staff member with questions or concerns regarding any aspect of our veterinary hospital services.

IN THIS ISSUE:

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VCR is pleased to announce a special partnership with Hills & Novartis:

Dr. Carlos has been nominated to participate on the Novartis/Hill's Osteoarthritis Speaker Advocate Panel. Dr. Carlos will be working with Kristin Dance from Hills and Jennifer Roscher from Novartis to discuss Pain and Osteoarthritis Management Strategies throughout the Tri-State Region. The team will be calling veterinary clinics to set up a breakfast, lunch, or dinner meeting that best fits your needs to discuss the strategies. Free samples of drugs, diets, and supplements will be provided.

New Services Offered:

Dr. Carlos & Dr. Galindo now offer the minimally invasive Tightrope procedure for the ACL deficient stifle. They are also certified to perform the Biomedtrix Total Knee Replacement and the Kyon Total Hip Replacement. Dr. Carlos and Dr. Steinberg are now certified to perform the Kyon TTA procedure for the ACL deficient stifle.

Custom orthotics are here. A custom made orthotic will be ordered for animals requiring long term management for orthopedic, soft tissue wound trauma, or neurologic deficits. If you have any patients requiring special needs for orthopedic, soft tissue, or neurologic support please contact one of the surgeons.

The Companion Class IV Laser is also here. The laser is currently being used to facilitate pain relief and to stimulate healing of traumatized or inflamed tissues. Just a few of the indications for use include post-operative pain and inflammation, osteoarthritis, joint swelling, wound healing, intervertebral disk disease, dermatologic conditions and diseases, stimulation of acupuncture points, and various internal medicine conditions. Please call any of the Doctors to discuss specific management procedures for your patients.

Locking plate technology is here for orthopedic fracture repair and TPLO surgery. Locking plates differ from the conventional plating systems as they possess inherent biological advantages in fracture fixation by preserving the periosteal blood supply serving as internal fixators. Therefore, they combine the biological benefits of external fixators with owner management benefits of internal fixation. Recent reports have shown that secondary to the strict anatomical fracture reduction as required with the conventional plating systems, disruption of the vascular supply can lead to delayed healing, nonunion, and susceptibility to bacterial infections. The Synthes Locking TPLO plate with locking screws is used for all TPLO's. Locking plates and screws are now used in adult patients with or without complicating fracture configurations. Please call any of the surgeons to discuss the exciting new locking plate technology.

VCVRC would like to partner with the referring veterinary hospitals to showcase the services you are currently offering. Call for sponorships for your hospital to advertise or appear on the Animal Doctor Show. If you want to showcase your hospital or a special service like Rehabilitation please contact our hospital administrator at AllysonTolliver@vcvrh.com

By Ellen Davison, VMD, DACVIM

Pulmonary Arterial Hypertension

What is pulmonary arterial hypertension?

Pulmonary arterial hypertension (PAH) is a sustained increase in systolic and/or diastolic pulmonary artery pressure. It is associated with high morbidity and mortality in humans and animals, and the diagnosis often carries a grave prognosis. These patients typically have a guarded prognosis once they have been diagnosed with severe PAH. Pulmonary hypertension is not commonly seen in feline patients. Normal pulmonary artery pressures (PAP) are 15-25mmHg and in those patients with severe pulmonary hypertension, the PA pressures will often be similar to or exceed systemic systolic pressures.

What causes pulmonary arterial hypertension?

Pulmonary hypertension is a multifactorial disorder in dogs and people. In veterinary patients, the most common causes are secondary to other diseases. These include increased pulmonary blood flow due to left-to-right shunts (e.g. patent ductus arteriosus, ventricular septal defect), pulmonary venous hypertension (secondary to left-sided heart failure usually due to chronic valvular disease), increased pulmonary vascular resistance, chronic parenchymal disease (e.g. pulmonary fibrosis, pneumonia, and neoplasia), pulmonary thromboemobolism, and heartworm disease.

Clinical signs & physical exam findings

Most patients diagnosed with PAH are middle-aged to older, small breed dogs. Clinical signs of PAH are variable and typically depend on the severity of disease. Patients may be asymptomatic in the earlier stages of disease or severely dyspneic with weakness or syncope during the latter stages of disease. The most common presenting complaints may include the following: lethargy, coughing, respiratory distress, weakness, exercise intolerance or syncope. Physical exam findings may include crackles in the absence of left-heart failure, tachypnea, dyspnea, respiratory distress, heart murmur, and abdominal or pleural effusion. Many patients will often have more than one presenting complaint or abnormal physical exam finding. Screening of small breed patients with clinical signs and physical exam findings of cardiorespiratory disease may be beneficial especially if syncope is reported.

Diagnosis

Diagnosis of PAH in canine patients can be difficult and usually requires an echocardiogram. Cardiac catheterization and direct measurement of the PAP are the gold standard for diagnosis in humans. Unfortunately, this is often impractical in our patient population since this would require sedation or general anesthesia. A diagnosis of PAH can be made by estimating pulmonary artery pressures during the echocardiographic exam. Measuring the velocity of tricuspid and/or pulmonic regurgitation can provide an estimate of systolic PAP and diastolic PAP, respectively. In the absence of tricuspid or pulmonic regurgitation, other echocardiographic findings can be supportive of the diagnosis of PAH. These findings include right ventricular dilation and/or hypertrophy, right atrial enlargement, dilated pulmonary artery, interventricular septal flattening, mass/clot within pulmonary artery and right-sided heart failure. Radiographs can also aide in the diagnosis of PAH. These findings include right-sided heart failure (pleural or abdominal effusion), right heart enlargement, dilated pulmonary arteries, and parenchymal disease.

Treatment

Treatment in veterinary patients is aimed at ameliorating the clinical signs associated with the disease and improving overall quality of life as there is no cure for PAH. Addressing the primary disease process is important (i.e. treatment for heartworms or left-sided heart failure). In most cases, treatment for PAH is not initiated until clinical signs have developed or the disease is in the moderate-severe range. In human patients with PAH, there has been no treatment that has been shown to improve survival and many treatment options are cost-prohibitive in our patients. Unfortunately, treatment options for PAH are limited in our patients and there are no approved medications. Oxygen therapy is the most effective vasodilator. It is used in acutely dyspneic patients but is impractical for long-term therapy in dogs. Currently, the most commonly used medication for the treatment of PAH is sildenafil (Viagra®). Sildenafil is a phosphodiesterase-5 inhibitor that leads to dilation of the pulmonary artery. This medication was recently approved by the FDA for the treatment of PAH in humans and has been relabeled as Revetio®. Sildenafil has been reported to improve the quality of life in dogs. This medication is not available as a generic and may be cost-prohibitive for some patients especially large breed dogs.

Prognosis

The prognosis for pulmonary hypertension is variable and depends on the underlying cause of the hypertension and response to therapy. It is generally guarded once severe pulmonary hypertension has developed. The goals of therapy are to decrease the clinical signs related to PAH, ideally, to decrease pulmonary artery pressure and most importantly, improve the quality of life in these patients.

By Salvador Galindo, DVM

Laryngeal Paralysis

Laryngeal paralysis occurs when there is recurrent laryngeal nerve dysfunction and subsequent denervation of the intrinsic laryngeal muscles.

With complete denervation, the arytenoid cartilages and vocal cords fail to actively abduct. As air rushes through the larynx during inspiration, the intraglottic pressure drops below that of the atmosphere, drawing the arytenoid cartilages and vocal folds medially into the glottic opening. This results in varying degrees of inspiratory air flow obstruction, noisy breathing and increased respiratory effort.

Two forms of laryngeal paralysis are recognized in dogs, congenital laryngeal paralysis which accounts for 20 to 30% of the cases (Siberian Huskies and Dalmatians most commonly affected in the US), and acquired laryngeal paralysis with 80% of the clinical cases reported. Several causes had been implicated in the development of acquired laryngeal paralysis: trauma to the cranial aspect of the thorax or cervical area, intrathoracic or cervical masses that cause vagal or recurrent laryngeal nerve damage or compression, generalized polyneuropathy or myopathy, myasthenia gravis, hypothyroidism and neoplasia either primary or metastatic.

Idiopathic is the most common form of laryngeal paralysis, usually occurring in middle-age to older, large-breed dogs (Labrador retrievers, Golden retrievers, Irish setters).

Characteristics and clinical signs of laryngeal paralysis are related to upper airway obstruction created when the arytenoid cartilages and vocal folds remain in a paramedian position during inspiration. Animals with early laryngeal paralysis are presented for dysphonia (70% of the cases), exercise intolerance (90% of the cases), inspiratory stridor (100% of the cases), postprandial gagging and coughing (65% of the cases), and ultimately respiratory distress and collapse.

A laryngeal examination is performed with the patient under general anesthesia for the definitive diagnosis of laryngeal paralysis. A light plane of anesthesia is required for laryngeal function to be evaluated during each inspiration.

During the laryngeal examination, motion of the arytenoid cartilage is observed. In the normal animal, the vocal fold and the arytenoids abduct during inspiration and passively relax during expiration. The arytenoids and vocal cords are immobile and drawn toward the midline during inspiration if the animal has laryngeal paralysis. If the paralysis is unilateral, only one cartilage does not move.

Animals are usually presented with acute cyanosis or collapse as a result of upper airway obstruction. Most animals

in a cyanotic crisis precipitated by upper airway obstruction recover initially with medical therapy. Excitement or increase in the ambient temperatures can trigger an acute onset of inspiratory dyspnea.

Increased respiratory rate results in trauma to the mucosa and arytenoid cartilage, inflammation and acute swelling results, which in turn induce an acute onset of inspiratory dyspnea, thus, a vicious circle is initiated. Medical therapy consists of administration of corticosteroids, sedation, oxygen and decreasing the presenting hyperthermia. If the patient is deteriorating, an emergency tracheostomy is recommended to bypass the upper airway or definitive surgical correction of the laryngeal paralysis.

Laryngeal surgery is directed at removing or repositioning laryngeal cartilages that obstruct the rima glottidis.

Reported surgical techniques for correction of laryngeal paralysis yield variable results and whereas no one technique is seemingly superior, unilateral arytenoid lateralization has been generally considered the gold standard by most surgeons. Reported morbidity ranges from 10% to 58% and mortality from 14% to 68% for various methods of surgical correction of laryngeal paralysis. There are four currently recognized surgical procedures; 1) Unilateral or bilateral arytenoid cartilage lateralization, 2) Ventricular cordectomy and partial arytenoidectomy through the oral or ventral laryngotomy approach, 3) Modified castellated laryngofissure, and 4) Permanent tracheostomy.

Recently a retrospective study procedure for the surgical treatment of laryngeal paralysis was published. This surgical technique combines bilateral thyroarytenoid cartilage lateralization, vocal fold excision and mucosoplasty through ventral median laryngotomy approach. This procedure was developed to address the structural (narrowed glottic opening) and soft tissue components

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(mucosal fold hypertrophy) of canine laryngeal paralysis. For narrowed glottic opening a bilateral thyroarytenoid cartilage lateralization and vocal fold excision is performed in order to increase the glottic aperture in a symmetrical fashion to better approximate normal anatomy and to an extent, minimize postoperative aspiration pneumonia. Mucosoplasty is performed in order to eliminate mucosal fold hypertrophy, thus, decreasing intralaryngeal flow turbulence. This surgical technique is performed with the patients positioned in dorsal recumbency; the head and neck are maintained in extension and through a 6 cm ventral skin incision a laryngotomy is created in order to expose the laryngeal lumen. The vocal folds are partially excised and sutured to a mucosal flap elevated from the lateral wall of the laryngeal ventricule. This is drawn caudally to cover the denuded area and sutured to the adjacent mucosa. A vertical suture is then inserted through the midbody of the thyroid lamina; this suture pattern is then tied on the lateral aspect of the thyroid cartilage. During knot placement, lateralization of each arytenoid cartilage is verified by direct visualization through the laryngotomy. Short term and long term results in this study were similar, with a satisfactory outcome in the majority of the dogs treated with this technique. This outcome may be due to the fact that bilateral thyroarytenoid cartilage lateralization symmetrically increases the glottic luminal diameter and prevents over abduction (as seen with "tie-back) of the arytenoid cartilages while maintaining a functional luminal diameter during inspiration. Vocal fold excision addresses the intraluminal component, by eliminating the contribution of paralyzed vocal folds to clinical signs. Mucosoplasty provides primary wound healing by eliminating scarring tissue formation that can be associated with vocal fold excision. In the end, bilateral thyroarytenoid lateralization and vocal fold excision through a ventral median laryngotomy permits improved access for vocal fold excision and mucosoplasty, provides better exposure of the thyroid cartilages and better visibility of the bilateral thyroarytenoid lateralization suture placement.

Despite the technique(s) used, aspiration pneumonia and recurrence of clinical signs can be observed as major complications. Controversy exists about the surgical treatment of choice for asymmetrical laryngeal paralysis (unilateral versus bilateral arytenoid lateralization technique). It is believed that asymmetrical affected patients that are treated unilaterally, leaves the contralateral side unstabilized and occasionally can cause it to be adducted into the laryngeal lumen during inspiration causing respiratory distress during times of increased oxygen demand. Post operatively, patients are hospitalized for 2-3 days, given ice cubes and small amounts of canned meatballs. Antibiotics, crystalloids, and analgesics are also given intravenously until the patient is able to eat in a controlled manner.

Please contact Dr. Galindo with any questions or to discuss cases with respiratory signs compatible with laryngeal paralysis surgery. Surgical cost can be given upon request.

WELCOME DR. EZRA STEINBERG TO OUR SURGICAL DEPARTMENT

Dr. Steinberg will offer various surigcal services, including laparoscopy, thoracoscopy, and arthroscopy.

Dr. Steinberg was raised in Orange County, NY. He attended Wesleyan Univsersity in Middletown, CT where he majored in neuroscience. Dr. Steinberg then graduated cum laude from the University of Pennsylvania in 2006. From there he then completed a small animal internship in medicine and surgery at the Oradell Animal Hospital. He then returned to University of Penn and completed a three year residency in small animal surgery.

Dr. Steinberg's professional interests include minimally invasive surgery such as laparoscopy, thoracoscopy, and arthroscopy. He has lectured at several international orthopedic conferences on the subject of Tibial Tuberosity Advancement for dogs with cranial cruciate ligament injury. He is published in the Journal of Small Animal Practice and has also worked as an instructor in wet labs at the Penn Annual Conference.

In his free time he enjoys going to the beach, snowboarding, and finding new places to hike with his dog Wesley.

To refer a patient to Dr. Steinberg or if you have any questions about the surgical department, please call 610 435-1553.

By Robert Peiffer DVM, PhD, DACVO

Differential Diagnosis of Visual Impairment of Rapid Onset

Similar ocular signs accompany two other poorly understood entities, cancer-associated **retinopathy and immune-mediated retinopathy**. These are thought to be related to the production of antibodies that affect neurotransmission at the level of the inner retina. Pupillary light reflexes to white, red, and blue light and ERG allow distinction from SARDS and visual prognosis is less bleak, with response to systemic immunosupression not uncommon.

Retinal detachment is a rather common finding as a cause of acquired visual impairment of rapid onset occurs related to exudation or transudation (as seen in posterior scleritis/chorioretinitis and hypertension), or associated with retinal tears or holes (referred to as rhegmatogenous) that may occur with a hereditary predisposition in brachycephalic breeds, or as a complication of cataract or lens luxation surgery. Separation of the photoreceptors from the choriocapillaris and retinal pigment epithelium causes photoreceptor degeneration over time. In partial detachments there are usually no obvious clinical signs due to the detachment. Pupillary light reflexes are abnormal to normal depending on extent and duration of the lesion. Ophthalmoscopically, the grey membranous retina is seen protruding into the vitreous, with clearly visible retinal vessels. If the retina is only partly detached, areas become elevated as flat or bullous regions that are out of focus compared to normal areas and the optic disc. When the retina is completely detached and disinserted from the ora ciliaris retinae, the neural tissue drapes over and obscures the optic disc, and the ophthalmoscopic appearance is that of the hyper-reflective tapetal fundus without retinal vessels Optic neuritis is treated by systemic corticosteroids at high doses initially (2–3 weeks), then as long-term treatment at lower levels. The underlying cause should be treated if possible. In specific infections, broad spectrum antimicrobials are indicated. The prognosis is guarded with recurrence of the disease and progression to optic atrophy is a common sequel.

Treatment of early cases and especially partial retinal detachment is sometimes successful, depending on etiology. Chorioretinitis cases have the most favorable prognosis where treatment consists of anti-inflammatory medication as well as treatment directed towards the primary cause. Mild to moderate exudative detachments often respond to systemic corticosteroids. Surgical treatment of rhegmatogenous retinal include cryopexy of holes and tears, drainage of subretinal fluid, application of a scleral buckle, and filling the posterior segment with air, gas, or silicone oil. Prognosis for large and complete retinal detachments in the dog is poor.

Hypertensive retinopathy occurs most often in elderly cats; however, measurement of blood pressure is indicated in all patients presenting with retinal detachment, edema, or hemorrhage. Blindness occurs associated with intraocular hemorrhage or retinal detachment. Affected animals usually have an elevated systolic arterial blood pressure (often greater than 200mmHg), Primary hypertension is rare in animals and underlying thyroid, renal, or cardiac disease warrant consideration. Therapy is directed towards treatment of the primary disease as well as systemic hypotensive therapy with ACE inhibitors, beta blockers, and/or calcium channel blockers and, in some cases, diuretics as required to control blood pressure. Early and effective treatment will result in resolution of the retinopathy over several weeks with return of vision in some cases . Prognosis for general health depends on the severity of the underlying systemic abnormalities and their response to treatment.

TECH TIP By Angie Itterly

Occasionally intravenous fluids need constant rate infusions of medications, such as Metronidazole and Reglan. The following formula will help calculate the amount of medication that should be placed in the bag to be dispensed over a 24 hour period.

The formula is: medication (mgs/kg/day) x bag size (in mls) Divided by IV fluid rate x 24 hours

Here is a problem: Rusty is a 50 lb (22.7 kg) dog that is on 93 mls/hr. He needs metronidazole added to his 1000 ml bag of fluids.

Let's plug in the numbers using metronidazole:

Metronidazone is 10 mg/kg, so Rusty would get 227 mg per day.

First part — 227 mg x 1000 ml bag size
Divided by
Second part — 93 mls/hr x 24 hours
Equals 101 mg or 20 mls in 1 liter of fluids

A little tip: The higher the fluid rate, the less medication added to the bag!

VALLEY CENTRAL
VETERINARY REFERRAL CENTER

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VCVRC has been serving the Lehigh Valley and surrounding areas since 1996.
We are dedicated to providing state-of-the-art veterinary care for your patients.

Doctors at Valley Central Veterinary Referral Center

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