JOURNAL CLUB

Collection of Commentaries on Recent Veterinary & Medical Literature

OPHTHALMOLOGY

Canine Conjunctival Mast Cell Tumors: A Retrospective Study
Fife M, Blocker T, Fife T, et al. 

The canine eye seems to be a privileged site for protection from metastasis when it comes to some usually aggressive tumors, such as melanoma, hemangiosarcoma, and conjunctival mast cell tumors (MCTs), which was confirmed in this recent report.

Of the 33 canine conjunctival MCTs, none metastasized, even when surgical margins were incomplete (25/30) and histologic grade was intermediate (18/33) or high (5/33). There were 5 patients with high grade tumors; 1 was lost to follow-up, 1 died of an unrelated tumor type, and 3 were disease free at the end-point of the study (51 months), which exceeded the median survival time of 9.2 months reported for cutaneous MCTs.

The authors concluded that there is low risk of local recurrence and metastasis and overall favorable prognosis, regardless of tumor type, with canine conjunctival MCTs.

—Kenneth Abrams, DVM, Diplomate ACVO, 
Veterinary Ophthalmology Services, Warwick, Rhode Island

Key Considerations
• If the primary tumor of a normally aggressive malignant neoplasm occurs in the canine eye, it is much less likely to metastasize than if it occurs elsewhere in the body.
• Canine conjunctival MCTs have a low risk of recurrence and metastasis and a favorable prognosis.
• Despite incomplete surgical margins and intermediate or high histologic grades, none of the MCTs in this study metastasized.
• Patients with high-grade conjunctival MCTs had longer survival times than those with high-grade cutaneous MCTs.

THERIOGENOLOGY

A Breed-Matched Case-Control Study of Potential Risk Factors for Canine Pyometra
Hagman R, Lagerstedt AS, Hedhammar A, Egenvall A. 
Theriogenology 2011; 75(7):1251-1257.

Pyometra is a common disorder of older, intact bitches and is reported to occur in as many as 25% of intact bitches 10 years of age or older. This study compared 87 bitches with verified cases of pyometra to the same number of healthy bitches; the bitches were matched by breed and age to evaluate risk factors for disease.

Having had 1 or more litters was identified as a protective factor in Rottweilers, collies, and Labrador retrievers; was somewhat protective in German shepherd dogs; and did not confer lifelong protection in golden retrievers. No other factor evaluated caused or protected against pyometra; these included pseudopregnancy, urinary tract infections (UTIs), previous hormone therapy for estrus suppression or pregnancy termination, and age at first whelping.

This data can be used to guide discussions regarding (1) whether to breed on consecutive estrous cycles or (2) whether to breed when a bitch is younger versus older.

—Margaret Root Kustritz, DVM, PhD, Diplomate ACT, 
University of Minnesota

Key Considerations
• Pyometra occurs in as many as 25% of intact bitches 10 years of age or older.
• In this study, 1 protective factor—having had 1 or more litters—was identified in Rottweilers, collies, and Labrador retrievers; it was somewhat protective in German shepherd dogs.
• Pseudopregnancy, UTIs, hormone therapy, and age at first whelping did not cause or protect against pyometra.
• Risk factors for pyometra may vary depending on breed, as previous pregnancy did not confer protection in golden retrievers.
HEMATOLOGY

Influence of Transfusion Technique on Survival of Autologous Red Blood Cells in the Dog
McDevitt RI, Ruaux CG, Baltzer WI.
Journal of Veterinary Emergency and Critical Care 2011; Epub ahead of print.

This study evaluated the effects of 3 different transfusion techniques on survival of autologous canine red blood cells (RBCs). The data suggested that RBCs delivered via volumetric peristaltic fluid pumps (through a 170–260 mcm built-in filter) and syringe pumps (through an 18 mcm microaggregate hemonate filter) were less likely to survive and be detected 24 hours following transfusion than those delivered by gravity flow.

That being said, the circulating half-life of cells (assessed to 49 days) surviving 24 hours after delivery by volumetric pump was not significantly different compared to those delivered by gravity flow. The exact reason for these differences is not known since the investigators did not detect an effect of transfusion technique on in vitro RBC integrity or osmotic fragility. It was hypothesized that shearing stresses, which resulted from blood being forced through the microaggregate filter, may have resulted in damaged RBCs that were moved by the reticuloendothelial system after transfusion. Similarly, the pumping mechanism used by the volumetric pump may have caused minor damage to some RBCs, which were then cleared from circulation following transfusion.

It did appear that cells that survived 24 hours had a normal lifespan. The main limitations of this study were (1) the relatively small sample size (9 dogs) and (2) the substantial processing of RBCs prior to transfusion to allow detection (which may have reduced lifespan). The authors concluded that while their findings were compelling, they should be very carefully considered before changes in transfusion practice are made.

—Claire Sharp, BSc, BVMS (Hons), CMAVA, MS, Diplomate ACVECC, Tufts University

Key Considerations
• This study evaluated the effect of 3 different transfusion techniques—volumetric peristaltic fluid pumps, syringe pumps, and gravity flow—on autologous canine RBCs.
• RBCs delivered by gravity flow were most likely to be detected 24 hours following transfusion.
• Regardless of administration technique, cells that were detected in circulation 24 hours after delivery had a normal lifespan.
• A potential reason for lack of cell survival was damage to cells during the transfusion process.

UROLOGY

Retrospective Study to Characterize Postobstructive Diuresis in Cats with Urethral Obstruction
Francis BJ, Wells RJ, Rao S, Hackett TB.

This study reviewed records from 32 male cats admitted to the Colorado State University Veterinary Medical Teaching Hospital for urethral obstruction. An indwelling urethral catheter connected to a closed sterile collection system was maintained in all cats. The volume of urine collected was measured every 6 hours and diuresis was defined as urine production > 2 mL/kg/H.

Postobstructive diuresis developed during the first 6 hours of urine collection in 46% of cats, and continued to increase through the first 30 hours. The likelihood of diuresis was greatest during the 18- to 24-hour time period, with 87% to 95% of cats exhibiting increased urine production. The occurrence of postobstructive diuresis was more likely in cats with venous pH < 7.35 at the time of admission.

This study suggested that urine production should be monitored following resolution of urethral obstruction because many cats will develop postobstructive diuresis. By measuring urine production, replacement fluid requirements can be adjusted to meet the actual needs of the individual patient.

—Gregory Grauer, DVM, MS, Diplomate ACVIM (Small Animal Internal Medicine), Kansas State University

Key Considerations
• In this study, diuresis was defined as urine production > 2 mL/kg/H.
• Diuresis was most likely 18 to 24 hours postobstruction, with 87% to 95% of cats exhibiting increased urine production.
• Postobstructive diuresis was more likely when venous pH was < 7.35 at time of admission.
• Cats should be monitored for postobstructive diuresis in order to meet the patient’s actual replacement fluid requirements.
**VETERINARY EDUCATION**

**Impact of the Purdue University School of Veterinary Medicine’s Boiler Vet Camp on Participants’ Knowledge of Veterinary Medicine**


This report described the results of a survey taken using eighth and ninth grade students attending a residential summer camp about careers in veterinary medicine. The participants completed a questionnaire designed to assess knowledge about veterinary careers on the first day and again on the last day. Demographic data was collected to determine interest in veterinary medicine as a career. The data demonstrated that, at the end of the camp, participants had an increased appreciation and understanding of the science of veterinary medicine and an increased understanding of career options in the veterinary medical and veterinary technology professions. However, it did not appear that an increased number of participants intended to apply to Purdue University’s College of Veterinary Medicine. This study demonstrated that this veterinary camp was beneficial for educating participants about veterinary medicine, but did not appear to result in increased interest in pursuing it as a career. This information may guide academic administrators in setting goals for the outcome of such camps.

—Joel D. Ray, Jr, DVM, MS, Mississippi State University

**Key Considerations**

• Eighth and ninth grade students completed questionnaires at the beginning and end of a summer camp about careers in the veterinary industry.
• At the end of the camp, participants had an increased understanding of veterinary medicine and careers associated with it.
• However, there was no change in the number of participants who planned on pursuing a career in veterinary medicine.
• This information can help academic administrators evaluate and assess goals for these types of camps.

**ANESTHESIA**

**Evaluation of Dexmedetomidine and Ketamine in Combination with Opioids as Injectable Anesthesia for Castration in Dogs**


This study evaluated the effectiveness of IM dexmedetomidine and ketamine with various opioids to provide anesthesia for castrations in healthy, client-owned dogs. The study showed that dexmedetomidine (15 mcg/kg) plus ketamine (3 mg/kg) combined with either butorphanol (0.2 mg/kg), buprenorphine (40 mcg/kg), or hydromorphone (0.05 mg/kg) generally produced anesthesia (sufficient for intubation) in < 6 minutes. Some of the dogs in each group required additional isoflurane anesthesia to accomplish castration; however, dogs that were administered buprenorphine required supplemental isoflurane less frequently.

Many of the dogs became hypoxemic (SpO2 < 90%) within the first 15 minutes following administration, but quickly responded to supplemental oxygen. Dogs that received the antagonist, atipamezole (150 mcg/kg), after surgery demonstrated a smooth reversal without any signs of an agitated recovery, which is sometimes associated with higher doses of ketamine.

—Lysa Pam Posner, DVM, Diplomate ACVA, North Carolina State University

**Key Considerations**

• The anesthetic effects of dexmedetomidine and ketamine combined with either butorphanol, buprenorphine, or hydromorphone (for castration in dogs) were evaluated.
• Some dogs required additional isoflurane; those that received buprenorphine required isoflurane less frequently.
• Many dogs became hypoxemic but quickly responded to supplemental oxygen.
• Atipamezole administration resulted in a smooth reversal from anesthesia.
NUTRITION/SENIOR PETS

Survey of Opinions About Nutritional Requirements of Senior Dogs and Analysis of Nutrient Profiles of Commercially Available Diets for Senior Dogs


Using an online survey, the investigators in this study examined pet owner opinions about feeding senior dogs, including the age at which a dog should be considered senior, and whether and how diets for senior dogs should differ compared with diets for adult dogs. They also evaluated the formulation and label claims of 37 over-the-counter commercial foods marketed for senior dogs.

The majority (84.5%) of the 1309 survey respondents answered that senior dogs had different nutritional needs when compared with adult dogs. In addition, most thought that senior foods should be reduced in calories, protein, fat, and sodium, and contain increased amounts of fiber. The review of commercially available foods, however, found wide variation in nutrient profiles, which were often in contradiction to the perceived attributes.

In addition to providing insight into opinions held about feeding of senior dogs, this article will alert veterinary health professionals to the fact that the nutritional requirements of senior dogs remain undefined and consequently the products marketed as senior diets are not held to any universal standards and show considerable variation in nutrient profile.

—Kathryn E. Michel, DVM, MS, Diplomate ACVN, University of Pennsylvania

Key Considerations

- This study evaluated 2 components: (1) results from an online survey about feeding senior dogs and (2) comparison of 37 commercial senior dog foods.
- Of the 1309 survey respondents, 84.5% felt that senior dogs had different nutritional needs than adult dogs. Most respondents thought senior foods should have more fiber, but less calories, protein, fat, and sodium.
- The evaluation of commercial senior dog foods found a wide variation in nutrient profiles that often contradicted the perceived attributes from the survey results.
- Nutritional requirements for senior dogs remain undefined and consequently, senior dog foods show considerable variation in nutrient profiles.

IMAGING

Magnetic Resonance Imaging Findings in 40 Dogs with Histologically Confirmed Intracranial Tumours


This study looked at dogs with histologically confirmed primary or secondary brain tumors that underwent diagnostic magnetic resonance imaging (MRI). The data suggested that MRI can be used to diagnose the presence of brain masses and, in 89% of cases, can determine whether the mass is benign or malignant.

The authors used several factors to determine malignancy on MRI, such as signal intensity, contrast enhancement, necrosis, mineralization, location, and other previously published characteristics for each tumor type. The tumor type was confirmed via biopsy, resection, or postmortem examination.

Although diagnosis of malignancy was highly accurate, the correct diagnosis of tumor type was only 70%. Overall the authors recommend a tissue biopsy for a definitive diagnosis, but the future implications for ease in diagnosing or predicting prognosis for cancer patients is intriguing.

—Jennifer L. Wardlaw, DVM, MS, Diplomate ACVS, Mississippi State University

Key Considerations

- The study used diagnostic MRI to evaluate dogs with primary or secondary brain tumors.
- Tumor type was confirmed via biopsy, resection, or postmortem examination.
- Data suggested that MRI can be used to diagnose the presence of a brain mass and, in 89% of cases, can determine whether the mass is benign or malignant.
- While diagnosis of malignancy was highly accurate, tumor type was only correctly diagnosed in 70% of cases.
Daily Controlled Physiotherapy Increases Survival Time in Dogs with Suspected Degenerative Myelopathy
Kathmann I, Cizinauskas S, Doherr MG, et al.

This study examined the effects of daily physical therapy on 50 dogs diagnosed with degenerative myelopathy. The study was primarily aimed at the survival time and quality of life of dogs with degenerative myelopathy. Twelve different breeds were treated with varying degrees of physical therapy, including active exercise, passive exercise, massage, aquatic therapy, and soft tissue protection. Dogs that received intense physical therapy had the longest survival time (mean, 255 days), those that received moderate physical therapy had a mean survival time of 130 days, and those that received no therapy had a mean survival time of 55 days. In dogs with severe neurologic deficits at time of diagnosis, intense physical therapy increased survival time. Physical therapy has often been suggested for dogs with degenerative myelopathy. This study indicates a very positive outcome when dogs with degenerative myelopathy are treated with physical therapy.

—Debbie Gross Saunders, DPT, MSPT, Diplomate ABPTS, CCRP, Wizard of Paws Physical Rehabilitation for Animals, LLC, Colchester, Connecticut

Key Considerations
- This study evaluated the survival time and quality of life of dogs with degenerative myelopathy that were treated with physical therapy.
- Fifty dogs received daily physical therapy, including active exercise, passive exercise, massage, aquatic therapy, and soft tissue protection.
- Intense physical therapy resulted in a mean survival time of 255 days; moderate physical therapy, 130 days; and no therapy, 55 days.
- Intense physical therapy also increased survival time in dogs with severe neurologic deficits.

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GASTROINTESTINAL

Evaluation of Initial Plasma Lactate Values as a Predictor of Gastric Necrosis and Initial and Subsequent Plasma Lactate Values as a Predictor of Survival in Dogs with Gastric Dilatation-Volvulus: 84 Dogs (2003-2007)


This study revisited the utility of lactate measurements in predicting gastric necrosis. Gastric necrosis that necessitates resection is associated with an increased mortality rate in dogs with gastric dilatation-volvulus (GDV). One study, by De Papp and colleagues in 1999, established that a lactate value of > 6 mmol/l has an 88% specificity for predicting gastric necrosis and subsequent increased risk of death. However, in the last 10 years, this figure of 6 mmol/l has been mistakenly quoted as a point where death is more likely, and this has lead to euthanizing dogs based upon initial lactate levels, rather than more objective and appropriate criteria.

This study challenged this belief by re-evaluating the presenting lactate and also introducing lactate clearance. Lactate clearance is the rate of decline in lactate level over time and, in humans, increasing rates of lactate clearance are considered positive predictive values. For example, if 2 dogs present with a lactate level of 11 mmol/L plus a diagnosis of GDV and, after 2 hours of therapy, 1 dog’s lactate value has decreased to 9.8 mmol/L and the second dog’s lactate value has decreased to 3.2 mmol/L, the second dog, with the higher lactate clearance, can be predicted to have a better outcome.

The results of this study supported that an initially high lactate level was more predictive of gastric necrosis; however, a cut-off of > 2.9 mmol/L predicted necrosis and > 4.1 mmol/L predicted death. Additionally, the study identified a 75% mortality rate in dogs that failed to decrease their initial elevated lactate level by more than 50% within 12 hours of presentation.

This study is helpful for the clinician on 2 fronts:
1. It confirms and clarifies the predictive values of initial lactate measurements.
2. It introduces the role of lactate clearance in GDV cases.

Most important, the clinician should recall that predictions are valid for a group of patients, and less so the individual dog. Euthanasia should not be automatically recommended at a certain lactate value in dogs with GDV.

—Elizabeth Rozanski, DVM, Diplomate ACVECC & ACVIM (Small Animal Internal Medicine), Tufts University

Key Considerations
- This study revisited the utility of lactate measurements in predicting gastric necrosis and mortality rates in dogs with GDV.
- The results of this study indicated that an initially high lactate was more predictive of gastric necrosis; a cut-off of > 2.9 mmol/L predicted necrosis and > 4.1 mmol/L predicted death.
- In addition, dogs that failed to decrease their initial elevated lactate level by more than 50% had a 75% mortality rate.
- In dogs with GDV, euthanasia should not be automatically recommended at a certain lactate value.

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