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15th Annual Symposium: Your Veterinarian and Your Dog

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15th Annual Symposium

More than 160 dog owners and breeders attended the 15th Annual Symposium "Your Veterinarian and Your Dog" at VHUP Jan. 26. Following is a summary of the presentations made by faculty members.

Inherited Eye Diseases in the Dog— New Perspectives.

Dr. Gustavo D. Aguirre discussed PRA and the diagnostic methods currently available. He pointed out that the ophthalmoscopic examination will detect the disease only when the dog is older which presents a problem for breeds with late onset PRA. The electroretinogram will detect the presence of PRA at an early age. "The ERG is a powerful tool for diagnosing eye disease," said Dr. Aguirre. "It identifies the affected dogs while they are very young. They can be removed from the breeding pool. It is also helpful in identifying carriers by using the ERG to examine puppies produced in test breedings."

He then discussed some of the current work of the Inherited Eye Disease Studies Unit (IEDSU) where he, Dr. Gregory Acland and Dr. Lawrence Stramm are searching for new methods to study, diagnose and treat inherited eye diseases.

"We are working with tissue cultures from cats with MPS, a group of diseases caused by a metabolic abnormality," Dr. Aguirre said. "We are looking at the disorder biochemically and structurally and hope to develop a tissue culture model for other eye diseases caused by metabolic abnormalities."

It is known that Irish setters with PRA have an enzyme deficiency in their rod cells which causes these visual cells to die. By studying the tissue cultures from the MPS cats the researchers hope to gain information which can be applied to PRA in the setter and other breeds. For example, it was found that the severity of the eye disease in one type of MPS cats varies, depending on the degree of pigmentation of the epithelial cells. If these cells are heavily pigmented, the disease is less severe. Epithelial cells are support cells and they nourish and cleanse the retinal visual cells. The members of the IEDSU hope to determine how the presence of pigment slows eye disease associated with MPS. If the mechanism is found then perhaps PRA in Irish setters can be better understood.

The group is also examining how cells of the eye renew themselves. "Cells of the retina keep renewing themselves every seven days," Dr. Aguirre said. "The renewal protects the photoreceptive cells from permanent damage due to excessive light, heat and oxygen." The specialized ciliated retinal cells in dogs with late onset PRA have a reduced renewal rate, sometimes 50 to 60 percent of normal. This slowdown is observable long before the disease manifests itself. It was found that renewal does not take place if the nucleus or the cell body is damaged. The researchers hope to find out why the rate of renewal is slowed and whether it can be altered or prevented. They are also studying other types of PRA to determine whether or not the renewal

of retinal cells is altered in these diseases.

Tissue cultures of diseased cells also permit researchers to explore different methods of treatment in an attempt to correct a metabolic abnormality. The work goes a step further. The group is not only studying eye cells but is also looking at tissues from other parts of the body. "It is possible that the metabolic disorder, responsible for the eye disease, is also present in cells in other parts of the body," Dr. Aguirre said. "If that is the case, one could identify an animal with such an eye disease by looking at cells from other parts of the body. It would permit early diagnosis and even the identification of carrier animals that are clinically normal." However, it is possible that the metabolic abnormality can only be found in the eye and that this avenue of research would not be fruitful.

The group is also studying the development of the eye. Dogs and cats are unique; when they are born the eyes are not fully developed. This allows researchers to observe the final stages of eye development after birth. They can determine

whether changes take place which later in life are manifested as eye disease. By looking at the developing eye it is also hoped to better understand diseases of the cornea and the lens. Perhaps one day ophthalmologists can state at which point in gestation certain defects first become evident. Such information is known for congenital heart defects.

One startling finding by the Penn researchers of the Section of Medical Genetics working with members of the Department of Human Genetics at the University of Maryland is that in test matings, the number of affected offspring with late onset PRA depends on the sex of the test bred animal. It was found that, as expected from classical genetics, if the dam was an affected animal and she was bred to a carrier, approximately half the litter was affected and half was phenotypically (clinically) normal, although still carriers of the disease. When the dam was a carrier and the sire an affected dog, surprisingly only one-third of the litter was affected, two-thirds were phenotypically normal. It is not fully understood why the percentage of affected offspring is smaller when the dam is the carrier but it is the first time that an extraocular "marker" or trait has been associated with the PRA gene. These findings in miniature poodles

New Diagnostic Methods: "CAT Scan and Magnetic Resonance Imaging."

Dr. Jeffrey A. Wortman discussed the new diagnostic tools available to radiologists at the School. While radiography still plays an important role, new technology such as nuclear medicine (scintigraphy), ultrasonography, x-ray computed tomography (CAT Scan, X-CT), and magnetic resonance imaging (MRI) permit diagnosis of disorders that may not be detectable through radiography.

Each of these diagnostic methods has a specific use. Nuclear medicine permits the study of an organ and its function e.g. bone scan or thyroid scan to look at metabolic activity of the skeleton and thyroid gland respectively. While these are commonly outpatient procedures for human

patients, regulations require that an animal be hospitalized for 24 to 48 hours after scintigraphy. During this time the veterinary patient is housed in relative isolation so that the body burden of radioactivity is reduced to a negligible level.

Ultrasound is used with increasing frequency to detect soft tissue disorders in both large and small animals. The procedure is non-invasive. High frequency sound waves are the source of imaging. The image displayed on a TV monitor allows the clinician to observe an area of the body in motion. This is particularly valuable for the cardiologist. Ultrasound is also useful for evaluating abdominal organs and in



Anesthesia technicians, Sharon Swift and Cheryl Kenney, position a patient in preparation for X-ray computed tomography. The XCT machine is the General Electric 8800 and is located in the Pendergrass Radiology Laboratory of the Medical School.

mean that a greater number of puppies are required in test mating to determine whether or not a female poodle is a carrier of PRA. In all likelihood this also applies to the American cocker spaniel, the English cocker spaniel and other breeds having the late onset form of PRA.

Canine Joint Disease

Dr. Charles D. Newton, associate professor of orthopaedic surgery, discussed the management and treatment of degenerative arthritis.

He pointed out that in dogs, unlike in people, degenerative arthritis is a secondary disease due to trauma or malformation of the joint. The disease involves the entire joint, the synovial fluid, cartilage and bony tissue. If a joint is injured or is developed improperly, the body reacts to the unusual wear and tear. The area becomes inflamed, bony projections develop and the joint becomes stiff.

Arthritis can be treated either medically or surgically. Medical treatment consists of administering drugs. Dr. Newton explained that aspirin is still the drug of choice and can be used for most dogs. He cautioned owners to not use some of the non-steroid anti-inflammatory drugs, approved for humans, for their arthritic



pet. "Some of these drugs are lethal to dogs," he said. "The veterinarian should be consulted before administering any drug to a dog."

Surgical treatment is used to correct the abnormality that causes arthritis to develop. It will not stop the process completely but will slow progression of the disease. Dr. Newton then discussed some of the disorders causing arthritis in greater detail.

Osteochondritis Dissecans is a disease of the articular cartilage covering the humeral head. Isolated cases have been reported involving the distal humeral condyles and the femoral condyles. In the course of the disease, a cartilage flap is formed, which causes pain when the dog

walks. The flap may fragment, forming joint mice. The disease is seen with greater frequency in young males of large breeds.

The underlying cause of OCD is osteochondrosis, a metabolic cartilage problem seen in many animals. It causes severe problems in swine and poultry.

The animal is treated surgically if the cartilage flap is torn. The piece is removed and the animal will rehabilitate with little trouble later in life. Dr. Newton pointed out the OCD is not only seen in the shoulder joint but that it also occurs in the elbow, stifle, and hock joints.

Another disorder discussed was Ununited Anconeal Process. Here a small bony process in the elbow joint becomes detached, causing instability of the joint which starts the degenerative arthritis process. The problem is seen in large breeds and is believed to be inherited.

Surgical treatment consists of attaching the anconeal process to the ulna to stabilize the joint. Another procedure is to remove the anconeal process. This reduces pain but does not result in joint stability.

Hip Dysplasia is a disease of man and animals wherein the hip develops improperly. This abnormal development usually results in unstable joints which undergo changes typical of osteoarthritis.

The disorder is treated primarily non-surgically with analgesics. Many young dogs at six to eight months are extremely painful during their last growth spurt. If the pain can be controlled for this period, many never require further treatment. Quite a few animals though, appear not to have pain, even though the disease is quite advanced.

Hip Dysplasia can also be treated surgically. There are several procedures, all aimed at making the joint more stable to minimize the wear and tear and the development of arthritis.

Legg-Calve-Perthes disease affects primarily small breeds though it occurs occasionally in larger breeds. In affected animals the head of the femur dies, the cartilage is crushed and the joint becomes rough. The animals are usually treated surgically, the head of the femur is removed and the dog does very well.

Another disorder causing degenerative arthritis is Cranial Cruciate Ligament Rupture. Dogs commonly rupture the cranial cruciate ligament, due to many reasons. The resulting instability promotes osteoarthritis and severe pain and lameness are the end result if untreated.

The ligament tear can be repaired surgically and the joint stabilized. Without direct surgical intervention, nearly all knees will become osteoarthritic.

Bad Breath, Tartar and Plaque—Gingival (Gum) Disease in the Dog.

Dr. Colin E. Harvey, professor of surgery, discussed gum disease in dogs, the most common health problem of animals five years or older.

Gum disease is caused by plaque, a soft material that forms on the surface of the tooth. Plaque consists almost entirely of bacteria and as these proliferate, the groove between the tooth and gum is invaded, causing gingivitis. Bacteria are always present on the surface of normal healthy teeth. As the disease progresses, the type of bacteria present changes from aero-

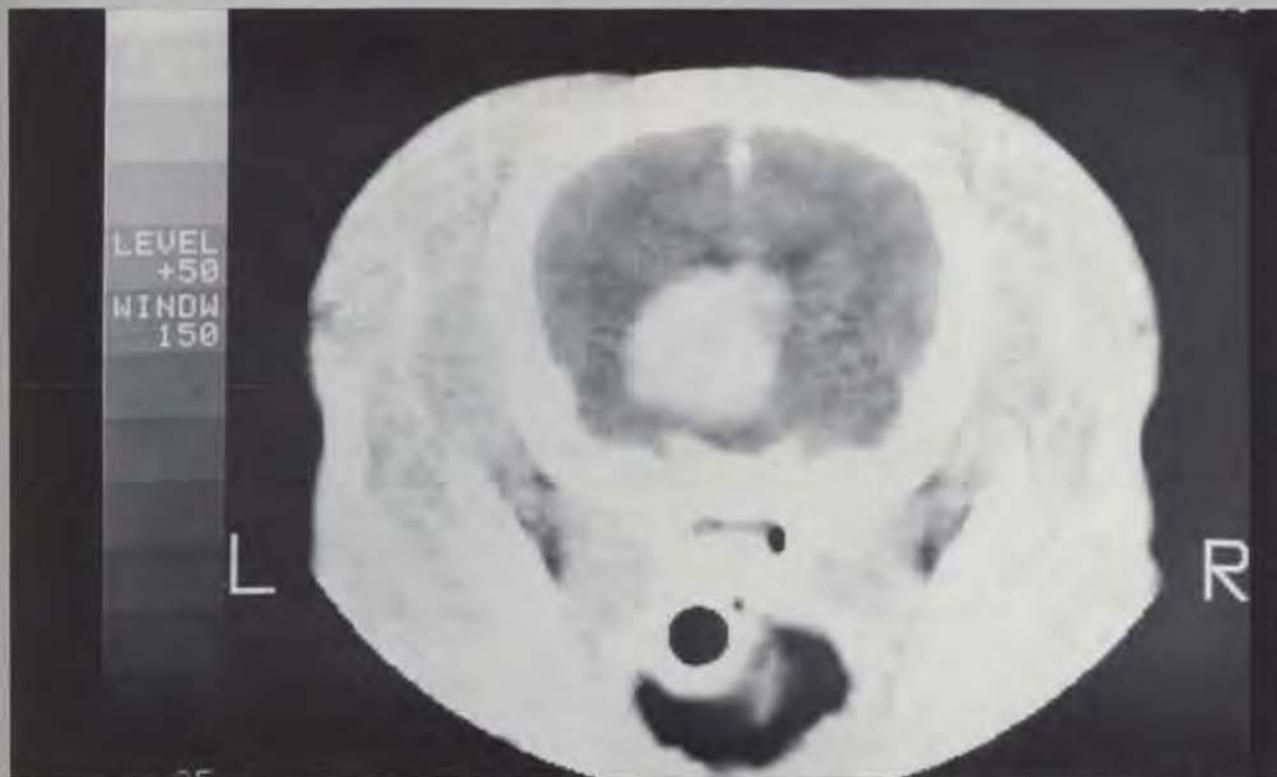
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detecting pregnancy and fetal viability.

X-ray computed tomography (CAT-Scan) is a sophisticated diagnostic tool the School has access to at the Medical School radiology research facilities. A cross-sectional image is reconstructed from computer analysis of the transmitted x-ray data recorded by sensitive detectors. The result is a detailed study of anatomic pathology. Software programs allow the view of a body area in an operator-selected plane of interest; magnification; and measurements such as length, area, and volume. X-CT is a powerful but expensive diagnostic tool. Here at the School it has been used primarily to detect brain lesions. It has been invaluable in detecting the precise location of these lesions. This is particularly important in cases involving brain tumors so that biopsy and/or surgical removal may now be feasible. Animals have to be anesthetized for the CAT scan procedure.

The newest modality in human imaging is Magnetic Resonance Imaging (MRI). This equipment is also available at the Medical School. The size of the unit there limits its use to small dogs and cats. MRI is also a computer-based imaging system. Here, instead of x-rays, a strong magnetic field and radio waves are used to obtain an image. It has much greater soft tissue contrast than an image generated through X-CT. Animals also have to be anesthetized for MRI.

Dr. Wortman pointed out that the value of these non-invasive diagnostic tools is to allow the clinician to make a more accurate diagnosis and prognosis and to develop more effective treatment planning. As the X-CT and MRI equipment is rather expensive, the cost for these procedures are higher. However, in human medicine the equipment has proven to be cost-effective.



A transverse section of the cerebrum of an eight year old female miniature poodle shows contrast enhancement of a left thalamic mass. This was a tumor (hemangiosarcoma) originating in the nasal cavity.

Gingival (Gum) Disease

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bic bacteria to more harmful anaerobic ones.

Gingivitis is seen as reddening or swelling of the gums. In some animals, the gingiva respond to the insult over a long period by becoming thickened; the gum tissue grows up around the teeth, creating pockets where food particles remain. In other animals, the gums recede exposing bone. As the bone is resorbed, a pocket develops between tooth and gum where bacteria flourish.

Almost all dogs five years or older have measurable gum disease, sometimes without the owner being aware of any abnormality. The most common sign is bad breath. Dogs rarely lose their appetite as a result of gum disease, even when they have a mouthful of loose teeth. Cats are much more likely to be painful.

Diagnosis of gum disease is made by inspection of the mouth. The extent of the disease is assessed by a blunt tipped probe; this is used to

measure the depth of pockets and to scrape the side of the tooth to test for adherence of plaque or calculus. A normal tooth has a pocket depth of no more than 2 to 3 mm.

Gum disease can be exacerbated by many conditions, including malnutrition or other general debility (including pregnancy or lactation), endocrine abnormalities, immunosuppression, etc.

Treatment is aimed at eliminating plaque, restoring the gum-tooth junction to as normal a condition as possible, and following up with a preventive program. Most animals presented with bad breath due to gum disease will require teeth cleaning under anesthesia as the first step.

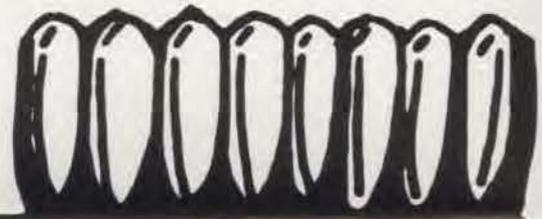
Teeth scaling is designed to clean the surface of the tooth, not only the crown but also the area between tooth and gum. This is the most important area as here the bacteria flourish. Cleaning is performed with ultrasonic and hand instruments. After cleaning the teeth are polished to create a smooth surface to which bacteria cannot adhere.

When the pocket depth is greater than 5 mm, surgery is necessary to eliminate the pocket. Sometimes the disease is so advanced that the tooth has to be extracted. This is particularly useful in cats, where severe gum disease can cause complete inability to eat or drink, and where results of conservative treatment are often poor.

Dog owners can prevent gum disease in their dogs. The clean and smooth teeth are kept in good condition by regular daily cleaning. This can be done to some extent by feeding dry food, or by encouraging chewing on toys or rawhide strips. A daily brushing with a soft child's toothbrush is much more efficient. Avoid human toothpastes because of the detergent they contain—dogs do not like the frothing.

Dr. Harvey's advice to the audience was to get a toothbrush for every dog and start brushing once a day. However, the teeth should also be thoroughly cleaned to control any gum disease already present.

Helma Weeks



Practicing Abroad

A Letter From Lima, Peru

Lima, Peru, with a population of 6 million, is the largest city in which I have ever lived. When we moved there 18 months ago, I was optimistic about work possibilities. There is a veterinary school here, and several veterinarians trained in the United States.

Peruvians, on the whole, are a very formal but warm people. As we are still with the diplomatic service, I spend a fair amount of time at social functions—discussing the weather, the maids, schools and shopping with Peruvian women. It is almost impossible for me to break beyond these topics with even the women, let alone the men. The men are reluctant to have a serious conversation should I even be within earshot. Therefore, you might be able to imagine how difficult it has been for me to establish myself professionally.

The University of San Marcos has the best veterinary school in the country but it has no money and therefore no equipment or supplies. Its facilities are about the poorest I have seen anywhere.

After spending a great deal of time "observing" at San Marcos and in several private practices, I agreed to work with Dr. Jose Brener, who did his post-doctoral training in Scotland. We run a small animal clinic out of one room and

make frequent house calls. When I started there was no microscope, no ophthalmoscope, no gas anesthesia, no X-ray machine. Now we have a microscope—mine. We also have a desk, a table, a large lamp, a basic set of surgery instruments and ketamine. We work together and the key to the relationship is that he holds animals for me. And I hold animals for him. He has devoured my library; his most current books are from the Sixties. Mail service to Peru is not the best either.

Mostly I see English-speaking clients from the United States and Canada. My office visit fees run high by Peruvian standards: I charge the equivalent of \$6. My housecalls are outrageous at \$10, but North Americans are usually willing to pay. As the annual rate of inflation is well over 100 percent, many suppliers have started to charge in dollar equivalents for imported products and medications. As the exchange rate changes daily, so do the costs of my vaccinations and medications. In my first year of practice, I lost enough money that I was beginning to feel like veterinary medicine had become an expensive hobby.

I have raised my surgery prices and I'm finally in the black. But I wonder about the average Peruvian veterinarian who is trying to

survive. He (there just aren't any "she's" in private practice) can't be making more than a few hundred dollars a month. Recently, someone came to me for a second opinion concerning the treatment of a hip dislocation. The first veterinarian had given them an all inclusive estimate of \$60 to do a femoral head and neck resection. I have to wonder about the quality of the work at that price.

I suppose my problem is that I'm still looking for the life I left in the United States in a third world country. The basic conditions for life here are unacceptable to me. I know things can be better. Why aren't they? But how can I expect a people who let hundreds of children starve or die because of no medical treatment to care properly for their animals? Even the wealthy don't.

So I create my own "little America" and practice as best I can. I have realized that I'll make no changes here, other than to improve Dr. Brener's library and equipment supply, but at least I have done something.

Susan D. Morgan (V78)

(Editor's note: In September, Dr. Morgan left Peru to return to Portland, OR, and a small animal practice.)