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Vascular Graft Helps Horse

Veterinary Dentistry at Penn

Veterinary dentistry, one of the most recent veterinary specialties, is generating a great deal of interest among practitioners, according to the AVMA. On September 1 the first full-time resident in veterinary dentistry anywhere began her duties at the University of Pennsylvania School of Veterinary Medicine. Dr. Jamie Anderson, a recent graduate of the University of California Veterinary School at Davis, and a former Registered Dental Hygienist, will spend two years here in a program designed to meet the entry requirements of the American Veterinary Dental College. Jamie comes from a "dental family" - her father is a dentist, and her mother and sister are dental hygienists.

Penn's Veterinary School is a natural choice as the site of the first veterinary dentistry residency. Dr. Colin Harvey, professor of surgery here, has been a moving force in the field. He was instrumental in the development of the American Veterinary Dental Society, started 13 years ago, and is one of the eight charter members of the American Veterinary Dental College, recently recognized by the AVMA.

The new residency program is supported by an anonymous grant and by grants from Nabisco Brands, Inc. and Henry Schein, Inc. Dr. Anderson works with Dr. Harvey, a board certified veterinary dentist and surgeon. She sees patients during the Monday oral, dental, nasal diseases clinics and participates in the diagnosis and treatment of the animals. During her residency she will rotate through the specialties of anesthesia, radiology, soft tissue and orthopedic surgery. In addition, she will spend time in the oncology and small animal medicine clinics as well as at the Philadelphia Zoo. Dr. Anderson participates in rounds at VHUP and will take part in clinical discussions at the Dental School, and will conduct a dental research project.

Dogs and cats with oral diseases are seen at VHUP by appointment, generally by Dr. Harvey or by a member of the medicine staff if the oral problem is part of a wider clinical problem. Orthopedic problems affecting the jaws are sometimes seen by the orthopedic staff, and problems due to cranial nerve diseases often start out in the neurology clinic. In addition to Drs. Harvey and Anderson, the current dental staff at VHUP includes Ms. Marcia Venner, a full-time dental hygienist/technician. The clinicians perform periodontic, endodontic, restorative and orthodontic procedures, and many oral surgical procedures - radical maxillectomies and hemimandibulectomies are common as treatment of oral neoplasms, some of which are followed-up with radiation and/or chemotherapy.

Many of the techniques used in veterinary dentistry are the same as in people. Teeth are cleaned, extracted, and, less frequently, capped. Malocclusion may be corrected, if necessary for the animal's comfort, and palate defects are repaired. However, while the human patient is conscious during dental treatment, the animal patient is not. Full anesthesia is generally required, which adds a health risk and is a cost consideration when treating an animal. A veterinary dentist can not ask the patient to return week after week for further treatment. So, when working on a dog or cat, as much as possible has to be repaired or corrected during one visit, with one anesthesia.

The foremost dental problem in dogs and cats is periodontal disease, where gums become inflamed due to plaque and calculus build-up. This sets the stage for bacterial infections. The inflamed gum tissue pulls away from the bone, pockets form and soon infection may spread deeply, affecting the root. In some cats, gum disease causes the formation of



Lower canine tooth that has been crowned with stainless steel crown.



Severe gingival hyperplasia surrounding upper canine tooth of a dog.

ulcers, making it an extremely painful condition where the animal is reluctant to eat or groom itself. This can be life-threatening if left untreated.

Most of the patients in the dental clinic are middle-aged or old animals. Often a teeth cleaning and deep scaling alone won't correct the problem and severely affected teeth have to be removed. Owners are then instructed how to brush their pet's teeth to prevent a recurrence of gum disease. Dogs are not prone to cavities, so drilling and filling are done rarely. Dental problems also affect large animals like horses and sheep, though not much research has been done in this area. Zoo animals too are important patients of veterinary dentists, again it is a field which is in its infancy.

Much of the dental research at Penn's Veterinary School centers on periodontal disease. Dr. Harvey and collaborating veterinarians, dentists and other scientists have conducted pioneering research in such areas as effectiveness of plaque retardants in dogs; the pathological, bacteriological, and immunological features of gingivitis-stomatitis in dogs and cats; the



Upper canine tooth of a dog following root canal treatment.



Lower jaw of a cat with severe gingival inflammation affecting the first premolar tooth.

epidemiology of periodontal disease in dogs, and other areas. Because some animal and human oral diseases share pathological similarities, this research may directly benefit human health. In addition the dental team is examining the efficacy of dentifrices (toothpaste) for animals and oral devices which aid in the natural cleaning of teeth, such as chew toys for dogs, made from a floss-like material.

Veterinary students at Penn rotate through the dentistry clinic. They also can take a 16-hour lecture series as an elective. About 50 percent of each class participates. Veterinary dentistry is a popular topic in the Continuing Education courses offered by the School, reflecting the rising interest of practitioners.

Dr. Harvey is looking to expand the dental program and to increase the collaboration with Penn's Dental School to enable the School to offer a full program in veterinary dental medicine. The addition of a dental residency is just a first step as Penn seeks to continue in its leadership role of veterinary dentistry.

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GORE-TEX®, familiar to most as a fabric for outerwear, is also a material for vascular grafts which have been used to replace diseased blood vessels in humans. Now a GORE-TEX® vascular graft has been implanted in a horse.

Heisman, a show horse, was brought to New Bolton Center last summer. His right jugular vein was completely occluded and his left jugular vein was partially occluded. He was seriously ill and was unable to exercise strenuously because of swelling of his head and head shaking. Dr. William Donawick, the Mark Whittier Allam and Lila Griswold Allam Professor of Surgery, attempted to unblock the left jugular vein by "drilling" through the blockage. The procedure was only partially successful and did not permit sufficient venous return from the head to alleviate the swelling.

Dr. Donawick then contacted the manufacturer of Ringed GORE-TEX® Vascular Grafts to determine whether this technique might be used in a horse. He also consulted with Dr. Anthony Comerota, a vascular surgeon at Temple University Hospital who

had implanted a number of such grafts in humans to replace lost jugular veins. Dr. Comerota agreed to assist Dr. Donawick in trying to replace Heisman's clogged right jugular vein with a 2.0 cm GORE-TEX® graft. The manufacturer, W.L. Gore and Associates, Inc., Medical Products Division, donated a GORE-TEX® Expanded PTFE Vascular Graft.

During a four hour long operation on July 11 the two surgeons removed the 25 cm long occluded section of the right jugular vein and implanted the Ringed GORE-TEX® graft. To ensure a continuous blood flow throughout the graft, a shunt was created between the right carotid artery and the undamaged portion of the jugular vein. Heisman woke up from the anesthesia in good order and walked back to his stall just one hour after the incision had been closed. Shortly thereafter he ate his hay.

He is home now in Maryland, hale and hearty, with a good blood flow through his replacement vein. The swelling of his head and his head shaking have passed and he is in training to resume his career in the show ring.