The use of medetomidine-based sedation protocols to perform urohydropropulsion and cystoscopy in the dog

Detection of retinoid receptors in non-neoplastic canine lymph nodes and in lymphoma

Prevalence of feline blood groups in the Montreal area of Quebec, Canada

Scrotal tumors in dogs: A retrospective study of 676 cases (1986–2010)

Extramedullary plasmacytoma in the lung of a Doberman pinscher dog

Long-term outcome of conventional endotracheal tube balloon dilation of tracheal stenosis in a dog

A case of ocular canine transmissible venereal tumor

Preoperative ketoprofen administration to piglets undergoing castration does not affect subsequent growth performance

Intravenous lipid emulsion for treating permethrin toxicosis in a cat

Effect of enteric biopsy closure orientation on enteric circumference and volume of saline needed for leak testing
Profender® is the only feline dewormer that treats multiple life stages of the most common tapeworms, roundworms and hookworms. And all in one convenient, cat friendly topical dose.

To get the complete story on Profender®, talk to your Bayer representative today.

©Bayer, Bayer Cross and Profender are registered trademarks of Bayer AG, used under license by Bayer Inc.

For complete deworming inside, use Profender® outside.
Nitrogenous waste ...
trapped, redirected, removed.

Renal Plus

Renal Plus lessens stress on the kidney by eliminating nitrogenous waste through the large intestine. With moderate levels of protein, the diet promotes better body condition.

It’s time to rethink your approach.

www.PGPetwellness.com • 1.800.535.VETS (8387)
I haven’t needed an alarm clock since Brody came along.

And I wouldn’t want it any other way.
### Scientific Rubrique Scientifique

#### Articles

1213 The use of medetomidine-based sedation protocols to perform urohydropropulsion and cystoscopy in the dog  
Jinelle A. Webb, Monica Rosati, Dinaz Z. Naigamwalla, Alice Defarges

1219 Detection of retinoid receptors in non-neoplastic canine lymph nodes and in lymphoma  
Carlos H. de Mello Souza, Victor E.O. Valli, Barbara E. Kitchell

1225 Prevalence of feline blood groups in the Montreal area of Quebec, Canada  
Fabrice T.J. Fosset, Marie-Claude Blais

1229 Scrotal tumors in dogs: A retrospective study of 676 cases (1986–2010)  
Michelle C. Trappler, Cathy A. Popovitich, Michael H. Goldschmidt, Kyle H. Goldschmidt, Rebecca E. Risbon

#### Case Reports  

RAPPORTS DE CAS

1237 Extramedullary plasmacytoma in the lung of a Doberman pinscher dog  
Lauren Adelman, Victoria Larson, Thomas Sissener, Tim Spotswood

1241 Long-term outcome of conventional endotracheal tube balloon dilation of tracheal stenosis in a dog  
Nili Kahane, Gilad Segev

1245 A case of ocular canine transmissible venereal tumor  
Jewel Milo, Elisabeth Sneed

#### Brief Communication  

COMMUNICATION BRÈVE

1250 Preoperative ketoprofen administration to piglets undergoing castration does not affect subsequent growth performance  
Glen Cassar, Rocio Amezua, Ryan Tenbergen, Robert M. Friendship

#### Student Paper  

COMMUNICATION ÉTUDIANTE

1253 Intravenous lipid emulsion for treating permethrin toxicosis in a cat  
Whitney D. DeGroot

#### Article

1255 Effect of enteric biopsy closure orientation on enteric circumference and volume of saline needed for leak testing  
Brad M. Matz, Harry W. Boothe, James C. Wright, Dawn M. Boothe

#### Quiz Corner  

TEST ÉCLAIR

1199
Help your patients get back to a normal life.

The **ONLY** nutrition clinically tested to dissolve struvite stones in as little as **7 days**¹ and **reduce the recurrence of FIC signs by 89%**.²

CHANGE THEIR FOOD.  
CHANGE THEIR WORLD.


HillsVet.ca/cdMulticare
## FEATURES RUBRIQUES SPÉCIALES

<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Author(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1185</td>
<td>Antidote for bromethalin poisoning</td>
<td>Israel Rubinstein, Guy Weinberg</td>
</tr>
</tbody>
</table>

### LETTER TO THE EDITOR COURRIER DES LECTEURS

<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Author(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1187</td>
<td>Ethical practice/Pratique éthique</td>
<td>Dr. Jim Berry</td>
</tr>
</tbody>
</table>

### PRESIDENT’S MESSAGE MOT DU PRÉSIDENT

<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Author(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1195</td>
<td>VETERINARY MEDICAL ETHICS DÉONTOLOGIE VÉTÉRINAIRE</td>
<td></td>
</tr>
</tbody>
</table>

### NEWS NOUVELLES

<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Author(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1201</td>
<td>Heather Broughton, Isabelle Vallières</td>
<td></td>
</tr>
</tbody>
</table>

### COMMENTARY COMMENTAIRE

<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Author(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1234</td>
<td>The “unwanted horse” — A modest proposal</td>
<td>Bernard Rollin</td>
</tr>
</tbody>
</table>

### VETERINARY PRACTICE MANAGEMENT GESTION D’UNE CLINIQUE VÉTÉRINAIRE

<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Author(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1260</td>
<td>Associate salaries increase ... for half the provinces/Les salaires des vétérinaires augmentent... pour la moitié des provinces</td>
<td>Darren Osborne</td>
</tr>
</tbody>
</table>

### DIAGNOSTIC OPHTHALMOLOGY OPHTALMOLOGIE DIAGNOSTIQUE

<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Author(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1263</td>
<td>Lynne S. Sandmeyer, Bianca S. Bauer, Bruce H. Grahn</td>
<td></td>
</tr>
</tbody>
</table>

### NOTICES ANNONCES

<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Author(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1249</td>
<td>Index of Advertisers Index des annonceurs</td>
<td></td>
</tr>
<tr>
<td>1258</td>
<td>New Products Nouveaux produits</td>
<td></td>
</tr>
<tr>
<td>1265</td>
<td>Industry News Nouvelles de l’industrie</td>
<td></td>
</tr>
<tr>
<td>1266</td>
<td>Classifieds Petites annonces</td>
<td></td>
</tr>
</tbody>
</table>

---

**Contributors**

“Instructions for authors” are available online (www.canadianveterinarians.net).

Les «Directives à l’intention des auteurs» sont disponibles en ligne (www.veterinaresaucanada.net).
Subscriptions (2014). Annual: Canada $190 + applicable GST or HST; foreign $195.00 US. Single issue/back issue: $25 each + GST or HST, if applicable. (All prices subject to change.) Missing issues will be replaced if the Subscriptions Office is notified within 6 months (for requests within Canada) and 1 year (for requests from abroad) of the issue date. The publisher expects to supply missing issues only when losses have been sustained in transit and when the reserve stock will permit. Telephone (613-236-1162) or (1-800-567-2862) and fax (613-236-9681). Orders accepted with a valid Visa or MasterCard number. Please advise the publisher of address changes promptly.

Abonnements (2014). Annuel : Canada 190 $ + TPS ou TVH en vigueur; pays étranger 195 $ É-U. Anciens numéros (chacun) : 25 $ + TPS ou TVH en vigueur. Les prix sont sujets à changement sans préavis. Les numéros qui ne sont pas reçus seront remplacés si l'éditeur en est informé dans les 6 mois (pour les demandes venant du Canada) et 1 an (pour les demandes venant de l'étranger) suivant la date de parution. L'éditeur s'engage à remplacer les numéros manquants seulement lorsque les pertes ont été subies en transit et lorsque ses réserves le permettent. On peut payer son abonnement par téléphone (613-236-1162), par télécopieur (613-236-9681) ou par carte de crédit (Visa ou MasterCard). Veuillez aviser le bureau de l'éditeur de tout changement d'adresse.

The Canadian Veterinary Journal
La Revue vétérinaire canadienne

The editors and staff of The Canadian Veterinary Journal are pleased to have as readers student veterinarians at Canadian veterinary colleges! The production and distribution of student subscriptions is made possible through the generous sponsorship of Royal Canin Canada, Veterinary Division

Les rédacteurs et le personnel de La Revue vétérinaire canadienne sont heureux de compter les étudiants en médecine vétérinaire des collèges vétérinaires au Canada au nombre de leurs lecteurs. La production et la distribution des abonnements des étudiants ont été rendues possible grâce au généreux soutien de Royal Canin Canada, Veterinary Division

1182
Member Benefits and Services

Take full advantage of your membership! The CVMA provides exclusive benefits, discounts and services to members. In many instances, the savings enjoyed in member prices can exceed the cost of your annual membership fee. Below is a partial list of some of the benefits and services available to members. Visit http://canadianveterinarians.net or contact CVMA Member Services at 1.800.567.CVMA (2462) for more information.

BUSINESS | FINANCIAL | LEGAL

CVMA Group Insurance Program
Members joining the exclusive CVMA insurance program are guaranteed a minimum 15% reduction of their current premiums for equal or superior coverage. Benefit from our group purchasing power, competitive pricing and rate stability. Many types of coverage are available, including the unique commercial profit protection. Administered by Westface Financial Group Insurance Solutions. Call 1.800.800.2862 or visit http://canadianveterinarians.net/insurance.aspx.

CVMA Business Management Program
Benefit from veterinary economic reports, suggested provincial tax guides, free local seminars and many valuable business management tools. Visit the CVMA National Veterinary Economic Hub at http://canadianveterinarians.net/business-management-program.aspx to access current and previous years' reports.

Vetlaw ™ Online Legal Advice Column
Need some legal advice from an expert on veterinary law? Send your question through the Vetlaw™ Quick Link on the CVMA website and lawyer, Mr. Doug Jack, LL.B., will provide free general legal advice. You can also consult previously-asked questions and answers available at http://canadianveterinarians.net/vetlaw-questions.aspx.

Online Classified Advertising (The CVJ)
Members enjoy a 50% rate discount on classified ads in The Canadian Veterinary Journal. Ads are posted online within one business day for 30 days or more and may also appear in the print issue if submitted before deadline. Submit your ad through the CVMA member website or contact Ms. Laina Laffitte at 613.673.2659 or laffitte@cvma-acvm.org.

Staples Advantage™
Benefit from the CVMA group purchasing program which gets you the most competitive pricing on office supplies and free next business day delivery on orders over $50. Also look for our quarterly promotions to save even more. Contact the CVMA to request an account application.

CVMA Guidelines for the Successful Employment of New Veterinary Graduates
This 60-page booklet is valuable for practice owners looking to hire and for veterinarians seeking employment. The booklet is free for members contacting the CVMA or by downloading it directly from our website.

Petro-Canada SuperPass™ Program
Earn in the Petro-Canada SuperPass™ credit card program to enjoy substantial savings on fuel, car washes, parts and labour. Contact the CVMA to request a CVMA account application.

Adtel ™ Telephone Hold Service
Transform your clinic’s on-hold button into a positive business information resource with professional animal health messages provided by the CVMA. CVMA members enjoy savings up to 67%. Contact Adtel at 1.800.661.9999.

Scotiabank Get Growing for Business
Scotiabank has launched “Get Growing for Business”, a new website for CVMA members with online resources that provide valuable information and interactive tools to help you run and grow your practice. Members can also take advantage of the Scotia® Professional Plan all-inclusive banking package to meet your business needs and your preferred merchant payment transaction rates. To find out more, visit the Member Benefits section of the CVMA website.

CVMA Hotel Discounts
CVMA now offers members exclusive international hotel discounts. You can save up to 50%, with rates averaging between 1% to 20% better than other online hotel booking services. Log on to the CVMA website using your personal ID and password, then click on Hotel Discount Program in the Quick Links section.

NEW! Car Rental Discounts and Benefits
CVMA members can now receive exclusive car rental discounts and benefits through National Car Rental and Enterprise Rent-A-Car. Login to the CVMA member website to take advantage of this new program.

VALUES | PRACTICE TOOLS

Valuable Practice Tools
Pain management protocols for dogs, cats and horses; antimicrobial use guidelines; compounding guidelines; veterinarians’ resource for recognizing, documenting and reporting animal abuse. These valuable practice tools are available to help you deliver high-quality veterinary care.

Journals and Publications
Receive The Canadian Veterinary Journal, the Canadian Journal of Veterinary Research (electronic), and the CVMA Annual Score Guide. The Publications section of our website also contains other valuable online publications and client relations education materials.

Stay Connected
Receive our eNewsletter “Online from 3:39”, breaking news alerts and information by e-mail and faxblasts and real news articles posted on our website. Subscribe to CVMA’s RSS news feed, follow us on Twitter, join us on Facebook or connect with your peers on our message board.

Small Animal Veterinary Rounds — Educational Resource
Developed by the OVC, SAVR provides concise reviews of topical, evidence-based discussions and perspectives on the most current scientific and clinical developments in small animal medicine. The CVMA provides support for the distribution of the print version and the current issue of SAVR and all back issues are also available online through the Publications section of the CVMA website.

Large Animal Veterinary Rounds — Educational Resource
Derived from monographs presented at WCVSaH Department of Large Animal Clinical Sciences, UWV provides a unique window on some of the most current information and discussions on important scientific and clinical developments in food animal and equine veterinary medicine. All back issues are available online through the Publications section of the CVMA website.

PROFESSIONAL DEVELOPMENT | NETWORKING | COMMUNITY

CVMA Annual Convention
CVMA members receive a discounted rate on the registration fee. Take advantage of an excellent continuing education program, practical workshops and networking opportunities for you and your healthcare team. Plan to join us in Toronto in 2012 and in Edmonton in 2013.

CVMA Emerging Leaders Program
This program aims to support and develop leadership skills within Canadian veterinarians. If you graduated within the past 10 years, you can apply to participate in “The Need to Lead” workshop. Successful applicants receive full sponsorship to attend this exciting space-limited event held during the CVMA convention.

CVMA Summit of Veterinary Leaders
Members are invited to attend the annual meeting of the leadership of the veterinary profession in Canada. It is a great opportunity to dialogue, engage and initiate solutions to common challenges facing the profession.

WSAVA World Congress
CVMA members receive the member rate when registering or delegates at the World Small Animal Veterinary Association (WSAVA) congress. As a national association member of WSAVA, the CVMA extends this privilege to its members by providing a discounted registration fee. The WSAVA Congress is held annually in a different part of the world and hosted by a member association.

EXTERNAL RELATIONS | PUBLIC AWARENESS CAMPAIGNS

Animal Health Week (AHW)
Discounted prices on AHW merchandise and online promotional tools are available. This annual national public awareness campaign is an opportunity for your health care team to celebrate animal health in your community. For information on this year’s AHW campaign, visit the CVMA website or contact our office.

Media and Public Relations
The CVMA has become the veterinary profession’s national voice and continually provides credible, expert information to the media and public. The CVMA carefully monitors and identifies issues that affect you.

Advocacy/Representation
The CVMA advances the interests of veterinarians through government relations, monitoring research of critical issues and the development of position statements addressing veterinary issues and the humane treatment and welfare of animals.

CVMA Member Website — http://canadianveterinarians.net
CVMA members can explore the site and consult extensive resources and information. Contact the CVMA to obtain your ID/pw.
IMMUNOCIDIN®
For the treatment of mixed mammary tumours and mammary adenocarcinomas in dogs.

IMMUNOCIDIN® is based on proprietary MCW† fraction technology
- Easy tumour injection
- Well-tolerated by dogs, including older animals
- Safe for use in-clinic, with no risk to clinic personnel
- Can be used as the sole treatment or in conjunction with surgery, with administrations given at 1 – 3 week intervals.

DOSING
Dosing varies with tumour size, but generally 0.2 mL to 2.5 mL is administered per treatment. 1 mL should be considered a minimum dose for the average dog. The dose may be adjusted down (0.2 – 0.5 mL) for geriatric and small dogs. 3 – 4 treatments may be required.

† Immunocidin® is an emulsion of mycobacterial cell wall (MCW) fraction that stimulates cytokine production and activation of macrophages and lymphocytes, which destroy tumour cells, resulting in significant reduction of the tumour mass. What to Expect: Local inflammation often occurs following treatment and may require the use of analgesics. Therapy should be discontinued until the reaction has subsided. Necrosis with suppuration often occurs in regressing tumours. Clients should be informed that the treated area may drain for several weeks.
Dear Editor,
We read with great interest the recent Special Report by Dr. Coppock (Can Vet J 2013;54:557–558), on the deadly consequences of accidental ingestion by veterinary patients of bromethalin rodenticide, a commonly used potent, long-acting (days) neurotoxin for which no known antidote exists (1,2). However, given the hydrophobic (lipid-soluble) characteristics of bromethalin (log P 6.78), we propose that intravenous or intraosseous administration of lipid emulsion using a well-established protocol (aka Lipid Rescue) could be a therapeutic option for veterinary patients with bromethalin toxicosis and should be initiated as soon as possible at point-of-care (3).

Intravenous administration of commercially available lipid emulsion (e.g., Intralipid® 20%; a parenteral nutritional supplement approved worldwide) is a relatively new, safe, and efficacious treatment modality for severe cardiovascular and neurological toxicity provoked by accidental and intentional poisoning with lipophilic drugs (3). This emerging intervention is already used successfully in dogs, cats, and other animals poisoned by ivermectin, moxidectin, permethrin, baclofen, lidocaine, and other lipophilic drugs (4,5). Treated animals often exhibit prompt recovery with no reported acute adverse events nor long-term sequelae (4,5). Although the exact mechanism(s) of action underlying the salutary effects of lipid emulsion in the CNS of these cases is uncertain (3), it is possible that the circulating lipid emulsion entraps bromethalin (viz, the “lipid sink”) and then shuttle it to other sites for catabolism and excretion from the body. At the cellular level, free fatty acids released from lipid emulsion could also rescue mitochondria from the toxic effects of bromethalin in the CNS by inhibiting mitochondrial permeability transition pore opening thereby promoting recovery of veterinary patients (1–3). Finally, we encourage healthcare providers who treat bromethalin-intoxicated veterinary patients with lipid emulsion to report their experience in the literature.

References

Israel Rubinstein, MD
Professor of Medicine
Department of Medicine
University of Illinois at Chicago
College of Medicine and Jesse Brown VA Medical Center
Chicago, Illinois 60612, USA
irubin@uic.edu

Guy Weinberg, MD
Professor of Anesthesiology
Department of Anesthesiology
University of Illinois at Chicago
College of Medicine and Jesse Brown VA Medical Center
Chicago, Illinois 60612, USA
guyw@uic.edu

Constructive and professional comments made in the spirit of intellectual debate are welcomed by the Editor. Writers are expected to be respectful of others and to ensure that letters are considerate and courteous. The Editor reserves the right to remove comments deemed to be inflammatory or disrespectful.
“My CE course at the Oquendo Center was similar to being back in school again! The hands-on experience was invaluable and I was able to bring my new skills back to my practice and share with my colleagues. Now we don’t hate doing a gastropexy!”

Stacee Santi, DVM
Managing Veterinarian
Riverview Animal Hospital, Durango, Colorado

THRIVING PATIENTS. THRIVING PRACTICE.

Register today for these upcoming courses:

March 14–15, 2014
Core Surgery Procedures for the Companion Animal GP
Don Waldron, DVM, DACVS

March 29–30, 2014
TPLO Surgery for ACL Injury
Brian Beale, DVM, DACVS
Some provincial veterinary associations define veterinary ethics defined? There is nothing in the CVMA bylaws and codes. oath talks about veterinary medical ethics as well as personal and professional ethical standards. As a member of the veterinary medical profession.....I will practise my profession conscientiously, with dignity, and in keeping with the principles of veterinary medical ethics. I will strive continuously to improve my professional knowledge and competence and to maintain the highest professional and ethical standards for myself and the profession” (1). Yet, where are the principles of veterinary medical ethics defined? There is nothing in the CVMA bylaws and codes. Some provincial veterinary associations define veterinary ethics, while others are silent. There are entire books written on the subject (2) and The Canadian Veterinary Journal hosts the “Ethical Question of the Month” to help address real life ethical decision-making. Is that enough to keep veterinarians current?

To start, we need to be clear on how ethics is defined. Betsy Saul describes ethics as an issue with no right answer; as an issue involving wrong versus wrong and right versus right (3). In contrast, moral dilemmas center on questions of right versus wrong, where a correct answer may be determined through research (3). Our personal ethics are influenced by our religious belief, the law and political ideology, economics, our educational background, the influence of family and peer groups, societal norms and personal desires (4). Ethics obviously have numerous underpinnings, but the function is to give us the basis to justify our actions (4). Ethics provide the basis to create a socially acceptable action, to help solve moral problems and issues involving wrong versus wrong and right versus right (3). Par
help us understand our own perspectives and those of others (4). All veterinarians proceed through their careers with an ethical perspective. They also have individual concerns, interests, biases, and typically a sense of what they wish to achieve in their respective areas of the profession. This can lead to the question of how ethical decision-making co-exists with professionalism in practice.

The role of veterinary medicine is dynamic and as society changes, our ethical decision-making must also evolve. It is becoming more difficult to navigate this role as our obligation to our patients may conflict with the expectations of our peers, clients and society in general (2). Although it is easy to access information online, it can be difficult to sort out fact from fiction. It is also a reality that many veterinarians work in private practices and may not have easy access to continuing education or reference sources. So, from what sources do we take our cues? Numerous protocols have been published to help guide veterinary decision-making in many aspects of veterinary medicine; everything from euthanasia, vaccination protocols, heart worm testing, infectious disease testing, weight loss regimens for pets, and parasite prevention programs. Although many of these protocols contain current information, they may not account for regional and local differences in disease occurrence. In other words, we may have access to the information, but not be able to adequately determine if there is a strong evidence base for any recommendations. It is up to the individual veterinarian to sort through the relevance of regional and local variables in decision-making. This may leave some veterinarians in the position of practicing off-label, or not working within the accepted common practice for the profession. Since ethical decisions are influenced by education, the access to significant amounts of information without the ability to check the underlying assumptions and authorship can influence our ethical choices, and therefore our practice paradigms. Advocacy and pressure from the public can also be a strong driving force in shifting veterinary attitudes, but the general populace is just as susceptible to the public can also be a strong driving force in shifting veterinarians and authorship can influence our ethical choices, and therefore our practice paradigms. Advocacy and pressure from the public can also be a strong driving force in shifting veterinary attitudes, but the general populace is just as susceptible to the public can also be a strong driving force in shifting veterinary attitudes, but the general populace is just as susceptible to

In other words, we may have access to the information, but not be able to adequately determine if there is a strong evidence base for any recommendations. It is up to the individual veterinarian to sort through the relevance of regional and local variables in decision-making. This may leave some veterinarians in the position of practicing off-label, or not working within the accepted common practice for the profession. Since ethical decisions are influenced by education, the access to significant amounts of information without the ability to check the underlying assumptions and authorship can influence our ethical choices, and therefore our practice paradigms. Advocacy and pressure from the public can also be a strong driving force in shifting veterinary attitudes, but the general populace is just as susceptible to the public can also be a strong driving force in shifting veterinary attitudes, but the general populace is just as susceptible to the public can also be a strong driving force in shifting veterinary attitudes, but the general populace is just as susceptible to the public can also be a strong driving force in shifting veterinary attitudes, but the general populace is just as susceptible to

So what should veterinarians do? I think the most reasonable answer is to question sources of new information that will impact how we treat our patients or our clients. It is legitimate to ask for the background research from peer-reviewed journals, it is legitimate to question the significance of diseases and testing regimens in your own geographic area, it is legitimate to ask if a new treatment is appropriate in your practice for your patients. It is legitimate and essential to question and to form your own evidence-based opinions. I believe that the basis of ethical decision-making in practice is to remember that our first responsibility is to our animal patients, but our second responsibility should be to our clients. If we can do this, our profession will truly be ethical, and can only prosper as a result.

Jim Berry

References
100% Response in Double Blind Tests
See the Results on www.lebalab.com

Cleans Teeth with the Ease of a Spray

The LebaLab difference:

Leba III stimulates the good flora in the saliva. The longer Leba III is used, the cleaner the teeth and the healthier the chemistry of the mouth becomes. Antibacterial products kill the good bacteria in the mouth leading to imbalance and repeated dental procedures.

Pets ingest dental products, they cannot rinse. They can become subject to the side effects of the components, that's why Leba III contains no Grapefruit Seed Extract, no chlorides or chemical agents.

Used by veterinarians since 1994

Email: tellus@lebalab.com    Office tel: 1-519-542-4236
To contact us, call toll free: 1-866-532-2522

LebaLab Inc.
nouveaux renseignements qui auront un impact sur la façon dont nous traitons nos patients ou nos clients. Il est légitime de demander la recherche de fond de la part des revues évaluées par les pairs, il est légitime de s’interroger sur l’importance des maladies et des régimes de tests dans votre propre secteur géographique, il est légitime de s’interroger à savoir si un nouveau traitement est approprié dans votre pratique pour vos patients. Il est légitime et essentiel de poser des questions et d’adopter nos propres opinions factuelles. Je crois que lors de la prise de décisions éthiques en pratique, nos patients animaux sont notre première responsabilité, mais que nos clients devraient être notre deuxième responsabilité. Si nous pouvons nous acquitter de cette tâche, notre profession maintiendra une éthique véritable et nous ne pourrons que prospérer.

Jim Berry

Renvois


Provide your clients with the benefits of robust research and nutritional excellence. Uniquely formulated for each life stage, PURINA VETERINARY DIETS® essential care™ delivers a veterinary exclusive, multi-benefit formula aimed to ensure 100% complete and balanced nutrition, every step of the way.

Recommend PURINA VETERINARY DIETS® essential care™ for complete nutrition at each life stage.

Trademarks owned by Société des Produits Nestlé S.A., Vevey, Switzerland.
Veterinarians

Dr. Stephen Waisglass
- A Start to Finish Approach to the Itchy Pet
  The CSI Approach: Interviewing Witnesses, Assessing Crime Scene and Gathering Evidence
- Skin Cytology; Latest Trends in Diagnosis and Management of Skin Infections; MRSA
- The Diagnosis of Allergic Dermatitis
  Food Trials and Intradermal Testing
  When are Skin Biopsies Needed
  Diagnostic Otology
- Management of the Itchy Pet
  Latest in the Treatment of Allergic Dermatitis
  Feline Self Trauma. Case Studies
- Claw and Claw-fold Diseases
- Immune Mediated Diseases
- Acquired Alopecias of the Dog

Dr. Julie Churchill
- Practicing Nutrition in Primary Care
  It Can be Easier Than You Think
- Keeping Current Amidst the Controversy of Feeding Cats
  Carb Free? Canned? Can We Do Better?
- Quagmires and Controversies of “Natural Diets”
- The “a b c’s” of Therapeutic Nutrition
  Using Evidence Based Nutrition to Decide Where to Put Your Efforts

Dr. Susan Little
- Cats, Stress and Illness; FIV Update
- The Amazing Fading Cat
- Breathing Easy: Diagnosis and Treatment of Feline Asthma
- When Good Bladders Go Bad
- Feline Idiopathic Cystitis & Feline Urethral Obstruction

Dr. Anthony Fischetti
- Radiographic Pearls for the Thorax
- The Struggle to Diagnose Normal
- Barking Up the Wrong Tree
  Where is the Problem?
- Radiology and Ultrasound
  Where Each Fits Best
- Abdominal Radiography
  Making the Call on Small Intestinal Obstructions
- What’s Your Diagnosis
  Challenging Case Presentations

Dr. Robert Stein
- Practical Anesthesia & Periop Pain Mgmt:
  Foundational Principles and Preanesthetic Meds
  System Selection
  Induction, Local Anesthesia and Patient Monitoring
  Patient Support, Intraop Analgesic Therapy and Postop Outpatient Analgesics
- The Nuts & Bolts of Optimal Chronic Pain Mgmt:
  Foundational Principles and Osteoarthritis Pain
  Bone Cancer Pain and Spinal Pain

Animal Health Technicians

David Liss
- What to Do in the First 5 Minutes
- Critical Care Syndromes
- Anesthesia for Critical Patients
- Acute Pancreatitis • Blocked Cats
- Sticking Together - IMHA
- ER Tips and Tricks

Join more than 850 other delegates, exhibiting companies and a world class list of speakers in an environment of true maritime hospitality
A COMPLETE PACKAGE FOR THE ENTIRE VETERINARY TEAM

Animal Health Technicians

Dr. Andrew Roark
• The Jedi Mind - How to Get Doctors to Do What You Want
• How to Lead From the Treatment Room
• The Top 3 Ways Doctors Hurt Your Practice

Dr. Robert Stein
• Practical Anesthesia & Periop Pain Mgmt: Foundational Principles, Preanesthetic Meds and System Selection
  Inductions, Locals, Monitoring, Support and Intraop Analgesic Therapy

Dr. Julie Churchill
• Weight Management; If Only They Could Lose, Everyone Wins!
• The Nuts and Bolts of a Practical Weight Loss Program

Dr. Andrew Roark
• The Jedi Mind - How to Get Doctors to Do What You Want
• How to Lead From the Treatment Room
• The Top 3 Ways Doctors Hurt Your Practice

Business Management

Dr. Andrew Roark
• How to Bond Clients in Person and Online
• How to Make Facebook Pay
• Twitter Basics - Get Up and Going to Drive Clients to the Door With Twitter

Dr. Amanda Donnelly
• Communicate for Results
• Leader of the Pack, Building a Dynamic Team

Karn Nichols
• Designing and Delivering Effective Employee Evaluations

Angela Schneider
• Discover Todays Best Practices in Inventory

Support Staff

Dr. Julie Churchill
• Make Nutrition Worth It - Aligning Team
• Petfood Ratings, Ranking and Recalls

Dr. Andrew Roark
• Battle for Sanity - 6 Steps to Manage Angry and Complaining Clients
• Building Client Loyalty
• Maximizing Exam Room Productivity

David Liss
• Emergencies: What to Do and Say
• How Important is the First Clinic Contact?

Dr. Susan Little
• How to Make Your Clinic Cat Healthy

Dry Lab

Veterinarians: 1/2 Day
Dr. Anthony Fischetti
• Radiology - Interesting Case Studies

Fees

Veterinarians
Full $350 (3 days)
Lab $175 or $125 with Full Reg (Radiology)
AHT’s & Vet’s Assistant’s
Full $175 (3 days)
Managers
Full $275 (3 days)
Support Staff
Full $125 (2 days)

For further information contact:
APVC Committee on Arrangements
Dr. Ernie Prowse - Chair
106 Maple Blvd
Truro, NS B2N 4N3
Email: eprowse@eastlink.ca
Tel: (902) 899-2233
Register online - www.apvc.ca
Join us for top-notch scientific sessions addressing companion animal, equine and ruminant medicine, business management and more.

Earn CE credits during specialized workshops, including a level 2 dental lab and an orthopedic lab.

A social evening to look forward to — we’ll be “Havin’ a Time in Newfoundland” as we experience the colourful culture and world renowned hospitality in St. John’s.
Ethical question of the month — January 2014

Acquiring funding for research at universities is becoming more difficult. To ensure objectivity and fairness, granting agencies require extensive pre-proposals followed by more demanding final proposals. Many strongly encourage multiple funding partners, which requires more grant writing. The percentage of competitive research grants sought that are successful can be as low as 10% to 20%. As a result, university professors spend much time in unsuccessful efforts to acquire research funding. A solution to this problem comes from the private sector which views university faculty as sources of credible and economical high quality research. If a hypothesis proposed by industry is of questionable scientific value, researchers reply that the work is valued by their “industry partners.” Faculty can now base their careers on non-competitive grants that fund research that tests hypotheses of someone else’s creation. As “negative” findings are seldom published, private industry risks little if their study does not produce the desired positive outcome. Can this trend of faculty acting as contractually limited researchers for private industry create unforeseen problems?

Responses to the case presented are welcome. Please limit your reply to approximately 50 words and forward along with your name and address to: Ethical Choices, c/o Dr. Tim Blackwell, Veterinary Science, Ontario Ministry of Agriculture, Food and Rural Affairs, 6484 Wellington Road 7, Unit 10, Elora, Ontario N0B 1S0; telephone: (519) 846-3413; fax: (519) 846-8178; e-mail: tim.blackwell@ontario.ca

Suggested ethical questions of the month are also welcome! All ethical questions or scenarios in the ethics column are based on actual events, which are changed, including names, locations, species, etc., to protect the confidentiality of the parties involved.

Use of this article is limited to a single copy for personal study. Anyone interested in obtaining reprints should contact the CVMA office (hbroughton@cvma-acmv.org) for additional copies or permission to use this material elsewhere.
Ethical question of the month — October 2013
You are an experienced veterinary surgeon who has worked for decades with a number of show breeders who are among your best clients. These breeders strongly believe that the standard elective surgical procedures that are routine in many breeds protect their dogs from infections, hematomas, and allow the dogs to do their intended work more effectively. The Canadian Veterinary Medical Association’s new position statement opposing “purely cosmetic” surgery has forced you to stop performing these procedures. Your clients now go to the United States to have this work done. One of these clients presents you with a 12-week-old puppy with badly infected ears following an ear cropping in the United States. She is distraught regarding the pain the dog is suffering and concerned because this is an outstanding individual from her best line of dogs. The ears are infected, sutures are tearing out, and the quality of the surgery is far below your standards. You are confident you can treat the infection, but some re-trimming is necessary to allow this dog to have any chance of a future on the show circuit. The breeder will euthanize the dog if it cannot be re-trimmed as she does not want the dog in its current state to represent her kennel even as someone’s pet. What should you do?

Question de déontologie du mois — Octobre 2013
Vous êtes un chirurgien vétérinaire chevronné qui a travaillé pendant des décennies avec plusieurs éleveurs de chiens de concours qui figurent parmi vos meilleurs clients. Ces éleveurs croient fermement que les interventions chirurgicales non urgentes habituelles qui sont routinières pour beaucoup de races protègent leurs chiens contre des infections, des hématomas et permettent aux chiens de réaliser leurs tâches caractéristiques plus efficacement. Le nouvel énoncé de position de l’Association canadienne des médecins vétérinaires qui s’oppose à la chirurgie « purement esthétique » vous a forcé à cesser ces interventions. Vos clients vont maintenant aux États-Unis pour faire effectuer ces chirurgies. L’un de ces clients vous présente un chiot âgé de 12 semaines qui a des oreilles gravement infectées après une taille des oreilles réalisée aux États-Unis. Elle est désolée de voir la douleur du chien et elle s’inquiète parce qu’il s’agit d’un chien exceptionnel provenant de sa meilleure lignée. Les oreilles sont infectées, les points de suture s’enlèvent et la qualité de la chirurgie est de beaucoup inférieure à vos normes. Vous êtes confiant que vous pouvez traiter l’infection, mais une nouvelle taille est nécessaire pour permettre à ce chien d’avoir une chance dans les concours. L’éleveur fera euthanasier le chien si les oreilles ne peuvent pas être taillées de nouveau, car elle ne veut pas que ce chien, dans son état actuel, représente son chenil, même en tant qu’animal de compagnie de quelqu’un d’autre. Que devriez-vous faire?

Cosmetic surgery dilemma — A comment
There are two elements to this scenario. The first — the need for the veterinarian to address the medical needs of the puppy — does not involve an ethical dilemma. This would likely involve wound debridement, appropriate antimicrobial, and analgesic therapy to treat the pinnae infection (i.e., this is not “cosmetic” surgery).

The second element in this scenario is how the veterinarian should approach the client’s desire to have this puppy endure not just one cropping procedure, but also a second “retrimming” for show purposes. The CVMA encourages veterinarians to educate clients that there is no scientific evidence to support the practice of ear cropping as a procedure that provides any health or welfare benefit for the dog. In this case, the veterinarian should counsel the client that euthanizing the puppy if the ear trimming procedure cannot be done such that the dog meets the current show standard is not a reasonable course of action.

The CVMA encourages all Canadian dog clubs to show leadership and eliminate the desire for cropped ears (and docked tails) by revising canine breed standards so that they allow for natural ears (and tails) and by raising awareness amongst purebred club members, show judges, and the public about the unnecessary pain and suffering caused by these procedures. CVMA position statements are intended to be science-based guidance documents and do not “force” Canadian veterinarians to stop performing cosmetic or other procedures. The CVMA recognizes the positive step that several Canadian provincial regulatory authorities have taken to pass by-law amendments or codes of practice that prohibit veterinarians from performing cosmetic surgery.

Patricia Turner, DVM, Chair, Animal Welfare Committee, Canadian Veterinary Medical Association
An ethicist’s commentary on botched ear-cropping

Currently, ear-cropping is banned in Australia, Austria, Belgium, Brazil, Croatia, Cyprus, Czech Republic, Denmark, England, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Poland, Scotland, Slovakia, South Africa, Sweden, Switzerland, Virgin Islands, and Wales. It has recently been opposed by the Canadian Veterinary Medical Association. The procedure is, except in rare cases, strictly a cosmetic one based on long-established breed standards. Given that society has ever increasingly moved in the direction of eliminating unnecessary pain in animal management, ear-cropping was an extremely plausible procedure to fall victim to this concern. Other than changing the “look” of the dog, (e.g., making Doberman pinschers look more intimidating), cropping has numerous negative consequences, including significant post-procedural pain (and even procedural pain when performed without anesthesia or by breeders); the very real chance of a botched job (eminent veterinary surgeon Dr. Harry Gorman always refused to either perform or teach ear cropping, because it too often made a surgeon look bad, in addition to harming the animal); and overtly displaying more concern for fashion than for animal well-being.

In the situation confronting us in this case, the breeder has had the surgery performed in the United States in order to circumvent Canadian regulations. The dog is already experiencing what is known to be a very painful infection, resulting from poor surgical procedure. Furthermore, the breeder has declared that she will euthanize the puppy failing rectification of the botched surgery. (This response is all too common among breeders, clearly evidencing total disregard for the animal’s intrinsic value.) Your choice is to either perform the retrimming and save the animal’s life, or allow it to be euthanized. Clearly, the former option is the moral choice, trading some significant short-lived pain for a potential good life. On the other hand, you emphatically do not wish to encourage the breeder to seek cropping in the future.

Were I the veterinarian, I would express reluctance at retrimming the ears, but would agree to do so and utilize the occasion as a teachable moment. I would point out that ear cropping and tail docking are nothing short of mutilations, doing no good for the animal, and being functionally and morally on a par with mutilations that most people deplore when they are performed on farm animals, for example, tail docking in dairy cattle, now known scientifically to be highly painful and totally ineffectual regarding diseases such as mastitis. I would forcefully argue that such mutilations are unworthy of those who supply companion animals to the public, and demean the role of breeders in society. I would ask the breeder to take a strongly proactive role in changing standards governing the breed.

Such a stance, while morally praiseworthy, is very unlikely to be effective. In my view, as attested to by the countries listed, only the law is powerful enough to create an effective ban on such procedures. I would, therefore, expend some energy on banning the selling and/or showing of cropped or docked animals. The key to success would be convincing the public of the need to eliminate significant unnecessary suffering. While this would not come overnight, it is clear from the multiple societal examples cited that it could be accomplished. Such an action would help catapult the veterinary profession into a strong animal welfare advocacy position recognized by the companion animal owning public and help mitigate the negative image of veterinarians as colluding with industry on matters of animal welfare.

Bernard E. Rollin, PhD
It begins with industry-leading technology and innovative techniques. Add one-of-a-kind networking opportunities where the best of the best exchange ideas. Factor in Las Vegas, and you get the unparalleled experience that is the Western Veterinary Conference.
1. Which agent should not be used to anesthetize greyhounds?
   a. propofol
   b. ketamine
   c. isoflurane
   d. thiopental
   e. tiletamine-zolazepam

2. Thoracocentesis on a dog with pleural effusion yields a modified transudate (protein 30 g/L, 1000 cells/μL, with 85% small lymphocytes and 15% nondegenerate neutrophils). The cholesterol level in the effusion is lower than in the serum, but the triglyceride level is much higher. What is the most likely cause of these findings?
   a. left-sided heart failure
   b. lymphosarcoma
   c. chylothorax
   d. diaphragmatic hernia
   e. pyothorax

3. Aside from iatrogenic causes, what is the most common cause of hyperadrenocorticism?
   a. pituitary tumor
   b. unilateral adrenal tumor
   c. bilateral adrenal tumor
   d. hypothalamic disorder
   e. adrenocortical hyperplasia

4. Which clinicopathologic finding is consistent with feline infectious peritonitis (FIP)?
   a. increased serum globulin level
   b. decreased serum globulin level
   c. monoclonal gammopathy
   d. Bence Jones proteinuria
   e. decreased serum albumin level

---

1. Lequel des agents suivants ne doit pas être utilisé pour anesthésier les lévriers?
   a. propofol;
   b. kétamine;
   c. isoflurane;
   d. thiopental;
   e. tiletamine-zolazépam.

2. La thoracocentèse effectuée chez un chien souffrant d’épanchement pleural révèle un transsudat modifié (protéines 30 g/L, 1000 cellules/μL, avec 85 % de petits lymphocytes et 15 % de neutrophiles non dégénérés). Le taux de cholestérol de l’épanchement est moins élevé que celui du sérum, mais le taux de triglycéride est beaucoup plus élevé. Quelle est la cause la plus probable de ces résultats?
   a. insuffisance cardiaque gauche;
   b. lymphosarcome;
   c. chylothorax;
   d. hernie diaphragmatique;
   e. pyothorax.

3. À part les causes iatrogènes, quelle est la cause la plus commune de l’hyperadrénocorticisme?
   a. tumeur hypophysaire;
   b. tumeur surrénale unitaire;
   c. tumeur surrénale bilatérale;
   d. trouble hypothalamique;
   e. hyperplasie corticosurrénale.

4. Lequel des résultats clinicopathologiques suivants est compatible avec la péritonite infectieuse féline?
   a. augmentation du taux de globuline sèrique;
   b. diminution du taux de globuline sèrique;
   c. gammapathie monoclonale;
   d. protéine de Ben Jones dans l’urine;
   e. diminution du taux d’albumine sèrique.
5. Which of the following most accurately describes anisognathism in equids?
   a. presence of an interdental space
   b. protrusion of the maxillary incisors rostral to the mandibular incisors
   c. protrusion of the mandibular incisors rostral to the maxillary incisors
   d. a mandibular arcade that is narrower than the maxillary arcade
   e. continual eruption of the tooth’s reserve crown

   (See p. 1224 for answers./Voir les réponses à la page 1224.)
Strength in Collaboration

Your support as a CVMA member is important so that we may continue to be the influential organization that Canadian veterinarians need as our profession faces many challenges of the changing times. Your membership not only contributes to strengthening our collective voice on the national and international scenes, but also ensures the CVMA’s ability to defend the profession and advance the interests of all veterinarians.

A joint Task Force of representatives of the provincial veterinary regulatory bodies and the CVMA has developed a collaboration proposal that has been approved in principle by 7 out of 10 provinces and the CVMA, and is now being further considered by the registrars. Most of the services CVMA provides benefit the entire profession and many of them serve the public, directly or indirectly. Collaboration among the regulatory bodies and with the CVMA creates efficiencies by eliminating duplication of processes and strengthens the effective flow of information and knowledge across all provinces.

At the national level, the CVMA provides the forum to create one voice for the profession through seeking input from members, veterinary medical associations, species groups, and regulatory bodies. The CVMA represents Canadian veterinarians in key government discussions on national and international issues to ensure that important decisions that may affect veterinary practice will not be made by others without veterinary input. Our profession must be engaged in national and international issues and show leadership in areas such as antimicrobial stewardship, regulation of extra label drug use, use of compounded drugs and telemedicine. Canadian veterinarians must show leadership on animal welfare issues such as cosmetic surgery, euthanasia, and pain management. The CVMA is participating in the development of food animal codes of practice, and developing and maintaining the Canadian cattery and kennel codes of practice. The CVMA’s 2 journals provide the only national platform for peer-reviewed research. Our work-life balance and business management services, including the CVMA’s suggested fee guides and our very competitive insurance program are just some of the benefits and services that support the needs of CVMA members.

We are a small profession, and the proposed collaboration aims at more equal participation and contribution of all Canadian veterinarians to outcomes that benefit the entire profession and the public.

La collaboration fait la force

Votre appui en tant que membre de l’ACMV est important afin que nous puissions continuer de demeurer l’organisation influente dont ont besoin les vétérinaires canadiens au moment où notre profession relève de nombreux défis en cette ère de changements. Votre adhésion contribue non seulement au renforcement de notre voix collective à l’échelle nationale et internationale, mais elle assure aussi la capacité de l’ACMV à défendre notre profession et à avancer les intérêts de tous les vétérinaires.

Un Groupe de travail conjoint composé de représentants des organismes de réglementation provinciaux et de l’ACMV a élaboré une proposition de collaboration qui a été approuvée en principe par 7 provinces sur 10 et l’ACMV, et qui fait maintenant l’objet d’un examen approfondi par les registraires. La plupart des services que l’ACMV fournissent profitent à l’ensemble de la profession et beaucoup d’entre eux desservent le public, soit directement ou indirectement. La collaboration entre les organismes de réglementation et l’ACMV procure des gains d’efficacité en éliminant le dédoublement des processus et elle facilite une circulation efficace de l’information et des connaissances entre les provinces.

À l’échelle nationale, l’ACMV sert de forum pour la création d’une voix collective au nom de la profession et elle sollicite la rétroaction des membres, des associations de médecins vétérinaires, des groupes des espèces et des organismes de réglementation. L’ACMV représente les vétérinaires canadiens dans les discussions cruciales avec le gouvernement sur des enjeux d’envergure nationale et internationale afin de veiller à ce que les décisions importantes qui pourront influencer la pratique vétérinaire ne soient pas prises par d’autres intervenants sans une rétroaction vétérinaire. Notre profession doit participer aux enjeux nationaux et internationaux et faire preuve de leadership dans des domaines comme la gestion responsable des antimicrobiens, la réglementation de l’utilisation des médicaments en dérogation des directives de l’étiquette, l’utilisation des préparations magistrales et la télémédecine. Les vétérinaires canadiens doivent faire preuve de leadership à l’égard des enjeux liés au bien-être animal, notamment la chirurgie esthétique, l’euthanasie et le contrôle de la douleur. L’ACMV participe à l’élaboration de codes de pratiques pour les animaux destinés à l’alimentation ainsi qu’à la rédaction et à la mise à jour des codes de pratiques pour les chatteries et les chenils du Canada. Les deux revues de l’ACMV offrent le seul véhicule national pour la recherche évaluée par les pairs. Nos services de conciliation travail-vie et de gestion commerciale, y compris les guides tarifaires suggérés de l’ACMV et notre programme d’assurance de l’ACMV très concurrentiel, ne représentent que quelques-uns des avantages et des services qui appuient les besoins des membres de l’ACMV.

Nous sommes une profession relativement petite et la collaboration proposée vise à assurer une participation et une contribution plus équitables de tous les vétérinaires canadiens aux résultats qui profiteront à la profession dans son ensemble et au public.
CVMA Releases a Collection of Eco-friendly Resources for Veterinary Practices

The Canadian Veterinary Medical Association’s (CVMA) Environmental Advisory Group has just released the new CVMA Green Veterinary Practice initiative, a collection of eco-friendly resources for veterinary practices. Veterinarians historically have fostered community health by being stewards of the link between human and animal health. Considerations for the profession’s impact on the environment are part of that concept. It is the obligation of veterinarians to minimize the detrimental impact of veterinary medicine on the environment, and we can all play a part! Through this web-based source of information, discover how to improve the environmental impact of your veterinary practice and infrastructure by learning more about concepts such as:

• Establishing an environmental policy for your practice
• Government funding incentives for going green
• Water and energy efficiency considerations
• Waste management decisions
• Careful selection of chemical and medical products
• Environmentally sustainable building construction and renovations
• Evaluating the eco-responsibility of your suppliers

Use the CVMA Green Veterinary Practice self-audit tool to determine how green your practice really is. Then consider the list of top 10 changes you can make to reduce your impact on the environment. Any change, no matter how simple or complex, will make a difference! Visit the Resources section of CVMA’s website (www.canadianveterinarians.net) and learn more today.

L’ACMV lance une collection de ressources écoresponsables pour les pratiques vétérinaires

Le Groupe consultatif environnemental de l’Association canadienne des médecins vétérinaires (ACMV) vient tout juste de lancer la nouvelle initiative d’une Pratique vétérinaire écoresponsable de l’ACMV, une collection de ressources écoresponsables à l’intention des pratiques vétérinaires. Les vétérinaires ont traditionnellement favorisé la santé communautaire en raison de leur rôle de gardien du lien entre la santé humaine et animale. L’évaluation de l’impact de notre profession sur l’environnement fait partie de ce concept. Nous avons l’obligation, en tant que vétérinaires, de minimiser l’impact néfaste de la médecine vétérinaire sur notre environnement et nous pouvons tous jouer un rôle! Cette source d’information sur le Web vous fera découvrir la façon dont vous pouvez atténuer l’impact environnemental de votre pratique et de vos infrastructures vétérinaires en vous communiquant des renseignements sur les différents concepts, notamment :

• L’élaboration d’une politique environnementale pour votre pratique
• Les incitatifs financiers du gouvernement en vue de favoriser l’écoresponsabilité
• L’efficacité énergétique et la conservation de l’eau
• Les décisions liées à la gestion des déchets
• Le choix prudent des produits chimiques et médicaux
• Les travaux de construction et de rénovation durables
• L’évaluation de l’écoresponsabilité de vos fournisseurs

Servez-vous de l’Outil d’autovérification d’une pratique vétérinaire écoresponsable de l’ACMV pour déterminer le degré d’écoresponsabilité de votre pratique. Puis, considérez la liste des 10 changements les plus importants que vous pouvez apporter pour réduire votre impact sur l’environnement. Tout changement compte, peu importe son ampleur! Visitez la section des Ressources sur site Web de l’ACMV (www.veterinairesaucanada.net) et apprenez-en davantage dès aujourd’hui.
Preparing for Canada’s Anti-Spam Legislation — Understanding Consent

Se préparer à la Loi canadienne anti-pourriel — Comprendre le consentement

In July 2013, we provided an overview of the proposed Canadian Anti-Spam Legislation (CASL). To help you understand the impact and begin planning for compliance, the CVMA is providing a series of information bulletins on the core provisions of the regulations. Last month we described Commercial Electronic Messages (CEM). This month, we’ll examine Consent. Before sending a CEM, you must obtain consent from the intended recipient. There are 2 types of consent: implied consent and expressed consent. Consent is valid only for 2 years and it must be tracked. Your CEM must identify you as the sender and provide a way for the recipient to withdraw their consent (i.e., an unsubscribe mechanism).

What is implied consent?
Implied consent applies to existing business relationships, conspicuously published e-mail addresses (e.g., recipients’ e-mail address posted publicly on their website), approved existing non-business relationships (e.g., becoming a member of an association implies that you allow that organization to contact you) and recipients who have previously given their e-mail address to the sender, provided that the CEM is relevant to the recipients’ business, role, functions or duties.

What is expressed consent?
Expressed consent means that the individual has agreed (orally or in writing) to receive CEM from you.

Tracking consent
You must be able to store a record of the date, time and manner in which you obtained written consent. Oral consent must be tracked by audio recording or verification by an independent 3rd party.

Exemptions
A number of consent exemptions exist, for example if there is a family relationship, or if a requested quote or estimate is being provided. Warranties, product recalls, upgrades, safety and security information are all exempt as well.

What you can do in anticipation of CASL?
Determine if you need to obtain consent and if so, how you will obtain consent. Establish how you will maintain a record of each consent you obtain.

Next month’s bulletin: Penalties
Whenever CASL comes into force, almost every business and organization in Canada will be affected. Questions? Visit www.fightspam.gc.ca or contact CVMA’s Communications team at communications@cvma-acmv.org or 613-236-1162, ext. 128. Please note: This is intended as a general guide only based on the draft regulations and the information available to date.

In juillet 2013, nous avons présenté un survol de la Loi canadienne anti-pourriel (LCAP). Afin de vous aider à comprendre l’impact de la loi et à commencer à planifier la conformité dès maintenant, l’ACMV fournit une série de bulletins d’information sur les principales dispositions de la réglementation. Le mois dernier, nous avons décrit les messages commerciaux électroniques (MCE). Ce mois-ci, nous examinerons le consentement. Avant d’envoyer un MCE, vous devez obtenir le consentement du destinataire visé. Il y a deux types de consentement : le consentement implicite et le consentement exprès. Le consentement est valide seulement pendant deux ans et il doit faire l’objet d’un suivi. Votre MCE doit vous identifier comme l’expéditeur et fournir une façon dont le destinataire peut retirer son consentement (c.-à-d., des mécanismes de désabonnement).

En quoi consiste le consentement implicite?
Le consentement implicite s’applique aux relations d’affaires existantes, aux adresses de courriel qui sont publiques (p. ex., l’adresse de courriel des destinataires était affichée publiquement sur leur site Web), des relations non commerciales existantes approuvées (p. ex., devenir membre d’une association implique que vous autorisez cette organisation à vous contacter) et les destinataires qui ont déjà donné leur adresse de courriel à l’expéditeur, pourvu que le MCE soit pertinent aux activités, au rôle, aux fonctions ou aux tâches des destinataires.

En quoi consiste le consentement exprès?
Le consentement exprès signifie que la personne a consenti (orale ou par écrit) à recevoir un MCE de vous.

Effectuer un suivi du consentement
Vous devez pouvoir stocker un enregistrement de la date, de l’heure et de la manière dont vous avez obtenu le consentement écrit. Le consentement oral doit être consigné dans un enregistrement ou une vérification audio par un tiers indépendant.

Exemptions
Plusieurs exemptions existent pour le consentement. Par exemple, s’il y a une relation de parenté, ou si une soumission ou une estimation demandée est fournie. Les garanties, les rappels de produits, les renseignements sur la sécurité sont aussi tous exemptés.

Que pouvez-vous faire en préparation à la LCAP?
Déterminez si vous avez besoin d’obtenir le consentement et, le cas échéant, comment vous obtiendrez le consentement. Déterminez aussi comment vous tiendrez un registre de chaque consentement que vous obtenez.

Bulletin du mois prochain : Sanctions
CVMA Membership — Return on Your Investment
Petro-Canada SuperPass™ Program

As a CVMA member, you are provided various benefits, products and services that support your personal and business needs. In many instances, the savings enjoyed more than cover the cost of your annual membership fee.

Your CVMA membership provides an opportunity for you to receive fuel and service discounts through the Petro-Canada SuperPass™ Program.

WHAT is the CVMA Petro-Canada SuperPass™ Program?
The CVMA Petro-Canada SuperPass™ is a credit card program providing CVMA members with fuel and services discounts that save you money. The program also provides access to a customized online account management service to help you better manage and control expenses.

WHO can benefit from the CVMA Petro-Canada SuperPass™ Program?
CVMA members with a registered business or company, be it a corporation, individual proprietorship or partnership, can enroll in this program. No matter how small or large your business is, or whether you have one vehicle or 5 credit cards issued to your account, by enrolling and signing up for a Petro-Canada SuperPass™ credit card through the CVMA program, you can optimize savings and control expenses.

Veterinarians operating a mobile practice or performing farm calls will especially benefit from the fuel and services rebates. As a business owner/partner, you will appreciate the convenience, control and security the program provides.

HOW can this service help you?
With this program, CVMA members will benefit from:

Significant savings
• Discount of 2.0 cents per litre on purchases of all types of gasoline and diesel at any Petro-Canada location in Canada, with a minimum purchase of 400 litres/month;
• Discount of 20% on car wash at Petro-Canada retail service stations.

Convenience
• User friendly SuperPass™ Program Online Service gives you 24-hour access to complete transaction activity;
• Flexible payment options let you decide how you want to pay (online, by phone, automatic bank withdrawal, electronic fund transfer or by mail);

À titre de membre de l’ACMV, vous avez droit à beaucoup d’avantages, de produits et de services qui appuient vos besoins personnels et professionnels en tant que professionnel vétérinaire. Dans beaucoup de cas, les économies dépassent amplement le coût de votre cotisation annuelle.

Votre adhésion à l’ACMV vous offre l’occasion de recevoir des rabais sur le carburant et les services dans le cadre du Programme SuperPassMC de Petro-Canada.

EN QUOI CONSISTE le Programme SuperPassMC de Petro-Canada de l’ACMV?
Le Programme SuperPassMC de Petro-Canada est un programme de carte de crédit offrant aux membres de l’ACMV des rabais sur le carburant et les services afin de vous permettre de réaliser des économies. Le programme permet aussi d’accéder à un service de gestion de compte en ligne conçu sur mesure pour vous faciliter la gestion et le contrôle de vos dépenses.

QUI peut profiter du Programme SuperPassMC de Petro-Canada de l’ACMV?
Les membres de l’ACMV avec une entreprise enregistrée, qu’il s’agisse d’une société, d’une entreprise à propriétaire unique ou d’un partenariat, peuvent s’inscrire à ce programme. Peu importe la taille de votre entreprise, ou que vous ayez un véhicule ou cinq cartes de crédit émises à votre compte, en vous inscrivant pour une carte de crédit SuperPassMC de Petro-Canada dans le cadre du programme de l’ACMV, vous pouvez optimiser les économies et contrôler vos dépenses.

Les vétérinaires qui exploitent une pratique mobile ou effectuent des visites à la ferme profiteront spécialement des rabais sur le carburant et les services. En tant que propriétaire ou associé d’une entreprise, vous apprécierez la commodité, le contrôle et la sécurité qu’offre le programme.

COMMENT ce service peut-il vous être utile?
Grâce à ce programme, les membres de l’ACMV profiteront des avantages suivants :

Économies importantes
• Rabais de 2 cents le litre à l’achat de tous les types d’essence et de diesel à toutes les stations Petro-Canada au Canada, avec un achat minimum de 400 litres/mois;
• Rabais de 20 % sur le lave-auto dans les stations-service Petro-Canada.

Commodité
• Le service en ligne convivial du Programme SuperPassMC vous offre un accès 24 heures par jour pour effectuer vos transactions;
• Des options de paiement flexibles vous permettent de décider comment effectuer le paiement (en ligne, par téléphone, retrait bancaire automatique, transfert électronique de fonds ou par courriel);
• Flexible billing options allow you to choose how you want to receive your statement (by Internet, mail or fax), and when you want to receive it (weekly or monthly).

Control and Security
• Receive detailed monthly reports with a record of all transactions, purchase locations and dates;
• Customize, restrict access, and limit purchases on your cards;
• Petro-Canada SuperPass™ Program credit cards are individually numbered with a distinct PIN.

WHERE can you access this service?
To request a Petro-Canada SuperPass™ credit card application linked to the CVMA member account, or for more information, contact the CVMA Member Services Directorate at 1-800-567-2862 or at (admin@cvma-acmv.org).

2014 CVMA Awards

Last Call! Nominations Close January 31, 2014
Each year, through CVMA’s national veterinary awards program, veterinarians are honored for their exceptional contributions to veterinary medicine. All CVMA members are encouraged to nominate deserving colleagues for their hard work and dedication to the profession.

CVMA Awards will be presented during the CVMA Convention, which takes place in St. John’s, Newfoundland and Labrador, from July 9–12, 2014. Nominations will be accepted until January 31, 2014 for the following awards:

CVMA Humane Award (Sponsored by Merck Animal Health)
Merck Veterinary Award (Sponsored by Merck Animal Health)
Small Animal Practitioner Award
(Sponsored by Petsecure Pet Health Insurance)
CVMA Industry Award
CVMA Life Membership
CVMA Honorary Membership
CVMA Practice of the Year Award

Nomination packages should be submitted by January 31, 2014 via e-mail (communications@cvma-acmv.org), by fax (613-236-9681), or by mail to the CVMA office, 339 Booth Street, Ottawa, ON K1R 7K1. Nomination packages must include a completed nomination form, a written description of the nominee’s work and supporting documents.

For additional information, including full descriptions of each award, nomination forms, and a listing of past award recipients, please visit the CVMA Awards and Honors section of the CVMA website (www.canadianveterinarians.net).

Des options de facturation flexibles vous permettent de choisir comment vous recevrez votre relevé de compte (par Internet, par la poste ou par télécopieur) et à quel moment vous désirez le recevoir (facture hebdomadaire ou mensuelle).

Contrôle et sécurité
• Recevez des rapports mensuels détaillés avec un registre de toutes vos transactions ainsi que l’emplacement et la date de tous les achats;
• Établissez des paramètres et limiterez l’accès et les achats sur vos cartes;
• Les cartes de crédit du Programme Petro-Canada SuperPass™MC sont numérotées individuellement avec un NIP distinct.

Où pouvez-vous accéder à ce service?
Pour obtenir un formulaire de demande de carte de crédit Petro-Canada SuperPass™MC reliée à votre compte de membre de l’ACMV ou pour en savoir davantage, communiquez avec la Direction des Services aux membres de l’ACMV au 1-800-567-2862 ou à (admin@cvma-acmv.org).

Prix 2014 de l’ACMV

Dernier avis! Les mises en candidature se terminent le 31 janvier 2014
Chaque année, dans le cadre du programme des Prix vétérinaires nationaux de l’ACMV, des vétérinaires sont honorés pour leurs contributions exceptionnelles à la médecine vétérinaire. Tous les membres de l’ACMV sont encouragés à mettre en candidature des collègues méritants pour leur travail ardu et leur dévouement envers la profession.

Les Prix de l’ACMV seront décernés durant le congrès de l’ACMV, qui se déroulera du 9 au 12 juillet 2014 à St. John’s, à Terre-Neuve-et-Labrador. Des mises en candidature seront acceptées jusqu’au 31 janvier 2014 pour les prix suivants:

Prix humanitaire de l’ACMV
(Commandité par Merck Santé Animale)
Prix vétérinaire Merck (Commandité par Merck Santé Animale)
Prix du praticien des petits animaux
(Commandité par Petsecure assurance maladie pour animaux)
Prix de l’industrie de l’ACMV
Membre à vie de l’ACMV
Membre honoraire de l’ACMV

Les trousses de mise en candidature doivent être soumises d’ici le 31 janvier 2014 par courriel à (communications@cvma-acmv.org), par télécopieur (613-236-9681) ou par la poste au Bureau de l’ACMV, 339, rue Booth, Ottawa (Ontario) K1R 7K1. Les trousses de mise en candidature doivent inclure un formulaire de mise en candidature rempli, une description écrite du travail du candidat et des documents à l’appui.

Pour obtenir des renseignements supplémentaires, y compris des descriptions complètes de chaque prix, des formulaires de mise en candidature et une liste des récipiendaire antérieurs, veuillez visiter la section des Prix et distinctions de l’ACMV sur le site Web de l’ACMV (www.veterinairesaucanada.net).
Veterinary Practice Team Resources from the Pet Nutrition Alliance

As a member of Pet Nutrition Alliance, the Canadian Veterinary Medical Association is pleased to inform CVMA members that you and your clients have access to a number of free online pet nutrition materials. Visit the website (petnutritionalliance.org) to discover the tools and resources available for veterinary professionals and pet owners. To help you navigate through the many tools available, we asked the members of the CVMA Communications Advisory Group to describe their favorite Veterinary Practice Team Nutrition Tools. This month, we’re featuring the top 3 tools selected by Dr. Jayne Takahashi, vice-president of Communications at Associate Veterinary Clinics:

Nutrition calculators & charts
One of the greatest challenges with nutrition discussions is to provide a thorough review of the pet’s current feeding program and compare this with the optimal plan for the pet in an efficient manner. The “Nutrition Calculators and Charts” provides tools for a quick calculation of daily energy requirements, a detailed and unique comparison of pet to human weight equivalents and a guaranteed analysis converter that allows for accurate comparisons of diets. Together, these resources set the foundation for dietary recommendations that are made during a veterinary consultation appointment.

Training for veterinary practice managers
This section is filled with practical tips, guidelines and examples on how the entire veterinary team can engage clients in effective discussions about pet nutrition. Each of the subsections can easily become a continuing education focus for staff meetings or become a monthly program for hospital team training. A great place to start would be from the client’s perspective as presented in the article “What I Wish My Veterinarian Would Have Told Me.” Several articles on specific communication skills and approaches to dialogue will help one to make specific dietary recommendations to create a successful nutrition centre. Equally

En tant que membre de la Pet Nutrition Alliance, l’Association canadienne des médecins vétérinaires est heureuse d’informer les membres de l’ACMV que vous et vos clients avez accès à plusieurs documents sur la nutrition des animaux de compagnie qui sont offerts gratuitement en ligne. Visitez le petnutritionalliance.org pour découvrir les outils et les ressources qui se trouvent à la disposition des professionnels vétérinaires et des propriétaires d’animaux. Pour vous aider à naviguer les nombreux outils offerts, nous avons demandé aux membres du Groupe consultatif des communications de l’ACMV de décrire leurs outils nutritionnels préférés pour l’équipe de la pratique vétérinaire. Ce mois-ci, nous présentons les trois outils choisis par la Dr. Jayne Takahashi, vice-présidente des communications chez Associate Veterinary Clinics :

Calculatrices et tableaux sur la nutrition
L’un des plus grands défis des discussions sur la nutrition consiste à présenter un examen complet du programme d’alimentation actuel de l’animal et à le comparer de manière efficace avec un plan optimal. Les calculatrices et les tableaux sur la nutrition (Nutrition Calculators and Charts) fournissent des outils qui permettent d’effectuer rapidement le calcul des besoins caloriques quotidiens, une comparaison détaillée et unique du poids équivalent chez les humains et les animaux et un convertisseur d’analyse garanti qui donne une comparaison exacte des diètes. Ensemble, ces ressources servent de fondement aux recommandations alimentaires qui sont présentées durant une consultation vétérinaire.

Formation pour les gestionnaires de la pratique vétérinaire
Cette section contient une foule de conseils pratiques, de lignes directrices et d’exemples sur la façon dont toute l’équipe vétérinaire peut engager des discussions efficaces avec les clients sur la nutrition des animaux de compagnie. Chacune des sous-sections peut facilement devenir un sujet de formation continue pour les réunions du personnel ou servir de programme mensuel de formation de l’équipe de la clinique. Pour commencer, le point de vue du client, tel qu’il est présenté dans l’article «What I Wish My Veterinarian Would Have Told Me» («Ce que j’aurais voulu que mon vétérinaire me dise»), représente une excellente introduction. Plusieurs articles sur les compétences particulières en communication et les approches face au dialogue vous aideront à présenter des recommandations alimentaires et à créer un centre de nutrition prospère. Les suggestions sur la
important are suggestions on how to monitor your efforts and track your progress.

**Nutritional needs for specific diseases**

For many of our medical cases, dietary modification is a necessary element in our treatment plan. This section includes an online library of nutritional articles for dogs and cats with medical conditions authored by veterinary nutritionist Dr. Rebecca L. Remillard, as well as feeding guides for hospitalized dogs and cats from The World Small Animal Veterinary Association. For clients who are used to seeking information on “Dr. Google,” an innovative and reliable website on veterinary medical conditions, “Partners in Animal Health” presented by Cornell University College of Veterinary Medicine, can be viewed in this resource section. Client information handouts prepared by the University of California, Davis are also available for your practice.

**Besoins nutritionnels pour les maladies particulières**

Pour beaucoup de nos cas médicaux, la modification de la diète est un élément nécessaire de notre régime de traitement. Cette section comprend une bibliothèque en ligne d’articles sur la nutrition des chiens et des chats atteints d’affections médicales qui ont été rédigés par une nutritionniste vétérinaire, la Dr Rebecca L. Remillard, ainsi que des guides d’alimentation pour les chiens et les chats hospitalisés qui ont été préparés par la WSAVA. Pour les clients qui ont l’habitude de solliciter des renseignements auprès du «Dr Google», un site Web innovateur et fiable portant sur les affections médicales vétérinaires, «Partners in Animal Health», qui est présenté par le Collège de médecine vétérinaire de l’Université Cornell, peut être visualisé dans cette section des ressources. Des feuillets d’information à l’intention des clients préparés par l’Université de Californie Davis sont aussi offerts pour votre pratique.

2014 CVMA Convention

“A New Discovery Down Every Lane”

The City of Legends, St. John’s, Newfoundland and Labrador, awaits you on July 9–12, 2014 as the destination for the Canadian Veterinary Medical Association’s (CVMA) annual convention, presented in partnership with the Canadian Association of Animal Health Technologists and Technicians (CAAHTT).

With a combination of big city luxury and small town charm, St. John’s is North America’s oldest port and has seen over 500 years of explorers and pirates. Downtown St. John’s is reminiscent of San Francisco (minus the cable cars) and is renowned for its brightly colored Victorian townhouses. Because of their vibrant colors, the houses are known affectionately as “Jellybean Row” and are one of the biggest stars of the hit CBC TV series Republic of Doyle.

Non-Newfoundlanders (known to Newfoundlanders as a “come from away” or “mainlander”) can get “screeched in,” which involves a shot of screech, a short recitation and the kiss-
ing of the cod. The lively George Street entertainment district, the site of the 2014 social evening, will offer this authentic experience for all willing convention delegates.

As a destination, Newfoundland and Labrador has much to offer — watching whales and icebergs from a sea kayak, biking the Irish loop, hiking coastal trails or relaxing at a spa by the sea.

But the most important reason to be in St. John’s next summer is to experience the top-notch continuing education (CE) and networking opportunities. CVMA’s Professional Development Committee, with the leadership of scientific coordinator, Dr. Jeanne Loftstedt, has been working diligently planning an enriching educational program. The 2014 local Chair, Dr. Heather Hillier, is looking forward to welcoming delegates to St. John’s and sharing the authentic kitchen party experience — the iconic image of the Newfoundland lifestyle.

Experience this unique 4-day convention, which features a strong scientific program including 34 speakers from Canada and the United States. With sessions focusing on small animal, equine, bovine and ruminant medicine, in addition to animal welfare and business management issues, there is something of interest for everyone. Additional CE credits can be earned during specialized workshops, including a Level 2 dental lab and an orthopedic lab (additional fee will apply).

Dr. Brook Niemiec from Southern California Veterinary Dental Specialties in San Diego, and Dr. Sue McTaggart, Fellow of the Academy of Veterinary Dentistry, will be presenting a Level 2 Dental Wet Lab on Wednesday, July 9. A lecture will share techniques for making difficult dental extractions easier in dogs and cats and will be followed by a wet lab for participants to practise these techniques. A 2nd lecture will cover radiographic positioning and interpretation in dogs and cats, followed by a wet lab for hands-on practise. Instrument sharpening and care instruction will also be shown and discussed. Dr. McTaggart presented a similar wet lab during the 2013 CVMA Convention, which sold out and was highly rated by participants.

Also on July 9, Dr. Thomas Gibson and Dr. Ameet Singh, assistant professors in the Department of Small Animal Surgery at the Ontario Veterinary College, will present an orthopedic lab concentrating on the “Basic Fracture Fixation Principals Using faire assermer aux techniques de réparation des fractures avec des plaques et des vis et la prise de décisions ainsi que des laboratoires de

Le D’ Brook Niemiec, de Southern California Veterinary Dental Specialties à San Diego, et la D’re Sue McTaggart, fellow de l’Academy of Veterinary Dentistry, présenteront un atelier de travaux pratiques sur les soins dentaires de niveau 2 le mercredi 9 juillet. Une conférence communiquera des techniques afin de faciliter les extractions dentaires difficiles chez les chiens et les chats et elle sera suivie d’un laboratoire de travaux pratiques qui permettra aux participants d’exercer ces techniques. Une deuxième conférence portera sur le positionnement radiographique et l’interprétation chez les chiens et les chats, suivie d’un laboratoire pour mettre en pratique les notions apprises. On présentera et discutera aussi l’affûtage des instruments et les instructions d’entretien. La D’re McTaggart a présenté un laboratoire de travaux pratiques semblable durant le congrès 2013 de l’ACMV, qui a fait salle comble et a été extrêmement apprécié par les participants.

Aussi le 9 juillet, le D’ Thomas Gibson et le D’ Ameet Singh, professeurs adjoints au Département de chirurgie des petits animaux de l’Ontario Veterinary College, présenteront un laboratoire en orthopédie qui portera sur les «Principes de base de la fixation des fractures à l’aide d’os palatins». Ce laboratoire d’orthopédie est une introduction à la fixation des fractures internes simples à l’aide de plaques et de vis. On présentera une combinaison de conférences sur la biomécanique des fractures, les principes de la réparation des fractures avec des plaques et des vis et la prise de décisions ainsi que des laboratoires de
Palatinate Bones.” This orthopedic lab is an introduction to basic internal fracture fixation using plate and screws. A combination of lectures on fracture biomechanics, principles of fracture repair with plate and screws and decision-making, with a hands-on lab experience using plastic models to practise the techniques discussed and gain familiarity with the equipment necessary for successful internal fracture repair.

Find out more about these sessions and more in the 2014 CVMA Convention brochure, which was provided with your December 2013 issue of The CVJ and can also be viewed online in the Events section of CVMA’s website (www.canadianveterinarians.net). Online registration for the 2014 CVMA Convention opens in mid-February.

**Antimicrobial Decision-making App**

An antimicrobial decision-making tool for urinary tract infections (UTIs) in cats and dogs will soon be available for CVMA members. Developed for use on smartphones and tablets, this app will guide companion animal practitioners through diagnostic steps and appropriate antimicrobial therapy for simple and complicated UTIs.

**Une application pour le choix des antimicrobiens**

Un outil de prise de décisions sur le choix des antimicrobiens pour les infections des voies urinaires (IVU) chez les chats et les chiens sera disponible à l’hiver pour les membres de l’ACMV. Développée pour utilisation avec les téléphones intelligents et les tablettes, cette application guidera les praticiens pour animaux de compagnie lors d’un cheminement d’étapes diagnostiques afin de déterminer une thérapie antimicrobienne appropriée pour les IVU simples et compliquées.

**Obituary**

**Dr. Bruce Gordon Watson**

**August 30, 1931 – November 11, 2013**

The Alberta Veterinary Medical Association (ABVMA) regretfully announces the passing of long time ABVMA member Dr. Bruce Watson. Dr. Watson passed away peacefully at the AGAPE Hospice on Monday, November 11, 2013 at the age of 82 years.

Dr. Watson graduated from the Ontario Veterinary College in 1955 and became a registered member of the ABVMA that same year. He was a 35-year active registered member of the Association.

**Nécrologie**

**Dr. Bruce Gordon Watson**

**30 août 1931 – 11 novembre 2013**

C’est avec regret que l’Alberta Veterinary Medical Association (ABVMA) annonce le décès du membre de longue date de l’ABVMA, le Dr Bruce Watson. Le Dr Watson est mort paisiblement à l’hospice AGAPE le lundi 11 novembre 2013, à l’âge de 82 ans.

Le Dr Watson avait obtenu son diplôme de l’Ontario Veterinary College en 1955 et était devenu un membre en règle de l’ABVMA cette même année. Il était un membre actif de l’Association depuis 35 ans.
150th Anniversary of the World Veterinary Association

The 31st World Veterinary Congress (WVC) took place in Prague (Czech Republic) from 17 to 20 September, 2013. This year, the WVC was marked by the World Veterinary Association’s 150 years Anniversary celebrations. Over 1350 delegates from 75 countries attended the WVC 2013.

The scientific program included 11 parallel sessions covering every veterinary discipline; from companion to exotic animals, from well-being of animals to well-being of veterinarians.

A 2-day Global Veterinary Seminar on Animal Welfare brought together specialists from different world regions to discuss the different aspects of Animal Welfare. On that occasion, the WVA signed a Memorandum of Understanding with The World Society for the Protection of Animals (WSPA) to promote animal welfare globally via agreed specific goals and actions.

This year, the WVA-WHO-OIE-FAO 2nd Global Summit focused on strengthening institutional collaboration and cooperation between animal and public health in education and research.

During the WVC 2013, the WVA held its own Presidents’ Assembly. The main issue on the agenda was the vote on the proposal to change the WVA Constitution and By-laws with the aim to broaden membership, improve members’ involvement, and enhance dynamics and decision-making. After in-depth presentations and discussions on the proposal, it was adopted with 100% of the votes in favor.

On the occasion of the WVA 150th Anniversary celebration, the WVA presented the John Gamgee Award to James Harlan Steele (USA), Milton Thiago de Mello (Brazil) and to Bernard Vallat (France) in recognition of their outstanding and exemplary services to veterinary science and to the veterinary profession.

The WVC 2013 was concluded by a presentation from the Turkish Veterinary Medical Association, the organizers of the 32nd WVC to take place in September 2015 in Istanbul, Turkey.

150º anniversaire de l’Association mondiale vétérinaire

Le 31ᵉ Congrès mondial vétérinaire (CMV) s’est déroulé à Prague (République tchèque) du 17 au 20 septembre 2013. Cette année, le CMV a célébré le 150ᵉ anniversaire de l’Association mondiale vétérinaire. Plus de 1350 délégués provenant de 75 pays ont assisté au CMV 2013.

Le programme scientifique incluait 11 ateliers parallèles portant sur toutes les disciplines vétérinaires : des animaux de compagnie aux animaux exotiques, en passant par le bien-être des animaux et le bien-être des vétérinaires.

Un Colloque vétérinaire mondial de deux jours sur le bien-être des animaux a réuni des spécialistes des différentes régions du monde pour discuter les différents aspects du bien-être des animaux. À cette occasion, le CMV a signé un Protocole d’entente avec la World Society for the Protection of Animals (WSPA) afin de promouvoir le bien-être animal à l’échelle mondiale en mettant en œuvre les buts et les actions spécifiques faisant l’objet de l’entente.

Cette année, le 2ᵉ Sommet mondial CMV-OMS-OIE-FAO a porté sur le renforcement de la collaboration et de la coopération des institutions de santé animale et de santé publique dans le domaine de l’éducation et de la recherche.

Durant le CMV 2013, l’AMV a tenu sa propre assemblée des présidents. L’enjeu principal au programme était le vote sur la proposition visant à modifier la Constitution et les règlements administratifs de l’AMV dans le but d’élargir l’effectif, d’améliorer la participation des membres et de renforcer la dynamique et la prise de décisions. Après des présentations et des discussions approfondies sur la proposition, elle a été adoptée à l’unanimité.

À l’occasion des célébrations du 150ᵉ anniversaire de l’AMV, l’AMV a décerné le Prix John Gamgee à James Harlan Steele (États-Unis), à Milton Thiago de Mello (Brésil) et à Bernard Vallat (France) en reconnaissance de leurs services exceptionnels et exemplaires à la science vétérinaire et à la profession vétérinaire.

Le CMV 2013 s’est terminé par une présentation de l’Association des médecins vétérinaires de Turquie, les organisateurs du 32ᵉ CMV qui se déroulera en septembre 2015 à Istanbul, en Turquie.
Around the Provinces
Nova Scotia Veterinary Medical Association

As I sit in my living room considering the contents to be included in this article the effects of tropical storm Gabrielle are manifesting themselves — 50 to 70 mm of rain is being dumped across the province. The weather arouses a storm within me. I try to decide whether I should consult my old hardcover copy of *Eats, Shoots and Leaves* before delving into this project. The reason of course is to brush up on my grammar before being judged by my peers. Nah — that’s what editors are for!

I am writing this article, which is due to be completed by October 6th for publication in the January issue of *The CVJ*. Between October and December an important event will occur — our AGM.

The Annual General Meeting of the Nova Scotia Veterinary Medical Association (NSVMA) will have occurred on Saturday November 23. The events of the day consist of a Continuing Education session bringing together 2 speakers, Dr. Terry Whiting and Dr. Carolyn Thomson. They will discuss the many challenges faced by veterinarians (mental health for example) and the Professional Support Program (PSP), to which members of the NSVMA and Nova Scotia students at the Atlantic Veterinary College (AVC) have access. The PSP provides confidential support to those who are facing personal and/or professional challenges faced by veterinarians (mental health for example) and the Professional Support Program (PSP), to which members of the NSVMA and Nova Scotia students at the Atlantic Veterinary College (AVC) have access. The PSP provides confidential support to those who are facing personal and/or professional difficulties. Council will also meet with Dean Don Reynolds of the Atlantic Veterinary College (AVC) to discuss matters important to veterinarians and the AVC, and to continue to build upon the positive relationships already formed.

The largest number of new members (24) in recent memory has joined the NSVMA this year and all are expected to attend the AGM. A new initiative has been developed for the new members; an orientation session will highlight the different aspects of the Association. The goals are to make new members aware of the benefits to which they are entitled, to introduce them to the various committees, and to encourage them to become active within the Association. Following the AGM there will be a dinner, a charity auction ($2700 was raised last year for the Heart and Stroke Foundation), and musical entertainment. The NSVMA AGM is not only an important event where issues are discussed and resolved but it brings together veterinarians from across the province to learn together, network, and to have a good time.

---

Le tour des provinces
Nova Scotia Veterinary Medical Association

Tandis que je suis assis dans mon salon en considérant le contenu à inclure dans le présent article, les effets de la tempête tropicale Gabrielle se manifestent — et il tombe de 50 à 70 mm de pluie dans la province. Je sens un orage qui monte en moi en raison de la tempête. Je tente de décider si je devrais consulter mon vieil exemplaire relié de *Eats, Shoots and Leaves* avant de me lancer dans ce projet. Bien entendu, la raison étant de me rafraîchir la mémoire sur les règles grammaticales avant d’être jugé par mes pairs. Eh bien tant pis! Voilà pourquoi nous avons des réviseurs!

J’écris le présent article, qui doit être achevé d’ici le 6 octobre aux fins de publication dans le numéro de janvier de *La RVC*, et, entre octobre et décembre, un événement important aura lieu — notre AGA.

L’Assemblée générale annuelle de la Nova Scotia Veterinary Medical Association (NSVMA) aura eu lieu le samedi 23 novembre. Les événements de la journée comprennent un atelier de formation continue qui présentera deux conférenciers, le Dr Terry Whiting et la Dr Carolyn Thomson. Ils discuteront les nombreux défis que doivent relever les vétérinaires (par exemple, la santé mentale) et le Programme de soutien professionnel (PSP), auquel ont accès les membres de la NSVMA et les étudiants de la Nouvelle-Écosse à l’Atlantic Veterinary College (AVC). Le PSP procure un soutien confidentiel à ceux qui vivent des difficultés personnelles et/ou professionnelles. Le Conseil rencontrera aussi le doyen Don Reynolds de l’Atlantic Veterinary College (AVC) pour discuter des questions d’importance pour les vétérinaires et l’AVC et pour continuer de miser sur nos relations positives.

Cette année, nous avons observé le plus grand nombre de nouvelles adhésions de mémoire récente (24) et nous prévoyons que ces nouveaux membres assisteront tous à l’AGA. Une nouvelle initiative a été développée pour les nouveaux membres : c’est une séance d’orientation qui soulignera les divers aspects de l’Association. Les buts consistent à informer les nouveaux membres à propos des avantages auxquels ils ont droit, de leur présenter les divers comités et de les encourager à participer activement à l’Association. Après l’AGA, il ya aura un dîner, un encan de bienfaisance (2700 $ ont été recueillis l’an dernier pour la Fondation des maladies du cœur) et un spectacle musical. L’AGA de la NSVMA n’est pas seulement un événement important où les enjeux sont discutés et résolus, mais elle réunit aussi tous les vétérinaires des diverses régions de la province pour qu’ils apprennent, réseautent et s’amusent ensemble.

Un nouveau Comité des prix a été formé. Trois prix seront désormais décernés annuellement lors de l’AGA afin de reconnaitre les vétérinaires dans les catégories suivantes :

1. *Prix du jeune vétérinaire* — ce prix sera décerné à un diplômé récent (qui a obtenu son diplôme au cours des dix dernières années) qui a apporté des contributions exceptionnelles à la profession vétérinaire et/ou à la collectivité.
2. *Prix de mérite* — Ce prix sera décerné à un vétérinaire ou à un membre de la collectivité qui a fait des contributions...
A new Awards Committee has been formed. Three awards will be given out annually at the AGM in recognition of veterinarians under the following categories:

1. **Young Veterinarian Award** — This will be presented to a recent graduate (graduated within the past 10 years) who has made outstanding contributions to the veterinary profession and/or the community.

2. **Award of Merit** — This will be presented to a veterinarian or a member of the community who has made significant contributions to the veterinary profession, the NSVMA, and the well-being of animals.

3. **Veterinary Medicine Leadership Award** — To be awarded to a veterinarian who has a strong career of achievement and dedication to the profession. This is the highest award presented by the NSVMA.

We are close to the completion of a 6-year project — The Veterinary Technologists Regulations. Once the Veterinary Technologists Regulations are in place, Registered Veterinary Technologists (RVTs) will be members of the NSVMA and will have the privileges that all NSVMA members have. The regulations describe duties that RVTs can perform under various degrees of supervision and makes RVTs accountable for their actions. The regulations also give RVTs title protection.

In response to a complaint generated by a veterinary clinic selling prescription flea/deworming medications over the counter to a member of the public without a valid Veterinary Client Patient Relationship (VCPR), the NSVMA produced a reminder letter to all veterinary hospitals/clinics and veterinarians that a valid VCPR must exist in order to sell prescription products. This generated negative feedback by the public and some veterinarians. At present I believe most parties involved understand that veterinarians are unique in that as members of a self-regulating body, we can diagnose, prescribe and dispense medications. This is a privilege, not a right. We are serving both the interests of the public as well as our own self-interest by adhering to the VCPR legislation in place.

The NSVMA is very disappointed that the Canadian Food Inspection Agency (CFIA) is ending its role in dealing with potential rabies cases, quarantining and testing of suspect animals. This may result in increased Post Exposure Prophylactic (PEP) rabies vaccines by Health Canada where it may not be needed. The NSVMA is continuing to work on how to solve this problem. We are currently assessing the level of interest of private practitioners to take on this important role.

Finally, the NSVMA is encouraged by the high level of agreement by other veterinary medical associations (VMAs) that a collaboration facilitated by the CVMA is beneficial to all VMAs and veterinarians nationwide. Collaboration will prevent redundancy in the development of position statements and will result in the development of one credible voice nationally and internationally benefitting both the profession and the public.

(submitted by Dr. Rob Doucette, President, Nova Scotia Veterinary Medical Association)
The use of medetomidine-based sedation protocols to perform urohydropropulsion and cystoscopy in the dog

Jinelle A. Webb, Monica Rosati, Dinaz Z. Naigamwalla, Alice Defarges

Abstract — Voiding urohydropropulsion and cystoscopy are routine procedures performed in the dog for diagnostic and therapeutic purposes. These procedures are typically performed under general anesthesia. The purpose of this study was to describe the use of medetomidine-based sedation protocols to perform voiding urohydropropulsion and cystoscopy in cardiovascularly healthy, non-diabetic dogs without evidence of urinary obstruction, renal disease, or hepatic disease. Results of this study revealed significantly shorter procedure times and decreased cost in sedated dogs, with diagnostic and therapeutic outcomes equivalent to those of patients that underwent general anesthesia. Based on the results of this retrospective study, the authors recommend medetomidine-based sedation protocols for voiding urohydropropulsion and cystoscopy in appropriately selected patients.


Introduction

Voiding urohydropropulsion is a non-invasive method for removing small urocystoliths from the dog, most commonly used in females due to the relatively wider and shorter urethra. Cystoscopy, both rigid and flexible, can be performed in male and female dogs for visualization of the lower urinary tract, procurement of samples, and removal of material. These procedures are typically performed under general anesthesia to allow complete relaxation of the urethra; however, general anesthesia results in longer procedure times and in the case of voiding urohydropropulsion, difficult endotracheal tube stabilization due to the vertical positioning of animals (Figure 1) (1–4). Extra staff members are also required to assist with endotracheal tube stabilization for voiding urohydropropulsion. Additional disadvantages to general anesthesia include the requirement for a properly set-up anesthetic machine, the use of inhalant anesthesia, the need for a patent airway and associated complications, an obtunded sympathetic nervous system, marked respiratory depression, loss of swallow reflex, increased inhalant required for adequate relaxation due to inhalant’s lack of analgesic properties, the production of hazardous exhaled waste gases, and increased cost to the client compared to sedation protocols (5). Sedation avoids disadvantages specific to general anesthesia; however, the use of a sedation protocol for voiding urohydropropulsion requires adequate relaxation of the urethra along with immobilization of the patient. A protocol that resulted in profound sedation would be required, such as one incorporating medetomidine. This degree of sedation requires monitoring similar to that for general anesthesia, including continuous electrocardiography, oscillometric non-invasive blood pressure measurement,
and pulse oximetry. As the use of profound sedation can result in compromised respiratory function, flow-by oxygen supplementation is recommended, along with intravenous access and immediately available supplies to facilitate rapid intubation in the event that respiratory compromise occurs and intubation is required.

Medetomidine, an alpha-2 adrenergic agonist, has been used intramuscularly (IM) and intravenously (IV) to provide moderate to profound sedation and analgesia in dogs, typically in combination with other agents such as opioids and ketamine (6–8). Common uses include the sedation of patients for examination and minor procedures, particularly if they are fractious or aggressive, and as part of a preanesthetic regimen due to anesthetic sparing properties (7). Urodynamic testing has indicated that medetomidine causes a decrease in maximal urethral closure pressure, suggesting a relaxation of the urethra that may facilitate voiding urohydropropulsion and cystoscopy (9). Contraindications to its use include patients with respiratory disease, hepatic and renal disease including urinary obstruction, cardiovascularly unstable patients, specific endocrinopathies such as diabetes mellitus and hyperthyroidism, geriatric patients due to their lack of cardiovascular reserve, and pediatric patients due to their immature sympathetic nervous system (6,8,10). Adverse effects include baroreceptor-mediated bradycardia, atrioventricular blocks, intermittent hypertension, depressed respiration, hyperthermia, increased urination, vomiting, and hyperglycemia due to decreased pancreatic release of insulin; rarely, prolonged sedation, paradoxical excitation, hypersensitivity, apnea, and death due to circulatory failure can occur (6–8,10).

The purpose of this study was to determine if medetomidine-based sedation protocols could be used to perform voiding urohydropropulsion and cystoscopy in the dog, with similar success rates in diagnostic and therapeutic goals when compared to anesthetized patients.

**Materials and methods**

**Criteria for patient selection**

Dogs that were presented to the Mississauga-Oakville Veterinary Emergency Hospital for voiding urohydropropulsion or cystoscopy were assessed by a board-certified anesthesiologist for suitability to receive medetomidine and for inclusion in this study; an American Society of Anesthesiologists (ASA) class was assigned to each case. Appropriate animals were cardiovascularly healthy, without evidence of renal disease (including urinary obstruction), hepatic disease, or diabetes, and were neither less than 12 wk nor considered geriatric for their breed. Cystoscopy was performed for several diagnostic and/or therapeutic reasons, including suspicion of ectopic ureters, assessment of lower urinary tract in cases of chronic urinary tract infection, and assessment of lower urinary tract masses. Informed consent was obtained from pet owners. Initially, a prospective study was planned; however, given the success of the medetomidine-based sedation protocols, retrospective cases were used for the general anesthesia control groups.

**Sedation protocol**

An intravenous catheter was placed and a combination of medetomidine (Domitor; Pfizer Canada, Mississauga, Ontario), 10 to 15 μg/kg body weight (BW), IV, and hydromorphone (Hydromorphone HP 10; Sandoz Canada, Quebec City, Quebec), 0.025 to 0.05 mg/kg BW, IV, or butorphanol (Torbegesic; Wyeth Animal Health, Guelph, Ontario), 0.2 mg/kg BW, IV, were administered, with the addition of ketamine (Ketalean; Bimeda-MTC Animal Health, Cambridge, Ontario), 2 mg/kg BW, IV, in fractious animals. The choice of sedation protocol was based on...
assessment of each animal by a board-certified anesthesiologist. Atipamezole (Antisedan; Pfizer Canada, Mississauga, Ontario) was administered IM as a reversal agent at a dose of 2 times the volume of medetomidine upon completion of the procedure. Supplemental flow-by oxygen at a rate of 1 to 2 L/min was provided. Monitoring included electrocardiography, oscillometric non-invasive blood pressure measurement, and pulse oximetry. Monitoring was performed and recorded by registered veterinary technicians under the supervision of a board-certified anesthesiologist, and included heart rate and rhythm, respiratory rate, blood pressure, oxygen saturation (SpO₂), and depth of sedation/anesthesia. The time of administration of sedation or time of induction into general anesthesia was recorded, and the time of administration of reversal agent or time of discontinuation of inhalant anesthesia was recorded; the interval between these times was considered the “procedure length.” Hospitalization time was recorded for each patient. The cost to the client of each procedure was recorded, including all requirements for sedation or anesthesia; additional costs such as procedural costs, diagnostic testing, and examination fees were excluded. Voiding urohydropropulsion and cystoscopy were performed as previously described (11). There were no alterations in the procedures performed in the sedated versus the anesthetized patients, other than the lack of stabilization of the endotracheal tube required for urohydropropulsion in sedated patients (Figure 2). Procedures were performed by 1 of 2 board-certified internal medicine specialists.

**Statistical analysis**

Statistical analysis was performed to determine significant differences in age, weight, cost of sedation/general anesthesia for procedures ("cost of restraint"), and procedure length between groups receiving general anesthesia and groups receiving sedation. Paired t-tests were employed to compare general anesthesia with sedation groups for both urohydropropulsion and cystoscopy. A P-value of < 0.05 indicated a statistically significant difference between groups.

**Results**

Thirteen dogs received medetomidine-based sedation protocols; 5 dogs had urohydropropulsion performed (Table 1, Figure 2), and 8 dogs had cystoscopy performed (Table 2, Figures 2, 3). Thirteen dogs that received general anesthesia were included as a control group; 5 dogs had urohydropropulsion performed (Table 3, Figure 1), and 8 dogs had cystoscopy (Table 4). No anesthetic or procedural complications were noted with any case. Dogs that received medetomidine-based sedation protocols for urohydropropulsion ranged in age from 2 to 9 y (average = 5.6 y), and ranged in weight from 7 to 18.3 kg (average = 10.6 kg). Dogs that received general anesthesia for urohydropropulsion ranged in age from 5 to 10 y (average = 7.2 y), and ranged in weight from 7.1 to 21.2 kg (average = 12.5 kg). Dogs that received medetomidine-based sedation protocols for cystoscopy ranged in age from 7 to 11 y (average = 8.4 y), and ranged in weight from 9.1 to 40.8 kg (average = 28.2 kg). Dogs that received general anesthesia for cystoscopy ranged in age from 0.5 to 12 y (average = 7.3 y), and ranged in weight from 4.2 to 36.6 kg (average = 20.1 kg). There was no significant difference in the age or weight between dogs in the treatment and control groups. All animals that received urohydropropulsion, regardless of use of sedation or general anesthesia, were spayed female dogs. Gender of animals that received cystoscopy is listed in Tables 2 and 4, and was similar between sedation and general anesthesia.

Procedure length for dogs receiving medetomidine-based sedation protocols for urohydropropulsion ranged from 6 to 25 min, with an average procedure length of 12.4 min. Procedure length
for dogs receiving general anesthesia for urohydropropulsion ranged from 44 to 78 min, with an average procedure length of 60.4 min. Procedure length for dogs receiving medetomidine-based sedation protocols for cystoscopy ranged from 10 to 45 min, with an average procedure length of 27.6 min. Procedure length for dogs receiving general anesthesia for cystoscopy ranged from 30 to 65 min, with an average procedure length of 49.4 min. There was a statistically significant difference in the procedure length between treatment and control groups, for both urohydropropulsion and cystoscopy. There was no relation between either age of dog or weight of dog and procedure length.

All urohydropropulsion procedures were performed by 1 internal medicine specialist. Of the 13 cystoscopy procedures, 9 were performed by 1 internal medicine specialist and 4 by the other. There was no relation between the internal medicine specialist performing the procedure and the length of the procedure.

Success of voiding urohydropropulsion was determined by assessment for residual urocystoliths via ultrasound examination and/or cystoscopy. In all dogs in both groups, removal of all urocystoliths was documented and therefore the procedures were considered completely successful. Success of cystoscopy was determined by assessment of diagnostic or therapeutic goals, including visualization of ectopic ureters, assessment of anatomy, and procurement of tissue for chronic urinary tract infection with supportive histopathology and culture, and visualization with procurement of diagnostic tissue for histopathology for urinary system masses (Tables 2, 4). In all dogs in both groups, diagnostic and/or therapeutic goals were considered completely successful.

Physiological parameters monitored during sedation were not significantly different from those measured in cases receiving general anesthesia, with the exception of heart rate. Medetomidine causes bradycardia with occasional atrioventricular blocking, which resulted in heart rates that were significantly lower in sedated patients compared with those receiving general anesthesia. There was no pain response noted in patients receiving

### Table 2. Summary of data for dogs that had cystoscopy performed under medetomidine-based sedation

<table>
<thead>
<tr>
<th>Signalment</th>
<th>Gender</th>
<th>Age (y)</th>
<th>Reason for cystoscopy</th>
<th>Weight (kg)</th>
<th>Duration of procedure (min)</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terrier cross</td>
<td>MN</td>
<td>1</td>
<td>Mass-like irregular UB wall and uroliths</td>
<td>9.1</td>
<td>40</td>
<td>Cystitis secondary to uroliths</td>
</tr>
<tr>
<td>Beagle</td>
<td>FS</td>
<td>7</td>
<td>Irregular UB wall and chronic UTI</td>
<td>22.8</td>
<td>30</td>
<td>Polypoid cystitis and <em>E. coli</em> infection</td>
</tr>
<tr>
<td>Collie cross</td>
<td>FS</td>
<td>7</td>
<td>Irregular UB wall and chronic UTI</td>
<td>34.7</td>
<td>24</td>
<td>Chronic cystitis and <em>E. coli</em> infection</td>
</tr>
<tr>
<td>Standard poodle</td>
<td>MN</td>
<td>8</td>
<td>Mass in UB</td>
<td>21.4</td>
<td>35</td>
<td>Transitional cell carcinoma</td>
</tr>
<tr>
<td>Australian shepherd</td>
<td>MI</td>
<td>9</td>
<td>Suspected mass in urethra</td>
<td>40.8</td>
<td>45</td>
<td>Transitional cell carcinoma</td>
</tr>
<tr>
<td>Golden retriever</td>
<td>MN</td>
<td>9</td>
<td>Irregular prostate</td>
<td>28.3</td>
<td>11.5</td>
<td>Transitional cell carcinoma</td>
</tr>
<tr>
<td>Portuguese water dog</td>
<td>MN</td>
<td>11</td>
<td>Chronic UTI</td>
<td>40.3</td>
<td>10</td>
<td>Malformed prepuce and penis</td>
</tr>
<tr>
<td>Wheaton terrier</td>
<td>FS</td>
<td>12</td>
<td>Mass in UB</td>
<td>17.4</td>
<td>25</td>
<td>Transitional cell carcinoma</td>
</tr>
<tr>
<td>Average</td>
<td>8</td>
<td>Average</td>
<td></td>
<td>26.9</td>
<td>27.6</td>
<td></td>
</tr>
</tbody>
</table>

MN — male, neutered; FS — female, spayed; MI — male, intact; UB — urinary bladder; UTI — urinary tract infection.

### Table 3. Summary of data for dogs that had urohydropropulsion performed under general anesthesia

<table>
<thead>
<tr>
<th>Signalment</th>
<th>Age (y)</th>
<th>Weight (kg)</th>
<th>Time of procedure (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bichon frisé</td>
<td>5</td>
<td>7.1</td>
<td>70</td>
</tr>
<tr>
<td>Bichon frisé</td>
<td>5</td>
<td>12.5</td>
<td>60</td>
</tr>
<tr>
<td>Springer spaniel</td>
<td>6</td>
<td>21.2</td>
<td>78</td>
</tr>
<tr>
<td>Miniature schnauzer</td>
<td>10</td>
<td>11.8</td>
<td>50</td>
</tr>
<tr>
<td>Miniature schnauzer</td>
<td>10</td>
<td>9.8</td>
<td>44</td>
</tr>
<tr>
<td>Average</td>
<td>7.2</td>
<td>12.5</td>
<td>60.4</td>
</tr>
</tbody>
</table>

Figure 3. A female dog positioned for cystoscopy after medetomidine-based sedation.
sedation protocols or general anesthesia protocols; all patients tolerated the procedure well.

Cost of restraint for procedures was determined by including all costs to clients related to sedation/general anesthesia, with the exclusion of all costs related to performing the procedure and submission of samples. Costs such as use of the endoscope and submission costs such as histopathology and bacterial culture were excluded. The cost of restraint for dogs receiving medetomidine-based sedation protocols for urohydropropulsion ranged from $274.70 to $406.20, with an average cost of $325.48. Cost of restraint for dogs receiving general anesthesia ranged from $350.15 to $579.45, with an average of $487.13. There was a statistically significant difference in the cost of restraint between treatment and control groups for both sedated animals and those receiving general anesthesia. In addition, review of files of patients that received general anesthesia revealed that they would have been acceptable candidates to receive medetomidine. There was a much larger discrepancy between the average procedure lengths for sedated and anesthetized dogs that had voiding urohydropropulsion performed, compared with those that had cystoscopy. It is the authors’ experience that the care required in endotracheal tube stabilization for voiding urohydropropulsion to reduce the risk of endotracheal-induced injury results in a much longer time positioning the patient prior to performing voiding urohydropropulsion. This extended time required in patient positioning is the probable reason for the significant increase in procedure length for voiding urohydropropulsion for anesthetized patients.

Most hospitals have higher fees for anesthetized patients compared with sedated patients. This is due to the requirement for premedication and induction agents, the on-going use of inhalant anesthetic, and additional equipment including an anesthetic machine and exhaust system. In addition, length of personnel time is increased as the procedure time is increased. Recovery times are shorter with medetomidine-based sedation protocols, and therefore personnel time is longer for animals receiving general anesthesia. All patients in this study were hospitalized for less than 12 h, and therefore hospitalization

<table>
<thead>
<tr>
<th>Signalment</th>
<th>Gender</th>
<th>Age (y)</th>
<th>Reason for cystoscopy</th>
<th>Weight (kg)</th>
<th>Duration of procedure (min)</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kuvasz</td>
<td>FI</td>
<td>0.5</td>
<td>Urinary incontinence</td>
<td>29.2</td>
<td>55</td>
<td>Ectopic ureters</td>
</tr>
<tr>
<td>Maltese</td>
<td>MN</td>
<td>5</td>
<td>Suspected intraluminal suture material</td>
<td>4.2</td>
<td>30</td>
<td>Confirmed intraluminal suture material</td>
</tr>
<tr>
<td>Bull terrier</td>
<td>FS</td>
<td>6</td>
<td>Chronic UTI</td>
<td>28.0</td>
<td>60</td>
<td>Chronic cystitis and Pseudomonas infection</td>
</tr>
<tr>
<td>German shepherd dog</td>
<td>FS</td>
<td>8</td>
<td>Stranguria</td>
<td>36.6</td>
<td>55</td>
<td>Proliferative urethritis</td>
</tr>
<tr>
<td>Kerry blue terrier</td>
<td>FS</td>
<td>8</td>
<td>Stranguria and hematuria</td>
<td>13.5</td>
<td>50</td>
<td>Proliferative urethritis</td>
</tr>
<tr>
<td>Wheaton terrier</td>
<td>FS</td>
<td>9</td>
<td>Mass in UB</td>
<td>19.4</td>
<td>40</td>
<td>Transitional cell carcinoma</td>
</tr>
<tr>
<td>Miniature schnauzer</td>
<td>MN</td>
<td>10</td>
<td>Irregular UB wall and chronic UTI</td>
<td>6.8</td>
<td>65</td>
<td>Chronic cystitis and E. coli infection</td>
</tr>
<tr>
<td>Collie</td>
<td>MN</td>
<td>12</td>
<td>Mass in UB</td>
<td>23.3</td>
<td>40</td>
<td>Transitional cell carcinoma</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td>7.3</td>
<td></td>
<td></td>
<td>20.1</td>
<td>49.4</td>
<td></td>
</tr>
</tbody>
</table>

MN — male, neutered; FS — female, spayed; MI — male, intact; UB — urinary bladder; UTI — urinary tract infection.

Discussion

Results of this study support the use of medetomidine-based sedation protocols for voiding urohydropropulsion and cystoscopy. The use of these protocols resulted in a shorter procedure time with decreased cost to the client, avoided the disadvantages and complications of general anesthesia, and had equivalent success in diagnostic or therapeutic goals. None of the patients receiving sedation or general anesthesia experienced any complications, and no patients showed evidence of pain during the procedure. Patient selection is important, and patients with cardiovascular instability, hepatic disease, renal disease or urinary tract obstruction, endocrine diseases such as diabetes mellitus, cardiac disease, or geriatric and pediatric patients, should not receive medetomidine. Alternative forms of sedation and analgesia will likely not achieve the level of patient restraint and urethral relaxation required for voiding urohydropropulsion and cystoscopy, and therefore general anesthesia is recommended for cases in which medetomidine is contraindicated.

Patient positioning in voiding urohydropropulsion may increase the risk of endotracheal tube complications including trauma to the trachea and right mainstem bronchi, especially in larger dogs. Medetomidine-based sedation protocols avoid the use of an endotracheal tube which, therefore, eliminates this risk. Providing flow-by oxygen to a patient in the perpendicular orientation required is simple with no risk to the patient.

Procedure length was significantly shorter for sedated dogs compared with dogs receiving general anesthesia, for dogs undergoing cystoscopy or voiding urohydropropulsion. Upon review of the patient files, the increased time could be attributed to several factors. There was an increased time for patient stabilization and adequate depth of anesthesia after induction, prior to initiation of the procedure. Patient stability and ASA classification may have resulted in longer anesthetic times; it is theorized by the authors that geriatric patients may take longer to achieve acceptable depths of anesthesia and stable vital parameters. However, review of the patients revealed no significant difference in age, weight, or ASA classification between sedated animals and those receiving general anesthesia. In addition, review of files of patients that received general anesthesia revealed that they would have been acceptable candidates to receive medetomidine. There was a much larger discrepancy between the average procedure lengths for sedated versus anesthetized dogs that had voiding urohydropropulsion performed, compared with those that had cystoscopy. It is the authors’ experience that the care required in endotracheal tube stabilization for voiding urohydropropulsion to reduce the risk of endotracheal-induced injury results in a much longer time positioning the patient prior to performing voiding urohydropropulsion. This extended time required in patient positioning is the probable reason for the significant increase in procedure length for voiding urohydropropulsion for anesthetized patients.
costs were the same for dogs receiving sedation and dogs receiving general anesthesia. In addition, monitoring equipment used for dogs receiving general anesthesia and dogs receiving medetomidine-based sedation protocols was similar. On average, the cost associated with general anesthesia compared to the medetomidine-based sedation protocol was 1.6 times higher for cystoscopy, and 1.5 times higher for urohydropropulsion.

Limitations to this study include the low numbers of dogs in each treatment group, and the retrospective nature of the control data. Urohydropropulsion is not a commonly performed procedure; therefore, achieving a large number of cases is unlikely. As all suitable cases that were presented to the Mississauga-Oakville Veterinary Emergency Hospital after initiation of the study received medetomidine-based sedation, it was necessary to use retrospective cases for the control group that received general anesthesia. However, we attempted to closely match the control group based on age, weight, and for cystoscopy cases, disease process.

Most of the procedures were performed by a single board-certified internal medicine specialist. Theoretically, the skill to perform urohydropropulsion and cystoscopy could improve over time, thereby decreasing procedure length. As control cases were obtained retrospectively, it is possible that procedure length was shorter in sedation cases as they were performed at a later date. However, within the groups of dogs there was no statistically significant difference between procedure length and the date that the procedures were performed. This would indicate that procedure length did not decrease over time due to an improvement in skill.

Voiding urohydropropulsion and cystoscopy are typically performed under general anesthesia. This study supports the use of medetomidine-based sedation protocols in cardiovascularly healthy, non-diabetic dogs without evidence of urinary obstruction, renal disease, or hepatic disease for both voiding urohydropropulsion and cystoscopy. Use of a medetomidine-based sedation protocol results in shorter procedure times and a decreased cost to the client, and also avoids risks associated with general anesthesia including possible endotracheal tube injury when positioned for urohydropropulsion.

References

Detection of retinoid receptors in non-neoplastic canine lymph nodes and in lymphoma

Carlos H. de Mello Souza, Victor E.O. Valli, Barbara E. Kitchell

Abstract — This study evaluated the difference in retinoid receptor expression between non-neoplastic lymph nodes and nodal lymphoma in dogs. Retinoid receptor expression was evaluated by immunohistochemistry in 32 canine lymph nodes. The lymph nodes had been previously diagnosed as non-neoplastic (6 normal and 7 hyperplastic lymph nodes) and B- and T-cell lymphoma (19 cases). Immunohistochemistry for retinoic acid receptors and retinoid-X receptors (and their subtypes α, β, and γ) was performed in all cases. In addition, immunohistochemistry for CD3 and CD79a was performed in all lymphoma cases. Non-neoplastic lymphocytes were negative for all retinoid receptors. Retinoic acid receptor-γ was detected in 100% of B-cell lymphoma and 78% of T-cell lymphoma, while retinoid X receptor-γ was positive in 78% of T-cell lymphoma cases. When normal lymph node architecture was still present, a contrast between retinoid-negative benign cells and retinoid-positive malignant cells was clear. Retinoid receptors were expressed in neoplastic, but not in benign lymphocytes, suggesting their value for both diagnosis and treatment of canine lymphoma.

Résumé — Détection des récepteurs aux rétinoïdes dans les ganglions lymphatiques canins non néoplasiques et dans les lymphomes. Cette étude a évalué la différence dans l’expression des récepteurs de l’acide rétinoïque entre les ganglions lymphatiques non néoplasiques et les lymphomes ganglionnaires chez les chiens. L’expression des récepteurs de l’acide rétinoïque a été évaluée par immunohistochimie dans 32 ganglions lymphatiques canins. Les ganglions lymphatiques avaient été antérieurement diagnostiqués comme étant non néoplasiques (6 ganglions lymphatiques normaux et 7 hyperplasiques) et les lymphomes B et T (19 cas). L’immunohistochimie pour les récepteurs de l’acide rétinoïque et les récepteurs X de rétinoïde (et leurs sous-types α, β et γ) a été réalisée dans tous les cas. De plus, l’immunohistochimie pour CD3 et CD79a a été réalisée dans tous les cas de lymphomes. Les lymphocytes non néoplasiques étaient négatifs pour tous les récepteurs de rétinoïde. Le récepteur-γ d’acide rétinoïque a été détecté dans 100 % des lymphomes B et dans 78 % des lymphomes T, tandis que le récepteur-γ X de rétinoïde était positif dans 78 % des cas de lymphome T. Lorsqu’une architecture normale des ganglions lymphatiques était présente, le contraste entre les cellules bénignes négatives pour la rétinoïde et les cellules malignes positives pour la rétinoïde était clair. Les récepteurs de rétinoïde étaient exprimés dans les lymphocytes néoplasiques, mais non dans les lymphocytes bénins, suggérant leur valeur pour le diagnostic et le traitement des lymphomes canins.

(Traduit par Isabelle Vallières)
Introduction

Lymphoma (LSA) is the most common hematopoietic malignancy in dogs and the disease most commonly treated by chemotherapy (1). Treatment for LSA has been well-documented and usually consists of multi-drug chemotherapy regimens. Most dogs with multicentric LSA respond to doxorubicin-based chemotherapy protocols. Remission rates of > 90% and median survival times ranging from 6 to 17 mo have been reported (2,3). Survival for dogs treated with doxorubicin-based protocols varies from 25% to 50% (1-year survival), and 13% to 27% (2-year survival) (3–5). The common induction of multi-drug resistance means that most dogs will still die or be euthanized after progression of disease. Long-term chemotherapy does not prolong survival in humans compared with short-term aggressive protocols. The same seems to be true for canine patients with 1 major difference being that the induction protocol is usually much more aggressive in humans than it is in dogs (2,3). Chemotherapy treatment intensity may be one of the reasons for the much higher cure rate in humans than dogs (3–7). Clearly, additional methods of therapy are needed to prolong remission times in dogs. One of these emerging approaches is the use of retinoids (8).

Retinoids are natural or synthetic derivatives of vitamin A shown to modulate cell growth, differentiation, and apoptosis in vivo and in vitro. Retinoids induce growth inhibition in tumor cells by induction of terminal differentiation, cell cycle arrest, and apoptosis (8,9). These effects occur through interaction with retinoid-specific nuclear receptors which function as ligand-dependent transcription factors; retinoid binding and activation of the receptor is followed by transcription of responsive genes. Retinoid receptors are divided into 2 classes: the retinoic acid receptors (RARs); and the retinoid X receptors (RXRs) and their 3 subtypes α, β, and γ (8,9). In humans, retinoids are used successfully for the treatment of promyelocytic leukemia, cutaneous lymphoma, lung and thyroid carcinomas, and glioblastomas (8–14).

Variation in retinoid receptor expression occurs in cancer and is associated with aggressiveness, response to treatment, and overall survival (8,10,11). In dogs, retinoids have been used in dermatology as differentiation agents in actinic keratosis, sebaceous adenitis, and benign pilomatrixomas (15–16). Few studies have demonstrated the effects of retinoids in canine cancer. In a study of 14 dogs with cutaneous lymphoma treated with retinoids as single agents, a clinical response rate of 42% was achieved (17). In addition, research in canine mast cell tumor (MCT) cell lines revealed that these cells expressed retinoid receptors and the level of expression of RARα mRNA correlated well with growth inhibition caused by all-trans retinoic acid (ATRA) (18,19). Furthermore, concentration-dependent cell death was achieved at micromolar levels of retinoid-treated MCT cell lines from grade II and III tumors (20). With the development of synthetic retinoids, specific receptor targeting has led to superior results in both cancer prevention and treatment in human medicine (8,11). The understanding of the pattern of retinoid receptor expression in canine lymph nodes may also lead to the use of specific receptor interacting agents to enhance responses in dogs with LSA. This study was conducted to evaluate the expression of retinoid receptors in lymph nodes of dogs. We hypothesized that the expression of retinoid receptors varies from non-neoplastic lymph nodes to lymphoma and between B- and T-cell lymphoma.

Materials and methods

Formalin-fixed paraffin embedded biopsy specimens from cases of lymphoma and lymphoid hyperplasia used in this study were consecutive cases retrieved from the archives of the University of Illinois, College of Veterinary Medicine. Lymph nodes from cases diagnosed with lymphoid hyperplasia had follow-up of 12 mo. Dr. David M. Vail from the University of Wisconsin-Madison College of Veterinary Medicine graciously provided the normal lymph nodes. Anti-human antibodies were used for retinoid receptor detection in our study. All antibodies are indicated by the manufacturer to react against human and mouse retinoid receptors. Some of them, RARβ, RXRβ, and RXRγ are described to also react against canine retinoid receptors [Santa Cruz Biotechnology, Santa Cruz, California, USA, RARα: sc-551 and blocking peptide (BP) sc-551P; RARβ: sc-552 and BP sc-552P; RARγ: sc-550 and BP sc-550P; RXRα: sc-553 and BP sc-553P; RXRβ: sc-831 and BP sc-831; RXRγ: sc-555 and BP sc-555P]. These antibodies were chosen based on a study by Mori et al (21) and a previous study from our laboratory, in which we confirmed that rabbit antibodies against retinoid receptors cross react with canine tissue (22). In addition, we performed an amino acid homology search [BLAST program, National Center for Biotechnology Information (NCBI), Bethesda, Maryland]. This search revealed a high degree of homology between all human and canine retinoid receptor proteins (RARα 99%, GenBank Accession No. NP-00102633.1; RARβ 92%, XP-862280.1; RARγ 94%, XP-849260.1; RXRα 89%, XP-548399.2; RXRβ 96%, XP-862727.1; and RXRγ 97%, XP-536146.2).

Deparaffinization and antigen retrieval were performed at room temperature as follows. Slides were placed in 3 changes of xylene for at least 3 min for each change. This was followed by 2 changes of 100% ethanol, 2 changes of 95% ethanol, and 1 change of 70% ethanol for at least 2 min per change. Slides were placed in running water for at least 1 min and then in 3% hydrogen peroxide in methanol for 15 min prior to rinsing in Optimax wash buffer (500M Optim; Biogenex, San Ramon, California, USA) for 5 min. Slides were placed in a container of citrated buffer, pH 6, to be microwaved on high power until the buffer boiled. Power was reduced to a level that produced intermittent boiling for 10 min. Slides were cooled for 20 min and rinsed again in Optimax buffer.

Primary antibodies used in the study were: RARα C-20, RARβ C-19, and RARγ C-19 (rabbit polyclonal biotinylated); RXRα D-20, RXRβ C-20, and RXRγ Y-20 (rabbit polyclonal biotinylated) (Santa Cruz Biotechnology). For the negative controls, specific blocking peptides (100 μg/0.5mL) were added to each antibody (25 μL of blocking peptide to 5 μL of antibody) and incubated for 2 h before dilution. The Supersensitive kit (streptavidin-biotin system) was used for all antibodies (Biogenex, San Ramon, California, USA). Immunoreaction
was visualized with 3,3′-diaminobenzidine substrate. Final dilutions were RARα (1:100), RARβ (1:100), RARγ (1:75), RXRα (1:100), RXRβ (1:100), and RXRγ (1:100). Finally, the slides were counterstained with hematoxylin for 1 min, rinsed in water, dehydrated, and mounted. Hematoxylin-eosin stained slides from a total of 32 cases previously diagnosed as normal lymph node (6 cases), lymphoid hyperplasia (7 cases), B-cell LSA (10 cases), and T-cell LSA (9 cases) were reviewed by 1 pathologist (VEOV). For all the lymphoma cases, slides immunophenotyped for CD3 and CD 79a expression by IHC were also re-evaluated (Dako-Cytomation, Carpinteria, California, USA). Formalin-fixed paraffin embedded tissues were used to create 15 sections of 3-μm thickness from each case. Slides were prepared from all blocks for immunostaining using all the markers described. Immunohistochemistry analysis was performed on all lymph nodes at the same time and by using the same biotin-streptavidin-immunoperoxidase amplified detection system as recently described (22). For retinoid receptors, mouse pup eyes were used as positive controls, and blocking peptides were used as negative controls. This decision was based on our previous study that compared the retinoid receptor retinal staining patterns of mice and dogs. That study showed that staining of the same retinal structures was similar in mice and dogs. We decided to use mouse eyes due to their greater availability (Figure 1) (22). The immunostaining for retinoid receptors had to be strong in the nucleus of the cell in order for phenotype. This dramatic difference between retinoid receptor expression in non-neoplastic (normal lymph nodes and lymphoid hyperplasia) and lymphoma cases indicates that retinoid receptor expression is associated with the malignant phenotype of nodal lymphoma in dogs. A striking finding of our study was the dramatic retinoid receptor staining contrast of benign versus neoplastic cells. In cases where normal lymph node architecture was still present, the interface between the strong positive neoplastic cells and the negative benign cells was very clear after IHC. To our knowledge this fact has not been reported in the literature. The strong retinoid receptor-staining pattern displayed by macrophages within lymph nodes demonstrating lymphoid hyperplasia was an expected finding. It has been previously shown in humans that dendritic cells and macrophages express retinoid receptors during inflammation and that this expression is associated with cytokine production (23–25).

**Results**

Retinoid receptor expression was not detected in any of the normal lymph node specimens. In cases of lymphoid hyperplasia, expression of RAR and RXR (α, β, and γ) was only present in sinus macrophages (Figure 2). Sinusoidal macrophages are the primary cell on nodal sinus and were identified by cell morphology, nuclear size and morphology, and by the common presence of hemosiderin granules in the cytoplasm. All LSA cases expressed at least 2 of the receptor subtypes. In such cases, >95% of the cells were positive. The most commonly expressed receptor was RARγ, positive in 17 cases (89% overall; 100% in the cases of B-cell LSA), followed by RXRγ, positive in 9 cases (47% overall; 78% in T-cell LSA specimens) (Figure 3). The other subtypes were positive in small percentages of cases (Table 1). In the LSA cases evaluated, where neoplastic cells had not effaced the lymph node, normal structures such as mantle cell cuff and germinal centers, when benign, were uniformly negative for retinoid receptor expression (Figures 3 and 4).

**Discussion**

Important findings in our study were the absence of retinoid receptor binding in lymphocytes and plasma cells of benign canine nodal tissue and a positive pattern present only in macrophages of hyperplastic lymph nodes. In contrast, we detected strong retinoid receptor expression in canine lymphomas. In addition, the most common receptor sub-type expressed varied with phenotype. This dramatic difference between retinoid receptor expression in non-neoplastic (normal lymph nodes and lymphoid hyperplasia) and lymphoma cases indicates that retinoid receptor expression is associated with the malignant phenotype of nodal lymphoma in dogs. A striking finding of our study was the dramatic retinoid receptor staining contrast of benign versus neoplastic cells. In cases where normal lymph node architecture was still present, the interface between the strong positive neoplastic cells and the negative benign cells was very clear after IHC. To our knowledge this fact has not been reported in the literature. The strong retinoid receptor-staining pattern displayed by macrophages within lymph nodes demonstrating lymphoid hyperplasia was an expected finding. It has been previously shown in humans that dendritic cells and macrophages express retinoid receptors during inflammation and that this expression is associated with cytokine production (23–25).

The retinoid receptor expression of lymphocytes has been evaluated in neonatal mice and young children. In mice, lymphocyte retinoid receptor expression varies throughout the embryonic development of the thymus (25). Both RARα and RARγ continue to be present in lymphocytes after birth and
expression of RARγ is particularly strong in both CD4+ and CD8+ mature cells (25,26). Based on studies in mice, retinoid receptor activation is important during B- and T-cell activation, where it is thought to modulate homing of cells to specific lymphoid organs and to alter cytokine production (26–29). In children, retinoid receptor expression is highest between the ages of 1 and 3 years, decreasing after that. Terminally differentiated lymphoid cells do not express or have low-expression of retinoid receptors (30). Despite the fact that retinoid receptor expression was evaluated in a small number of cases of non-neoplastic lymph nodes in this study, this lack of expression seems to be similar to that in lymph nodes of older children, when the immune system is fully developed. An alternative possibility to this negative finding is that retinoid receptor expression was present but at levels too low for detection. In contrast, the common expression of some subtypes (RARγ and RXRγ) in LSA cases suggests that retinoid receptor expression plays a role in this disease, which merits further investigation. Due to unavailability of information regarding any treatments, response rates, or survival times of the cases from which lymph node material was gathered for the study, we were not able to assess the value of retinoid receptor expression as a prognostic factor. The importance of specific receptor subtype has been underscored by various studies in humans.

The expression, or sometimes loss of expression, of specific retinoid receptor subtypes is associated with biologic behavior and overall prognosis in a variety of carcinomas and also in melanomas in humans (31–35). Retinoic acid receptor and RXR expression in human thyroid carcinomas can predict their response to retinoids and related drugs (35–37). Also in humans, the expression of RARβ correlates with less aggressive behavior in a variety of malignancies (31,35). In contrast, loss of RARβ has been associated with more aggressive behavior and this receptor is now considered to serve a tumor suppressive function, although precise mechanisms for this effect have yet to be elucidated (38). Loss of RARα, RARγ, and RXRβ expression also occurs in lung and prostatic cancer in humans (38,39). In addition, recent studies in breast cancer cells showed that natural and synthetic retinoids can induce expression of RARβ and down-regulate levels of Bcl-2 and survivin, which in turn leads to an increase in cellular apoptosis (40).
The pattern of retinoid receptors in adult humans with lymphoma and leukemias, other than promyelocytic leukemia, is unknown. Only 2 studies correlated the presence of retinoid receptors with response to retinoid/rexinoid therapy in lymphomas and leukemia. In 1 of these studies, response to the RXR selective agent, bexarotene, was associated with clinical remission. When relapse occurred despite treatment, evaluation of the resistant cells revealed the RXR-α had been down-regulated. As in any immunohistochemistry study, ours has limitations such as the inability to detect functionality of the detected proteins. Despite that and a small number of cases, our findings demonstrate that retinoid receptor expression varies markedly between non-neoplastic and neoplastic lymphoid tissue. In addition, the high amino acid homology shared by dogs and humans increases the strength of our results. Correlation of retinoid receptor and tumor grade, to extend our findings into the realm of low-grade tumors, might be useful in determining the impact of IHC as a diagnostic modality to differentiate reactive from neoplastic lymphocyte proliferation. Since the presence or absence of specific retinoid receptors has been associated with response to treatment, a study correlating specific retinoid receptor isotype to response to treatment, remission time, and survival is warranted. Furthermore, our results suggest that retinoids such as isotretinoin and etretinate (RAR binding drugs) and bexarotene (RXR binding drug), may prove to be of therapeutic benefit in the treatment of nodal LSA in dogs.

Acknowledgments

We thank Dr. David M. Vail for providing the slides of cases of normal lymph nodes. The authors also thank Mrs. Jane Chladny for preparing the slides for the IHC procedures.

References

36. Haugen BR, Larson LL, Pugazenthli U, et al. Retinoic acid and retinoid-X receptors are differentially expressed in thyroid cancer cells


Answers to Quiz Corner

Les réponses du test éclair

1.  

d) Greyhounds have prolonged and stormy recoveries from thiobarbiturate anesthesia. This is a result of altered hepatic metabolism, rather than a result of their lean body mass and lack of fat for redistribution. Recovery from propofol is smooth, but it takes longer in greyhounds than in other dogs.

d) Chez les lévriers, la récupération suite à une anesthésie au thiobarbiturique est prolongée et laborieuse en raison d’une altération de leur métabolisme hépatique, plutôt qu’à cause de la forme effilée de leur corps et du manque de redistribution du gras corporel. La récupération suite à l’anesthésie au propofol est facile, mais prend plus de temps chez les lévriers que chez les autres races de chiens.

2.  

c) The high triglyceride and low cholesterol levels are diagnostic of a chylous effusion.

c) Un taux élevé de triglycéride et un taux faible de cholestérol sont caractéristiques d’un diagnostic d’épanchement de chyle.

3.  

a) Pituitary tumor is the most common cause of hyperadrenocorticism, with resultant hyperplastic adrenal cortices and excessive production of cortisol.

a) La tumeur de l’hypophyse est la cause la plus commune d’hyperadrénocorticisme et elle provoque des cortex surrénaux hyperplasiques et une production excessive de cortisol.

4.  

a) Hyperglobulinemia frequently occurs secondary to FIP and is usually classified as a polyclonal gammopathy.

a) Une hyperglobulinémie se produit fréquemment à la suite de la péritonite infectieuse féline et elle est habituellement classée comme une gammapathie polyclonale.

5.  

d) This is the definition of anisognathism.

d) C’est la définition de l’anisognathisme.
Prevalence of feline blood groups in the Montreal area of Quebec, Canada

Fabrice T.J. Fosset, Marie-Claude Blais

Abstract — The feline AB blood group system has clinical significance because type B cats have natural alloimmune anti-A antibodies which can cause isoeerythrolysis of the newborn and life-threatening transfusion reactions. In the United States, the prevalence of type B blood is estimated to be 1% to 2%. This study determined the prevalence of feline AB blood groups among 207 potential blood donor cats that included 178 domestic cats, in the Montreal area of Quebec, Canada. Blood typing was performed using a standardized tube technique. Blood types AB and B were confirmed using a backtyping technique. The frequency of blood types among the studied population was as follows: 95.2% type A, 4.4% type B, and 0.48% type AB. Among domestic cats, the frequency was 94.4% for type A, 5% for type B, and 0.6% for type AB. The frequency of type B was higher than expected, which reinforces the recommendation to ensure blood compatibility of the recipient and donor before transfusion through typing and possibly cross-matching as well.

Résumé — Prévalence des groupes sanguins félin dans la région de Montréal au Québec, Canada. Le système de groupe sanguin félin AB possède une signification clinique parce que les chats de type B ont des anticorps anti-A allo-immuns qui peuvent causer l’isoérythrolyse du nouveau-né et des réactions potentiellement mortelles lors de transfusions. Aux États-Unis, la prévalence de sang de type B est estimée à 1 % ou 2 %. Cette étude a déterminé la prévalence des groupes sanguins AB féins parmi 207 chats donneurs de sang qui comprenaient 178 chats domestiques, dans la région de Montréal au Québec, Canada. La détermination des groupes sanguins a été réalisée à l’aide d’une technique en tube normalisée. Les types sanguins AB et B ont été confirmés en utilisant une technique de détermination croisée. La fréquence des types sanguins parmi la population étudiée était la suivante : 95,2 % type A, 4,4 % type B et 0,48 % type AB. Parmi les chats domestiques, la fréquence était de 94,4 % pour le type A, de 5 % pour le type B et de 0,6 % pour le type AB. La fréquence du type B était supérieure aux prévisions, ce qui renforce la recommandation afin d’assurer la compatibilité du sang du récipiendaire et du donneur avant la transfusion par la détermination du groupe sanguin et aussi la possibilité d’une épreuve de compatibilité croisée.

Introduction

The AB blood group system includes 3 types: A, B, and AB (1). These blood types are particularly important because, in contrast to most other species, most cats have natural alloimmune antibodies against other blood types (2).

Blood type A has the highest prevalence in the cat population worldwide (3–24). In most countries, the prevalence of type A is between 85% and 100% in non-pedigree cats. However, some countries, such as Greece and England, have a higher prevalence of type B among domestic cats (20% and 30%, respectively) (21,22). In any country, the prevalence may also vary by region. In Australia, where the prevalence of type B cats is generally higher in domestic cats than in other countries, a 10% difference in the distribution of type B was observed between Brisbane (26.3%) (1) and the Sydney area (36%) (23) (Table 1).

The prevalence of type AB cats is generally very low or even zero; however, some countries have an exceptionally high prevalence of type AB in non-pedigree cats. For example, in domestic cats prevalences of up to 4.1% and 6.3% were found in Grand Canary Island (14) and Portugal (17), respectively (Table 1).

The prevalence of feline blood types varies depending on the breed. Some breeds, such as the Siamese, Tonkinese, and Oriental short hairs, are almost uniformly type A regardless of the country (11,17,19,22,25). Other breeds have a high prevalence of type B, such as the Turkish van in Turkey (57.7% to 60%), Persian (24%), Devon rex (43%), and the British...
shorthair (58.9%) in the United States (6,24–26). Ragdolls are known to have a higher prevalence (94%) of type AB, as confirmed in a recent study in Italy (27). The DNA test for feline blood typing has not been fully validated in the breed, necessitating further investigation in this breed (28).

Blood type frequencies in domestic cats

<table>
<thead>
<tr>
<th>Country (reference)</th>
<th>N</th>
<th>A</th>
<th>B</th>
<th>AB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada⁴</td>
<td>178</td>
<td>94</td>
<td>5.0</td>
<td>0.6</td>
</tr>
<tr>
<td>USA (6)</td>
<td>1072</td>
<td>99</td>
<td>7.3</td>
<td>0.0</td>
</tr>
<tr>
<td>Brazil (9)</td>
<td>172</td>
<td>94.8</td>
<td>2.9</td>
<td>2.3</td>
</tr>
<tr>
<td>China (10)</td>
<td>262</td>
<td>88.2</td>
<td>11.4</td>
<td>0.4</td>
</tr>
<tr>
<td>Grand Canary Island (14)</td>
<td>97</td>
<td>88.7</td>
<td>7.2</td>
<td>4.1</td>
</tr>
<tr>
<td>Greece (21)</td>
<td>207</td>
<td>78.3</td>
<td>20.3</td>
<td>1.4</td>
</tr>
<tr>
<td>Portugal (17)</td>
<td>147</td>
<td>89.3</td>
<td>4.4</td>
<td>6.3</td>
</tr>
<tr>
<td>Portugal (18)</td>
<td>515</td>
<td>97.5</td>
<td>2.1</td>
<td>0.4</td>
</tr>
<tr>
<td>Spain (20)</td>
<td>100</td>
<td>94</td>
<td>5.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Turkey (36)</td>
<td>301</td>
<td>73.1</td>
<td>24.6</td>
<td>2.3</td>
</tr>
<tr>
<td>UK (22)</td>
<td>105</td>
<td>67</td>
<td>31.0</td>
<td>2.0</td>
</tr>
</tbody>
</table>

N — total number.

Materials and methods

This study was approved by the Ethical Committee of the Faculté de médecine vétérinaire de l’Université de Montréal.

The sample size was estimated assuming a prevalence of 2% of type B cats in the feline population based on results obtained in previous North American prevalence studies (6,7). Therefore, we aimed to enroll 200 cats [95% confidence interval (CI); 1% margin of error]. The screening process was also conducted to recruit potential feline blood donors. Therefore, only healthy cats ≤ 8 years old were enrolled from the university community, regional shelters, and a British Shorthair and Scottish Fold breeder.

Ethylenediamine tetra-acetic acid (EDTA) blood samples (1 to 2 mL) were obtained for blood typing. The blood was stored at 4°C and typed within 7 days of collection. A red cell preservative solution [Teruflex blood bag system CPD/Opsisol® Red cell Preservative Solution (each 56 mL contains 491 mg NaCl, 504 mg dextrose monohydrate, 294 mg mannitol, and 16.8 mg adenine; Terumo Corporation, Tokyo, Japan)] was added to the sample (1:1 ratio) when blood typing could not be performed within 48 h of collection.

The typing was carried out using a standardized tube technique (3,32). Polyclonal antibodies contained in type B cat serum (diluted 1:3 with 0.9% saline, stored at −24°C) were used as primary reagents for the detection of type A red cell antigens. *Tricimum vulgare* lectin (8 μg/mL, stored at −24°C) was used for the detection of type B red cell antigens (32,33). A 0.9% saline solution was used as a negative control and to test for autoagglutination. Blood samples were centrifuged for 5 min at 1000 × g to separate red blood cells (RBC) from plasma. The plasma was stored in a dry tube for possible backtyping. Packed RBCs were washed by adding 4 to 5 mL of 0.9% saline. Following centrifugation (1 min at 1000 × g), the supernatant was removed and the pellet was suspended in 1.5 to 2 mL of 0.9% saline to obtain a 3% to 5% RBC suspension.

Three tubes were prepared for typing: the anti-A tube contained 50 μL of diluted type B serum (0.9% saline 1:3), the anti-B tube contained 50 μL of the lectin solution (8 μg/mL), and the control tube contained 50 μL of 0.9% saline. A 25-μL volume of 3% to 5% RBC solution was added to each tube. The tubes were agitated gently and incubated for 15 min at room temperature and then centrifuged for 15 to 20 s at 1000 × g.

The results were read while gently shaking the tubes and observing for the presence of agglutination. An agglutination-grading chart was used (a large clot without any free cells = 4+, a large clot associated with small clots = 3+, several medium-sized clots = 2+, a few small clots = 1+, no clot = 0, hemolysis = H). Any agglutination was considered a positive result. Agglutination observed in blood typing usually ranges from 2+ to 4+.

In addition, backtyping was performed to confirm type AB and B cats (32,33). Type B plasma does not react with type B RBCs, but agglutinates very strongly (4+) with type A RBCs.
because of the presence of strong anti-A antibodies. The plasma of type AB cats, which lacks alloantibodies, does not react with type A or type B RBCs.

Only EDTA-whole blood of less than 24 h was used for backtyping. A 50 μL volume of the plasma to be backtyped was added to each of 3 tubes containing 25 μL of 3% to 5% known type A RBC suspension, 25 μL of 3% to 5% known type B RBC suspension, and 25 μL of the individual’s own 3% to 5% RBC suspension (auto-control). The tubes were agitated gently, incubated at room temperature for 15 min and then centrifuged for 15 to 20 s at 1000 × g. The results were read according to the same agglutination-grading chart.

The AB type cat was also confirmed using the Diamed gel column agglutination system [ID Card Anti A + B (Cat), DiaMed, Bio-Rad Laboratories, Switzerland], which is based on monoclonal antibodies; according to the manufacturer’s protocol and as previously described (27,34).

Statistics
The Chi-squared test was used to evaluate the blood type prevalence according to origin, breed, and gender. The t-test for unequal variances was used to test for a link between blood type and age. For both tests, \( P < 0.05 \) was considered significant.

Results
Healthy cats (\( n = 207 \)) were enrolled in the study with an average age of 3 y (ranged from 0.25 to 8 y). The population sample consisted of 76 sterilized females, 16 intact females, 100 castrated males, and 15 intact males. Most cats (\( n = 146 \)) came from the Centre Hospitalier Universitaire Vétérinaire (CHUV) of the Université de Montréal, with 73 cats belonging to staff and students, 57 cats obtained from the CHUV shelter, and 16 cats from the teaching colony. In addition, 48 cats were recruited from a shelter nearby. Finally, 13 cats came from a British shorthair and Scottish fold breeder, with the hope of recruiting possible type B cats as blood donors.

The study group included 178 domestic cats (86%), 8 British shorthair (3.9%), 8 Persian or Persian cross (3.9%), 7 Scottish fold, Highland fold or Foldex (3.4%), 4 Siamese or Siamese cross (2%), and 2 Birmans (1%).

The prevalence rates of feline blood types in the overall studied population were: 95.2% type A cats (\( n = 197 \)), 4.3% type B (\( n = 9 \)), and 0.5% type AB (\( n = 1 \)). The prevalence rates among domestic cats were 94.4% type A (\( n = 168 \)), 5% type B (\( n = 9 \)), and 0.6% type AB (\( n = 1 \)). All pedigree cats tested were type A. Among the type B cats identified, none were related. Among type A cats, the blood typing resulted in 3 to 4+ agglutination reactions in 77% of cats (\( n = 152 \) cats), and 2+ agglutination reactions in 23% of cats (\( n = 45 \) cats). All type B cats had 3+ agglutination reactions. Finally, the type AB cat had a 3+ agglutination reaction in the anti-A tube and a 1+ reaction in the anti-B tube. In backtyping, type B cats were all 4+ in the tube containing the type A RBC. The backtyping of the type AB did not show any hemagglutination. The type AB cat was confirmed with the Diamed gel column agglutination system (3+ positive in A and B columns).

There was no statistical association between the frequency of blood group and gender (\( P = 0.16 \)), origin (\( P = 0.72 \)), and breed (\( P = 0.37 \)). However, type A cats were significantly older than type B cats (\( P = 0.001 \)).

Discussion
Based on previously published North American studies, there was a higher than expected percentage that were type B, notably in domestic cats. Previous studies in North America reported 0.4% type B for a population of non-pedigree cats. For domestic cats only, there were 0% to 0.4% type B and no type AB (6,7). Our study found that 4.3% were type B (\( n = 9 \)) cats, all breeds included. Among domestic cats only, the frequency of type B was 5% (\( n = 9 \)), and type AB was 0.6% (\( n = 1 \)) (Table 1).

As this is the first prevalence study of feline blood types in Quebec, and to our knowledge in Canada, it is impossible to determine if this variation is geographic or time-related. In fact, the previous studies from the United States (6,7) are 15 years old and the prevalence may have changed. Factors such as importation, cross-breeding, and natural selection of type B kittens by the type B female cats (neonatal isoerythrolysis) may have modified the prevalence of the blood types over time.

Although 7 of the 9 type B cats came from the same shelter, they appeared to be unrelated, as they were documented to have come from different litters and different geographical areas. Also, this shelter tends to host young cats, which may account for the age difference between type A and type B cats.

The agglutination reactions when blood typing type A cats (3 to 4+ agglutination reactions in 77% of cats) and when backtyping type B cats (4+ agglutination reactions in all cats) illustrate the hemagglutination strength of anti-A antibodies carried by type B cats. This strong hemagglutination is responsible for the life-threatening reaction seen in A-B mismatched transfusions and for isoerythrolysis of the newborn.

Only healthy cats under 8 years of age were recruited. This criterion of selection was dictated by the secondary goal of our study, i.e., to recruit new feline blood donors, including type B cats, for the blood bank at the CHUV of the Université de Montréal. In order to be able to properly respond to blood demand, it is pertinent for a blood bank to know the prevalence of type B cats in its area, especially when considering the life-threatening consequences of A-B incompatibilities. Therefore, in the hope of recruiting long-term type B blood donors, kittens were also included in the study.

In our study, no conclusions can be drawn about pedigree cats as the number recruited was too low (\( n = 29 \)). In order to increase the chances of finding a type B donor for the blood bank, we included 13 cats from a British shorthair and Scottish fold breeder and other cats from breeds known to have a higher percentage of type B. However a significant number of breeders, aware of the risks of neonatal isoerythrolysis in specific breeds, tend to exclude all type B individuals from reproduction in order to avoid the reproduction of a type B female with a type A male.

Recently, another clinically relevant red cell antigen called Mik was identified (35). This blood type was not investigated herein since blood typing is not readily available. The recent discovery of this antigen and its consequences reminds us that
transfusing blood requires caution. Typing is essential before any feline transfusion and a cross-match may be advisable. This study identified a higher than expected prevalence of type B cats, notably among domestic cats, within a sample of cats from Quebec. This finding reinforces the recommendations to always type a cat before giving a transfusion, and even to perform a complete cross-match to prevent transfusion reactions.

References

Scrotal tumors in dogs: A retrospective study of 676 cases (1986–2010)
Michelle C. Trappler, Cathy A. Popovitch, Michael H. Goldschmidt, Kyle H. Goldschmidt, Rebecca E. Risbon

Abstract — The objective of this study was to determine common tumor types that occur on the canine scrotum in relation to other cutaneous locations and to identify potential risk factors for specific scrotal tumor development. A retrospective study was conducted and the database of pathology reports from the Surgical Pathology Service of the Department of Pathology and Toxicology, School of Veterinary Medicine, University of Pennsylvania from 1986 to 2010 was searched for canine neoplastic scrotal and non-scrotal cutaneous lesions. Neoplastic lesions were evaluated based on diagnosis, breed, age, and number and location of tumors (scrotal versus non-scrotal cutaneous). Mast cell tumor, melanocytoma, malignant melanoma, vascular hamartoma, hemangiosarcoma, hemangioma, and cutaneous histiocytoma were the most common tumor types identified on the canine scrotum. Breed predispositions and mean age at diagnosis were identified for each tumor type and should be considered when planning surgical excision of a canine scrotal tumor.

Résumé — Tumeurs scrotales chez les chiens : étude rétrospective de 676 cas (1986–2010). Cette étude avait pour objectif de déterminer les types communs de tumeurs qui se produisent sur le scrotum canin par rapport à d'autres endroits cutanés et d'identifier les facteurs de risque potentiels pour le développement de tumeurs scrotales spécifiques. Une étude rétrospective a été réalisée et une recherche a été effectuée dans la base de données des rapports de pathologie du Service de pathologie chirurgicale du Département de pathologie et de toxicologie de l'École de médecine vétérinaire de l'Université de la Pennsylvanie de 1986 à 2010 pour les lésions scrotales néoplasiques et les lésions cutanées non scrotales canines. Les lésions néoplasiques ont été évaluées en fonction du diagnostic, de la race, de l'âge ainsi que du nombre et de l'emplacement des tumeurs (scrotales par opposition à cutanées non scrotales). Les tumeurs à mastocytes, les mélanocytomes, les mélanomes malins, les hamartomes vasculaires, les hématogiosarcomes, les hématiomes et les histiocytomes cutanés étaient les types les plus communs de tumeurs identifiées sur le scrotum canin. Les prédispositions des races et l'âge moyen lors du diagnostic ont été identifiés pour chaque type de tumeur et devraient être considérés lors de la planification de l'excision chirurgicale d’une tumeur scrotale canine.

Introduction
Specialized areas of skin can be found on the nose, digital pads, external auditory meatus, mucocutaneous junctions, and the scrotum (1). Regional variation of the skin with regards to type and amount of hair present, distribution and type of glands, and skin thickness allows the animal to develop functional adaptations to its environment and may alter the pattern of disease that arises in specialized skin areas.

The skin of the scrotum is thinner than other skin, is typically pigmented, and may contain fine hairs on the surface (2). The scrotum is also unique in that it is glabrous skin. The dermal layer contains well-developed sebaceous and apocrine glands (1,2). The dartos muscle lies below the scrotal skin, and is composed of smooth muscle and a mixture of collagen and elastic fibers (1,2). A well-developed counter-current vascular heat exchanger is present below the dartos and may influence development of vascular hamartomas in the scrotal region. These progressive vascular malformations have been reported, and are typically seen in older dogs with pigmented scrotal skin (3–5). Arterial supply to the scrotum is directly from the scrotal arteries and indirectly from the perineal arteries, both of which are branches of the external pudendal. Hemorrhage from a vascular lesion in the scrotum can be significant, and there are reports of exsanguination (5,6). Venous drainage is accomplished by satellite branches of the arterial supply (2). Lymphatics drain to the superficial inguinal lymph nodes (2).

There have been many studies of canine skin tumors, but no studies have specifically evaluated tumors that arise in the scrotum (3–15). A review of cutaneous scrotal lesions in dogs briefly described scrotal neoplasms and their histologic
appearance, but did not elaborate on prevalence and potential risk factors in these patients (4). Mast cell tumors have been documented as the most common scrotal neoplasm in the dog; however, there is a paucity of information on other tumor types (2,14,16,17). The aim of this study was to identify those tumors that arise most commonly on the canine scrotum and their prevalence compared with other cutaneous locations, and to determine if any predisposing factors exist in dogs.

**Materials and methods**

**Study design**

Histopathology reports from cases submitted to the Surgical Pathology Service of the Department of Pathology and Toxicology, School of Veterinary Medicine, University of Pennsylvania from 1986 to 2010 were searched for canine scrotal and cutaneous non-scrotal lesions. Information obtained from the database included age, breed, diagnosis, number and location (scrotal versus non-scrotal) of all cutaneous tumors diagnosed over the same period, and presence of additional scrotal tumors. Any sample that was diagnosed solely with a non-neoplastic lesion was excluded. Data on tumor type were reported as absolute number and as a percentage of the total number of masses included in data analysis. Age at diagnosis was reported as a mean.

Mast cell tumors were re-classified as low grade and high grade in an attempt to correlate with the recently published mast cell tumor grading scheme (18). For the purposes of this study, previously reported grade 1 and 2 mast cell tumors were reclassified as low-grade and previously reported grade 3 were reclassified as high-grade mast cell tumors (19).

**Statistical analysis**

The SAS/STAT (R) 9.2 program was used to run statistical analysis. Cochran-Mantel-Haenszel statistics were used to calculate the logit common odds ratio. Confidence intervals (95% CI) were determined using Greenland and Robins variance estimate. P-values were calculated using the Breslow-Day test for homogeneity of the odds ratio, which can be approximated by a Pearson chi-squared distribution with q-1 degrees of freedom.

**Case selection**

There were 676 scrotal tumors among the 337,762 cases in the database submitted between January 1, 1986 and December 31, 2010. All inflammatory lesions of the scrotum were excluded.

**Results**

A total of 165,054 cutaneous neoplasms were submitted during the study period. Of these, 655 patients were diagnosed with scrotal tumors, so that scrotal neoplastic lesions represented 0.4% of all neoplasms. Twenty-one dogs had a second scrotal tumor in the sample submitted. Thus, a total of 676 scrotal masses met the inclusion criteria. Castration status prior to surgical biopsy could not be definitively determined from the records examined.

Round cell neoplasms were the most prevalent, representing 396/676 tumors (58.6%). Mesenchymal neoplasms were diagnosed in 92 cases (13.6%), melanocytic neoplasms in 80 cases (11.8%), hamartomas in 52 cases (7.7%), epithelial neoplasms in 29 cases (4.3%), and cysts and tumor-like lesions in 27 cases (4.0%) (Table 1). Percentages of the specific tumors on the scrotum are presented in Table 2. Odds ratios (OR), 95% CI, and P-values for all identified tumors are reported in Table 3.

**Mast cell tumor**

Mast cell tumors comprised 54.6% (369/676) of scrotal tumors diagnosed during the study period. Low-grade tumors were 44.2% (299/676) of tumors, and high-grade tumors were 10.4% (70/676). The mean age at diagnosis was 9.3 y (+/− 2.9 y) and 10.1 y (+/− 2.7 years) for low- and high-grade scrotal mast cell tumors, respectively. Boxers, Boston terriers, and American pit bull terriers were predisposed to scrotal and non-scrotal cutaneous low-grade and high-grade mast cell tumors. Vizslas were predisposed to development of scrotal low-grade mast cell tumors and beagles were predisposed to development of scrotal high-grade mast cell tumors.

**Melanocytoma**

Melanocytomas comprised 7.1% (48/676) of scrotal tumors and scrotal melanocytomas were 0.9% (48/5090) of all cutaneous melanocytomas diagnosed during the study period. The mean age at diagnosis of scrotal melanocytoma was 9.4 y (+/− 2.3 y). Golden retrievers were predisposed to development of scrotal and non-scrotal melanocytomas compared with other breeds.

**Malignant melanoma**

Malignant melanomas comprised 4.7% (32/676) of scrotal tumors and scrotal malignant melanomas were 3.1% of all cutaneous malignant melanomas diagnosed during the study period. The mean age at diagnosis of scrotal malignant melanoma was 9.7 y (+/− 2.9 y). Standard schnauzers and miniature schnauzers were predisposed to development of scrotal and non-scrotal malignant melanoma. Giant schnauzers were predisposed to development of non-scrotal cutaneous malignant melanomas.
Table 3. Breed predispositions for scrotal and non-scrotal cutaneous tumors

<table>
<thead>
<tr>
<th>Breed</th>
<th>Tumor type</th>
<th>OR</th>
<th>95% CI</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>American pit bull terrier</td>
<td>Low-grade mast cell tumor-scrotal</td>
<td>7.50</td>
<td>4.53–12.43</td>
<td>&lt;0.0005</td>
</tr>
<tr>
<td></td>
<td>Low-grade mast cell tumor-non-scrotal</td>
<td>2.80</td>
<td>2.51–5.16</td>
<td>&lt;0.0005</td>
</tr>
<tr>
<td></td>
<td>High-grade mast cell tumor-scrotal</td>
<td>15.00</td>
<td>6.90–32.80</td>
<td>&lt;0.0005</td>
</tr>
<tr>
<td></td>
<td>High-grade mast cell tumor-non-scrotal</td>
<td>2.50</td>
<td>1.80–3.50</td>
<td>&lt;0.0005</td>
</tr>
<tr>
<td></td>
<td>Vascular hamartoma-scrotal</td>
<td>3.20</td>
<td>1.00–10.1</td>
<td>0.035</td>
</tr>
<tr>
<td></td>
<td>Vascular hamartoma-non-scrotal</td>
<td>6.16</td>
<td>1.49–25.40</td>
<td>&lt;0.0005</td>
</tr>
<tr>
<td>Bassett hound</td>
<td>Vascular hamartoma-scrotal</td>
<td>4.70</td>
<td>1.10–19.40</td>
<td>0.018</td>
</tr>
<tr>
<td>Beagle</td>
<td>High-grade mast cell tumor-non-scrotal</td>
<td>2.80</td>
<td>1.00–7.70</td>
<td>&lt;0.0005</td>
</tr>
<tr>
<td></td>
<td>Histiocytoma-scrotal</td>
<td>4.35</td>
<td>1.01–18.55</td>
<td>0.030</td>
</tr>
<tr>
<td></td>
<td>Histiocytoma-non-scrotal</td>
<td>1.20</td>
<td>1.10–13.0</td>
<td>&lt;0.0005</td>
</tr>
<tr>
<td>Boston terrier</td>
<td>Low-grade mast cell tumor-scrotal</td>
<td>7.78</td>
<td>4.54–13.23</td>
<td>&lt;0.0005</td>
</tr>
<tr>
<td></td>
<td>Low-grade mast cell tumor-non-scrotal</td>
<td>4.37</td>
<td>3.92–4.86</td>
<td>&lt;0.0005</td>
</tr>
<tr>
<td></td>
<td>High-grade mast cell tumor-scrotal</td>
<td>4.70</td>
<td>1.20–19.30</td>
<td>&lt;0.0005</td>
</tr>
<tr>
<td></td>
<td>High-grade mast cell tumor-non-scrotal</td>
<td>3.40</td>
<td>2.50–4.70</td>
<td>&lt;0.0005</td>
</tr>
<tr>
<td>Boxer</td>
<td>Low-grade mast cell tumor-scrotal</td>
<td>7.60</td>
<td>5.74–10.05</td>
<td>&lt;0.0005</td>
</tr>
<tr>
<td></td>
<td>Low-grade mast cell tumor-non-scrotal</td>
<td>5.13</td>
<td>4.88–5.38</td>
<td>0.1</td>
</tr>
<tr>
<td></td>
<td>High-grade mast cell tumor-scrotal</td>
<td>3.80</td>
<td>1.80–8.00</td>
<td>&lt;0.0005</td>
</tr>
<tr>
<td></td>
<td>High-grade mast cell tumor-non-scrotal</td>
<td>2.20</td>
<td>1.80–2.60</td>
<td>&lt;0.0005</td>
</tr>
<tr>
<td></td>
<td>Vascular hamartoma-scrotal</td>
<td>4.80</td>
<td>2.90–7.90</td>
<td>&lt;0.0005</td>
</tr>
<tr>
<td></td>
<td>Vascular hamartoma-non-scrotal</td>
<td>3.60</td>
<td>1.40–9.20</td>
<td>&lt;0.0005</td>
</tr>
<tr>
<td></td>
<td>Hemangioma-scrotal</td>
<td>5.81</td>
<td>2.22–15.18</td>
<td>&lt;0.0005</td>
</tr>
<tr>
<td></td>
<td>Hemangioma-non-scrotal</td>
<td>3.20</td>
<td>2.80–3.50</td>
<td>&lt;0.0005</td>
</tr>
<tr>
<td></td>
<td>Histiocytoma-scrotal</td>
<td>4.36</td>
<td>1.29–14.66</td>
<td>0.009</td>
</tr>
<tr>
<td></td>
<td>Histiocytoma-non-scrotal</td>
<td>4.60</td>
<td>4.40–4.90</td>
<td>0.005</td>
</tr>
<tr>
<td>Golden retriever</td>
<td>Melanocytoma-scrotal</td>
<td>2.57</td>
<td>1.20–5.50</td>
<td>0.011</td>
</tr>
<tr>
<td></td>
<td>Melanocytoma-non-scrotal</td>
<td>2.10</td>
<td>1.90–2.20</td>
<td>&lt;0.0005</td>
</tr>
<tr>
<td></td>
<td>Hemangiosarcoma-scrotal</td>
<td>6.15</td>
<td>2.99–12.61</td>
<td>&lt;0.0005</td>
</tr>
<tr>
<td></td>
<td>Hemangiosarcoma-non-scrotal</td>
<td>2.20</td>
<td>1.90–2.50</td>
<td>&lt;0.0005</td>
</tr>
<tr>
<td>Schnauzer-giant</td>
<td>Malignant melanoma-non-scrotal</td>
<td>4.60</td>
<td>2.10–10.40</td>
<td>&lt;0.0005</td>
</tr>
<tr>
<td>Schnauzer-miniature</td>
<td>Malignant melanoma-scrotal</td>
<td>17.30</td>
<td>7.11–42.30</td>
<td>&lt;0.0005</td>
</tr>
<tr>
<td>Schnauzer-standard</td>
<td>Malignant melanoma-scrotal</td>
<td>5.00</td>
<td>3.90–6.40</td>
<td>&lt;0.0005</td>
</tr>
<tr>
<td></td>
<td>Malignant melanoma-non-scrotal</td>
<td>23.30</td>
<td>8.15–66.70</td>
<td>&lt;0.0005</td>
</tr>
<tr>
<td>Vizsla</td>
<td>Low-grade mast cell tumor-scrotal</td>
<td>3.51</td>
<td>1.12–10.95</td>
<td>0.02</td>
</tr>
</tbody>
</table>

OR — odds ration; CI — confidence interval.

Vascular hamartoma
Vascular hamartomas comprised 6.8% (46/676) of scrotal tumors, but the scrotum accounted for 36.2% (46/127) of all cutaneous vascular hamartomas diagnosed during the study period. The mean age at diagnosis of scrotal vascular hamartomas was 5.9 y (+/– 2.7 y). Boxers and American pit bull terriers were predisposed to developing scrotal vascular hamartomas; these 2 breeds and the basset hound also had a predilection for non-scrotal cutaneous hamartomas.

Hemangiosarcoma
Hemangiosarcoma comprised 5.0% (34/676) of scrotal tumors and scrotal hemangiosarcoma comprised 1.9% (34/1802) of cutaneous hemangiosarcomas diagnosed during the study period. The mean age at diagnosis of scrotal hemangiosarcoma was 8.2 y (+/– 3.0 y). Golden retrievers were predisposed to development of scrotal hemangiosarcoma and cutaneous non-scrotal hemangiosarcoma.

Hemangioma
Hemangiomas comprised 4.6% (31/676) of scrotal tumors. Scrotal hemangiomas comprised 0.7% (31/4313) of all cutaneous hemangiomas diagnosed during the study period. The mean age at diagnosis of scrotal hemangioma was 8.3 y (+/– 2.9 y). Boxers were predisposed to development of cutaneous scrotal and non-scrotal hemangiomas compared with other breeds.

Histiocytoma
Histiocytomas comprised 3.4% (23/676) of scrotal tumors. Histiocytomas of the scrotum comprised less than 0.1% (23/16,744) of all cutaneous histiocytomas diagnosed during the study period. The mean age at diagnosis of scrotal histiocytoma was 2.8 y (+/– 2.6 y). Boxers and beagles were predisposed for development of scrotal histiocytomas. Both breeds were also predisposed to development of cutaneous histiocytomas on non-scrotal skin. Four additional round cell tumors were reported on the scrotum: 1 each of a histiocytic sarcoma, a lymphohistiocytic sarcoma, and 2 round cell tumors that were not further classified.

Discussion
Mast cell tumors account for 16% to 21% of cutaneous tumors in the dog (7,8,15,20,21). They seem to have a predilection for the caudal half of dogs and occur more commonly on the rear
limbs, abdomen, perineum, and scrotum (7,14). It has been reported that mast cell tumors of the preputial, inguinal, and subungual regions and other muco-cutaneous sites tend toward more aggressive behavior (22,23). More recent reports indicate that tumors in scrotal and inguinal areas behave similarly to tumors in other cutaneous locations, although, when the data are critically evaluated, there is a trend towards more aggressive behavior (23–26). The reported median disease-free interval for dogs with mast cell tumors in the inguinal or perineal region was 9.6 mo, compared with 33.9 mo for dogs with these tumors in other cutaneous sites. When dogs with preputial and scrotal mast cell tumors were specifically separated out, there was a significant difference in disease-free interval (median of 4.2 mo compared with 33.9 mo, respectively) when dogs with preputial mast cell tumors were compared with dogs with scrotal mast cell tumors (24). However, with aggressive treatment (clean surgical excision with or without definitive radiation therapy), perianal and preputial mast cell tumors have a similar biological behavior to mast cell tumors at other sites (23–26). Additional studies on biologic behavior and prognosis of mast cell tumors in the inguinal and preputial areas are warranted.

If a diagnosis of suspected mast cell tumor is made based on fine-needle aspiration, a scrotal ablation should be performed at the time of surgery (14). The increased proportion of high-grade tumors in the scrotum and improved prognosis with aggressive local control warrants scrotal ablation. Furthermore, evaluation of the inguinal lymph nodes should be undertaken at the time of surgery to exclude metastatic disease and better determine prognosis (21).

Melanocytomas and malignant melanomas comprised approximately 12% of the scrotal tumors and only 1.3% of all cutaneous tumors in this study, which is lower than previously published data in which 3% to 7% of canine skin tumors were melanocytic neoplasms (8,10,26–30). Although a previous study on the biological behavior of melanomas reported that greater than 75% of melanocytic tumors in doberman pinschers and schnauzers were behaviorally benign (31), we did not find an increased risk for these breeds to develop scrotal melanocytomas. In the scrotum there was an increased incidence of melanocytomas (60%) compared with malignant melanoma (40%); however, the percentage of malignancy was still high. Therefore, any suspected melanocytic neoplasm of the scrotum should be considered more likely to be malignant than those arising from non-scrotal hairy skin and a more radical surgical approach may be appropriate. Mitotic index and pleomorphism are prognostically significant (32). These data are not available for this study, but would be of value in future studies.

Cutaneous vascular hamartomas were first described in 1954 (5) and are relatively uncommon in dogs (0.4% of all hamartomas); however, their predilection for the scrotum is noteworthy. Because they are arteriovenous malformations there may be a significant blood loss from these lesions (5,6). The increased incidence of these lesions on the scrotum is most likely associated with the unique vascular and thermoregulatory function of the scrotum. A prior report identified 2.6% of all cutaneous hemangiosarcomas in a scrotal location (7). In the current study, we reported 0.7% of all cutaneous hemangiosarcoma in a scrotal location. The lower percentage of lesions on the scrotum may reflect an increased prevalence of neutered male dogs at the current time compared to when the study was published.

Hemangiosarcomas were more prevalent than hemangiomas in the scrotum, whereas hemangiomas were much more common than hemangiosarcoma in non-scrotal skin. Boxers appeared to be predisposed to the development of scrotal and non-scrotal cutaneous hemangiosarcomas, whereas golden retrievers appeared to be predisposed to the development of scrotal and non-scrotal cutaneous hemangiosarcomas. It is unknown whether any of the vascular neoplasms are associated with excessive ultraviolet light exposure or whether there is malignant transformation of vascular endothelium; however, future biopsy samples should be evaluated for evidence of solar elastosis, which is a hallmark of UV-light induced hemangiosarcoma (33).

Scrotal hemangiomas comprise 1.1% of all cutaneous hemangiomas (7). In this study, scrotal hemangiomas accounted for 4.59% of scrotal tumors and 0.7% of cutaneous hemangiomas. There is an increased probability of development of cutaneous hemangiomas in several breeds, with Airedale terriers, Gordon setters, boxers, soft-coated Wheaton terriers, and wire-haired fox terriers having the highest odds ratios (7). The previously reported odds ratio for boxers and development of cutaneous hemangioma was 3.1 (95% CI: 2.5 to 3.9, P < 0.005). Our results agree with these data.

Histiocytomas are benign tumors of Langerhans cells that are typically found in dogs less than 3 to 4 years old and occur predominantly on the head and neck (11,34). They comprise 5.5% to 7.5% of canine cutaneous tumors (12,13,30). Consistent with previous reports, our mean age at diagnosis for scrotal histiocytomas was 2.8 y (+/− 2.6 y). Scrotal histiocytomas accounted for only 3.4% of all scrotal tumors, but less than 0.01% of all cutaneous histiocytomas arose on the scrotum. These tumors tend to regress spontaneously so it is likely that these numbers under-represent the true incidence, as the lesions may regress preventing surgical removal and biopsy (11,34). Based on our data, boxers and beagles appear to be at increased risk for developing cutaneous histiocytomas at both scrotal and non-scrotal sites.

Only 4.2% of scrotal neoplasms were of epithelial origin. The most common epithelial neoplasm was squamous cell carcinoma. Low incidence of this neoplasm on skin that is exposed to ultraviolet light radiation may be due to the amount of melanin pigment that is present within the epidermis of the scrotum. However, the geographic location from which the
biopsy samples were obtained may also have influenced the low incidence of this neoplasm.

As we have demonstrated, certain dog breeds are predisposed to development of specific tumor types on the scrotal skin. This may be due to the unique anatomy of the canine scrotum and specialized adaptations in this region. Knowledge of the most common tumors types on the canine scrotum will aid the surgeon in decision-making and surgical planning. The ability to perform a scrotal ablation may aid in obtaining clean margins at the time of surgery. Conversely, the anatomic location of the scrotum in the inguinal area, where skin is otherwise limited and motion is a significant factor, may deter the surgeon from being aggressive on a first attempt at excision in this region. Identification of the common tumor types in this area should guide the surgeon when deciding between an incisional biopsy or a wide excision. This may be especially important in valuable breeding dogs and for owners who prefer to leave their dogs sexually intact.

Because of the retrospective nature of this study, we were unable to determine prognostic data for scrotal tumors. Another limitation of this study is that castration status prior to surgical biopsy could not be definitively determined from the records examined. Further studies are warranted to determine if reproductive status influences scrotal tumor development and biological behavior. Cases were evaluated by several pathologists and were classified based on their diagnosis, with the exception of mast cell tumors as previously stated. Classification and diagnostic criteria may have changed over the study period, and these changes were not accounted for in our data analysis. Also, this study did not evaluate change of tumor prevalence over time. It may be of value to determine if changes in prevalence occurred with changes in environment, husbandry, and other external factors in the life of domestic dogs.

Despite study limitations, our data found that mast cell tumors accounted for more than 50% of the cases and that certain breeds are predisposed to development of specific tumor types in a scrotal location. These predispositions should be considered prior to surgical removal of a scrotal mass. Preoperative staging, local tumor control, and the need for adjuvant chemotherapy following surgical excision may all be influenced by the knowledge of common tumor types and breed predispositions for scrotal masses. Further investigation into the biological behavior and prognosis of scrotal tumors is warranted.

References

Commentary  Commentaire

The “unwanted horse” — A modest proposal

Bernard Rollin

The power of words to mislead is well known to philosophers, but perhaps not as well known to others. An extreme philosophical example comes from the work of the 19th century philosopher Alexius Von Meinong. Meinong argued that proper nouns named real entities, and he asked what proper nouns like Superman or Thor or Mickey Mouse named. In his view, such fictitious names did not refer to nothing. After all, while Superman refers to a baby from Krypton who grew up in Smallville and hid his true identity as “mild-mannered Clark Kent,” Thor denotes the Thunder God who resides in Valhalla among the Norse pantheon. Clearly, those names represent different individuals. Although those individuals do not exist in our world, they must have some existent status in order for us to talk about them. Meinong concluded that anything we can talk about has some kind of existence, and not just as an idea, because Thor differs from “the idea of Thor.” As a result, Meinong’s world was vastly overpopulated.

Just as Meinong was misled by language, so may the rest of us be. Consider the concept of “the unwanted horse.” Talking about “unwanted horses” suggests that we are talking about a certain natural kind of horse, like a draft horse, Morgan horse, Thoroughbred horse, white horse. Yet, although grammatically “unwanted horse” looks identical to “white horse,” conceptually it is very different. Whiteness is an absolute property of the horse in question. “Unwantedness,” however, is a relational property of the horse relative to some human. In other words, horses do not come naturally as unwanted — that property arises in relation to human beings.

That linguistic legerdemain is reminiscent of the same sort of linguistic obfuscation some confinement agriculturalists engage in when they refer to aberrant animal behavior under extreme, unnatural confinement conditions as “vices,” as when sows kept in tiny cages where they cannot stand up or turn around — or even lie down fully extended — compulsively chew the bars. As if the animal is somehow bad or blameworthy for behaving that way!

In particular, being unwanted grows out of blatant abrogation of a human being’s responsibility voluntarily assumed. In my view, when one acquires an animal, be it a dog or cat or horse, one implicitly makes a lifelong commitment to that animal to care for and be responsible for its life and well-being. This is true whether the animal is a companion or a working animal. (This is why the racing industry has been forced to develop retirement farms for racehorses which can no longer run and were callously auctioned for slaughter, even though owned by millionaires.)

Whenever I hear people defending horse slaughter as a way an owner can realize some monetary value from the horse, which is now unwanted due to its owner irresponsibility, I grow extremely angry. Why do such people deserve to benefit from their blatant violation of trust presuppositional to adoption and their dishonorable attempt to worm their way out of what should be a permanent contract? To be sure, there are cases, very few, where the owner dies or becomes chronically ill or incapacitated, and is no longer physically capable of caring for the animal. In many such cases, the burden should fall upon the owner’s estate, with owners making provision for care of the animal well in advance of a crisis.

In my view, the responsibility incumbent upon acquiring an animal should not be easily shrugged off. I have often been accused of “elitism” or, were there such a word, “wealthism” for daring to suggest that one demonstrate the possession of resources sufficient to care for the animal, come what may. “You are saying,” whines the chorus, “that only the rich should have horses. That is not fa, a, a, a, i e.” In fact, to quote Pres. Jack Kennedy, “life is unfair!” Wealthy people get to vacation on the Riviera, own multiple homes, drive hundred thousand dollar cars. What I am saying is very simple — society should not allow people to take responsibility for an animal’s life if the person in question lacks the resources to fulfill that responsibility! And why should slaughter in Canada serve as an easy answer to United States irresponsibility?

How might reliance on slaughter be fixed? Fairly easily. In order to be allowed to get a horse, one should be able to prove to an agency that one has sufficient disposable income to care for the animal under the normal vicissitudes of the economy, say by posting a bond when purchasing an animal. Is this a drastic and draconian policy? For sure! But the current situation of acquiring the horse as an impulse item has led to a very sorry and morally unacceptable state of affairs. The same logic should be applied to other animals, such as dogs and cats, which are victims of human irresponsibility; society destroys millions of these animals each year. Perhaps because we have become accustomed to pet euthanasia and wrongly see “spay neuter” as the solution,
it shocks us less than the fate of the horses. (Though spay and neuter is part of the solution, it does not touch the part of the problem growing out of callous human irresponsibility.) In any case, just because animals are legally property, does not mean we can use or dispose of them as we see fit — think of medical waste, batteries, or other property that can harm others.

The market for such animals is already supersaturated. My friends who rodeo have told me of driving their own horses to a rodeo or fair and leaving their horse trailer in the parking lot. Upon returning to the trailer, they found two horses within, and a note reading “please give us a good home.”

Why, then, do we fail to place responsibility for the lives and well-being of the “unwanted horse” upon those who freely and voluntarily undertook the acquisition of the animal? Why do we in the United States bemoan the closing of slaughter houses that provided an easy, but immoral, way out for those who abrogate responsibility? I am deeply disappointed in those veterinarians who declare that the protein shortage across the world militates in favor of horse slaughter. As I once told a veterinarian making this case, why was he not arguing for the same disposition of the estimated 4 million dogs and cats trashed by our irresponsibility as a society. After all, there are places across the world where people eat dogs and cats! Also, in my experience, the vast majority of veterinarians will affirm that their primary obligation is to the animal, not to the owner, to relieve or prevent suffering.

Plato makes an oft-forgotten distinction that applies to our question. When one is a craftsman, be it a goldsmith, a carpenter, a stonemason or any other artisan, one must conceptually distinguish between the artisan aspect of that work, and one’s conceptually separable role as a wage-earner. Qua craftsman, one’s sole job is to improve, make better, or increase the value of that upon which one exercises one’s craft. Thus, creating a necklace out of raw gold adds value to the gold, making it worth more than the simple raw material. The same model applies to health professionals, be they physicians or veterinarians. Qua veterinary, one’s role is to restore health to an animal, thereby increasing its functional value. Whatever one earns doing so, is conceptually separable from what Plato considers the primary goal of restoring or improving an animal’s health and well-being. Thus the primary moral obligation of a veterinarian is to the entity upon which he or she practices their art — the animal.

The entire project of realizing profit from irresponsibility, rather than punishment, bears a considerable resemblance to Jonathan Swift’s infamous satirical pamphlet in which he suggests raising poor and unwanted children to a year of age, and then selling them as food to wealthy gourmets. The obvious reply, of course, is that horses are not children. I am well aware of that. But the point is that the logic of the two cases is remarkably parallel. In both cases, horse or child, the creature is paradigmatically innocent. Parent and horse owner have both voluntarily decided to take responsibility for a life. If a parent abrogates that responsibility, we punish them. And society takes responsibility for the human life in question. Should we allow irresponsible animal owners to abrogate responsibility, and in essence punish the victim? Allowing people to discard responsibility without sanction fails to discourage such behavior in the future. On the contrary, it sends the message that others in the future can be irresponsible without suffering negative consequences. If people in fact lack the money to care for the animal, it would be possible to allow them to do public work to pay the state for assuming the care burden.

For many years, some of my work focused on the fact that shelters and humane societies were not sheltering, but instead doing society’s dirty work and killing animals because of human irresponsibility in breeding, or because animal owners felt no compunctions about surrendering animals for the most trivial and frivolous reasons — “the dog no longer matches my color scheme since I redecorated,” “the dog is no longer a puppy,” “it is cheaper to get a new dog than to board this one while I go on vacation.” As I discovered at the time, not only were innocent animals victims of this sort of unspeakable irresponsibility, so too were innocent humans. Humane society workers, pound workers, animal control officers, and veterinarians all felt as if they were complicit in an endless assembly-line of unnecessary killing, generating in these people large amounts of “moral stress,” the stress growing out of their moral commitment to helping animals clashing horribly with what they were in fact doing — killing them. I became aware that as a result of this stress, countless numbers of dedicated people were becoming alcohol and drug abusers, undergoing divorce, and living unhappy lives.

On one occasion, while I was lecturing at a large shelter, an employee told me of a woman who had come in to surrender a blind Labrador. The dog had lived with her since puppyhood, but now was “too much trouble to manage.” The owner instructed the shelter worker to “adopt the dog out to a home with a lake.” I asked the employee how she responded: “As I am ordered to by management — I said I would try my best.” Then she started to sob. “Why didn’t you tell her the truth, to come back in a week and watch the dog being killed,” I said, “It is not your job to be a sin eater for the guilty and irresponsible.” Countless numbers of such employees carried the burden of others’ irresponsibility, and labored in constant misery, further punished by the fact that the unwanted animals kept coming.

St. Thomas Aquinas argued that although in Catholic theology animals enjoy no moral status, it was wrong to visit cruelty upon them, because people who do so would “graduate” to the abuse of people. That has been empirically confirmed in the past 50 years. I would argue analogously that those who are irresponsible towards their animals are very likely to graduate to mistreating people. After all, if we cavalierly kill old animal friends, because they are old and too much trouble to care for, isn’t it possible that the same mindset can extend to family?

It is unquestionable that shipping horses for slaughter, one commonly cited “solution” to unwanted horses, results in significant stress, distress, fear, pain, and suffering for the animals, ranging from improper transport to nightmarish methods of slaughter in Mexico. If society insists on killing them, the process should be genuine euthanasia. Fortunately, a well-placed bullet of the proper caliber is quick and painless and inexpensive. But this raises an ancillary question: — can an animal value life per se? To answer this question we must consider some conceptual differences between animal and human cognition.
Human cognition is such that we can value long-term future goals and endure short-run negative experiences for the sake of achieving them. Examples are plentiful. Many of us undergo voluntary food restriction, and the unpleasant experience attendant in its wake, for the sake of lowering blood pressure or looking good in a bathing suit as summer approaches. We memorize volumes of boring material for the sake of gaining admission to veterinary or medical school. We endure the excruciating pain of cosmetic surgery to look better. And we similarly endure chemotherapy, radiation, dialysis, physical therapy, and transplant surgeries to achieve a longer, better quality of life than we would have without it or, in some cases, merely to prolong life to see our children graduate, to complete an opus, or fulfill some other goal.

In the case of animals, however, there is no evidence, either empirical or conceptual, that they have the capability to weigh future benefits or possibilities against current misery. To entertain the belief that “my current pain and distress, resulting from the n d of chemotherapy or some highly invasive surgery, will be offset by the possibility of an indefinite amount of future time,” is taken to be axiomatic of human thinking. But reflection reveals that such thinking requires some complex cognitive machinery. For example, one needs temporal and abstract concepts, such as possible future times and the ability to compare them; a concept of death, eloquently defined by Heidegger as “grasping the possibility of the impossibility of your being;” the ability to articulate possible suffering; and so on. This, in turn, requires the possibility to think in an if-then hypothetical and counterfactual mode; that is, if I do not do X, then Y will occur. This mode of thinking, in turn, seems to necessitate or require the ability to process symbols and combine them according to rules of syntax in language.

I have argued vigorously elsewhere against the Cartesian idea that animals lack thought and are simply robotic machines. It is also clear that animals have some concept of enduring objects, causality, and limited futural possibilities (probably learned by association), or else the dog would not expect to get fed, the cat would not await the mouse outside of its mouse hole, and the lion could not intercept the gazelle. Animals also clearly display a full range of emotions, as Darwin famously argued.

To treat animals morally and with respect, we need to consider their mentalational limits. Paramount in importance is the extreme unlikelihood that they can understand the concepts of life and death in themselves rather than the pains and pleasure associated with life or death. To the animal mind, in a real sense there is only quality of life, that is whether its experiential content is pleasant or unpleasant in all of the modes it is capable of, for example whether they are bored or stimulated, fearful or not fearful, lonely or enjoying companionship, in pain or not, hungry or not, or thirsty or not. We have no reason to believe that, lacking linguistic tools, an animal can grasp the notion of life itself, nor can we be said to abort its future plans if we kill it.

The evil in euthanizing these animals is more a matter of what has been called “virtue ethics” than anything else. Do we really aspire to be the kind of society that treats animals as disposable and that views our implicit commitments to them as revocable for convenience? Do we wish to teach our children that moral obligations last only as long as we feel compelled to honor them, particularly in a society where half of all marriages end in divorce? Furthermore, having them euthanized once again resurrects the moral stress we recounted that affected shelter workers. Now that we know these untoward effects, is it morally acceptable to impose this upon a new class of sin eaters?

I do not propose legislation lightly. I very strongly feel that, as a society, we are significantly over-legislated, over-regulated, with the government far too intimately involved in our daily lives. Am I therefore contradicting myself? I don’t believe so. While there may well be too much legislation and regulation in many significant areas, it emphatically does not follow that there is a sufficient amount in other areas. Over the last 50 or so years, society has moved in the direction of strengthening and buttressing the moral status of animals. Animals are steadily being viewed less as objects or things, and more and more as moral persons. And my argument against seeing horses and dogs and cats as disposable things fits well with social distaste at the extermination of what once were viewed as vermin, be they prairie dogs, starlings, wolves, gophers, crows or in general, “trash” animals.

In exactly the same way that we discussed the allegedly “unwanted horse” at the beginning of this essay, society ever-increasingly realizes that animals need to be defined not merely in relation to how they affect us, and our convenience, but also — and even more so — in terms of having their own interests constitutive of what Aristotle and I have called their telos, their biological and psychological natures. Acknowledging our responsibilities to the horse, a North American icon, rather than shirking them or bellowing that “horses are livestock,” and trying to squeeze every dirty penny out of them, is a good place to start. While I am not so naïve as to believe that what I propose will occur in the short run, I do believe that articulating it can serve to get people thinking in a different way.
Case Report Rapport de cas

Extramedullary plasmacytoma in the lung of a Doberman pinscher dog
Lauren Adelman, Victoria Larson, Thomas Sissener, Tim Spotswood

Abstract — A 7-year-old Doberman pinscher dog was referred for evaluation of a radio-opaque thoracic mass. The left cranial lung lobe and associated mass were surgically resected and histopathology confirmed the presence of an extramedullary plasmacytoma (EMP). This is the first clinical description of an EMP in the lung of a veterinary patient.


A 7-year-old intact male Doberman pinscher dog was presented to the Calgary Animal Referral and Emergency (CARE) Centre oncology service in March, 2010 with a recent history of lethargy and exercise intolerance. A radio-opaque mass had been detected by the referring veterinarian in the left cranial lung field on plain radiographs (Figure 1). The patient had a past history of dilated cardiomyopathy and hypothyroidism and was being treated for these conditions with sotalol HCl and levothyroxine sodium.

Case description
On presentation, the patient was bright, alert, and responsive with a body condition score of 6/9. All physical examination parameters were within normal limits. An echocardiogram showed mild bradycardia (heart rate 80 beats/min), reduced fractional shortening (18% to 20%), mild left ventricular eccentric hypertrophy, and mild tricuspid and mitral insufficiency. These changes were similar to those seen in a previous echocardiogram in November 2007, and are consistent with mild non-progressive dilated cardiomyopathy. An abdominal ultrasound examination was also performed; this showed mild cystic prostatomegaly, consistent with benign prostatic hyperplasia, and mild hepatomegaly with normal hepatic echotexture. Following the ultrasound examination, the patient was induced with ketamine hydrochloride (KETASET 100 mg/mL; Wyeth Animal Health, Guelph, Ontario), 5 mg/kg body weight (BW), IV, and valium (Diazepam; Hospira Healthcare Corporation, Saint-Laurent, Quebec), 0.25 mg/kg BW, IV. Computed tomography (CT) of the thorax was performed (GE HiSpeed CTi, GE Healthcare, Burnaby, British Columbia) under isofluorane anesthesia with the dog in dorsal recumbency using helical acquisition of 3-mm slice thickness and 2-mm slice intervals. Sagittal and dorsal multiplanar reformatting was applied. The CT scan revealed a well-defined craniodorsal lung mass (black arrowheads).

Figure 1. Right lateral recumbent thoracic radiograph showing a well-defined craniodorsal lung mass (black arrowheads).
unremarkable. Differential diagnoses included a primary pulmonary mass, a single metastatic mass, pulmonary granuloma, and pulmonary cyst.

Directly after the CT scan, the patient was clipped and aseptically prepared for a left 5th intercostal lateral thoracotomy. A buccal mucosal bleeding test performed prior to surgery was within normal limits. The mass was identified on the medial aspect of the left cranial lung lobe. Gentle dissection at the hilus was performed to free up room for a thoracoabdominal (TA) stapler. A TA30 V3 stapler (Tyco Healthcare, Mansfield, Massachusetts, USA) was applied to the affected lung lobe hilus. A transfixing ligature of 2-0 Prolene (Ethicon, Somerville, New Jersey, USA) was placed for added security. The lobe was resected, removed, and observed for hemorrhage. The lymph nodes were not biopsied. A 12-gauge silicone thoracostomy tube (Smiths Medical, Dublin, Ohio, USA) was placed through the skin at the 10th rib and tunnelled subcutaneously to the 7th rib space before insertion into the thorax. Simple interrupted sutures of 0 Prolene (Ethicon) were placed around the ribs and then individually tied with tension on the sutures from above. The scalenus and latissimus dorsi muscles were closed with 3-0 PDS (Ethicon) and the skin was closed with 3-0 Monosof (Tyco Healthcare). The thoracostomy tube was secured to the skin using a Chinese finger trap suture with 3-0 Monosof (Tyco Healthcare). Gentle suction using a large bore syringe was applied to the thoracostomy tube until negative pressure was obtained. After surgery the patient was supported with intravenous fluids, analgesia (fentanyl citrate injection (Sandoz Canada), 4 μg/kg BW, IV, fentanyl patch (Novo-fentanyl; Novopharm, Toronto, Ontario), 5 mg transdermal patch for 5 d, meloxicam (Metacam; Boehringer Ingelheim Canada), 0.2 mg/kg BW, SQ, once, then 0.1 mg/kg BW, SQ, q24h for 3 d), intravenous antibiotics (cefazolin sodium; Sandoz Canada), 22 mg/kg BW, IV, q8h for 2 d, and thoracic drainage every 4 h. The thoracostomy tube was removed the day after surgery and the dog was discharged from the hospital after 2 d.

Two tissue samples from the resected lung lobe (Figure 3) measuring 3 cm × 9 cm and 1 cm × 9 cm, representative of the lung mass, were submitted for histopathology. Margins were not evaluated. Results showed polygonal cells arranged in sheets and indistinct packets (Figure 4). Cells had distinct borders and contained moderate to abundant eosinophilic, finely granular cytoplasm and ovoid nuclei. Multiple nuclei were present in many cells. Nucleoli were prominent and contained coarse chromatin with 0-1 mitoses present per high power field (Figure 5). Marked anisokaryosis and karyomegaly were also present. Overall, these findings were consistent with a round cell tumor and strongly favored an anaplastic plasma cell tumor. It was determined to be an extramedullary plasmacytoma (EMP). The possibility that this tumor represented a part of a systemic neoplastic process such as multiple myeloma could not be ruled out.

Immunostaining of block 3 for MUM-1 and kappa and lambda light chains was performed to aid in identification of the cell type of origin. Only the staining for lambda chains was positive, further supporting the diagnosis of a plasma cell tumor.

Further diagnostic tests included serum protein electrophoresis and examination of bone marrow aspirates; survey radiographs (spine and pelvis) were recommended to the owner to rule out multiple myeloma. Serum protein electrophoresis showed a mild polyclonal elevation in the beta fraction at 14 g/L which was not consistent with multiple myeloma. Urine protein electrophoresis was not performed as the urine protein concentration was too low. Serum and urine electrophoresis were unremarkable. A bone marrow aspirate from the right proximal

Figure 2. Axial CT image through the cranial thorax (4th intercostal space) showing a well-circumscribed soft tissue mass in the left cranial lung lobe (white arrows). “E” and “A” denote esophagus and aorta, respectively.

Figure 3. Left cranial lung lobe and associated mass resected at time of surgery. Pen in photo measures approximately 17 cm.
humerus was obtained under sedation. Hematopoietic precursors were present in low numbers diffusely dispersed throughout the slides and there was representation of all blood cell lines and stages of maturation. While proportions were difficult to determine, occasional plasma cells were noted and did not appear in significant numbers or of abnormal morphology. A complete blood (cell) count (CBC) that was done in conjunction with the bone marrow aspirate revealed no abnormalities. Serum biochemistry was not done.

Repeat radiographs and blood work (for elevated globulins) were recommended at 1 mo after surgery and every 3 mo thereafter. These tests were performed at the referring veterinary clinic. In January 2011, the patient was presented to the CARE Centre for acute non-painful nonsymmetrical hind limb paresis, suspicious for a fibrocartilagenous embolism, although neoplasia could not be ruled out. The dog fully recovered without any specific therapy. At the time of case report submission, the patient was 8 ½-years-old and continued to do well.

**Discussion**

Plasma cell tumors originate from the proliferation of a single cell of the B-lymphocyte plasma cell line that forms a malignant population of like cells. This population of neoplastic cells is typically monoclonal in that all immunoglobulin produced is identical (1). However, there are reports of both biclonal and polyclonal plasma cell tumors (1). Multiple myeloma is clinically the most important form of plasma cell tumor in the canine patient.

Solitary plasmacytomas are collections of monoclonal plasmacytic tumors that can form in bone as solitary osseous plasmacytomas, or in soft tissues as extramedullary plasmacytomas (1). They are uncommon in the dog and in 1 study made up only 2.4% of all canine tumor submissions (2). The median age of afflicted dogs is 9 to 10 y (2,3). The English and American cocker spaniel, West Highland white terrier, and possibly also Yorkshire terriers, boxers, German shepherds, and Airedale terriers, are at an increased risk (2,3).

Extramedullary plasmacytoma (EMP) refers to tumors occurring outside of the bone marrow, in soft tissues or organs that may be focal, spread to regional lymph nodes, or metastasize to distant areas (4). In a large veterinary case study (751 cases), the most common EMP location in the dog was cutaneous sites (86%), followed by mucous membranes (9%), and the rectum and colon (4%). Other sites, including the stomach, spleen, genitalia, eyes, uterus, and liver made up the remaining 1% of cases (2). Unlike solitary osseous plasmacytoma for which most cases eventually progress to systemic multiple myeloma, EMP characteristically have a more benign course in dogs (1). Cutaneous and oral EMP are typically easily curable with local excision and although visceral EMP (esophagus, stomach, intestines, colorectal) may metastasize to associated lymph nodes, bone marrow involvement and monoclonal gammopathies are uncommon (1,5,6). Extramedullary plasmacytomas in the trachea, liver, and uterus are also believed to behave as benign tumors following local resection (7–9). To date, there have been no clinical case reports of EMP in the lung of a veterinary patient.

Diagnosis of EMPs usually requires fine-needle aspiration or tissue biopsy. Several immunohistochemical studies may be used on undifferentiated solitary plasmacytic tumors to help differentiate them from other round cell tumors (1). Diagnosis of EMP has historically been based upon demonstration of clonality for lambda or kappa immunoglobulin light chains (10,11). Mixed cell populations would be expected to have both light chains while a monoclonal population would have only one of the two. The immunohistochemical findings in this case are therefore supportive of the diagnosis of a plasma cell tumor, which is a tumor of monoclonal immunoglobulin-producing cells (12).

Staining for Multiple Myeloma 1/Interferon Regulatory Factor 4 (MUM1/IRF-4) can also be useful in detection of plasmacytomas. MUM1/IRF4 is an interferon regulatory factor which is involved in lymphoid cell differentiation via its role in light-chain rearrangement at the pre-B stage of lymphocyte maturation (13,14). In 1 study of 109 canine plasmacytomas, greater than 94% were positive for MUM1/IRF4, demonstrating
that the antibody Mum-1p is very specific for this tumor (12). It was also shown to have a higher sensitivity and specificity for the detection of canine plasmacytomas when compared to CD79a and CD20 (12). In humans, expression of MUM1/IRF4 is associated with decreased survival; however, additional studies are needed to determine its prognostic significance in veterinary medicine.

In this case, staining for MUM-1 was negative, which is not consistent with previously reported findings. This could be a spurious finding due to laboratory error in staining (false negative), or it could be that this particular plasmacytoma does not stain positive. Re-staining for MUM-1 as well as T- and B-cell markers was requested, but the tissue block had been discarded by the laboratory. Therefore, a diagnosis of lymphoma could not be ruled out. However, based on the location of the tumor (solitary pulmonary mass), breed of the patient, presence of a monoclonal gammopathy, the remainder of the diagnostic findings and the overall clinical picture, the diagnosis of an extramedullary plasmacytoma is strongly favored.

In human medicine, EMP is a rare plasma cell neoplasia and lesions involving the lung are even fewer (4,15,16). In the lung, EMP can be the first indication of multiple myeloma or it may be restricted to the lung with or without spread to local lymph nodes (4). The most common site in the respiratory tract of humans is the submucosa of the upper respiratory tract (15,16). Plasmacytomas occurring in the lower respiratory tract [primary pulmonary plasmacytoma (PPP)], are extremely rare (14,15). The association between multiple myeloma, EMP, and solitary plasmacytomas of bone is not well understood in human medicine; some authors view these as separate disease entities while others interpret them as different manifestations of one disease spectrum (4).

Due to the rarity of this disease, standard treatment protocols in human and veterinary medicine have not been established; however, if surgical resection is complete, it may be considered curative (17,18). Surgery and radiation therapy appear to have equivalent efficacy (16) while combinations of surgery, chemotherapy, and radiation have been tried with no difference in survival times noted (4). However, in these studies, follow-up was limited (4). The use of adjuvant chemotherapy in the treatment of PPP is an area that requires further investigation. Since so few cases have been reported, little information is known on prognosis. However, it is believed that PPP behaves differently than multiple myeloma and increased survival rates have been reported (4).

This case report suggests that long-term survival is possible with surgical excision alone for the treatment of EMP in veterinary patients. Further studies into the role of adjuvant chemotherapy and radiation are necessary to determine optimal treatment protocols for EMP in both human and veterinary medicine.

References
Case Report Rapport de cas

Long-term outcome of conventional endotracheal tube balloon dilation of tracheal stenosis in a dog

Nili Kahane, Gilad Segev

Abstract — This report describes a successful dilation of tracheal stenosis in a 16-year-old dog using a conventional endotracheal tube balloon. This technique should be considered as palliative treatment when owners decline other therapeutic options.

Résumé — Résultat à long terme de la dilatation du ballonnet-tube trachéal d’une sténose trachéale chez un chien. Ce rapport décrit une dilatation réussie d’une sténose trachéale chez un chien âgé de 16 ans à l’aide d’un ballonnet-tube trachéal conventionnel. Cette technique devrait être considérée comme un traitement palliatif lorsque les propriétaires refusent les autres options thérapeutiques.


Acquired tracheal stenosis may result from various disorders including neoplasia, inflammation, infection, and trauma (1–4). Clinical signs vary from exercise intolerance and mild inspiratory effort to life-threatening respiratory distress and cyanosis (3,4). The 2 most common treatments for tracheal stenosis are resection and anastomosis and stenting. The former is technically difficult and might be associated with complication and the latter requires special equipment and training (2,5).

Case description

A 16-year-old, neutered female, mixed breed dog, weighing 10 kg, was presented with the chief complaint of respiratory distress. The clinical signs were first noted 4 mo prior to arrival and included exercise intolerance and respiratory difficulties during excitement. During these 4 mo the dog was treated by the referral veterinarian with antibiotics with no improvement. Upon arrival, the dog had severe inspiratory effort and cyanosis; she was immediately hospitalized in an oxygen cage. Due to progressive deterioration in respiratory effort the dog underwent general anesthesia using butorphanol (Morphasol 10 mg/mL; aniMedica GmbH, Baisensell, Germany), 0.2 mg/kg body weight (BW), SC, for premedication, ketamine (Clorketam Veterinary 10%; Vétoqinol, Lure, France), 5.0 mg/kg BW, IV, and diazepam (Assival 10 mg/2 mL; Teva, Godollo, Hungary), 0.5 mg/kg BW, IV, for induction. For maintenance, propofol (Propofol-Lipuro 1%; B. Braun Melsungen AG, Melsungen, Germany) was given IV to effect. Resistance was noted during intubation; however, immediately after placing the endotracheal tube, the inspiratory effort dramatically improved.

Complete blood cell count and serum creatinine concentration were unremarkable. Due to financial reasons and lack of owner compliance serum biochemistry was not conducted. Arterial blood gas analysis on room air after intubation, but with no oxygen supplementation, revealed a PaO₂ of 83.8 mmHg, a PaCO₂ of 42.7 mmHg, and a pH of 7.37 (at sea level). Before intubation, and during extubation, the larynx was evaluated for arytenoid function and for gross lesions; findings were unremarkable. Cervical radiographs (after removal of the endotracheal tube) revealed a marked narrowing of the trachea approximately 2 cm caudal to the hyoid apparatus (Figure 1). The diameter of the narrowing was estimated to be 5 mm, compared with a diameter of 12 mm for the normal trachea. At the end of the procedure the dog received 4 mg of Dexamethasone (Dexacort 4 mg/mL; Teva) IV. Following extubation there was a marked improvement in respiratory effort, most likely due to widening of the stenosis following intubation. Tracheoscopy, which was performed the same day, revealed abnormal tissue at the cranial trachea, 2 to 3 cm long, extending from the larynx distally and causing severe stenosis (3 to 4 mm in diameter). Differential diagnosis included inflammatory process, neoplastic process, or fibrotic tissue. During tracheoscopy, samples were obtained using swabs and touch smears were performed, but were non-diagnostic.

The dog was discharged but the owners were warned that the relief was expected to be temporary and further diagnostics and treatment such as surgery or stenting were recommended. The owners declined any other diagnostic or therapeutic procedure, however, due to financial constraints.

Six months later the dog was presented again for a surgical and oncology consultation due to the recurrence of clinical...
signs. During the last 2 mo there had been progressive deterioration in respiratory effort, which was most notable with minimal activity and upon excitement. On presentation, the dog was tachypneic (respiratory rate: 120 breaths/min), and had a marked inspiratory effort. On thoracic and cervical radiography, a severe narrowing was noted approximately 2 cm caudal to the hyoid apparatus, at the same previous location. The diameter of the stenosis as revealed by radiographs was ~5 mm, comparable to the previous estimate (Figure 2). Additionally, an alveolar pattern was present at the right middle, left cranial, and caudal lung lobes. Main differential diagnoses for the alveolar pattern included non-cardiogenic pulmonary edema secondary to the upper airway obstruction, or pneumonia.

On repeated tracheoscopy, a 3 to 4 mm diameter stenosis was noted, approximately 2 to 3 cm caudal to the larynx. The mucosa cranial to the stenosis was thick and edematous. Resection and anastomosis was considered as the treatment of choice despite the concern for dehiscence. Due to financial constraints, the owners declined any surgical option, including stenting across the stenosis; therefore, palliative treatment with balloon dilation was performed. The balloon size was selected based on the degree of narrowing and the diameter of the normal cervical trachea. To prevent bleeding into the lungs during the procedure, a 3.5 mm internal diameter endotracheal tube was initially inserted through the stenosis and the balloon was fully inflated. A second, 5.5 mm internal diameter endotracheal tube was then inserted over the small endotracheal tube and was further dilated by inflation of the endotracheal tube balloon at the stenosis site. The assessment was that the stenosis rather than the abnormal lung pattern played a larger role in the respiratory difficulty, because after the dilation procedure, the dog was breathing normally without effort. Further diagnostics were not conducted at the owner’s request. Biopsies obtained via endoscopy from the abnormal tissue at the stenosis site were consistent with neutrophilic tracheitis and fibrosis with no evidence of a neoplastic process.

Eleven months later the dog was presented with a complaint of respiratory distress and hemoptysis. History revealed that the dog had been free of clinical signs until 2 mo prior to presentation, during which the dog suffered from periods of increased respiratory effort, which had become worse during the last few days. At arrival, tracheoscopy was performed and revealed a 2 to 3 mm diameter tracheal stenosis at the previous site. It was decided to balloon dilate the stenosis again using the same technique, as other options were declined by the owners. Following the procedure the diameter of the trachea was 7 to 9 mm and the dog was breathing with no respiratory effort.

A week later the dog was presented with a complaint of decreased appetite, coughing, and 1 episode of syncope. Chest radiographs revealed a diffuse alveolar pattern, predominantly in the cranial lung lobes, likely due to pneumonia, non-cardiogenic edema, or neoplasia. The diameter of the stenosis was about 8 mm, unchanged compared with its diameter following the last procedure, and the clinical signs were therefore assessed to be unrelated to the stenosis. On broncho-alveolar lavage, red blood cells, white blood cells, and a few epithelial cells were seen; however, a cell count was not performed. There was no evidence of a neoplastic process or pneumonia. Further diagnostics were declined for financial reasons. At the owners request the dog was discharged with treatment which consisted of oral antibiotics; Amoxicillin-clavulanate (Augmentin 250 mg; Smith Kline Beecham PLC, Brantford, UK), 1/2 a tablet twice a day, Ofloxacin (Oflodex 200; Dexcel, Or-Akiva, Israel), 1 tablet.
once a day, and a bronchodilator: Theophylline (Theotrim 100; Trima, Maabarot, Israel), 1 tablet twice a day. The dog was presented again 6 d later with neurological signs of head pressing, bumping into walls, and ataxia. At this point the dog was euthanized at the owner’s request.

Discussion

Dilation of tracheal stenosis as a palliative measure for segmental tracheal stenosis in a dog using a new technique is described. Tracheal stenosis, although uncommon, may be seen with neoplastic diseases, inflammatory processes, congenital abnormalities, previous tracheal surgery, endotracheal tube pressure necrosis, or scar formation from previous trauma, abscesses, foreign bodies, vascular anomalies, granulomas, and extratracheal compression (1–4).

Clinical signs commonly consist of stridor, respiratory distress, and subsequent cyanosis. When the stenosis limits luminal size to approximately 50% to 75% of normal diameter, respiratory distress becomes obvious at rest and cyanosis develops with minimal exercise (6). The diagnosis is usually based on radiographs and tracheoscopy (3,4).

Treatment of tracheal stenosis may be either medical or surgical. Resection and anastomosis of up to 50% of the trachea in an adult dog can be performed (6). Surgical resection and anastomosis is the treatment of choice for tracheal stenosis, especially when tracheal neoplasia is diagnosed, not only to eliminate the obstruction, but also to resect the neoplastic tissue. Resection and anastomosis is a relatively complicated, invasive procedure, and can result in significant morbidity including dehiscence, tracheal stenosis or necrosis, pneumothorax, and laryngeal paralysis (7). In the present case, the risk for dehiscence was considered high since the tissue from the stenosis site cranial to the larynx was abnormal and thus less likely to heal well (8,9).

A permanent tracheostomy is another surgical option for proximal cranial segmental tracheal stenosis, and is indicated when upper airway obstruction is prolonged or cannot be relieved. Complications associated with permanent tracheostomy in dogs and cats include infections, stenosis, and obstruction of the stoma with a foreign body, skin folds, or mucous secretions (10). In this case, a permanent tracheostomy was offered to the owners; however, because of immediate and dramatic improvement after the first intubation, most likely due to dilation of the stenosis following intubation, the owners requested that surgical intervention be postponed until clinical signs recurred.

Tracheal stent placement is becoming more common in companion animals; however, it has been typically reserved for tracheal collapse in dogs. Intraluminal tracheal stent is a reasonable treatment option for tracheal stenosis (7), but it was not performed in the current case due to financial constraints. Complications associated with intraluminal tracheal stenting in dogs include stent migration, collapse, breakage or deformation, abscess formation, excessive granulation tissue formation, tracheitis, coughing, pneumomediastinum, pneumonia, and death (7,11).

Another nonsurgical option is tracheal bougienage, which is used with reasonable success in humans as primary therapy for stenosis or as an initial therapy to allow urgent relief of airway obstruction and to make dilation and stent placement simpler and safer. The bougienage can be done using designated equipment such as an angioplastic balloon catheter, valvuoplasty catheters, or a Fogarty catheter (3). Alternatively, the stenosis can be dilated using an endotracheal tube balloon (12) as was done in this case. In both procedures repeated treatments may

![Figure 3](image1.png)

**Figure 3.** Demonstration of the 2 endotracheal tubes used in this procedure. A smaller tube of 3.5 mm internal diameter was inserted first through the stricture and was dilated (smaller/blue balloon) to secure the airways in case of bleeding during stricture dilatation. After balloon inflation of the 3.5 mm endotracheal tube, a 5.5 mm tube (larger/red balloon) was inserted over the smaller endotracheal tube and the balloon was gradually inflated at the stenosis site.

![Figure 4](image2.png)

**Figure 4.** Bronchoscopic image of the site of the tracheal stricture prior (A) and immediately after (B) dilatation using the endotracheal balloon.
be needed and the treatment may be combined with steroids and stenting. Nomori et al (12) used a conventional endotracheal tube balloon as an initial treatment prior to stent placement with adequate dilation and without complications. In this case, steroids were administered following the first visit and first balloon dilation procedure in an attempt to decrease the risk for recurrence. The use of steroids has been described following esophageal stricture dilation (13); however, there is limited evidence to support their use in tracheal stricture dilation.

We emphasize that the procedure is palliative and that the stenosis is likely to recur; therefore, multiple dilations may be required. Retrospectively, the final cost of the 2 balloon dilations might approach the cost of surgery. Surgery was presented to the owner each time the stenosis occurred but was rejected due to the lower cost of balloon dilation, the success of the previous dilation procedure, and that the potential complication of stenosis recurrence in both procedures (7).

Once clinical signs recurred in this dog it was decided to dilate the stenosis again using an endotracheal tube balloon, considering the dog’s age and the good and relatively long-lasting response to the first intubation that widened the stenosis. This decision was further supported the second time by the histopathology, which was consistent with an inflammatory process.

One of the risks of any type of dilation is bleeding into the respiratory system, which, when severe enough, may directly obstruct the airways and become life-threatening. To prevent this complication herein, a small endotracheal tube was first inserted caudal to the stenosis, via endoscopic guidance, and then sufficiently inflated to prevent bleeding into the lungs. Once the airways were secured, a second endotracheal tube was inserted over the small one and positioned at the stenosis site. The balloon was then inflated repeatedly, each time to a larger diameter. The pressure used to inflate the balloon sufficiently was evaluated subjectively, while the mucosa was carefully inspected via the bronchoscope for any damage. Since the procedure was performed using the cuff of a tracheal tube, it was non-obstructive, allowing it to be left in place for a relatively long time, in order to achieve adequate dilation of the stenosis.

Balloon dilation may be performed under fluoroscopic or endoscopic guidance (14,15). Both tracheoscopy and fluoroscopy require specialized equipment and experienced staff. The disadvantage of fluoroscopy is the exposure of the animal and staff to radiation, and its unavailability in many small animal clinics.

In the present case, the balloon dilation was repeated with an interval of 11 mo between treatments. This is a long interval and was acceptable by the owner and veterinarians, and thus should be considered as a treatment option for dogs with tracheal stenosis. The procedure is relatively easy, cost-effective, and quick (compared with resection and anastomosis), resulting in a shorter anesthesia time and decreased risks for anesthetic complication. It provided immediate respiratory relief with no complications, and was performed on an outpatient basis. The procedure was considered successful considering the long intervals between the procedures; although the final outcome was not favorable.

In conclusion, this case demonstrates that when resection and anastomosis or stents cannot be used due to financial constraints, technical difficulties, or the animal’s condition, the use of endotracheal tube balloon should be considered as a palliative treatment for segmental tracheal stenosis. The technique described herein was successful, with no complications, and minimized the risk for respiratory system bleeding. It is relatively easy to perform, inexpensive, and provides an effective alternative to other methods.

References
Case Report  Rapport de cas

A case of ocular canine transmissible venereal tumor

Jewel Milo, Elisabeth Snead

Abstract – A 1-year-old, intact female mixed-breed dog was presented to St. George’s University Small Animal Clinic in Grenada for a third eyelid mass. The dog was diagnosed with a rare ocular transmissible venereal tumor (TVT) and concurrent anaplasmosis, ehrlichiosis and dirofilariasis. Treatment with vincristine sulfate resulted in complete resolution of the TVT.

Résumé – Cas de tumeur vénérienne canine oculaire transmissible. Une chienne de race croisée intacte âgée de 1 an a été présentée à la clinique pour petits animaux de l’Université St. George de la Grenade pour une masse de la troisième paupière. La chienne a été diagnostiquée avec une rare tumeur vénérienne oculaire transmissible (TVT) et l’anaplasmose, l’ehrlichiose et la dirofilariose concomitantes. Le traitement au sulfate de vincristine a produit une résolution complète de la TVT.


Case description

A 1-year-old, 15-kg, intact, mixed breed, female dog was presented to St. George’s University Small Animal Clinic (SGU SAC) for evaluation of a suspected prolapse of her right third eyelid and unilateral ocular discharge. The dog had been adopted by a veterinary student 3 days earlier after it was found wandering the neighborhood. On presentation the right third eyelid was prominent, light pink in color with diffuse punctate, raised lesions. There was moderate, yellowish-brown crusting around the eye. A neuro-ophthalmic examination showed the eyes to be normal bilaterally. Tear production, intraocular pressures, and a fundoscopic examination were normal in both eyes. There was no corneal uptake of fluorescein stain bilaterally. Clavamox (Pfizer Animal Health, New York, New York, USA) 16 mg/kg body weight (BW) PO, q12h for 14 d, Rimadyl (Caplets and Chewables; Pfizer Animal Health) 2.5 mg/kg BW PO, q12h for 5 d, and chloramphenicol ophthalmic ointment (Vetachloracin Ophthalmic Ointment 1%; Dechra Veterinary Products, Overland Park, Kansas, USA) OD ¼ inch strip applied topically q12h for 7 d were prescribed. Despite these therapies chemosis of the right third eyelid worsened and the ocular discharge increased.

Three days later the dog was re-examined at the SGU SAC. The right third eyelid was noticeably more swollen with punctate hemorrhages, scalloped edges, and several lobulated masses evident. Blood-tinged epiphora with moderate brown-black crusting around the eye was seen (Figure 1). The third eyelid mass was friable and bled when manipulated with a cotton tip applicator. The left eye was normal.

A complete blood (cell) count (CBC), serum biochemistry profile, and analysis of urine collected by cystocentesis were performed along with a Snap 4Dx test (IDEXX Laboratories, Westbrook, Maine, USA) to screen for vectorborne disease agents Dirofilaria immitis (heartworm disease), Ehrlichia canis (ehrlichiosis), Anaplasma phagocytophilum (anaplasmosis), and Borrelia burgdorferi (Lyme disease). In addition, impression smear cytology of the third eyelid mass was done. The CBC revealed a mild non-regenerative anemia [hematocrit (HCT) 34%; reference interval (RI): 37% to 55%, reticulocyte count 1.5%] and marked thrombocytopenia (36 × 10^9/L; RI: 175 to 500 × 10^9/L). The serum biochemistry profile revealed mild hyperphosphatemia (2.45 mmol/L; RI: 0.81 to 2.2 mmol/L), and moderate hyperproteinemia (93 g/L; RI: 52 to 82 g/L) characterized by a hyperglobulinemia (63 g/L; RI: 25 to 45 g/L). The urine specific gravity was 1.045 and the urine sediment examination was unremarkable. The dog was positive for D. immitis, E. canis, and A. phagocytophilum and negative for B. burgdorferi on the IDEXX 4Dx Snap test. Impression smear cytology of the right third eyelid mass using Giemsa stain revealed a neoplastic round cell population with some inflammatory cells (75% neutrophils and 25% macrophages). Features of malignancy in the round cell population included mild to moderate anisocytosis, anisokaryosis, numerous mitotic figures, and abundant faint basophilic cytoplasm. The cells had an increased nuclear to cytoplasmic ratio and the cytoplasm contained 3 to 4 distinct vacuoles characteristic for transmissible venereal tumor (TVT) (Figure 2). Given the findings
consistent with TVT a vaginal examination was performed. No vaginal mass was visualized or palpated.

Treatment with doxycycline (Westward Pharmaceutical Corp, Edmonton, New Jersey, USA), 10 mg/kg BW, PO q12h for 30 d, for ehrlichiosis and anaplasmosis was initiated. In addition, Iverhart Max Chewable tablet containing ivermectin 136 mg, PO, q30d, praziquantel 114 mg, and pyrantel pamoate 114 mg (Virbac Animal Health, Fort Worth, Texas, USA) were prescribed for heartworm and intestinal parasites. For the TVT, treatment with vincristine sulfate (Hospira, Lake Forest, Illinois, USA), 0.025 mg/kg BW, IV, q7d for a total of 6 treatments was initiated. Due to financial limitations of the owner the dog was monitored with a CBC every other week instead of every week. Photographs of the right nictitating membrane lesion were taken at each follow-up visit to monitor progress (Figures 3a, b).

After the first vincristine treatment only minimal improvement was noted. A CBC performed prior to the second vincristine treatment revealed no improvement in the anemia (HCT 34%), a persistent but improved thrombocytopenia (162 × 10^9/L; RI: 175 to 500 × 10^9/L), and a mild eosinophilia (1.7 × 10^9/L; RI: 0.5 to 1.5 × 10^9/L).

By the third week the right third eyelid mass had decreased dramatically in size. By the fourth week only a small remnant of the mass was visible (Figure 3a) and by week 6, the mass was no longer evident without exteriorization of the third eyelid. However, marked thrombocytopenia (25 × 10^9/L; RI: 0.5 to 1.5 × 10^9/L) persisted, along with a now regenerative anemia (HCT 35.9%). A manual platelet count with only 1 platelet seen per high power field (hpf) confirmed the thrombocytopenia. Because the thrombocytopenia was attributed to bone marrow suppression from the vincristine the sixth, and final vincristine treatment, was postponed by a week. Prior to the sixth treatment a recheck CBC revealed normalization of the platelet count (200 × 10^9/L; RI: 175 to 500 × 10^9/L) and resolution of the anemia (HCT 37.5%). At this time the dog was sedated with Propofol (PropoFlo; Abbot Laboratories, Abbott Park, Illinois, USA), 0.2 mg/kg BW, IV and her right third eyelid was everted to permit examination. Only a very small remnant of the mass was still visible. Complete resolution was noted 1 week after the final treatment (Figure 3b). With resolution of the ocular TVT, heartworm adulticide treatment was initiated and was well-tolerated with no complications. Eighteen months after initial presentation, there was no visible recurrence of the dog’s TVT.

Discussion

Transmissible venereal tumor (TVT), also referred to as Sticker’s tumor, venereal granuloma, transmissible venereal sarcoma, infective venereal tumor, and transplantable lymphosarcoma is a tumor that primarily affects the genitalia of sexually mature dogs. It is a common tumor in tropical and subtropical regions where there is a high population of stray, malnourished dogs (1–4). A TVT is unique in its pathogenesis compared with other neoplasms since it does not arise spontaneously but is transmitted from one animal to another (2). The transmissible nature is suggestive of an infectious etiology; however, no infectious particles have ever been detected within the tumor cells (2–3). These tumor cells are not the patient’s own cells transformed into cancer cells. The TVT is a tumor that grafts itself from one dog’s body onto another dog’s body (5).

In male dogs the tumor typically affects the caudal aspect of the penis (Figure 4) and occasionally the prepuce. Phimosis or paraphimosis may occur as a complication (2). In female dogs lesions are most common at the posterior part of the vagina, particularly at the vestibulovaginal junction (2). Due to this deeper location a visible genital growth may not be evident; however, in some cases the mass may be large enough to protrude from the vulva (Figure 5) (2,4). A digital vaginal examination and possibly vaginoscopy should be performed in a female dog with a confirmed extragenital TVT to look for a primary vaginal tumor. Unlike other genital tumors in dogs that tend to occur in older dogs (> 10 y of age), TVT tends to occur in young dogs, typically 2- to 5-years old (2).
The TVT is typically transmitted during coitus (2–4). Transmission can also occur through dogs’ normal social behavior when they lick, sniff, scratch, or bite at their own genitalia (autoimplantation) or if they lick the genitalia of an affected dog (heteroimplantation) (2,4,5). Early on, the genital tumors appear as small hyperemic papules but with time progress to become nodular, papillary multilobulated, friable masses with cauliflower-like or pedunculated proliferations that can measure up to 15 cm in diameter (2). Ulceration of the surface of the tumor with secondary inflammation is common (2,5). Transmissible venereal tumors also bleed easily and often have a malodorous serosanguinous discharge especially if they become secondarily infected (2,4,5–7). The bloody discharge can be confused with signs of estrus or cystitis in females or prostatitis in male dogs (2,4).

Transmissible venereal tumors can also occur in extragenital sites, even in the absence of pre-existing genital lesions as in the case described (2,4,8,9–11). This is typically the result of primary auto- or hetero-implantation. Much less commonly this can result from metastatic spread from a primary genital tumor via hematogenous or lymphatic routes (2,5,7,12). Metastases occur in less than 5% of cases and most commonly affect regional lymph nodes. However, metastasis to other internal organs such as the skin and subcutaneous tissue, pharynx, tonsils, liver, spleen, kidneys, brain, eyes, and lymph nodes has been reported (2,4,6,8). Diagnosis of a TVT at an extragenital site such as the eye, when there is no concurrent genital tumor, as in the case described, can be challenging. The clinical signs seen with TVT in the eye can range from chemosis to episcleritis, severe uveitis, corneal edema, and glaucoma (13,14). There are only a few reported cases of ocular TVT in the literature. Most cases have involved other structures of the eye (sclera, cornea) and have been clearly the result of metastasis from genital lesions (5,6,12,13). In this case, the third eyelid TVT tumor was suspected to be a primary tumor and not to have resulted from metastasis since no external lesions were visible on digital vaginal examination. Given the conjunctival location it is speculated that the dog developed this lesion after being licked on the face by an affected dog.

Tumors of the third eyelid are rare, seen in older dogs, and are typically malignant (15). They usually arise from the conjunctival or glandular tissue. Types of tumors include adenocarcinoma (most common), hemangiosarcoma, mastocytoma, squamous cell carcinoma, hemangioma, fibrosarcoma, and malignant melanoma (15). Transmissible venereal tumors should also be considered, especially in a young to middle-aged sexually intact dog which resides in or has visited a region where TVT is endemic. Importantly, with the exception of TVT, the treatment for other forms of neoplasia of the third eyelid is amputation of the third eyelid and associated gland (15).

A presumptive diagnosis of canine TVT is often made based on the combination of epidemiological factors (young- to middle-aged sexually active dog living in an endemic region) and the location of the tumor (genitalia involvement). Definitive diagnosis of TVT, with differentiation from other round cell tumors, can usually be made from impression smear cytology or fine-needle aspirate cytology (1,2,16). Differential diagnoses include other round-cell tumors such as histiocytomas, lymphoma, poorly differentiated mast cell tumors and carcinomas, and amelanotic melanomas (2,7,12,13). Impression smear cytology is preferred over biopsy for establishing the diagnosis of TVT because it is minimally invasive, inexpensive, and highly sensitive (1,2,16). There is also less cellular distortion with cytology than with formalin-fixed biopsy samples. Histopathology, immunohistochemistry, and electron-microscopy can also be used to establish a diagnosis of TVT (2) and differentiate TVT from other round-cell tumors (3,13) if required. For example, canine TVT cells possess 57 to 64 chromosomes (average of 59), in contrast with the normal 78 in canine somatic cells (2,17). This finding on electron microscopy can be used to help support the diagnosis of TVT when the diagnosis is questioned.

Vincristine sulfate, as a single agent given IV once weekly is the most common treatment protocol for TVT (2,16–19). Four to 8 doses are usually necessary to effect a cure (17).
regression of the right third eyelid TVT in this dog was seen after 6 treatments with vincristine sulfate, with no recurrence or metastasis. The most common side effects with vincristine are gastrointestinal upset and myelosuppression evident by leukopenia (8,17). In the case described, the dog was already severely thrombocytopenic and slightly anemic when vincristine therapy was initiated. The initial thrombocytopenia was attributed to ehrlichiosis and anaplasmosis. Treatment for these diseases with doxycycline resulted in marked improvement in the thrombocyte count; however, there was no improvement in the anemia for several weeks. This was likely because the pathophysiology of the anemia was complex and at least in part explained by chronic inflammatory disease. After the fifth treatment with vincristine, the dog became markedly thrombocytopenic again. This was attributed to myelosuppression from vincristine because the thrombocytopenia resolved with a short delay of further vincristine administration. Transmissible venereal tumors have been reported to be immunogenic tumors; therefore, occurrence, metastasis, and recurrence can depend on the strength of the dog’s immune system (17). It is possible that being a stray and being malnourished, in addition to having 3 concurrent infectious diseases may have predisposed this dog to the development of TVT. The lack of recurrence and metastasis may have also been attributable to improved nutrition and successful ongoing treatment of the concurrent infections.

Medical treatment options for TVT include other chemotherapy drugs such as monotherapy with doxorubicin or vinblastine or combination chemotherapy protocols (2,17). Surgical excision is also an option, but due to the locally invasive nature of TVTs and the risk of tumor transplantation into surgical wounds from contaminated instruments and gloves, the results are often unrewarding with recurrence being common (2,8,17). Radiation therapy has also resulted in complete remission of TVTs but this requires special equipment and personnel, which would have been prohibitively expensive in this case (2,17).

The dog herein was also diagnosed with heartworm disease and there was some concern with immunosuppression from chemotherapy. However, the recommendations of the American Heartworm Society (AHS) were followed (20). This dog was diagnosed with stage 1 (asymptomatic) heartworm disease; the initial recommended treatment is to give a heartworm preventative monthly for 3 mo along with doxycycline at 10 mg/kg BW, PO, q12h for 28 d with adulticide treatment being delayed until days 60, 90, and 91 following diagnosis (20). Doxycycline is recommended to reduce the numbers of the rickettsial bacterium, Wolbachia spp. that works symbiotically with D. immitis in all stages of heartworm disease (20). Killing the Wolbachia spp. disrupts heartworm transmission and reduces pathology associated with adult heartworms (20). Cage rest was also recommended with only short, slow leash walks as needed. This treatment was well-tolerated by the dog.

The typical presentation for TVT often involves the genitalia; however, as the present case illustrates primary ocular TVT may occur. The dog was also diagnosed with 3 concurrent infectious diseases which may have contributed to the dog’s risk of developing a TVT tumor. Treatment of all the diseases was initiated simultaneously and there was complete resolution of the TVT.

Acknowledgments

The authors thank Dr. Sachin Kumthekar, Veterinary Pathology, for his expertise in cytological interpretation of the ocular tumor and for providing 1 of the photographs; Dr. Tara Paterson and Dr. Emma Hage for assistance in management of the case.
References

Brief Communication

Preoperative ketoprofen administration to piglets undergoing castration does not affect subsequent growth performance

Glen Cassar, Rocio Amezcua, Ryan Tenbergen, Robert M. Friendship

Abstract — The purpose of this study was to determine if treatment of pigs with ketoprofen (3 mg/kg body weight) before castration at 7 days of age would affect subsequent growth during the suckling period. Piglets from 301 litters were treated with ketoprofen or a placebo and weighed at castration and at weaning. There was no difference in growth rate between the 2 groups of pigs.

Résumé — L’administration préopératoire de kétoprofène aux porcelets subissant une castration n’affecte pas la performance de croissance subséquente. Cette étude avait pour but de déterminer si le traitement des porcs avec le kétoprofène (3 mg/kg poids corporel) avant la castration à l’âge de 7 jours affecterait la croissance subséquente durant la période d’allaitement. Les porcelets provenant de 301 portées ont été traités à l’aide du kétoprofène ou d’un placébo et pesé à la castration et au sevrage. Il n’y avait aucune différence au niveau du taux de croissance entre les 2 groupes de porcs.

T he issue of pain as it affects animal welfare and performance in swine production has been widely discussed. In addition to the need for treatment of pain in farmed animals for ethical and moral reasons, pain management can have economic ramifications (1). Pain may be viewed as not being an end point in itself, but might be considered in the same manner as a “pathogen” (2). Pain may cause discomfort, impaired physiological functions, suppression of immune responses, negative energy balance, and self-mutilation (3). The report of the Scientific Panel for Animal Health and Welfare (2004) summarized the physiological and behavioral signs exhibited by piglets undergoing castration based on research studies (4). The procedure is generally performed without anesthesia or analgesia, although it has been demonstrated that it is painful, both during the surgery and for some hours later, and has become a welfare concern (5–8). Castration results in acute pain, particularly with the severing of the spermatic cord, but piglets also continue to experience pain for several hours and possibly days following castration. Anesthetics can block the acute pain, but are of little value in suppressing the chronic pain that occurs in the post-surgical period (5,8). Most studies in this field have evaluated the effect of analgesics on controlling pain, using small numbers of animals under controlled conditions to carry out intensive behavior and physiological studies.

In order to improve the adoption of analgesia into the standard operating procedures of commercial farms it is important that producers know whether or not analgesics given at the time of castration will result in an increased performance in growth rate or piglet survival so that they can better determine the economic cost. In order to determine the effect on performance, large numbers of animals are required and trials need to be performed under commercial farming conditions. Ketoprofen, a non-steroidal anti-inflammatory drug (NSAID), was chosen for this study because it is one of the few pain control products approved for use in swine in Canada. The primary goal of the trial was to determine if preoperative treatment with ketoprofen would result in an improvement in suckling pig performance.

A field trial was conducted on a commercial 650-sow farrow-to-feeder pig operation near Guelph, Ontario. The protocol was approved by the Animal Care Committee of the University of Guelph and followed the guidelines of the Canadian Council on Animal Care. A total of 1416 7-day-old piglets from 301 litters were alternately assigned to: i) Control — saline given by IM injection 30 min before castration (n = 703), or ii) Treatment — ketoprofen (Anafen; 100 mg/mL; Mérial Canada, Baie d’Urfé, Quebec) given by IM injection, 3 mg/kg body weight (BW) 30 min before castration (n = 713). The first male piglet caught in a litter was randomly assigned (by coin toss) to control or treatment and subsequent piglets were assigned alternately. Placebo and treatment were given in equal volume and researchers were blinded to treatment. All piglets were ear notched for identification within 24 h of birth and individually weighed at the time of castration and at 21 d of age to determine average daily weight gain (ADG).
Mortality between the 2 weighing periods was recorded. Piglets were returned to their litters after castration and observed for approximately 15 to 20 min after castration for signs of discomfort, including isolation or abstention from suckling with littermates. In addition, a total of 120 blood samples from piglets in 23 litters were collected at 30 min, 60 min, 90 min, and 4 h following castration for determination of cortisol concentrations. An individual pig was only bled once, and therefore, in general, 4 littermates in the same treatment group were used where possible. The blood samples were centrifuged at 3900 g at 5°C for 20 min, within 1 to 3 h after collection. The plasma samples were stored in 2-mL polypropylene micro tubes (Sarstedt, Newton, NC) and frozen at -20°C until they were analyzed for cortisol with a solid-phase, competitive chemiluminescent enzyme immunoassay (Immulite/Immulite Cortisol 1000; Siemens Healthcare Diagnostic Products, Los Angeles, California, USA). The test had an analytical sensitivity of 5.5 nmol/L with a calibration range of 28 to 1380 nmol/L.

Descriptive statistics and quantitative statistical analysis were completed in Statistix (Statistix10, Version 10.1; College Station, Texas, USA). Each continuous variable was plotted and tested for normality using the Shapiro-Wilk test. The correlation among continuous variables was tested using pairwise correlations. The simple association between continuous variables with treatment were evaluated with a 2 sample t-test when continuous variables were normally distributed and with the Wilcoxon rank sum test when variables were not normally distributed. The simple association of continuous variables with categorical variables was analyzed with a one-way analysis of variance (ANOVA). A Chi-square test was used to determine the simple association between treatment and dichotomous or categorical variables.

Weight at castration was not normally distributed. Mean ADG, weight at castration, and weight at weaning between treatment and control groups are summarized in Table 1. No significant difference was observed for these parameters between the 2 groups. Weight at castration, and weight at weaning and ADG were highly correlated (P < 0.001). Mortality rates were similar for pigs in the 2 groups (P = 0.83). A total of 2.7% (19/703) of pigs died in the control group, and 2.5% (18/713) of pigs died in the treatment group. No significant differences were observed between treatment and control groups among parity categories (P = 0.8). However, ADG varied significantly among sow parity categories (P = 0.004). Piglets born from the oldest sows (> 6 parity) had lower ADG [263 g/d; ± 80 g/d standard deviation (SD)] compared to pigs born from parity 3 to 6 sows (279 g/d; ± 70 g/d SD). There was a tendency for better growth for piglets nursing sows in parity 1 to 2 (276 g/d; ± 70 g/d SD) compared to piglets of sows in parities > 6 (263 g/d; ± 80 g/d SD) (P = 0.08). No significant differences in ADG were observed for piglets nursing sows in parity 1 to 2 compared to piglets of sows in parity 3 to 6. Based on subjective evaluation by an observer who was blinded to treatment, there was little evidence of behavior suggesting discomfort in either treatment or control group for 15 to 20 min after castration. Plasma cortisol concentrations were significantly higher in the placebo group at 30 min, 60 min, and 90 min following castration but not at 4 h (Figure 1).

When an injectable analgesic drug is given 30 min before castration, piglets need to be handled twice, and the process of castration may take twice as long. Because of practical considerations most pork producers will want to administer an analgesic at the time of castration in order to minimize time and labor, as well as reduce the stress for the pig of being handled twice. Research suggests that analgesia does not reduce the acute pain associated with castration so there may be limited advantage in administering ketoprofen 30 min prior to castration. Treatment at the time of castration should still result in reduced pain over the next few hours. The cost of drugs, syringes, and needles is approximately 15 cents per castrated piglet. The cost of analgesia is small on a per pig basis, but for a moderate-sized pig operation the cost associated with extra labor and drug costs represents thousands of dollars. In the present study, ketoprofen administered 30 min before castration did not result in an improvement in ADG or survival. Because piglet performance is not improved there is no obvious economic incentive to help encourage producers to implement this practice.

An additional reason producers may be hesitant to use an analgesic is that it is difficult to assess pain in piglets, and they may not be convinced of the need from a welfare standpoint. In the present study observations over the first 15 to 20 min post-surgery failed to note a difference in behavior between piglets treated with ketoprofen and those receiving the placebo. Other studies that have followed pigs for a longer period of time and used more intensive observation methods have noted more isolation behavior and sometimes other changes. Generally, most studies have found that castrated piglets continue to nurse with littermates whether or not they have received analgesia (7,9), and one explanation that has been presented is that the activity of suckling provides some analgesia or calming effect (10).

Blood cortisol concentrations are often used as an objective indicator of stress and pain in response to painful procedures such as castration, but handling alone may not result in elevated blood cortisol (5,11). The present study found that plasma cortisol levels were significantly reduced for up to 90 min after castration in piglets that received ketoprofen compared with those that received the placebo. The rise in cortisol for up to 3 h is similar to that reported in other studies (5,12). Other researchers reported that peak values of plasma cortisol were found between 30 and 60 min after surgical castration, and that the return to pre-surgery levels occurred within 3 h after the procedure (13). The difference found in cortisol levels between treatment and

---

**Table 1. Growth rate and mortality for piglets treated with ketoprofen* or placebo at castration**

<table>
<thead>
<tr>
<th></th>
<th>Placebo n = 703</th>
<th>Ketoprofen n = 713</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Litter size at castration</td>
<td>10.16 ± 1.62(ab)</td>
<td>10.15 ± 1.61</td>
<td>0.9</td>
</tr>
<tr>
<td>Weight at castration (kg)</td>
<td>2.78 ± 0.61</td>
<td>2.85 ± 0.61</td>
<td>0.06</td>
</tr>
<tr>
<td>Weight at 21 d (kg)</td>
<td>6.63 ± 1.46</td>
<td>6.76 ± 1.46</td>
<td>0.11</td>
</tr>
<tr>
<td>ADG (7 to 21 d) (g)</td>
<td>271 ± 0.70</td>
<td>276 ± 0.70</td>
<td>0.08</td>
</tr>
<tr>
<td>Mortality</td>
<td>2.7%</td>
<td>2.5%</td>
<td>0.83</td>
</tr>
</tbody>
</table>

*Anafen; 100 mg/mL; Mérial Canada, Baie d’Urfé, Quebec, given by IM injection (3 mg/kg BW) 30 min before castration at 7 days of age.

b ± standard deviation.
controls in the present study is a useful objective indicator that the castrated pigs did experience pain and that ketoprofen was of some benefit in reducing the pain.

The impact of surgical castration of male piglets on subsequent weight gain during the suckling period has been previously studied, but results are mixed (12). Pre-weaning growth rates and subsequent weaning weights in pigs can be quite variable depending on a variety of factors, including genetics, environment, sow health, and nutrition (14). When a field trial is conducted on a commercial farm it is difficult to control for all the factors that may influence piglet growth. In the present study it was shown that parity, litter size, and starting weight were important factors influencing growth and were controlled for in the analysis. The present study is in agreement with other reports, which found no relationship between pain control treatment at castration and weight gain, using other analgesics, and in other species (8,12,15). There is limited research on the use of ketoprofen for the treatment of pain associated with routine practices such as castration and tail-docking in swine, but research in cattle has demonstrated ketoprofen to be effective in the treatment of pain in bulls after castration (15).

There is growing concern from consumers regarding best welfare practices including the incorporation of pain control into routine farm practices (12). This current study illustrates that pigs receiving analgesia grew the same as pigs not receiving pain control and that farmers are unlikely to see an economic return associated with using analgesia at the time of painful procedures in order to provide better welfare for their animals.

Ketoprofen seems to be of benefit in the treatment of post-operative pain associated with surgical castration of male piglets based on plasma cortisol results. No negative side-effects were noted in this trial. Overall, the results of this study are supportive of the use of ketoprofen as a practical method of reducing post-operative pain associated with castration.

Acknowledgment

This trial was funded by Ontario Pork.

References


Figure 1. Average plasma cortisol concentrations (nmol/L) from male piglets at various times after castration following ketoprofen or placebo treatment.

* Anafen; 100 mg/mL, Mérial, Canada, Baie d’Urfé, Quebec, given by IM injection (3 mg/kg body weight) 30 min before castration at 7 days of age.
* Significantly different at 30, 60, 90 min (P < 0.01).
Intravenous lipid emulsion for treating permethrin toxicosis in a cat

Whitney D. DeGroot

Abstract — A 2-year-old cat was presented with acute onset seizures, tremors, and hypersalivation. Permethrin toxicity was diagnosed based on a history of recent flea treatment. Measures were taken to minimize further absorption of permethrin, and methocarbamol and intravenous lipid emulsion were used to control tremors. The cat recovered and was discharged within 42 h.

Case description

A 2-year-old spayed domestic shorthair cat was presented as an emergency to Van Isle Veterinary Hospital, Courtenay, British Columbia, for acute onset of tremors, seizures, and hypersalivation. Upon physical examination, temperature, pulse, and respiration were within normal limits, but the cat was exhibiting seizures, tremors, and hypersalivation. The history revealed that the cat had received a flea treatment of Zodiac PowerSpot for dogs [permethrin 45%, (s)-methoprene 2.9%; Wellmark International, Guelph, Ontario] about 2 h earlier. The patient was diagnosed with permethrin toxicity. The owner indicated that treatment would need to be constrained because of financial reasons.

The patient was given a bath with a gentle shampoo for dermal decontamination to reduce cutaneous exposure. A 20-mL volume of 20% activated charcoal suspension (Charcodote; Pharmascience, Montreal, Quebec) was administered orally to reduce gastrointestinal absorption in the event of possible oral exposure. An IV catheter was placed and Normosol-R (Abbott, Montreal, Quebec) fluid therapy was initiated at maintenance rate. Injectable methocarbamol (Methocarbamol; Summit Veterinary Pharmacy, Aurora, Ontario) was administered as needed to control body tremors and twitching: after 2 h, 250 mg/kg body weight (BW) had been administered. The maximum recommended daily dose is 330 mg/kg BW (1). As a means of reducing treatment costs, and keeping tremors under control without exceeding the recommended daily dose of methocarbamol, intravenous lipid emulsion therapy was started. A 1.5 mL/kg BW bolus of a 20% fat emulsion (Intralipid 20%; Fresenius Kabi, Cheshire, United Kingdom) was given via a cephalic catheter, followed by a constant rate infusion at 0.25 mL/kg BW per minute for 60 min. The cat exhibited a good response and there was marked reduction in the severity of twitching. Intravenous Normosol-R (Abbott) was continued at 2 mL/kg BW per hour overnight.

The following morning the cat was able to sit up on its own but was still exhibiting severe twitching. Temperature, pulse rate, and respiratory rate were within normal limits. Intralipid therapy was repeated at 0.25 mL/kg BW per minute for 60 min, and a marked reduction in tremors was again noted. Intravenous Normosol-R (Abbott) was continued at 2 mL/kg BW per hour. By the evening, the patient looked much better, was bright and alert, eating and drinking on her own, and urinating in the litter box. Mild body tremors were still present.

The next morning (approximately 36 h after presentation), the only residual effect of the toxicosis was mild facial twitching. No additional methocarbamol was required after intralipid therapy was implemented. Intravenous fluids were discontinued and the catheter was removed. The patient was discharged approximately 42 h after initial presentation for continued monitoring at home.

Discussion

Permethrins are a class I pyrethroid insecticide, a synthetic analog of pyrethrins. Pyrethrins are naturally occurring extracts from the flowers of Tanacetum (Chrysanthemum) cinerariifolium.
Permethrin is a neurotoxicant that acts on gated sodium channels in the cell membranes of muscle and nervous tissue (2,3). Thus, permethrin toxicity manifests clinically with tremors, ataxia, hyperesthesia, hypersalivation, hyperthermia and, in severe cases, seizures and death can occur (3,4). Permethrin has a low toxicity in most mammalian species and is commonly found in spot-on pesticides used for flea control (2). It is not fully understood why cats are particularly sensitive, though it may be related to a deficiency in glucuronyl transferase. This deficiency results in slower hepatic metabolism of permethrin and increased time for absorption into target tissues (2,4). Permethrins are reported to be the most common cause of poisoning in cats in the USA (5).

Cats may be exposed from cutaneous application of topical products, oral ingestion, and direct contact with topically treated dogs (6). Many pet products contain permethrins, including over the counter spot-ons, flea sprays, flea collars, and flea shampoos. Products that contain over 40% permethrin are labeled for use in dogs only (6). There has been significant concern in the veterinary community about the inadequate labeling of these products and lack of control over their sale, which has resulted in many deaths of feline patients. This could easily be prevented by having more obvious safety warnings on product labels and by improved client education (3,7).

Clinical signs following exposure usually appear within a few hours of application, though they may be delayed up to 72 h. There does not appear to be any correlation between the amount of permethrin applied and the severity of clinical signs (2).

Treatment protocols aim to control the clinical signs while the toxicant is metabolized and excreted (4) and focus on early seizure control, decontamination, and supportive care (2). Control of seizures is often accomplished using either diazepam or midazolam. If seizures continue after administration of benzodiazepine, propofol or alfaxalone may be considered. Methocarbamol is the most commonly used drug to control muscle fasciculation. Other management includes skin decontamination, ensuring a patent airway, IV crystalloids, and temperature monitoring (2). The intravenous route is preferred over the oral route for administration of methocarbamol because of its rapid onset of action, ability to titrate to effect, and safety in compromised patients. On average, it takes 2 to 3 days for cats to recover, though recovery periods of up to 7 d have been reported (3).

Intravenous lipid emulsion (ILE) has been used in treatment of lipophilic toxicities, such as intravenous local anesthetic overdose, moxidectin toxicity in dogs, and lidocaine toxicity in cats (4). Permethrins are highly lipophilic molecules, thus there is potential that ILE can be used as adjunct therapy in treating toxicities (4). The exact mechanism of ILE is speculative, though the prevailing hypothesis is the “lipid sink” theory. This theory suggests that expanding the lipid compartment in the blood sequesters fat-soluble toxins within the intravascular space and away from target tissues (nervous and muscle tissue, in the case of permethrins) (6). Adverse effects of ILE are uncommon, and most are due to long-term use as parenteral nutrition. These may include hyperlipidemia, icterus, seizures, hemolytic anemia, and thrombocytopenia (6).

In the present case, the use of ILE significantly reduced the amount of methocarbamol required to control clinical signs. Typical therapy is expensive due to hospitalization and drug costs, so ILE may be a reasonable option to help reduce costs associated with treatment of permethrin toxicity and reduce the number of cases euthanized due to financial constraints.

Before using ILE, owners should be fully informed of its off-label use and potential for adverse reactions. However, in cases where clinical signs are difficult to control, conventional therapy is unavailable, or euthanasia is imminent, ILE appears to be a relatively safe and inexpensive alternative (4).

Acknowledgments

I thank Dr. Bruce Renooy for hosting me at Van Isle Veterinary Hospital for my externship, and Dr. Mireille de Winter for her expertise in dealing with this case.

References

Effect of enteric biopsy closure orientation on enteric circumference and volume of saline needed for leak testing

Brad M. Matz, Harry W. Boothe, James C. Wright, Dawn M. Boothe

Abstract — This study describes the effect of enteric biopsy closure orientation on circumference and volume of saline needed for leak testing. There were significant differences in circumference measurements at baseline, central circumference of longitudinally closed sites, and volume of saline for leak testing.


Introduction

Intestinal leakage can be a sequel to enteric biopsy, lead to significant postoperative complications, result in a need for re-operation, and potentially lead to mortality of the patient (1). Identification of intestinal suture line leaks by use of the leak test is easily performed with minimal equipment (2). Also, intra-operative identification of leaks allows for intervention (e.g., additional suture placement), potentially reducing postoperative morbidity and mortality (2). Studies in humans have shown the incidence of postoperative intestinal leakage to be variable, with up to 30% being reported, although an incidence of 5% to 7% is more typical (3,4). Such studies have shown that leaks identified at surgery are more effectively managed, compared with those that are detected after the development of septic peritonitis (3,4). Additionally, owner financial constraints may influence the opportunity to manage intestinal incisional leakage in veterinary patients, further illustrating the importance of identification and correction of leaks during the operation. Moreover, it is recommended that enterotomies in a small-diameter loop of intestine be closed transversely to minimize luminal reduction (5,6). To the authors’ knowledge, there is minimal information regarding the effect of longitudinal and transverse closure of intestine on lumen size or leakage potential. The purpose of this paper is to report the effect of longitudinal and transverse closure of 6-mm enteric biopsy sites in dogs on enteric circumference, leak frequency, and saline volume needed to achieve predetermined intraluminal pressures of 20 and 34 cm H₂O. We hypothesized that lower volumes of saline would be needed to reach a pressure of 34 cm H₂O during intestinal leak testing of longitudinal closures with a significant reduction of enteric circumference compared to transverse closure and that frequency of leaks would be similar between the 2 closure methods.

Materials and methods

The study protocol was approved by the Auburn University Animal Care and Use Committee. Nineteen dogs were used for data collection; 37 enteric biopsy sites (n = 19 longitudinal; n = 18 transverse) were evaluated. These dogs were anesthetized for reasons unrelated to this study. Two sites were identified for biopsy by use of a flexible sterile ruler (Surgical Marking Pen; Cardinal Health, Dublin, Ohio, USA) placed level with the cecal apex and measuring 10 cm and 25 cm orad. A sterile skin marker was used to identify these sites for biopsy. Prior to the incision, baseline undistended enteric circumference was measured by placing the ruler at the mesenteric border of the intestine and measuring to the other side of the mesentery across the antimesenteric border. Method of closure (longitudinal or transverse) was randomized to either site.

A full-thickness enteric defect centered on the anti-mesenteric border was created using a dermal biopsy punch (6 mm Acu-Punch; Acuderm, Fort Lauderdale, Florida, USA) (7,8). A variable number of full-thickness, simple interrupted appositional sutures of 4-0 polydioxanone (PDS II; Ethicon, Somerville,
New Jersey, USA) were used for closure. Leak testing was performed by isolating a 10-cm segment of intestine containing the closed biopsy site using Doyen intestinal forceps closed to the first ratchet. An 18-gauge over-the-needle intravenous catheter was introduced into the occluded segment and attached to extension tubing connected to a water manometer and 3-way stopcock. A 20-mL syringe was attached to the stopcock to incrementally add saline to the occluded segment until the predetermined pressures of 20 and 34 cm H2O were reached. Volume of saline to achieve 20 and 34 cm H2O pressure for each closure orientation was recorded. Leaks were recorded for each pressure and corrected by placing 1 or 2 additional suture(s). A repeat leak test was performed to ensure leak-free closure. Enteric circumference was measured immediately adjacent to the closed biopsy site for each closure orientation and at the center of longitudinally closed sites at each pressure. Differences in enteric circumference were significantly different from adjacent measurements for both closure orientations, P < 0.001.

Descriptive and inferential statistics were performed using SAS (SAS Institute; Cary, North Carolina, USA). A general linear model (PROC GLM) was used to compare the pre- (baseline) and post-closure enteric circumference and the difference between pre- and post-closure by site (oral versus aborad), method (longitudinal versus transverse), and pressure (20 versus 34 cm water). Least square means were calculated for each dependent variable and significant differences were detected using Tukey’s test of multiple comparisons. To determine whether or not the incidence of leaks was dependent on site, pressure, or closure orientation, Wald Chi-square analysis was performed (PROC LOGISTIC) with leak reduced to a binomial (yes or no). Finally, linear regression (PROC REG) was used to explore the relationship between body weight and pre- or post-closure enteric circumference, leaks, and volume of saline needed to achieve the target pressure of 20 cm or 34 cm water. Students paired t-test was used to compare measurements taken at the center of longitudinally closed sites versus those taken immediately adjacent to the closure (longitudinal and transverse closures). For all comparisons, a P-value of ≤ 0.05 was considered evidence of statistical difference.

Table 1. Mean ± standard deviation (SD) saline volume, circumference values, and leak data

<table>
<thead>
<tr>
<th>Volume of saline or circumference</th>
<th>Baseline</th>
<th>Longitudinal closure</th>
<th>Transverse closure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume of saline at 20 cm H2O</td>
<td>9.0 ± 3.5 mL</td>
<td>8.4 ± 4.9 mL</td>
<td></td>
</tr>
<tr>
<td>Volume of saline at 34 cm H2O</td>
<td>14.5 ± 5.1 mL</td>
<td>14.2 ± 5.9 mL</td>
<td></td>
</tr>
<tr>
<td>Circumference — baseline, oral site</td>
<td>3.2 ± 0.46 cm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Circumference — baseline, aborad site</td>
<td>3.4 ± 0.41 cm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Circumference at 20 cm H2O — adjacent</td>
<td>4.8 ± 0.7 cm</td>
<td>5.0 ± 0.6 cm</td>
<td></td>
</tr>
<tr>
<td>Circumference at 20 cm H2O — center</td>
<td>4.0 ± 0.6 cm</td>
<td>5.3 ± 0.7 cm</td>
<td></td>
</tr>
<tr>
<td>Circumference at 34 cm H2O — adjacent</td>
<td>4.3 ± 0.7 cm</td>
<td>5.5 ± 0.9 cm</td>
<td></td>
</tr>
<tr>
<td>Circumference at 34 cm H2O — center</td>
<td>4.8 ± 0.7 cm</td>
<td>5.0 ± 0.6 cm</td>
<td></td>
</tr>
<tr>
<td>Number of sites that leaked</td>
<td>n = 6\textsuperscript{a}</td>
<td>n = 3</td>
<td></td>
</tr>
<tr>
<td>Pressure at which leak was observed</td>
<td>20 cm H2O (n = 3)</td>
<td>20 cm H2O (n = 1)</td>
<td></td>
</tr>
<tr>
<td>(Number of sites)</td>
<td>34 cm H2O (n = 3)</td>
<td>34 cm H2O (n = 2)</td>
<td></td>
</tr>
</tbody>
</table>

\textsuperscript{a} Baseline circumferences were significantly different, P = 0.005.
\textsuperscript{b} Volume of saline to achieve 34 cm H2O pressure was significantly different from that to achieve 20 cm H2O, P < 0.001.

\textsuperscript{c} Central measurements for longitudinal closures were significantly different from adjacent measurements for both closure orientations, P < 0.001.

\textsuperscript{d} No significant differences were observed for frequency of leaks for either closure orientation or pressure at which a leak was detected.

Results

Dog breeds were variable, and mean dog weight was 15.7 ± 6.0 kg. Information regarding closure orientation, number of closures that leaked, and pressure at which a leak occurred is listed in Table 1. Mean dog weight was similar in dogs with closures that leaked, 15.9 ± 5.7 kg versus those with closures that did not leak, 15.5 ± 6.5 kg. Of the initial closures that leaked (24%), 67% were longitudinal closures and 33% were transverse closures. All leaks were resolved by the addition of 1 (n = 7) or 2 (n = 2) sutures. One transverse closure site was not included in the study due to the initial placement of excessive sutures.

Table 1. There was no correlation between baseline enteric circumference at either site and dog weight. Circumference measurements at the center of longitudinally closed sites were on average 0.8 ± 0.7 cm (20%) and 1.0 ± 0.7 cm (23%) smaller than immediately adjacent measurements at 20 and 34 cm H2O, respectively. A significant central reduction was observed in longitudinally closed sites compared to those measured immediately adjacent to either longitudinally or transversely closed sites at each pressure (P < 0.001).

Discussion

Volume of saline needed to leak test selected small intestinal segments in dogs after biopsy has been reported previously (2). Minimal information is available regarding effect on lumen size or leakage of longitudinal or transverse closure of enterotomies, including biopsy sites. Transverse closure of enterotomies in a small-diameter loop of intestine has been suggested, so as to not limit the intestinal diameter at the site (5,6). Transverse closure may be inappropriate in some circumstances, due to potential for luminal distortion. Information regarding effect of closure orientation of enteric biopsy sites on security of closure and enteric circumference is important, in part, because complications associated with enteric biopsy in dogs have been reported (1).
There was a significant difference in post-closure enteric circumference between the central portion of longitudinal closures and those measured immediately adjacent to suture lines in both longitudinal (Figure 1) and transverse closures. There was also a significant difference in volume of saline needed to achieve 20 cm and 34 cm H2O, consistent with a previous report (2). The volume of saline needed to reach predetermined pressures of 20 cm and 34 cm H2O during leak testing was similar for each closure orientation. The upper pressure measurement was chosen because intraluminal pressures in normal dogs have been recorded to be as high as 34 cm H2O (25 mmHg) in the small intestine during peristalsis (9). The orientation of closure of a 6-mm intestinal defect did not influence closure security as indicated by leak tests. The “ideal” number of sutures needed to close a 6-mm intestinal defect is unknown; clinical experience suggests that 3 to 4 sutures should achieve an effective closure in most situations and limit the amount of suture material in the wound. In the present study, closure orientation of a 6-mm enteric biopsy site did not significantly influence incidence of enteric leak during leak testing but did influence enteric circumference.

This study had several limitations. Central circumferential measurements were only obtained for longitudinal closures because of the interference of sutures and knots with a similar measurement in transverse closures. The presence of suture material/knots limited the ability to obtain an accurate measurement directly over the transverse closures. Transverse closure did not result in an area of depression, as did longitudinal closure, thus enteric circumference was measured immediately adjacent to the suture line. The finding of baseline differences in circumference of the 2 sites (aboral jejunum and presumed orad ileum) was unexpected, and it complicated the comparison of post-closure enteric circumference. Healing of the biopsy sites was not assessed due to the acute nature of the study. It is unknown what effect the reduced central circumference of longitudinally closed biopsy sites had on enteric healing and long-term enteric circumference.

In conclusion, longitudinally closed enteric biopsy sites had a smaller central circumference compared to measurements immediately adjacent to suture lines in both longitudinal and transverse closures. Closure orientation did not impact the incidence of leaks.

References

New Products  
Nouveaux produits

Championing Pet Owner Happiness

Now open for business, Pets Plus Us embarks on its crusade with a new pet owner community and insurance coverage. RSA Canada has launched Pets Plus Us™, a pet owner community and insurance product line focused on delivering pet owner happiness. Pets Plus Us will provide pet owners with the resources, conversations and tools they need to enable them to make the right choices for their pet’s well-being.

“In our research, we heard loud and clear that Canadian pet owners want access to tools and information that empowers them to make the best decisions for their pets. That’s why we’re building a community for pet owners to come together and share experiences, knowledge and tips, and seek out advice from experts,” says Randy Valpy, Top Dog at Pets Plus Us.

Pets Plus Us has four coverage options ranging from traditional Accident and Accident & Illness to the pet insurance industry’s first stand-alone Wellness Care package — a preventative “prescription” for regular vet care. All coverage includes:

• 4Life Guarantee, which means that once your pet is enrolled with Pets Plus Us™, your policy won’t be cancelled, except for non-payment
• Blue-Ribbon Benefits, which includes access to the 24/7 Pet-Poison Helpline®, PetHelpFone™ and more
• AIR MILES® reward miles: Pets Plus Us™ is the only pet insurer to offer AIR MILES.

“We believe that providing Canadian pet owners with the tools and information they need to make the best choices for their pet, and backing that up with innovative products and outrageous customer service is a winning combination,” says Valpy. “Our ambition is to champion pet owner happiness, and we’re ready with a team of people and pet lovers ready to learn more about you and your pet.”

The Pets Plus Us community will grow to include resources that will help pet owners with everything from recovering a lost pet to finding a local dog park to learning more about a specific breed of dog or cat. Pets Plus Us will be a place where pet owners can come to ask a vet a question, learn about how to be a responsible pet owner and even post pictures and videos of their four-legged friends. The community is available to pet owners at petsplusus.com, facebook.com/PetsPlusUsCA and twitter.com/PetsPlusUsCA.

Pets Plus Us is underwritten by Royal & Sun Insurance Company of Canada (RSA), and is part of the RSA Canada Group of companies. RSA is one of Canada’s leading home, auto, travel and commercial insurance providers.

Contact: Pets Plus Us, 1115 North Service Road, Unit 2, Oakville, Ontario L6M 2V9; Tel: 1-800-364-8422; website: www.petsplusus.com

AliveCor™ Veterinary Heart Monitor

Woodley Veterinary Diagnostics have been appointed the exclusive distributor of the AliveCor™ iPhone® ECG Heart Monitor. The product is easy to use and portable by acting as a case for an iPhone 4/4S/5, wirelessly communicating with the free AliveCor ECG App, which transforms the phone into a clinical-quality, single-lead ECG recorder. The monitor is not only convenient and portable, but also highly accurate compared to traditional devices. Results can be stored along with notes and patient information for either immediate or longer-term analysis, sharing or printing. The popular iPhone ECG Heart Monitor is now available for the iPhone 5.

Features: Easy to use; portable; powerful; accurate; accessible; valuable and convenient.

Contact: Woodley Veterinary Diagnostics, Woodley Equipment, Old Station Park Buildings, St. Johns Street, Horwich, Bolton, Lancashire, BL6 7NY United Kingdom; Tel: 144 (0)1204 669033; E-mail: sales@woodleyvetdiagnostics.com; website: www.woodleyvetdiagnostics.com
Introducing the Veterinary Equipment Exchange Network (VEEN)

Canmedical is proud to announce a veterinarian to veterinarian equipment exchange network called VEEN (Veterinary Equipment Exchange Network). Veterinarians anywhere in North America can find other veterinarians with surplus working equipment and arrange to purchase it through VEEN. Veterinarians can also easily list their equipment to sell with photos and access a handy shopping cart. Visit www.veencanada.com for more details.

Contact: Canmedical, R. R. # 3, Yarker, ON K0K 3N0; 1-800-267-4608 (Canada) or (613) 358-5658; e-mail: info@canmedical.ca

New Canine Parvovirus Antigen Test Kit

Modern Veterinary Therapeutics, LLC announces the Canadian launch of the Canine Parvovirus Antigen Test Kit, a rapid in-clinic chromatographic immunoassay test that is already successful in the U.S. market for the qualitative detection of Parvovirus antigens in canine feces. This test kit has a two year shelf life, thus solving the current common problem of test expiration in Canadian veterinary clinics. The Canine Parvovirus Antigen Test Kit is highly sensitive and specific, providing a positive or negative result in 5 minutes to help practitioners recognize the fatal canine disease in the clinic. The kit of five tests is easy to use and can be stored at room temperature. “We are extremely pleased to bring a solution to one of the most common problems of the Canadian veterinary market. Our Canine Parvovirus Antigen Test Kit now allows vets to keep a small number of tests on hand for immediate testing as needed without worry of any financial risk,” said Dr. Cuong Tu Ba, President and founder of Modern Veterinary Therapeutics.

Contact: Modern Veterinary Therapeutics, 18001 Old Cutler Road, Suite 633, Miami, FL 33157 USA; website: www.modernveterinarytherapeutics.com
Associate salaries increase ... for half the provinces
Les salaires des vétérinaires augmentent... pour la moitié des provinces

Darren Osborne

Amidst weak economic numbers coming from veterinary hospitals around the country, associate salaries beat inflation in 5 of 10 provinces. Nationally, the average associate veterinarian experienced a 3% salary increase; 2% better than inflation which is running uncharacteristically low at 1%.

Inflation, both nationally and provincially, was down from a high of 3% two years ago; the current rate of 1% nationally and a range of 0% to 3% provincially provides an opportunity for staff veterinarians to get real gains in income even with mediocre wage increases. Any wage increase above the rate of inflation is considered to be a “real economic gain” because it provides the individual with more purchasing power than before.

Figures for average associate salaries come from the 2013 Survey of Associate Compensation and Benefits. This survey was conducted by the Canadian Veterinary Medical Association in conjunction with the provincial associations and corporate sponsors, PetSecure, Merck Animal Health, Scotiabank, and Idexx Laboratories. Results are provided for individual provinces (Table 1).

The 2013 survey was distributed to all associates across the country; 1037 surveys were returned for a 26% response rate. Figures in the report are generally accurate to 2%, 19 times out of 20. Respondents were asked to provide information related to their current salary and benefits from private practice in 2013. The survey examined several characteristics such as type of practice, seniority, and location, and evaluated the effect the characteristics had on salary.

Many trends were inconsistent with half the provinces going in one direction and half going in the other. Nationally the average increase of 3% was ahead of inflation but only 5 provinces.

En consultant les données financières qui proviennent des cliniques des diverses régions du pays, nous constatons que les salaires des vétérinaires étaient supérieurs à l’inflation dans 5 des 10 provinces. À l’échelle nationale, le vétérinaire moyen a connu une hausse salariale de 3 %, soit 2 % de plus que l’inflation qui se situe à un faible taux inhabituel de 1 %.

L’inflation, à l’échelle nationale et provinciale, a chuté d’un sommet de 3 % il y a deux ans; le taux actuel de 1 % à l’échelle nationale et l’écart de 0 % à 3 % à l’échelle provinciale fournissent l’occasion aux vétérinaires salariés d’obtenir des gains réels du revenu, et ce, même avec des hausses salariales médiocres. Toute hausse salariale au-dessus du taux d’inflation est considérée comme un «gain économique» parce qu’elle procure un pouvoir d’achat supérieur.


Le sondage 2013 a été distribué à tous les vétérinaires salariés du pays; 1037 sondages ont été retournés pour un taux de réponse de 26 %. Les données du rapport sont généralement exactes selon un écart de 2 %, 19 fois sur 20. On a demandé aux répondants de fournir des renseignements se rapportant à leur salaire et à leurs avantages sociaux actuels en pratique privée en 2013. Le sondage a examiné plusieurs caractéristiques, incluant le type de pratique, l’ancienneté et l’emplacement, et il a évalué l’effet des caractéristiques sur le salaire.
saw average increases that beat inflation. Alberta surged ahead for the second year with a 5% gain in average associate salaries and with provincial inflation only running at 1%, the real gain for associates amounted to 4%. Last year, the average associate in Alberta experienced a 4% increase in salaries. The other province with higher than average salary increases was New Brunswick with a 6% increase. New Brunswick posted a lower inflation rate of 1% and veterinarians in that province were able to experience an average real gain in salaries of 5%. This was good news considering that last year there was zero growth in associate salaries in New Brunswick.

Provinces that experienced decreases in salaries included British Columbia, Newfoundland, and Prince Edward Island. The decrease in wages for these provinces reflects changes in seniority levels in the sample. Consistently, veterinarians with less seniority earn lower salaries and in these 3 provinces, there are smaller samples and more, less-experienced veterinarians reporting than in previous years. It is not expected that individual veterinarians experienced salary cuts.

The other 5 provinces experienced real increases in wages between 0% and 2%. Nationally, the real increase in associate salaries was 2%. What is the reason for weak increases? We know from the 2012 Practice Owners Economic Survey (1) that veterinary practices across the country are suffering with declining client numbers and stagnating revenues and under these economic conditions practice owners are less likely to offer higher increases in salaries for staff veterinarians.

To counter a weakened market for associate salaries, some associate veterinarians are offering to take on some of the financial risk and it is turning into significant increases in wages. The key factors that contribute to increased salaries for associates include type of practice, location, seniority, and method of payment. In the short run, there is little that can be done to affect demographics or seniority, but associates can change the way they are getting paid. Associates who are paid a commission based on the gross revenue they bring in earn 23% higher full-time salaries than the average.

Compensation based on revenue is attractive to the practice owner because the associate is shouldering some of the risk that Beaucoup de tendances ne concordaient pas avec les faits indiquant la moitié des provinces allant dans une direction et l’autre moitié se dirigeant dans l’autre direction. À l’échelle nationale, la hausse moyenne de 3% se situa au-dessus de l’inflation, mais seulement cinq provinces ont observé des hausses qui ont battu l’inflation. L’Alberta a pris de l’avance pour la deuxième année avec un gain de 5% des salaires moyens des vétérinaires et, vu que l’inflation provinciale s’établissait à seulement 1%, le gain réel pour les vétérinaires s’élevait à 4%. L’an dernier, le vétérinaire moyen de l’Alberta a connu une hausse salariale de 4%. L’autre province avec des hausses salariales supérieures à la moyenne était le Nouveau-Brunswick, avec une hausse de 6%. Le Nouveau-Brunswick affichait un taux inférieur d’inflation de 1% et les vétérinaires de cette province ont pu connaître un gain salarial réel moyen de 5%. Ce sont de bonnes nouvelles car, l’an dernier, les salaires des vétérinaires au Nouveau-Brunswick avaient connu une croissance zéro.

Les provinces qui ont connu des baisses des salaires incluient la Colombie-Britannique, Terre-Neuve et l’Île-du-Prince-Édouard. La baisse des salaires pour ces provinces reflète un changement des niveaux d’ancienneté dans l’échantillon. Les vétérinaires qui ont moins d’ancienneté gagnent généralement des salaires inférieurs et, dans ces trois provinces, il y avait des échantillons plus petits et, cette année, plus de vétérinaires possédant moins d’expérience ont répondu au sondage par rapport aux années antérieures. Nous ne nous attendons pas à ce que les vétérinaires individuels aient subi des réductions de salaire.

Les cinq autres provinces ont connu des hausses salariales réelles se situant entre 0% et 2%. À l’échelle nationale, la hausse réelle des salaires des vétérinaires a été de 2%. Quelle est la raison pour les faibles hausses? En nous basant sur le Sondage économique 2012 auprès des propriétaires de pratique (1), nous savons que les pratiques vétérinaires du pays souffrent d’une baisse du nombre de clients et d’une stagnation des revenus et, en raison de ces conditions économiques, il est moins probable que les propriétaires de pratique offriront des hausses de salaire supérieures aux vétérinaires.

Pour compenser un marché affaibli pour les salaires des vétérinaires, certains vétérinaires offrent d’assumer une part du

---

**Table 1.**/**Tableau 1.** Comparison of average associate salaries for 2012 and 2013/Comparer des salaires moyens des vétérinaires pour 2012 et 2013

<table>
<thead>
<tr>
<th>Province/Province</th>
<th>Number of responses</th>
<th>Median salary 2013</th>
<th>Median salary 2012</th>
<th>2013–2012 Change</th>
<th>Inflation</th>
<th>Real gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>NF/T.-N.</td>
<td>13</td>
<td>$85 000</td>
<td>$85 750</td>
<td>−1%</td>
<td>2%</td>
<td>0%</td>
</tr>
<tr>
<td>PEI./.-P.-É.</td>
<td>5</td>
<td>$57 348</td>
<td>$62 856</td>
<td>−9%</td>
<td>2%</td>
<td>0%</td>
</tr>
<tr>
<td>NB/N.-B.</td>
<td>47</td>
<td>$74 000</td>
<td>$70 000</td>
<td>6%</td>
<td>1%</td>
<td>5%</td>
</tr>
<tr>
<td>NS/N.-É.</td>
<td>58</td>
<td>$70 000</td>
<td>$70 000</td>
<td>0%</td>
<td>1%</td>
<td>0%</td>
</tr>
<tr>
<td>QC/QC</td>
<td>216</td>
<td>$70 000</td>
<td>$68 000</td>
<td>3%</td>
<td>1%</td>
<td>2%</td>
</tr>
<tr>
<td>ON/Ont.</td>
<td>363</td>
<td>$79 662</td>
<td>$77 000</td>
<td>3%</td>
<td>1%</td>
<td>2%</td>
</tr>
<tr>
<td>MB/Man.</td>
<td>71</td>
<td>$80 000</td>
<td>$77 250</td>
<td>4%</td>
<td>3%</td>
<td>1%</td>
</tr>
<tr>
<td>SK/Sask.</td>
<td>53</td>
<td>$75 000</td>
<td>$74 500</td>
<td>1%</td>
<td>2%</td>
<td>0%</td>
</tr>
<tr>
<td>AB/Alb.</td>
<td>158</td>
<td>$87 500</td>
<td>$85 000</td>
<td>5%</td>
<td>1%</td>
<td>4%</td>
</tr>
<tr>
<td>BC/C.-B.</td>
<td>53</td>
<td>$80 000</td>
<td>$85 000</td>
<td>−6%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>CND/CAN</td>
<td>1037</td>
<td>$77 808</td>
<td>$75 670</td>
<td>3%</td>
<td>1%</td>
<td>2%</td>
</tr>
</tbody>
</table>

goes with paying a higher salary. The threat of inconsistent or declining revenues stands in the way of most salary increases. If a practice owner was guaranteed that an associate could attain a revenue target, then they could be more forthcoming with salaries. The problem is what comes first — does the associate wait to hit the revenue target before salary goes up or does the practice owner offer the higher salary and hope the associate makes the revenue target. With commission-based pay you get the chicken and egg. The owner gets the assurance that the higher wage will only get paid if the revenue target is met and the associate is guaranteed to get the higher pay when they hit the target. Information on compensation pay rates is available in the Report on Associate Compensation and Benefits (2) offer through the specific provincial veterinary medical associations.

Associate salaries increased 3% in 2013. The increase was above the rate of inflation nationally but only half the provinces saw increases above the rate of inflation. A weakened veterinary economy appears to be what is holding back associate salaries and, until the economy turns around, associate veterinarians wanting to beat the odds will have to look to creative payment methods like compensation-based pay.

References
History and clinical signs

A 10-year-old, castrated male Quarter horse was examined at the ophthalmology service at the Western College of Veterinary Medicine related to a 3-day history of squinting, ocular discharge, and a white spot on the cornea of the right eye. The horse was currently being treated with topical BNP ophthalmic ointment, and a systemic non-steroidal anti-inflammatory drug (NSAID), Flunixin meglumine (Flunazin; Vétoquinol Canada, Lavaltrie, Quebec). The menace responses, and palpebral and oculocephalic reflexes were present bilaterally. The direct and consensual pupillary light reflexes were present bilaterally. Schirmer tear test (Schirmer Tear Test Strips; Alcon Canada, Mississauga, Ontario) values were 35 and 20 mm/min in the right and left eye, respectively. The intraocular pressures were estimated with a rebound tonometer (Tonvet; Tiotal, Helsinki, Finland) and were 7 and 17 mmHg in the right and left eye, respectively. Fluorescein staining (Fluorets; Bausch & Lomb Canada, Markham, Ontario) was positive over a 6-mm oval area in the central right cornea. On direct examination there was moderate blepharospasm, conjunctival hyperemia, and mucopurulent ocular discharge in the right eye. Biomicroscopic examination (Osram 64222; Carl Zeiss Canada, Don Mills, Ontario) of the cornea revealed a diffusely edematous, central, 6 mm, oval, gray-white, soft, slightly raised, and ulcerated lesion. The right pupil was miotic and moderate aqueous flare was present. The right pupil did not completely dilate following application of 0.5% tropicamide (Mydriacyl; Alcon Canada). Indirect ophthalmoscopic (Heine Omega 200; Heine Instruments Canada, Kitchener, Ontario) examination was normal bilaterally. A photograph of the right eye following mydriasis is provided for your assessment (Figure 1).

What are your clinical diagnosis, differential diagnoses, therapeutic plan, and prognosis?

Discussion

Our clinical diagnosis was a melting corneal ulcer and anterior uveitis in the right eye. A melting ulcer is a form of complex corneal ulceration. This is a clinical category of corneal ulcers which includes those that are infected, melting, and/or deep/perforated. Melting is more appropriately referred to as keratomalacia. Keratomalacia occurs due to enzymatic breakdown of the cornea (1,2). Microbial enzymes, such as collagenases and proteinases incite dissolution of the corneal intercellular ground substance and collagen lamellae. Neutrophils, attracted by chemotactic factors invade the corneal stroma, then degranulate and release additional degradative proteinases (1,2). Progressive stromal necrosis can result in rapid, increasing depth of the stromal lesion.

The clinical manifestations of a melting corneal ulcer include photophobia, blepharospasm, conjunctival edema, lacrimation, and often a purulent ocular discharge. There is frequently a yellow/white infiltrate of inflammatory cells in the ulcer bed. In addition, the corneal stoma becomes opaque, soft, and liquid-like. Melting corneal ulcers, like all complex corneal ulcers, are accompanied by anterior uveitis. Manifestations of anterior uveitis include miosis, ciliary spasm causing pain and photophobia, lacrimation, aqueous flare, and a lowered intraocular pressure.

The diagnosis of a melting corneal ulcer is based on clinical manifestations and positive fluorescein staining. Further diagnostic testing in all cases of complex corneal ulcers should include aerobic and anaerobic bacterial and fungal culture and sensitivity testing and corneal ulcer cytology. Cultures and scrapings for cytology must be taken directly from the corneal ulcer to obtain meaningful results. If surgery is part of the therapeutic plan, keratectomy specimens removed at the time of surgery are submitted for histopathology and laboratory analysis for potential microbial colonization of these lesions.

Melting ulcers are ocular emergencies as progression may result in loss of the cornea and eye within 24 to 48 h.
Progression of melting ulcers may result in corneal perforation and development of septic endophthalmitis. Treatment of all complex corneal ulcers requires aggressive medical therapy, often in combination with surgical therapy (3,4). The choice of antimicrobial is most appropriately made based upon the results of culture and sensitivity. However, results of cultures are often not available for 48 to 72 h following submission. Cytologic examination may aid in identification of bacterial or fungal organisms and may be useful in directing initial therapy while awaiting culture results. *Pseudomonas* spp. are the most notorious organisms associated with melting ulcers. Tobramycin or amikacin are good antibiotic choices to initially treat a melting ulcer due to the susceptibility of most *Pseudomonas* spp. (5). Frequency of administration of antimicrobials in complex ulcers should be every 1 to 4 h with the higher frequencies used in severely infected or melting ulcers.

Anticollagenases are required for treatment of keratomalacia. There are several different anticollagenases reported for use in melting ulcers including autologous serum, 10% N-acetylcysteine, 0.05% potassium EDTA, and tetracycline antibiotics (2). However, the most commonly used, readily available, and broad-spectrum anticollagenase is autologous serum. Serum is obtained from the patient and must be stored and handled in a sterile manner to prevent bacterial growth. It may be kept in the refrigerator and should be replaced with fresh serum at least every 8 d (1,2). Anticollagenases are most often applied every hour for the first 24 h or until stromal liquefaction is halted, and then frequency of administration is tapered.

In addition to antimicrobial and anticollagenase therapy, control of uveitis is essential. The mainstay of treatment for uveitis is a combination of anti-inflammatory and anticholinergic therapy. Systemic non-steroidal anti-inflammatory drugs (NSAIDs) should be used to reduce pain and inflammation. Topical NSAIDs applied up to 4 times daily are also recommended to reduce anterior uveitis in cases of complex corneal ulceration. Topically applied anticholinergics (1% to 2% atropine) are useful for 3 reasons: they reduce protein and cellular leakage from inflamed uveal blood vessels, they dilate the pupil which protects the eye from development of posterior synechia, and they relax ciliary muscle spasm, which is a major factor in discomfort associated with uveitis (3).

Following initiation of appropriate medical treatment, prompt referral to an ophthalmologist for potential surgery is recommended in all cases of complex corneal ulceration. Infected and melting ulcers benefit from a keratectomy to remove infected and necrotic cornea and this is usually followed by placement of a conjunctival or corneal graft (3,4). The most commonly performed grafting procedure in these cases is the conjunctival pedicle graft in which the base of the graft retains a connection to the bulbar conjunctiva. The benefits of the conjunctival pedicle graft include replacement of tissue to strengthen the corneal defect and the continued presence of a blood supply. This is useful to provide the affected cornea with the antibacterial, antifungal, antiprotease, and anticollagenase properties of serum. The deeper layers of the graft provide immediate fibroblasts and collagen with which to rebuild the corneal stroma (3,4). Medical therapy is initiated to stabilize the corneal disease prior to surgery to reduce protease digestion of the absorbable sutures that will hold the graft in place (usually 12 to 24 h before surgery) and continued after surgery for 3 to 4 wk (3,4).

Treatment of this horse was initiated with topical Tobramycin 0.3% (Tobrex; Alcon Canada), q4h. Autologous serum was also applied q4h. A topical NSAID, diclofenac sodium 0.1% (Voltaren; Novartis, Mississauga, Ontario), q6h and a systemic NSAID, Flunixin meglumine (Flunazin; Vétoquinol Canada), 1.1 mg/kg body weight (BW), q12h, IV were initiated to reduce intraocular inflammation. Topical atropine sulphate 1% (Isopto-atropine; Alcon Canada) was administered q6h. The eye was treated medically until surgery the following day at which time the abnormal corneal tissue was removed by lamellar keratectomy. This tissue was submitted for histopathologic examination for bacterial and fungal organisms. A vascularized conjunctival pedicle graft was sutured into the corneal defect. A subpalpebral lavage system (Mila International, Florence, Kentucky, USA) was placed to facilitate post-operative medical therapy.

Results of corneal cultures were negative for bacterial and fungal organisms in this case. Cytologic and histopathologic examinations revealed suppurrative keratitis but organisms were not identified. Corneal cultures may be negative either due to superficial culture collections that miss deeper organisms or previous use of antimicrobials before cultures are attempted. Topical and systemic medical therapies were continued for 3 wk following surgery, after which re-evaluation revealed a comfortable and sighted eye. The conjunctival graft was healing and incorporated into the cornea. The remainder of the ocular examination was normal. The subpalpebral lavage system was removed and all ocular medications were discontinued.

The prognosis for any complex corneal ulcer is guarded as there is the potential for rapid progression. Early and accurate diagnosis and instituting aggressive medical therapy contribute greatly to a successful outcome. A combination of medical and surgical therapy is often required in the management of complex corneal ulcers.

### References

Merck Animal Health is pleased to introduce the following appointments:

**Daniel Beauchamp, General Manager, Merck Animal Health Canada**

Daniel Beauchamp is the new General Manager of its Animal Health division in Canada. In this role, Daniel will be responsible for leading Merck's Canadian Animal Health commercial division with the strategic objective of providing integrated solutions with innovative animal health products and services that meet the evolving needs of the industry.

Daniel is a proven leader with more than 25 years of successful industry experience that he brings to Merck Animal Health. He has held senior leadership roles in a number of organizations in the U.S. and Canada. Most recently, he served as Country Manager for Vetoquinol USA and Vetoquinol Canada. Daniel has also worked in sales and marketing at Pfizer Animal Health in Canada, Intervet in the USA and Hoechst Roussel Vet in Canada.

**Kevin Ryan**

Kevin Ryan has been appointed to the position of Canada Cattle and Equine Business Unit Director. Kevin holds a B.A. Honours in Economics and Political Science from the University of Toronto. He has previously held senior sales and marketing leadership positions with Pfizer Animal Health, Merial and the Agri-Food Division of the Angus Reid Group, based in the United States, Europe and Canada. Kevin is widely recognized as an accomplished people manager that is highly committed to developing talent, is highly adept in marketing and market research, and experienced in building longer-term strategic plans in the animal health sector.

**Susanne Martin**

Susanne Martin is the new Regional Sales Manager for Companion Animals in Eastern Canada. Susanne is a graduate from the University of Guelph, with a Honours Bachelor degree in Biological Sciences and a Master of Science degree in Epidemiology. She brings with extensive experience in the Canadian small animal health industry as a territory manager and product manager with Pfizer (now Zoetis).

**Jacki Rocchio**

Jacki Rocchio is the new Regional Sales Manager for Companion Animals in Ontario. Jacki is an accomplished pharmaceutical executive with extensive sales, marketing leadership, and people management experience in the Canadian industry (both human and animal health pharmaceutical industry). She comes from Novartis Animal Health where she held the position of sales District Manager. Prior, she worked with Janssen Ortho Inc. as a Sales Representative in Animal and Human Health, a Product Director, a Product Manager and a Sales Training and Development Manager.

Based in Pointe Claire, Quebec, Merck Animal Health is part of Merck's global animal health business offering veterinarians, farmers, pet owners and governments the widest range of veterinary pharmaceuticals, vaccines and health management solutions and services. It is dedicated to preserving and improving the health, well-being and performance of animals.

**Contact:** Merck Animal Health, 16750 Trans Canada Hwy, Kirkland, QC H9H 4M7; phone: (514) 426-7300; website: [http://www.merck-animal-health.ca](http://www.merck-animal-health.ca)
DOUGLAS C. JACK | Counsel
- Practice Management Agreements
- Incarcerations
- Employment Matters
- Disciplinary Proceedings and Dismissal
- Buying and Selling a Practice

Tel: 519.747.7044 • F: 519.747.2995
F: 518.798.2775 • E: becjack@law.com
109 Regina St. Suite 220
Waterloo, ON N2L 4P9

Vetlaw

ULTRAMARINE

ERIC HOFFMANN
Tel: 514.631.4477 • F: 514.631.3643 • C: 514.889.1580
E: eric@uxr.ca • W: www.uxr.ca
1370 - 55th avenue, Lachine, QC H8T 3J8

Practice One Consulting
Practice Valuations ✶ Practice Purchase
Practice Sale ✶ Practice Management

Dr. Frank Richardson, DVM, MBA
Veterinary Management Consultant
P.O. Box 176
Western Shore, Nova Scotia
B0J 3M0
Phone: (902) 531-2617
E-mail: fdrrahosp@eastlink.ca
Fax: (902) 531-2618
Introducing our new logo!!
Same company — New Look

Check out our renewed website
www.gallantcustomlaboratories.com

Gallant Custom Laboratories Inc., 1425 Bishop St. N Units 10–13 Cambridge, ON N1R 6J9 Toll free: 1 888-838-5223 Fax: 519 620-2489
Contact: Jackie Gallant e mail: jackie@gallantcustomlaboratories.com

Horseback Expeditions
Into British Columbia’s Northern Working Wilderness
Now Booking, Expeditions & Base Camps
(June–September)
Veterinary recommended by jleonn@hotmail.com (519) 326-3171
Experience with horses is useful, but not necessary; Fitness however is mandatory....
www.go2mk.ca...wsawchuk@pris.ca
(http://vimeo.com/user17242253/muskwa-kechika)

DENT-GAS Equipment Services Inc. OxygenSystems
Design • Supply • Install • Service

• Design & Install
• Anesthetic Waste Gas Scavenging Systems
• Parts & Accessories: regulators, hoses, quick connects
• Service and installation in most of Southern Ontario
dentgasoxygen.com

“The Medical Gas System Specialists”
416-690-2455 or 1-800-529-5015

Concord Veterinary Supply

German quality instruments
Huge inventory of Veterinary specialty products

Specialists in new clinic setup
Call 1-877-330-3335 Fax 1-888-897-8081

CONCORD VETERINARY SUPPLY

FOR PERSONAL USE ONLY
YOU’VE SEEN NOTHING LIKE THIS BALANCING ACT

Feline-specific insulin for optimal glycemic control

• AAHA recommended
• Feline-friendly dose concentration

ProZinc®

Optimal Glycemic Control

ProZinc® is a registered trademark of Boehringer Ingelheim Vetmedica Inc., used under license.
©2013 Boehringer Ingelheim (Canada) Ltd.
Relief. Just where it’s needed.

Onsiór® is different from other NSAIDs. It’s the ONLY tissue-selective* and COX-2 selective NSAID for dogs and cats.

• With a short blood half-life, Onsiór quickly exits the bloodstream, sparing vulnerable organs such as kidneys and the gastrointestinal tract from prolonged exposure to effective drug concentrations.1,2,3

• Onsiór is highly protein-bound and mildly acidic, persisting longer and at higher concentrations at the site of inflammation than in blood.1,2

• Available as palatable tablets for dogs and cats. Injectable formulation approved for control of pain and inflammation associated with orthopedic and soft tissue surgery in dogs.

* Clinical significance unknown.

® Onsiór is a registered trademark of Novartis AG; used under license.
© 2013 Novartis Animal Health Canada Inc.