

Ocular Lymphoma: A Case Study

By Jamie N. Henningson, DVM, PhD, DACVP

A globe initially discarded post-surgically, but then retrieved, from a 12-year-old Chihuahua with a three week history of a cloudy eye and corneal ulcer was submitted to the KSVDL. On examination of the globe, the ciliary body and adjacent choroid were expanded by sheets of monomorphic round cells (Figure 1) consistent with neoplastic lymphocytes.

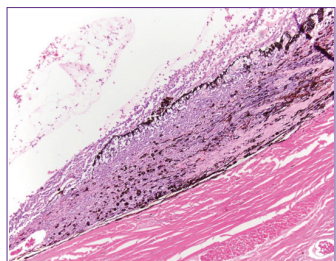


Figure 1. Eye, Lymphoma. Ciliary body and choroid expanded by monomorphic round cells that are consistent with neoplastic lymphocytes.

Immunohistochemistry was performed for B and T cell markers and the neoplastic cells were positive for B cell lymphoma (Figure 2). This animal had no enlarged lymph nodes or signs of illness.

Primary ocular lymphoma in dogs is rare and is primarily part of multicentric lymphoma. In cats, lymphoma is the second most common intraocular neoplasm and is usually part of the systemic disease process. However, ocular disease is often the presenting complaint and may precede signs of systemic involvement.

Not only is neoplasia a common disease that affects eyes but so are other disease processes, such as autoimmune, trauma, and infectious causes. An autoimmune disease example is uveodermatological syndrome (Vogt-Koyanagi-Harada syndrome (VKH)) in dogs, which is most often bilateral; diagnosis

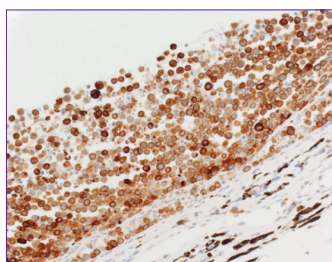


Figure 2. Positive IHC staining for CD79a, a marker for B cells, confirming B cell lymphoma.

in one eye may help save the other eye if treatment is initiated immediately. Ocular biopsy submission can be an important diagnostic tool for your patient and client.

To submit eyes for biopsy they should be left intact and not incised. Surrounding soft tissue can be trimmed if it does not appear to be involved in the disease. If there is a lesion present in the soft tissues surrounding the eye, leave the soft tissues intact. Place the eye in 10% neutral buffered formalin immediately after enucleation. The eye should be fixed in a ratio of 10X formalin volume: 1 X specimen volume. The formalin: specimen sample should be placed in a liquid tight container, and then placed into another container such as Ziploc baggie or whirlpack to prevent leakage during shipping.

Including a clinical history explaining the course of disease and the lesions observed on ocular examination are important when submitting samples. Drawings of the lesion(s) location and/or clinical pictures are beneficial and appreciated.

If you have questions about submitting eyes, please don't hesitate to call Dr. Henningson at 785-532-1429 or email at heningsn@vet.k-state.edu.

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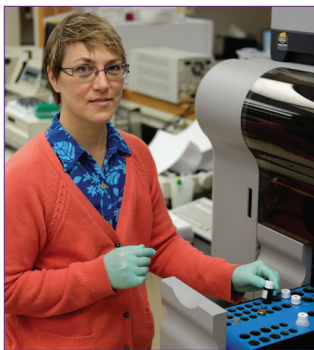
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KSVDL Selects Diagnostic Medicine Interns

In 2013, the Kansas State Veterinary Diagnostic Laboratory (KSVDL) began offering a program designed to provide advanced training in diagnostic medicine to graduate level veterinarians. As an added bonus, participants can tailor the internship to match their individual career goals.



Dr. Yvonne Wikander

Selected for this year's internship is Dr. Natalia Strandberg, a 2014 graduate of the University of Wisconsin and Dr. Yvonne Wikander, a 1989 graduate of Oregon State University.

Drs. Strandberg and Wikander will receive extensive training in clinical pathology methods and interpretation. Additionally,

to gain experience concerning laboratory techniques and results interpretation in other diagnostic medicine specialties, they will rotate through each KSVDL laboratory area including anatomic pathology, clinical microbiology, histopathology, molecular diagnostics, next-generation sequencing, rabies, serology and virology.

"Laboratory rotations allow one to see the latest and greatest in the diagnostic world as well as learning about the coolest up-and-coming technologies," Dr. Wikander said. "The after-hours time spent on-call is excellent hands-on experience using sophisticated laboratory equipment and interacting with the clinicians."

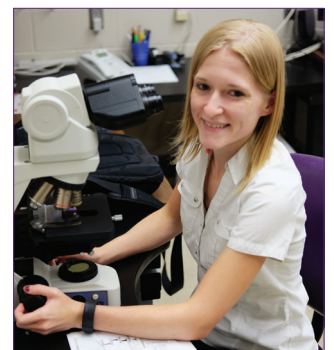
Dr. Strandberg echoed similar sentiments about the program.

"The diagnostic medicine internship has been an invaluable experience for preparing me for a clinical pathology residency," she said. "The rotations are a great way to get hands-on experience with the other departments in a diagnostic laboratory and to learn how diagnostic tests are performed, which is helpful in making recommendations for one test over another."

After completion of the specialty rotations, both interns have the option to focus on any diagnostic area outside the clinical pathology specialty as a possible career path during the course of the year, if so desired.

Both daytime training and after-hours emergency on-call duties are required of the interns. Daytime activities include not only training and laboratory rotation, but also the opportunity to participate in a variety of specialty medical rounds and to enroll in classes chosen to match the intern's career interests, offered through Kansas State University. Emergency after-hours duties include interacting with clinicians and completing clinical pathology testing for cases that are hospitalized within the Veterinary Health Center at Kansas State University.

The program is open to applicants who have a Doctorate of Veterinary Medicine and a strong interest in diagnostic medicine. If you would like more information about this program, please contact Dr. Gregg Hanzlicek at 785-532-4853 or gahanz@vet.k-state.edu or Dr. Lisa Pohlman at 785-532-4882 or lpohlman@vet.k-state.edu.



Dr. Natalia Strandberg

Join the conversation online!



Significance of Surgical Margins For Low Grade Mast Cell Tumors... New Insights

By Chanran K. Ganta, BVSc, PhD, DACVP, Kansas State Veterinary Diagnostic Laboratory

Canine cutaneous mast cell tumors (MCTs) are one of the most commonly diagnosed cutaneous malignant neoplasms in dogs. Approximately 90% of all canine MCTs are low grade according to the recent 2-tier grading system. Surgical excision remains the treatment of choice for low grade MCTs. Acquiring tumor free surgical margins can be challenging due to the location of the mass, the extent of local invasiveness, and the difficulty in distinguishing between inflammatory and neoplastic mast cells histologically. In addition, subcutaneous MCTs often extend to the surgical margins.

The mitotic activity of MCTs is frequently measured by microscopic examination; however, the true proliferative nature of the tumor is better determined by measuring the proliferative index. Proliferative index is the product of individual scores of Ki67 and AgNOR tests (proliferative index = Ki67 x AgNOR). Ki67 is a nuclear staining proliferation marker and AgNOR is a growth rate indicator. Recent studies have shown that 60% of dogs with proliferative index scores of greater than 54 died due to MCT associated disease within 12 months of the first tumor detection. Preliminary analysis of MCTs diagnosed at KSVDL showed that 100% of high grade and approximately 20% of low grade MCTs had proliferative index scores of 54 or above.

Two recent studies showed that marginally excised low grade MCTs that had proliferative index scores of less than 54 had recurrence rates similar to that of low grade MCTs that were completely excised with tumor free margins. Thus, the proliferative index analysis can provide valuable information on low grade MCTs to improve case management.

As shown in the **figure**, the proliferative index score could help determine if additional treatment should be considered in a marginally excised low grade mast cell tumor. Even if surgical margins are not tumor free, a low proliferative index score (<54) indicates that no additional treatment is required. If the proliferative index score is high (>54), additional treatment is required.

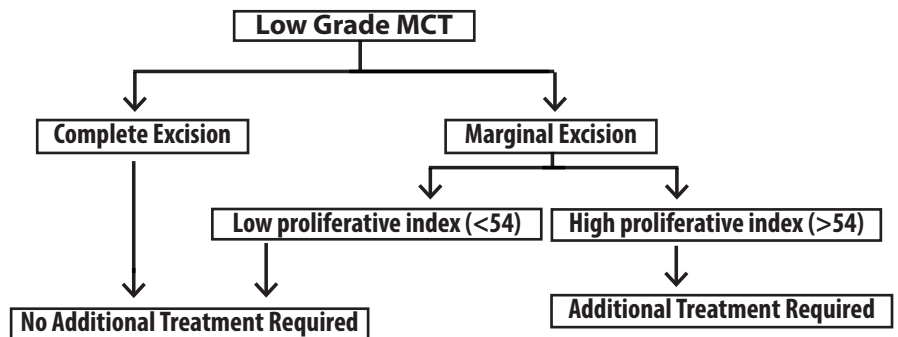


Figure adapted from Sledge et. al. 2016

KSVDL offers both the Ki67 (\$29.00) and the AgNOR (\$25.75) tests.

References available. Contact author.

KSVDL Welcomes Dr. Brad Njaa

Dr. Brad Njaa recently joined the KSVDL faculty as an anatomic pathologist. As more of a generalist he enjoys diagnosing disease in a broad variety of animal species. Areas of particular interest include surgical pathology, respiratory pathology, abortion and neonatal death diagnostics, avian pathology and special sense pathology (ocular and otic pathology). He is the primary author of several articles and book chapters on the subject of otic pathology (Jubb, Kennedy and Palmer's Pathology of Domestic Animals, 6th ed, 2016; Zachary's Pathologic Basis of Veterinary Disease, 6th ed, 2016; Vet Clinics of North America Small Animal Otology and Otic Disease; and a forthcoming Tumors in Domestic Animals, 5th ed. Wiley Blackwell 2017). He was also the editor of the recently Updated Kirkbride's Diagnosis of Abortion and Neonatal Loss in Animals, 4th edition, Wiley Blackwell 2012.



Rabies Update

By Rolan Davis, M.S., KSVDL Rabies Laboratory

With the conclusion of what we refer to as 'bat-season' in the rabies diagnostic laboratory, it is a good time to look back at lessons-learned over the summer.

Over the course of June, July and August, the rabies laboratory examined 816 specimens from KS and NE with over 500 of those samples being bats with 13 reported positive cases in bats. Human cases of rabies in the United States are most often attributed to variants of rabies virus found within bat populations. The underlying sentiment is that there is a lack of awareness among the general public that bats are a source of rabies virus infections. Veterinarians are often on the front lines of this public health issue and I applaud your efforts to keep your clients informed and their pets vaccinated.

Among the samples tested over the summer months, we unfortunately had to issue results of "Unsuitable" on 17 samples. Again, a majority of these were from bats, either because they had the skull crushed or because the sample was discarded for several days prior to the realization of the importance of rabies diagnostics testing.

If clients contact your clinic about collecting a bat from their property, make sure that they don't allow themselves to be bitten while capturing the animal. We had several cases where the bat was collected

using a towel and the bat bit the victim through what they thought was a protective layer. As well, they should not kill the bat by striking it as this often destroys the tissues we need for diagnosis. Live bats should be euthanized within your clinic using gas anesthetic on a cotton ball or gauze.

Other animal species have been reported as unsuitable as well including dogs, cats and bovines. Samples should be cooled as soon as the need for diagnosis is realized and shipped by courier and not the postal service. Brains from large animals are still occasionally received divided longitudinally, which renders the sample inappropriate for proper rabies diagnosis.

National guidelines require that we are able to test a full cross section of brainstem along with representative portions of the cerebellum, or both lobes of the hippocampus.

If tissues you submit require histopathology following rabies diagnosis, we ask that you submit the whole, fresh brain and our pathologists will formalin fix the appropriate tissues once received.

Rabies data in Kansas and Nebraska can be tracked on our web-site at <http://www.ksvdl.org/rabies-laboratory/diagnostic-test/rabies-results/index.html>



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KansasStateVeterinaryDiagnosticLaboratory1](http://www.youtube.com/c/KansasStateVeterinaryDiagnosticLaboratory1)

**To view a video on removing bovine
brain for rabies submission, please use
to following link to view on our YouTube
channel:**

<https://www.youtube.com/watch?v=01gXa8KkuPA>

KSVDL Personnel Activities

Publications:

- Duration of serum antibody response to rabies vaccination in horses. Alison M. Harvey; Johanna L. Watson; Stephanie A. Brault; Judy M. Edman; Susan M. Moore; Philip H. Kass W. David Wilson. Journal of the American Veterinary Medical Association, Vol 249 Issue 4, 411-418, 2016
- Comparison of parasitic mite retrieval methods in a population of community cats. Milley C, Dryden M, Rosenkrantz W, Griffin J, Reeder CJ Feline Med Surgery 1-8 Jun, 2016 (epub)
- Evaluation of fluralaner and afoxolaner treatments to control flea populations, reduce pruritus and minimize dermatologic lesions in naturally infested dogs in private residences in west central Florida USA. Dryden MW, Canfield MS, Kalosy K, Smith A, Crevoiserat L, McGrady JC, Foley KM, Green K, Tebaldi C, Smith V, Bennett T, Heaney K, Math L, Royal C, Sun F. Parasites & Vectors 9:365, 2016
- Is there a risk for introducing porcine reproductive and respiratory syndrome virus (PRRSV) through the legal importation of pork? Niederwerder, M.C., and R.R.R. Rowland. Food Environ Virol doi:10.1007/s12560-016-9259-z, 2016
- Heterogeneous Associations of Ecological Attributes with Tick-Borne Rickettsial Pathogens in a Periurban Landscape. Raghavan RK, Goodin DG, Dryden MW, Hroobi A, Gordon DM, Cheng C, Nair AD, Jakkula LUMR, Hanzlicek GA, Anderson GA, Ganta RR. Vector-Borne and Zoonotic Disease 16(9):569-576, 2016.
- A randomized field study comparing differences in core-body temperature, health, and performance in crossbred beef heifers administered two antimicrobial products given upon arrival at a stocker facility. Gregg A. Hanzlicek; Dale A. Blasi; Brandon E. Oleen; Gary A. Anderson. The Professional Animal Scientist, August Vol 32 Issue 4, 389-399, 2016

Presentations/Convention Exhibitions:

- Dr. Jianfa Bai was invited to speak at the Foreign Animal Disease Diagnostic Laboratory on "Improving diagnostic sensitivity by using current database in molecular assay development" at Plum Island.
- Dr. William Fortney and Beth McQuade manned the KSVDL exhibit and participated in the rabies human titer blood drawing booth at the AVMA Convention in San Antonio, TX.
- Dr. Michael Dryden spoke at the American Veterinary Medical Association on "Evaluation of fluralaner and afoxolaner treatments to control flea populations, reduce pruritus and minimize dermatologic lesions in naturally infested dogs in private residences in West Central FL. USA".
- Dr. Mike Moore assisted in the KSU-CVM Birthing Center at the Kansas State Fair in Hutchinson, KS.
- Dr. Michael Dryden presented several topics at the Central Veterinary Conference in Kansas City: 1) "Latest advances in oral therapies for flea and tick control", 2) "Controlling intestinal parasites from a public health perspective", 3) "Heartworm: Why is prevention better than treatment?", 4) "Clinical Management of Flea Infestations and FAD: Do you have skin in the game?".
- Dr. Dick Hesse presented a research proposal to the National Pork Board-Swine Health Committee in St. Louis, MO.
- Dr. Gregg Hanzlicek presented "Johne's disease in Cow-Calf Operations" and "An Update on Anaplasmosis" at the Bovine Health Update meeting sponsored by Larned Veterinary Clinic in Larned, KS.
- Dr. Megan Niederwerder will present a PRRSV/PCV2 research update at the 2016 K-State Swine Day in Manhattan, KS.
- Dr. Megan Niederwerder will present "Microbiome associations in pigs with the best and worst clinical outcomes following

Personnel Activities (continued)

- co-infection with porcine reproductive and respiratory syndrome virus (PRRSV) and porcine circovirus type 2 (PCV2)" in the Research Highlights Session at the Allen D. Leman Swine Conference in St. Paul, MN.
- Dr. Gregg Hanzlicek presented "Anaplasmosis diagnosis and control" at the Next Generation Veterinarian meeting sponsored by Boeringer Ingelheim in Kansas City, MO.
- Dr. William Fortney, Dr. Mike Moore & Beth Mcquade manned the KSVDL exhibit and participated in the rabies human titer blood drawing booth at the CVC Convention in Kansas City, MO.
- Dr. Gregg Hanzlicek presented "VFD for the beef producer" to producers in Fort Scott and Parsons, KS sponsored by K-State Research and Extension.
- Dr. William Fortney was the KSVDL exhibitor representative at the American Holistic Veterinary Medical Association Convention in Columbus, OH.

- Dr. Gregg Hanzlicek will present "Veterinary Feed Directive" at the SEK Genetics client appreciation dinner in Parsons, KS.
- Dr. Gregg Hanzlicek will present "Veterinary Feed Directive" in Stockton and Hill City, KS.

Field Investigations:

- Less than optimal reproductive efficiency in a large purebred cow-calf herd
- Sudden death in yearling beef calves on pasture

Field Research:

- Kansas cow-calf anaplasmosis herd-prevalence, strain differentiation, and management study. Gregg A. Hanzlicek, Mark Spare, Ram K. Raghavan, Daniel U. Thomson, Gary A. Anderson, Roman R. Ganta

KSVDL Seeking Kansas Cattle Producers to Help with Bovine Anaplasmosis Study

The KSVDL is looking for Kansas cattle producers to participate in a study to determine the prevalence of bovine anaplasmosis in cow herds within the state and to investigate management risk factors associated with blood test results.

Understanding anaplasmosis prevalence and the management factors that contribute to its presence in cow-calf herds will be important for formulating both prevention and disease management plans in the near future. This information will not only be useful for Kansas herds, but herds throughout the United States.

The targeted sampling period will start Oct. 1, 2016 with a targeted endpoint of Jan. 31, 2017.

Students at the Kansas State University College of Veterinary Medicine will be contacting veterinarians to participate in this study. If you are selected to participate, please say YES as your participation is very important for the success of this project.

More information is available by contacting Gregg Hanzlicek at 785-532-4853 or email gahanz@vet.k-state.edu.

Developing and Delivering Accurate, Innovative Diagnostic Services

The mission of the Kansas State Veterinary Diagnostic Laboratory (KSVDL) is to develop and deliver accurate, innovative, and timely diagnostic and consultative services to the veterinary and animal health community while providing support for teaching, training and research programs.

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Continuing Education

www.vet.k-state.edu/education/continuing/

November 5, 2016

Cargill Equine Nutrition

Texas A&M, College Station, Texas

<http://vetmed.tamu.edu/ce/schedule/cargill-equine-nutrition>

December 8-11, 2016

CVC San Diego

San Diego, California

<http://www.thecvc.com/dates-and-locations/cvc-san-diego-2/>

For more information, call the Continuing Education Office at 785-532-4528.

Test Results and Schedules

Laboratory results available online, all the time!

Holiday Schedule:

Thanksgiving: Closed: Thursday, November 24th and Friday, November 25th; Open Saturday, November 26th

Christmas: Open Saturday, December 24th

New Year's: Open Saturday, December 31st

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