



NEWSLETTER

Vol. 2, No. 1 - December 2008

VETERINARY SOCIETY OF SURGICAL ONCOLOGY

VSSO NEWS

THE NEW VSSO EXECUTIVE COMMITTEE

Dr. Nicole Ehrhart is the new President of the VSSO. Dr. Jim Farese is the President-Elect and Dr. Nick Bacon is the new Secretary. Dr. Bill Dernell will continue as our Treasurer. Dr. Sarah Boston has joined the Research Committee. Congratulations and we know that the VSSO will continue to improve and advance under your care.

NEW SURGICAL ONCOLOGY FELLOWS

The new Fellows in Surgical Oncology for 2008-2009 are Dr. Bill Culp at Colorado State University and Dr. Sarah Shallberger at the University of Florida.

CONTINUING EDUCATION AT ANNUAL MEETINGS

VSSO members were well represented at professional meetings in North America, Europe and Australia. We had a wet laboratory on limb-sparing surgery and two sessions (general and orthopedic surgical oncology) at the recent ACVS Symposium in San Diego. The didactic sessions were well attended and the limb-sparing laboratory was a huge success, thanks largely to the efforts of Dr. Dan Degner.

Dr. Jolle Kirpensteijn organized a very well-attended session on intrathoracic and throacic wall surgical oncology at the ECVS meeting in Basel, Switzerland. He has also organized a session on osteosarcoma for

the 2009 ECVS meeting in Nantes, France. Your support of this meeting and Dr. Kirpensteijn's efforts would be greatly appreciated (while enjoying the wines and food of France and watching Lance Armstrong's comeback in the Tour de France!).

Dr. Maurine Thomson organized the surgical oncology-themed Science Week, the annual meeting for board-certified specialists in Australia, in 2008 and this was also very well-received.

Thanks to everyone for their efforts in making these meetings such a success and promoting both continuing education in surgical oncology and also the VSSO.

RESEARCH PROJECT UPDATE

The VSSO has completed two research studies and the preliminary results of the canine appendicular chondrosarcoma and feline apocrine gland anal sac carcinoma studies were presented at the 2008 Veterinary Cancer Society meeting in Seattle by Drs. Nick Bacon and Sarah Shallberger, respectively. Both were excellent and showcased the potential of the VSSO in conducting clinical research.

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CLINICAL UPDATE OF SENTINEL LYMPH NODE MAPPING -

A BRIEF REVIEW AND SNEAK PEAK

Dr. Deanna Worley - Colorado State University

Selective lymphadenectomy via sentinel lymph node mapping is a technique considered standard of care in many human cancers that can improve understanding in the biologic behavior of metastatic neoplasia and improve the clinical accuracy of staging in small animal cancer patients. The purpose of sentinel lymph node mapping is to identify the first lymph node or nodes draining a tumor as these nodes will be most at risk for the presence of metastasis if the tumor spreads in an orderly fashion to the local regional lymph nodes prior to systemic spread. The concept was first published in 1977 by Dr. Cabanas in a penile carcinoma paper describing consistent anatomic localization of a lymph node presumed to be the sentinel lymph node draining the penis and that presence of metastasis within that sentinel node was related to patient survival.¹ In 1991, Dr. Morton published the first paper describing the use of intradermal dye injections to consistently find draining (sentinel) lymph nodes in six cats to determine the feasibility of selective lymphadenectomy, and then later published on the clinical application of selective lymphadenectomy with isosulfan blue in human cutaneous malignant melanoma patients when there was anatomic variability in where the sentinel lymph nodes would be located.^{2,4} A current PubMed query of "sentinel node" now identifies over 6000 publications cataloged.

The sentinel lymph node can be identified using more commonly a combination of, or singly, a radioisotope and/or injectable dye such as methylene blue, fluorescein, isosulfan blue, or patent blue. Radioisotopes are frequently ^{99m}Tc linked with colloidal sulfur, dextrans, hetastarch, or albumin through use of commercial kits or from laboratories developing their own tracers. A few commercial examples are Microlite from Du Pont and Sulfur Colloid from CIS.⁵ Radioisotopes help in locating the sentinel node(s) preoperatively with use of a gamma camera and intraoperatively

via a hand held gamma probe. An example of commercially available gamma probes includes Navigator by Auto Suture and Neoprobe by Neoprobe.⁶ In regarding radiation safety, the amount of radiation a surgeon is exposed to intraoperatively during a 3 hour procedure when 20mCi of ^{99m}Tc is used is approximately 1mrem (acceptable annual whole body radiation limits for radiation workers is 5000mrem).⁷ In patients who received 400 μ Ci ^{99m}Tc, the amount of radiation within the operating suite was found to be 0.01 to 0.03 mrem per hour, similar to background levels.⁸ There are advantages and disadvantages in choosing which dye to use. Even though isosulfan blue is more expensive, it is more preferentially uptaken in the lymphatic system and is more visible intraoperatively though it causes anaphylaxis in a small percentage of human patients.⁹⁻¹⁰ Methylene blue is cheaper and may have a little more nonselective uptake into the tissues. At higher doses, methylene blue can cause Heinz bodies in dogs and a decrease in PCV.¹¹ We have found anecdotally that either methylene blue or isosulfan can be difficult to identify after about an hour post injection as the dye will dissipate and migrate beyond the sentinel lymph node.

In order to understand the biologic behavior of forelimb osteosarcoma better and to assess the clinical feasibility of sentinel lymph node mapping in a select population, patients are being prospectively enrolled into a clinical trial at the Animal Cancer Center, Colorado State University addressing those points. The trial investigators include Stewart Ryan, William Dernell, Phillip Steyn, Josh Milgram, Debra Kamstock, and Deanna Worley. This study is motivated by a retrospective report of 228 canine osteosarcoma cases by Hillers et al that demonstrated a median survival time of two months for dogs having lymph node metastasis from osteosarcoma.¹²

CLINICAL UPDATE OF SENTINEL LYMPH NODE MAPPING -

A BRIEF REVIEW AND SNEAK PEAK

Dr. Deanna Worley - Colorado State University

To date six dogs with distal radial osteosarcoma have been enrolled in this study. Select patients receive approximately 500 millicuries of technetium 99 labeled Lymphoseek (a ^{99m}Tc labeled dextran tracer manufactured by Neoprobe) injected in four quadrants around the tumor while under general anesthesia. Regional limb and lymphatic images are obtained with a gamma camera over 20-40 minute interval. The dog is then moved to the surgical suite for routine forelimb amputation. Just prior to the skin incision, 0.2 mg of methylene blue is injected in four quadrants similar to the Lymphoseek injections around the tumor. Once the limb is freed from the body, the axillary lymph node and the prescapular lymph nodes are identified with guidance of a gamma probe and removed. Presence of blue coloration within the extirpated lymph nodes is noted as well as radioactive counts. This has been accomplished in one dog. The remaining five dogs to date have received injections exclusively of methylene blue without Lymphoseek radioisotope.

The axillary lymph nodes has been the sentinel lymph node in all six dogs. In five of six dogs, the axillary lymph nodes have had visible blue dye seen within each node. No dye uptake has been seen in the prescapular lymph nodes and thus no prescapular lymph node has been found to be a sentinel node yet in this study. The sole dog not having any visible dye uptake in either lymph node happened to be the single dog having a concurrent radioisotope injection. In this dog, the axillary node had a radioactive signal greater than ten times the background level, as measured with the gamma probe, making this node a sentinel node. None of the sentinel nodes thus far have had histological evidence of metastatic disease. Multilevel sectioning of the extirpated lymph nodes has been performed in five dogs where five

levels are evaluated instead of the traditional longitudinal slice of a bivalved lymph node.

Lymphoseek radioisotope has also been used in combination with methylene blue dye in dogs each having a stifle synovial cell sarcoma, mandibular salivary gland adenocarcinoma, and thyroid carcinoma. A preoperative gamma scan was performed on the first dog having synovial cell sarcoma. Intraoperative scanning with a gamma probe was done in all three cases. A sentinel node could not be identified in the stifle synovial cell sarcoma patient with combined usage of a gamma probe and methylene blue, consistent with the preoperative gamma camera scan, as the popliteal, inguinal, and sublumbar lymph nodes were all carefully evaluated. In the patient with a salivary gland adenocarcinoma, use of the gamma probe intraoperatively rapidly located the medial retropharyngeal (sentinel) lymph node for extirpation. The medial retropharyngeal lymph node did not have histological signs of metastasis. Following Lymphoseek and methylene blue injections in the thyroid carcinoma patient, a hand held gamma probe could not identify any sentinel node, though a false positive signal was found in an area of extravasated dye.

Some of the technical goals of this project include assessing the clinical feasibility of sentinel lymph node mapping in our patients, finding an ideal volume of methylene blue to use, determining a more precise time prior to blue dye dissipation beyond the sentinel node, and developing our technical proficiency. No complications from sentinel node mapping have been identified yet in these patients. There is a learning curve associated with these techniques, but vast untapped potential is possible for improving the care of our cancer patients. References available on request.

Surgical Oncology Postdoctoral Fellowship
Animal Cancer Center, Colorado State University

The Animal Cancer Center and the Clinical Oncology Service at Colorado State University are offering a one-year postdoctoral fellowship in surgical oncology. The position is designed for veterinarians who have completed a 3-year ACVS approved residency (or equivalent) in small animal surgery. The 12-month appointment will consist of 2 weeks of vacation, 2 months without clinic duties to study for ACVS boards, 2 additional off-clinic weeks and 9 months of clinical duties and research related to surgical oncology. The new 35,000 square foot Animal Cancer Center (ACC) is a research and cancer affinity facility immediately adjacent to the Veterinary Medical Center which will house oncology personnel and operations. Research within the ACC includes: limb-sparing, cortical allografts, bone morphogenesis, osteogenesis, infection, tumor markers, drug delivery systems, isolated limb perfusion, preclinical drug testing, pharmacology, gene therapy, oncogenesis, radiation therapy, pathology and clinical oncology research.

The salary is \$42,000 per year and the appointment is for one year. The proposed starting date is on or about July 1, 2008. Colorado State University is an equal opportunity/affirmative action employer and complies with all Federal and Colorado State laws, regulations, and executive orders regarding affirmative action requirements. The Office of Equal Opportunity is located in 101 Student Services. In order to assist Colorado State University in meeting its affirmative action responsibilities, ethnic minorities, women, and other protected class members are encouraged to apply and to identify themselves. Interested individuals should submit curriculum vitae, a letter of intent, and three letters of recommendation to Drs. Nicole Ehrhart, Deanna Worley or Stephen J. Withrow at:

Veterinary Medical Center at Colorado State University
Department of Clinical Sciences
c/o Ms. Morna Mynard
300 West Drake Road, Fort Collins
CO 80523-1620
Telephone: 970-297-4175; Fax: 970-297-1254.

The deadline for receipt of materials is February 1, 2009, for full consideration.

Surgical Oncology Postdoctoral Fellowship
College of Veterinary Medicine, University of Florida

A 1-year postdoctoral fellowship in surgical oncology is being offered by the Oncology Service at the University of Florida (UF) Veterinary Medical Center. The 12-month appointment will consist of 2 weeks of vacation, 3 months without clinic duties to study for ACVS boards, and 2 additional off-clinic weeks. The Fellow will also be able to participate in practice exams currently given to our small animal surgical residents and will have interaction with the musculoskeletal oncologic surgery group at the Enneking-Anspach Research Center at the UF College of Medicine. The salary is \$40,000 per year. The proposed starting date is July 1, 2009.

REQUIREMENTS: Applicants must have completed a 3-year ACVS approved residency (or equivalent) in small animal surgery.

AREAS OF CURRENT CLINICAL AND BENCHTOP RESEARCH: Limb-sparing surgery, distraction osteogenesis, bone regeneration, management of post-operative limb-spare infections, stereotactic radiosurgery, soft tissue sarcomas, urogenital tumors, radiation models of canine and feline cancer, vaccine development and experimental therapeutics.

The University of Florida is a classic large land grant institution with a student population of 42,000, is a member of the prestigious American Association of Universities and ranks in the top 10 among public universities in the number of national merit scholars. The College of Veterinary Medicine is a part of the University of Florida's Health Science Center which contains one of the largest and most well-respected medical centers in the Southeastern United States. Opportunities for collaborative research with the Health Science Center and other campus colleges are essentially limitless. The Gainesville area has a population of approximately 150,000. North Central Florida has world famous natural springs, beautiful rivers and beaches. The University of Florida is an affirmative action/equal opportunity employer/educator.

Interested individuals should submit curriculum vitae, a letter of intent, and three letters of recommendation to James P. Farese and Nicholas Bacon at:

2015 SW 16th Ave, Department of Small Animal Clinical Sciences, Veterinary Medical Center, University of Florida, Gainesville, FL 32610-0126; Tel: 352-392-4700, ext. 4709 (Farese-w), 352-258-9264 (Farese-c); 352-494-0448 (Bacon-c); Fax: 352-392-6125. The deadline for receipt of materials is February 1, 2009, for full consideration.