

InTown Veterinary Group Newsletter

Volume 9, Issue 2
April 2009

InTown Veterinary Group is dedicated to providing referring veterinarians and their clients with an unparalleled range of emergency & specialty services.

Services:

Acupuncture:

Essex Referral, N. Andover, MA
Mass Vet, Woburn, MA

Cardiology:

Mass Vet, Woburn, MA
Port City Vet, Portsmouth, NH

Dermatology:

Mass Vet, Woburn, MA

Behavior Services:

Essex Referral, N. Andover, MA
Mass Vet, Woburn, MA
Port City Vet, Portsmouth, NH

Emergency/Critical Care:

Essex Referral, N. Andover, MA
Mass Vet, Woburn, MA
Port City Vet, Portsmouth, NH

Internal Medicine:

Mass Vet, Woburn, MA
Port City Vet, Portsmouth, NH

Neurology:

Mass Vet, Woburn, MA

Ophthalmology:

Essex Referral, N. Andover, MA
Mass Vet, Woburn, MA
Port City Vet, Portsmouth, NH

Physical Therapy & Rehabilitation:

Mass Vet, Woburn, MA
Port City Vet, Portsmouth, NH

Radiology:

Mass Vet, Woburn, MA
Port City Vet, Portsmouth, NH

Surgery:

Essex Referral, N. Andover, MA
Mass Vet, Woburn, MA
Port City Vet, Portsmouth, NH

In This Edition:

Articles:

Veterinary Acupuncture 2

Written by Bethany S. Innis, DVM, CVA, CCRT

Diagnosis & Treatment of Ocular Disease caused by Feline Herpesvirus 5

Written by Ruth Marrion, DVM, PhD, DACVO

Hyperthyroidism in Dogs & Cats: An Update 7

Written by Tonya E. Boyle, DVM, *(Practice limited to Internal Medicine)*

Notes:

Upcoming Doctor Continuing Education Lectures:

For an always current list of upcoming CE, (& to register) go to www.InTownVet.com & click on CE Lectures. To register follow the links to CE lectures, doctor or tech lectures, & fill out & submit the form.

Upcoming Lectures:

Wed. May 20 - Surgical and Medical Management of the Septic Abdomen, Mass Vet
Tues. May 26 - Diagnosis and Treatment of Glaucoma, Essex Referral, N. Andover, MA
Tues. June 6 - Surgical Diseases of the Canine Elbow and Shoulder, Port City Vet, NH

A Day of Internal Medicine: Open to doctors, techs, students, residents & interns.

Sunday April 26, 2009: Marriott Peabody, MA

Go to www.InTownVet.com for information on pricing, location & to register.



Hospital Information:

■ Essex County Veterinary Referral Hospital
247 Chickering Road, N. Andover, MA 01845
Tel:(978) 725-5544 Fax: (978) 975-0133
www.InTownEssexVet.com

■ Port City Veterinary Referral Hospital
215 Commerce Way, Suite 100,
Portsmouth, NH 03801
Tel: (603) 433-0056, Fax: (603) 433-0029
www.InTownPortCityVet.com

■ Massachusetts Veterinary Referral Hospital
20 Cabot Road, Woburn, MA 01801
Tel: (781) 932-5802, Fax: (781) 932-5837
www.InTownMassVet.com

**Dr. Bethany S. Innis practices at
Massachusetts Veterinary Referral Hospital in Woburn, MA &
Essex County Veterinary Referral Hospital in North Andover, MA**

Veterinary Acupuncture

Beth Innis, DVM, CVA, CCRT



As alternative medicine and treatments become more widely available in human medicine, veterinary clients are seeking the same options for their pets. Therapeutic treatments including acupuncture, herbal medicine, chiropractics and homeopathy are all becoming more widely available, sought after and accepted both in veterinary medicine and by pet owners. Acupuncture is the technique of piercing the skin with very thin needles at precise, predetermined foci to prevent or treat disease; its history, neurophysiology and applications will be reviewed in this article.

History

Acupuncture has been most closely associated with ancient China and remains part of Traditional Chinese Medicine (TCM). The earliest known reference to acupuncture is in the book Huangdi Nei Jing, estimated to have been written in the second century BCE. The book addresses the subjects of physiology, morphology, pathology, diagnosis and prevention of disease. The first written veterinary acupuncture text was likely written around 450 BCE.

Western veterinary medicine was introduced into China in the early 1900s, and since that time, both systems have coexisted. In Chinese veterinary healthcare, the current emphasis and goal is the integration of Traditional Chinese Veterinary Medicine (TCVM) with Western veterinary medicine to gain the benefits of both while minimizing the disadvantages of either.

In 1972, President Richard Nixon established diplomatic relations with the People's Republic of China, opening the channels of communication in medicine. After American James Reston received postoperative acupuncture for pain control following a well publicized emergency appendectomy, interest in acupuncture and TCM began to grow.

The National Institute of Health (NIH) sponsored a team of physicians over the next several years to research acupuncture, the mechanisms of its actions and its efficacy. In 1997, the NIH sponsored a consensus statement concluding that the efficacy of acupuncture in adult postoperative cases, chemotherapy-induced nausea and vomiting, and in postoperative dental pain showed promising results. They also stated that acupuncture may be of benefit for addiction, stroke rehabilitation, headache, menstrual cramps, tennis elbow, fibromyalgia, myofascial pain, osteoarthritis, low back pain, carpal tunnel syndrome and asthma. By the time a JAMA study was conducted in the 1990s, 42% of the American public was already looking for alternatives for their personal healthcare.

The Neurophysiology of Acupuncture

Most research on acupuncture has been focused around pain control. Studies have used laboratory animals, healthy humans, and humans and animals with spontaneous disease (usually chronic pain). Functional MRI is providing further information on the links between acupuncture points and the activation of specific regions of the brain. Significantly, a connection has been established between the endogenous opioid peptide system and the analgesic effects observed with acupuncture. Models of the neurophysiologic mechanisms of acupuncture have been put in place making it possible for doctors, both human and veterinary, to integrate acupuncture into conventional pain-relieving methods.

Traditional Model of Acupuncture

In TCM the paradigm centers on the concept of Qi (or Chi). Qi was understood by ancient Chinese practitioners as an energy or life force that circulates throughout the body and controls its harmony. It travels in and through organs and over the surface of the body along Meridians or Channels. In a balanced healthy

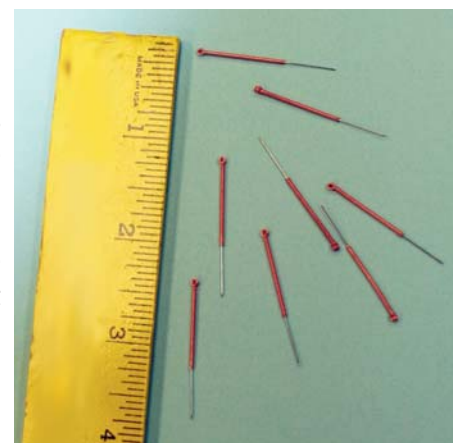


Fig. 1: Acupuncture needles



Fig. 2: Casey Starlight, oblivious to the fact that he is undergoing acupuncture.

body Qi flows smoothly and remains at adequate and appropriate levels. In a disease state, Qi can be obstructed, reduced, or in excess. Acupuncture helps by tapping into the body's Qi and helping to restore the body's balance.

How Acupuncture Works

Acupuncture needles are placed in very specific points based on surrounding anatomy. Acupuncture points are areas of the skin (often in surface depressions located along the cleavage between muscles) rich

in free nerve endings, nerve bundles and nerve plexi, mast cells, lymphatics, capillaries and venules. Many overlap with trigger points and motor points. They also tend to be areas of lower electrical resistance and higher electrical conductance compared with the surrounding skin. Acupuncture points are organized according to two different structures:

- Points located at the perforation site of nerves and vessels through the fascia, or
- Points located at the site where a cutaneous nerve enters the dermis, medially to the site of its fascial penetration.

These nerve-vessel bundles act as morphologic substrates and provide a means for information transfer to and from acupuncture points.

The following sequence of events occurs when a sterile needle is inserted into a specific acupuncture point: initially afferent nerve impulses enter the spinal cord and follow pathways similar to the pain pathway. Stimulation at acupuncture points activates small-diameter nerve fibers within peripheral nerves, which synapse in the dorsal horn of the spinal cord and thus activate three Central Nervous System regions (spinal cord, brainstem, and hypothalamus-pituitary). This releases neurotransmitters to block pain messages. Along these ascending pathways, axons synapse within medullary reticular formation nuclei. Input from these nuclei is then transmitted to the periaqueductal gray and thalamus (regions that have high concentrations of endogenous opiates and/or opiate receptors). Efferent axons synapse within the nucleus raphe magnus and nucleus reticularis gigantocellularis. Output from these particular nuclei descends within the spinal cord to

inhibit spinal transmission from pain afferents (descending inhibition).

Other mechanisms may also be involved in the mediation of acupuncture. Acupuncture needling induces microtrauma. This tissue damage, in turn, stimulates local inflammation, which includes the release of Hageman factor XII and subsequent stimulation of the clotting cascade, plasminogen, kinins, and the complement system. Inflammatory mediators (like bradykinin, prostaglandins, leukotrienes, platelet activating factors, protons and free radicals) are released. Acupuncture has been documented as enhancing humoral immunity and increasing white blood cell counts, phagocytic activity, T-cell rosette formation, antibody levels and interferon levels.

The vasoactive effects of acupuncture follow a specific time course. There is a short period of vasoconstriction (15-30 seconds), followed by a quasi-control state (10 seconds to 2 minutes), and then a vasodilation phase (2 minutes to 2 weeks). Pain is relieved as a result of increased perfusion and relief of muscle spasm caused by the local effects of needling and somatovisceral reflexes. Segmental analgesia is induced rapidly, whereas generalized opiate-mediated analgesia requires an induction period of 20-30 minutes.

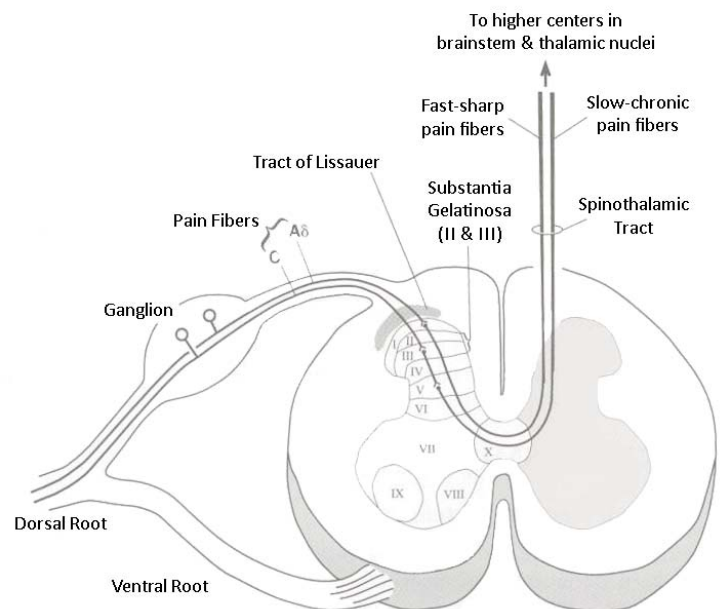


Fig. 3: Ascending pain pathway within the spinal cord.

Applications

Acupuncture can be used to treat a wide range of conditions. Musculoskeletal conditions are among the most commonly treated, consisting mostly of arthritis,

hip dysplasia and intervertebral disc disease. Dermatologic conditions including lick granulomas and chronic allergic dermatitis are some indications which respond to acupuncture. Traumatic nerve injury and epilepsy are also frequently treated, as are asthma, and cases of inflammatory bowel disease and chronic constipation. Post-operative pain control is another area where acupuncture can augment conventional treatment.

Veterinarians and clients are often surprised at the ease with which animals take to acupuncture. While not every patient is amenable to acupuncture treatment, the great majority are cooperative. A typical treatment begins with a conventional physical exam and TCVM exam. (The TCVM exam pays special attention to the color and nature of the patient's tongue, and palpation of the femoral pulses, as well as palpation of meridians, in search of reactive acupuncture points). A thorough history is taken. Acupuncture needles are placed; specific points are chosen based on the examination and the patient's history. The needles are maintained at the acupuncture points anywhere from 30 seconds to 45 minutes.

Few patients show any signs of pain, discomfort or distress when the needles are placed.

Some veterinary acupuncturists will stimulate the needles by rotating them; others will simply allow them to remain still. The client stays with the patient the entire time. Often, the patient will become very relaxed and even fall asleep during the treatment. At the end of the appropriate period, the needles are withdrawn & discarded.

Variations on Acupuncture

Certain patients and conditions warrant modalities other than needles alone. Electroacupuncture (attaching electrical stimulation to the needles themselves), aquapuncture (injecting solutions such as Vitamin B12 into acupuncture points), acupressure (applying manual pressure to acupuncture points) and laser (applying low level laser to acupuncture points) are all commonly used in treatments.

Side Effects and Treatment Schedules


Side effects of acupuncture are rare. Occasionally, an animal will show temporary deterioration in their condition before improving. Sterile, single-use needles preclude infection.



Fig. 4: Morrison, receiving treatment for chronic back pain.

Acupuncture treatment schedules vary. It is often recommended that six to eight treatments be performed to establish whether a pet is positively responding to acupuncture. Some animals improve after just one session, others take many sessions; chronic diseases tend to respond more slowly. These treatments often start off more frequently (as often as one to two treatments weekly) then taper off once an improvement in symptoms is established. Schedules are often dependent upon the acupuncturist, the patient's condition and the client's availability. Maintenance therapy is often recommended and can vary between one and six months in duration.

Conclusion

While research into the mechanisms and applications of acupuncture is ongoing, there are many places in a modern small animal practice where it can be very useful. Whether it is an adjunct to your use of nutraceuticals and non-steroidal anti-inflammatories for your arthritis treatments, or an alternative treatment for patients that cannot tolerate conventional medication, acupuncture is a great modality to offer clients. Blending the ancient art of acupuncture with modern day practice can lead to an integrative and effective medical protocol. 

References available upon request

Dr. Ruth Marrion practices at
Essex County Veterinary Referral Hospital in N. Andover, MA.

Diagnosis and Treatment of Ocular Disease caused by Feline Herpesvirus

Ruth Marrion, DVM, PhD, DACVO



Clinical Signs and Diagnosis

Most surface (corneal and conjunctival) ocular disease in cats is due to infection with feline herpesvirus. This virus, like other herpesviruses, is epitheliotropic, with the feline virus causing infection and necrosis of corneal and conjunctival epithelium. The result of conjunctival infection is a painful conjunctivitis with often marked hyperemia. Infection of corneal epithelium results in superficial ulceration, which may extend to involve the stroma if secondary bacterial infection occurs. Dendritic ulceration is pathognomonic for feline herpesvirus infection, but geographic (superficial, irregular "map-like") ulceration is much more common.

There are other causes of corneal ulceration in cats, but if the cause is trauma, the ulcer should heal uneventfully within a week. The other cause of non-healing ulcers in cats that I see regularly is entropion, although this should be apparent upon studying the cat's eyelid conformation.

An ulcer from any cause can become infected with bacteria; if this occurs in an ulcer originally from herpesvirus infection, the ulcer will extend into the stroma and take on the characteristics of an infected ulcer (yellow-white infiltrate, melting appearance, reflex uveitis, etc). Therefore, even if an ulcer extends into the corneal stroma, feline herpesvirus infection could have been the original cause.

Besides corneal ulceration and conjunctivitis, the other manifestation of feline herpesvirus infection that we see regularly is feline eosinophilic keratitis/conjunctivitis. When the conjunctiva is involved, it becomes irregularly thickened and hyperemic. Eosinophilic keratitis is generally characterized by a raised, red to white plaque on the corneal surface. Scraping of the affected cornea or conjunctiva, using topical anesthesia and the handle end of a scalpel blade, yields many eosinophils if this condition is present.

At this time, there is no definitive diagnostic test for feline herpesvirus infection. Viral serology, virus isolation, immunochemical tests, etc. have been found to have too little specificity and/or sensitivity to be useful. The most recently developed test is a polymerase chain reaction (PCR) test for the presence of viral DNA, and even this test has an unacceptable number of false positives and negatives.

Most veterinary ophthalmologists diagnose infection with feline herpesvirus based on clinical signs, lack of another possible cause for clinical signs such as entropion, and response to treatment. Herpesvirus infection can occur bilaterally, but be strongly suspicious of herpesvirus infection in a cat with recurrent ocular disease in one eye.

Treatment and Management

Feline herpesvirus causes recurrent ocular disease in cats when latent virus is activated and replicates. The virus exists in the trigeminal nerve and may be inactive for years. Stress, disease and other factors can cause recrudescence of the virus, which causes clinical signs of conjunctivitis, corneal ulceration and occasionally other conditions such as eosinophilic keratitis. Almost every client understands if you use the analogy of cold sores. This condition is caused by a herpesvirus that infects people, and cold sores are most likely to occur when the person with a latent infection is stressed or ill.

When planning treatment for feline herpesvirus, the lowest frequency of treatment that will be medically effective is ideal. The adage "less is better" is appropriately used to describe recommended treatment for feline herpesvirus.

- 5 - The mainstay of treatment for feline herpesvirus infection is oral L-lysine, which has been shown to decrease the

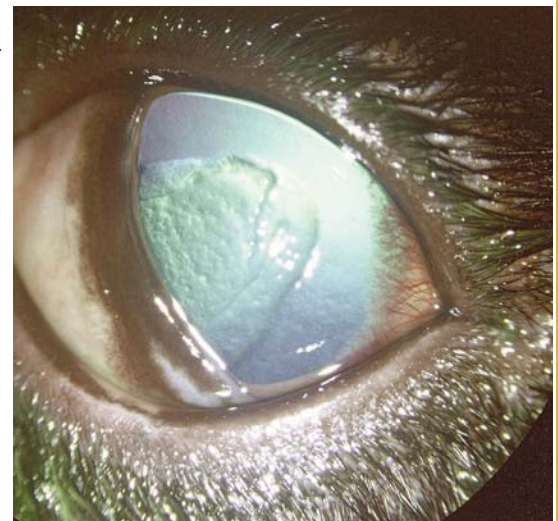


Fig. 1: Characteristic appearance of a corneal ulcer caused by infection with feline herpesvirus - a superficial ulcer with loose epithelial margins.

frequency and severity of herpesvirus outbreaks in people and cats. The theory about the mechanism of lysine treatment has to do with the high concentration of arginine in the herpesvirus protein. Lysine and arginine are structurally similar. Theoretically, if there is a high concentration of lysine vs. arginine at the site of viral replication the viral proteins are structurally abnormal due to substitution of lysine.

Dosage recommendations vary from 250 mg/cat/day to 500 mg/cat twice daily. I generally recommend 250 mg/day for a smaller cat (less than nine pounds) and 500 mg/day for a larger cat. In keeping with the theme of stress reduction, the lysine should ideally be mixed in with food or given as a palatable treat. There are many options including: compounded lysine, using pill pockets, etc. If just adding it to food in a multi-cat household, I recommend adding enough for each cat in the food. Lysine is a supplement so cats not infected with herpesvirus can take it.

Most veterinary ophthalmologists recommend long term treatment with oral lysine. If a cat has an outbreak despite treatment with lysine, it is appropriate to add an antiviral medication to the treatment regimen. In keeping with low stress/low frequency of treatment, I prescribe one of two medications, depending upon which is easier for the owner to administer.

Famcyclovir is one of the newer antivirals available to treat feline herpesvirus infection, and one that is well tolerated by cats. Dosage recommendations vary, but a recent survey on a discussion group of veterinary ophthalmologists revealed that most are prescribing approximately 30 mg (1/4 of a 125 mg tablet) orally twice daily for two weeks. The medication is well tolerated with a low incidence of side effects (leucopenia or anemia). Some ophthalmologists recommend a complete blood count and chemistry profile prior to treatment, and then again one week after starting treatment.

Several topical medications are available to treat feline herpesvirus infections, but most require application multiple times daily (four or more). Cidofovir 0.5% has the advantage of only twice daily use, and many

ophthalmologists have found this medication to be as effective as other medications given four to six times per day. Cidofovir 0.5% is available as a compounded medication from The Prescription Center in North Carolina, phone (800) 682-4664. This topical medication is prescribed for use twice daily for two weeks.

As mentioned above, there are other medications available to treat feline herpesvirus. I generally do not recommend the medications that need to be applied topically more than twice daily. There are also oral medications besides famcyclovir, but they are either not as effective, or have an unacceptably high rate of negative side effects.

Other Considerations

Anything that increases a cat's stress level can also stimulate an outbreak or prolong the course of viral infection. Some obvious stressors are boarding and Elizabethan collars. I think that cats are better off being left at home with minimal medication than going to a boarding facility and getting all of their prescribed medication – unless they enjoy the boarding facility! Similarly, having a cat wear an Elizabethan

collar is stressful, much more so for a cat than for a dog since cats groom themselves. Furthermore, I have never seen a cat injure its eye, so I have not seen benefit from the use of these collars.

Follow-up

Owners will want to know the course of their pet's herpesvirus infection. This is difficult to predict and depends upon many factors – the general health of the cat, stressors such as boarding, changes in the household (visitors, additions to the household – dogs, cats, people - strain of the virus, viral load, etc.) If a cat does not show improvement in clinical signs within a week or two I will try to determine if there is underlying medical condition, since owners generally won't understand that any other problem the cat is having will cause stress, and slow healing. ■

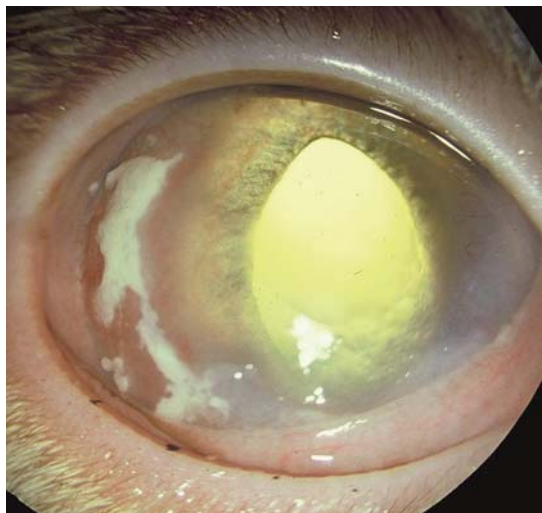


Fig. 2: Eosinophilic keratitis is characterized by the appearance of white plaques on the surface of the cornea.



Hyperthyroidism in Dogs & Cats: An Update

Tonya E. Boyle, DVM, (Practice limited to Internal Medicine)

Canine Hyperthyroidism

Canine hyperthyroidism is a rare disorder characterized by a functional mass of the thyroid gland. Thyroid masses in dogs have no sex predilection as is the case in human medicine, where women are two times more likely to develop thyroid tumors than men. The average age of dogs diagnosed with thyroid tumors is 10 years with the majority of dogs being diagnosed at four years and up.

Breeds predisposed to the development of thyroid carcinomas include:

- Beagles
- Golden Retrievers
- Boxers are predisposed to both thyroid adenomas and carcinomas.

Tumors of the Thyroid Gland, Some Data:

Tumors of the thyroid gland comprise fewer than 4% of all neoplasms in dogs. Though the majority of thyroid tumors remain non-functional, 90% found antemortem are discovered to be malignant carcinomas, are often large enough to be palpable, non-mobile and typically multi-nodular. In dogs diagnosed with tumors, 15% are hyperthyroid, 30% are hypothyroid.

Clinical Signs

Clinical signs of hyperthyroidism in dogs are rarely secondary to endocrine function or dysfunction. When present, signs are similar to those reported in cats with hyperthyroidism, but are more mild. Some of the most commonly reported clinical signs include: weight loss despite a good or voracious appetite, polyuria, polydipsia and tachycardia.

Diagnosing Hyperthyroidism in Dogs

As in cats, the total and free T4 concentrations are usually elevated in dogs with hyperthyroidism, although often to a milder degree. Clinical signs of thyroid tumors in dogs are often related to the compression of the mass on surrounding tissue. These clinical signs may include coughing, gagging, regurgitation, change in bark and dysphagia. Ectopic remnants of thyroid tissue may be found from the base of the tongue to the thoracic inlet, thyroid involvement must be considered whenever masses are found from the oral cavity to the base of the heart.

Canine thyroid tumors are usually unilateral. Bilateral involvement may be the primary neoplasm or secondary to tumor metastasis. The size of the mass is proportionately indicative of the likelihood of metastasis. Tumors less than 20 cm in diameter have a < 20% chance of metastasis; tumors >100 cm have a 100% chance of metastasis.

Aspiration and Biopsy

Fine needle aspiration with cytology of a cervical mass may be diagnostic for carcinoma, although cells may not exfoliate well. Cytology may also differentiate between salivary mucocele, abscess, granuloma and other neoplasms. In some cases, thyroid masses may be mineralized and may contain necrotic or hemorrhagic centers. Due to the vascular nature of the area, core biopsy is only recommended if performed via surgery or by an experienced ultrasonographer. Staging with three view thoracic radiographs, abdominal ultrasound and fine needle aspiration of regional lymph nodes looking for evidence of metastasis is recommended. Due to extensive venous drainage of the thyroid, pulmonary metastasis may occur before regional lymph node metastasis. Radiographs have been shown to be better than scintigraphy for the diagnosis of pulmonary metastasis. The prognosis for mobile tumors with complete surgical excision is excellent, but as most thyroid carcinomas are non-encapsulated and regionally invasive, surgical excision is sometimes difficult.

Treatment Options

Scintigraphy with radioactive iodine (^{123}I) or technetium ($^{99\text{m}}\text{Tc}$) may aid in the identification of exact tumor location, ectopic tissue and regional metastasis. Therapeutic options of thyroid tumors vary based on location and the extent of regional tissue invasion. Until a more definitive treatment can be performed, medical therapy with carbimazole or methimazole is advised (5 mg every 8 hours then tailored to effect). Therapeutic options showing the longest survival rates are for surgical excision followed by chemotherapy (cisplatin or doxorubicin) with definitive or palliative radiation therapy, if indicated.

The presence of metastasis has not been shown to influence survival in dogs with thyroid tumors. If the tumor has previously been shown to actively take up and concentrate iodine, and if macroscopic disease has been reduced to a microscopic level, treatment with radioactive iodine ^{131}I may be considered. Since the dose required for canine therapy is much higher than in feline medicine, the hospitalization required following ^{131}I therapy is also longer. To minimize environmental and staff contamination metabolic cages for dogs are also required within the hospital. Dogs receiving ^{131}I for hyperthyroidism may require multiple doses. The patient should be monitored carefully as transient neutropenia following ^{131}I may be common.

Feline Hyperthyroidism

Increased risk factors for the development of hyperthyroidism include consumption of a canned diet (particularly fish based diets), the regular use of litter and exposure to lawn herbicides or pesticides. It appears that Himalayan and Siamese breeds may be at decreased risk for the development of the disease.

Hyperthyroidism is reported to be the most common endocrine disorder affecting cats from eight months to 20 years or older. Fewer than 5% of cats are younger than 10 years of age when they are diagnosed, although with identification of the pre-hyperthyroid state and earlier recognition of the disease, this percentage may increase in the near future. There is no reported sex or breed predisposition. Most cats suffer from functional adenomatous hyperplasia or adenomas of both thyroid glands. Only 30% of cats have disease in a single gland. Only 2% of hyperthyroid cats have thyroid carcinomas. In either case, disease develops from the over production of active thyroid hormones (T3 and T4).

Clinical Signs

Weight loss is the most common and consistent clinical sign seen in cats with hyperthyroidism. Often this weight loss occurs despite a normal or increased appetite. Other clinical signs include hyperactivity, increased heart rate with or without a heart murmur, and increased water consumption and urination. Some cats will have intermittent gastrointestinal signs such as vomiting, diarrhea or anorexia. Occasionally, cats will present very sick from thyrotoxicosis, and may be weak and depressed. On physical examination almost all cats will have a palpably enlarged thyroid nodule. If large enough, the nodule can fall into the thoracic inlet necessitating that the clinician palpate very carefully to completely assess the thyroid. A recent study found that a traditional palpation method is preferred for identification of feline thyroid nodules.

High blood pressure and increased heart rate that occurs with hyperthyroidism ultimately causes hypertrophy of the cardiac muscle. If left untreated, hypertension can also be damaging to the kidneys. There is an association between unregulated hyperthyroidism and the development of hypertrophic cardiomyopathy in cats. The overall increased systemic blood pressure is usually mild unless there is an element of renal failure (common in older cats). Atenolol is the treatment of choice for mild hypertension secondary to hyperthyroidism in cats. Renal failure can be masked due to an increased glomerular filtration rate (GFR) from systemic hypertension. In these cases, retinal lesions or detachment secondary to hypertension may occur and a cat may be presented for sudden blindness. Hypertension is usually reversed with the addition of enalapril or amlodipine to atenolol therapy. Underlying cardiac or kidney changes may persist and will need to be monitored.

Diagnosing Hyperthyroidism in Cats

The diagnosis of hyperthyroidism in cats is made with demonstration of an elevated total T4 and T3. There is documentation of a pre-hyperthyroid state in cats, also reported in people, where the animal exhibits clinical signs of hyperthyroidism despite a normal T4. Factors to consider include daily fluctuations of T4 and a condition termed euthyroid sick syndrome, where the presence of a concurrent disease appears to lower the total T4.

The suspicion for hyperthyroidism should remain high in any cat with clinical signs and a palpable nodule that has a normal or high normal total T4, particularly if a concurrent disease is present. In this case, options include treating the concurrent disease, re-evaluating the T4 in 1-2 months or performing additional thyroid testing. A free T4 by equilibrium dialysis or thyroid scintigraphy is usually the next step in evaluating a patient believed to be hyperthyroid. Free T4 by equilibrium dialysis has a lesser chance of being influenced by concurrent disease than the total T4.

Scintigraphy is useful for evaluating the size and location of hyperfunctional thyroid tissue, and for evaluating a patient for carcinoma. Some cats may require thyroid stimulation testing for diagnosis of hyperthyroidism; although there are several tests available to stimulate the thyroid gland, all of them have some disadvantages, require exact drug administration and special sample handling, all of which can influence the test results.

Treatment Options

There are three main options for treatment of feline hyperthyroidism:

- Antithyroid Drugs
- Thyroidectomy
- Radioiodine Therapy

Antithyroid Drugs: Medical management with antithyroid drugs such as methimazole is often the first line of therapy. _ 8 _

offered to owners. It is also useful for screening patients for underlying chronic renal failure that may be unmasked when the increased GFR secondary to increased blood pressure is normalized with therapy. Methimazole reversibly blocks iodine uptake and the formation of T3 and T4 on several levels in the thyroid tissue. It does not block the release of T3 and T4 that have already been synthesized and therefore takes between 2 and 4 weeks to reach full efficacy. Mild to fatal side effects of methimazole have been reported in about 18% of cats. Adverse effects include neutropenia and/or thrombocytopenia in 3 to 9% of cats treated with methimazole. These side effects are typically reversible and will resolve in approximately 1 week after stopping the drug. Bleeding without thrombocytopenia has been rarely reported in cats and people, and is likely due to inhibition of vitamin K clotting factor activation. In rare cases, acquired myasthenia gravis can develop; discontinuation of the medication may reverse this condition.

Excoriation of the neck and face is reported in approximately 2 to 3% of cats treated with methimazole. Typically, these patients present with scabbed lesion in front of the pinnae and stopping drug therapy is necessary. About 10% of cats will experience vomiting, anorexia and lethargy during the first few weeks of treatment with methimazole due to gastric irritation. This may resolve with time or dose reduction though sometimes a transdermal formulation of the drug may be needed. Transdermal methimazole has been shown to be effective (reaching efficacy after 4 to 8 weeks of treatment) when applied to the hairless inner pinnae of the ear.

Alternating ears daily and cleaning any dried crusts off of the ear prior to treatment is recommended. Drug stability is unknown after 2 weeks and frequent refills from a compounding pharmacy are often necessary. Methimazole can be hepatotoxic and will need to be discontinued for this reason in 2% of cats. Liver enzyme elevation will usually resolve several weeks following discontinuation of the medication. The decrease in GFR after starting methimazole therapy unmasks renal failure in approximately 20% of cats. For most cats, this renal failure remains mild and slowly progressive, and requires only nutritional changes for management.

A trial of methimazole may be used for pre-screening for radioiodine therapy as it provides valuable information in a patient where underlying renal disease is suspected. Many cats become refractory to treatment with methimazole over time and require higher doses as the disease

progresses, leading to an increase in adverse effects. These cats may be good candidates for permanent curative therapy with radioactive iodine.

Other options for medical therapy include propylthiouracil, which has a higher incidence of side effects and carbimazole, a prodrug of methimazole in cats and people.

Thyroidectomy: Several surgical techniques exist for treatment of adenomatous hyperplasia of one and occasionally both of the thyroid glands. Nuclear scintigraphy is recommended to visualize hyperfunctional tissue and localize ectopic tissue. The extracapsular technique has been advocated to allow for complete surgical removal of the thyroid gland(s) while maintaining a low occurrence of post-operative hypoparathyroidism. This risk is significantly lowered if only one thyroid gland is affected and removed, leaving functional thyroid and parathyroid tissue behind. Medical stabilization of disease is recommended prior to surgery to minimize anesthetic and surgical complications. Close monitoring of serum calcium levels for hypocalcemia is necessary. Relapse may occur 1 to 2 years after surgery due to adenoma regrowth. Hypocalcemia is more common after a second thyroidectomy.



Scampi, Dr. Boyle's own cat received radioactive iodine treatments in 2007. Two years later Scampi's thyroid levels are still normal. She is a healthy & happy 13 year old.


Radioactive iodine (¹³¹I): This is the current gold standard of treatment for feline hyperthyroidism. It is a safe, effective, simple cure for most cases of hyperthyroidism. Since approximately 70% of cats suffer from bilateral disease, radioactive iodine is an ideal therapy for cats that do not tolerate methimazole

and are at risk for post-operative hypoparathyroidism. Radioiodine therapy is also indicated for owners who are less willing (or able) to regularly give methimazole in tablet or topical form. This therapy avoids the complications of methimazole therapy, and the risks associated with anesthesia and surgical resection. Patients should be screened with a minimum database (complete blood count, chemistry panel and urinalysis) to assess for renal disease, blood pressure, thoracic radiographs and/or echocardiogram to assess for cardiac disease and a pre-treatment T4. If the patient has been receiving methimazole for longer than 1-2 months, discontinuation of the medication for about 1 week and rechecking a total T4 is recommended for dosing purposes.

Radioactive iodine is dosed based on untreated total T4 and palpable nodule size. The dose is administered subcutaneously. The animal will need to be placed in a

special hospital ward designed to protect others from the radiation. The patient is boarded for 5 to 10 days depending on the facility requirements for clearance. The inconveniences of boarding and post-treatment precautions are the greatest disadvantage to ¹³¹I. Limited direct contact with the cat (3-4 hours a day) is recommended for about one week after discharge; gloves should be worn when flushing disposable litter. Exposure to children and pregnant women is not recommended. These guidelines should be discussed with clients prior to treatment. Cats that are ill should not be treated until their disease is stable enough for them to be boarded with limited supervision. About 5% of treated cats will need to be treated again in their lifetime either because of adenoma re-growth or the presence of carcinoma. About 5% of cats will become hypothyroid after treatment and will need regular thyroid supplementation either temporarily or for life, defeating the purpose for many clients of not having to give regular medications. A post-treatment minimum database to assess for unmasked renal disease, a blood pressure, and a post-treatment T4 is recommended 3-4 weeks after treatment and again 3 months post-treatment. It may take 3 months for thyroid function to return to a euthyroid status so patients who initially were diagnosed as hypothyroid but not clinically in need of supplementation, may be found to be euthyroid at that time.

Hyperthyroidism is a common disease of geriatric cats with potentially serious complications such as hypertension, hypertrophic cardiomyopathy and renal disease if left untreated. Hyperthyroidism is less common in dogs, but has similar side effects and long term complications.

Clients may have questions regarding therapeutic options and complications in both species. A thorough understanding of the disease process and potential side effects of therapy is paramount to communication and resolution of disease. 

References available upon request

Would you like to receive a personal copy of our quarterly newsletter?
If so, please go to our website & sign up by filling out the form. You may choose to receive this newsletter by mail or e-mail (PDF format).

www.InTownVet.com/InTown/Newsletters.html

PRSRRT STD
U.S. POSTAGE
PAID
N. READING, MA
PERMIT NO. 96

247 CHICKERING ROAD, N. ANDOVER, MA 01845

INTOWN VETERINARY GROUP

