

# InTown Veterinary Group Newsletter

Volume 8, Issue 2  
April 2008

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

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#### Acupuncture:

Essex Referral, N. Andover  
Mass Vet, Woburn

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#### Surgery:

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Written by Karen L. Campbell, DVM, DACVIM

## Notes :

### Upcoming Technician CE Lectures:

**Current Concepts in Pain Management** (2CEU)  
presented by **Lisa B. Corti, DVM, DACVS, CCRP**

Monday, April 14, 2008, 7:00 - 9:00pm at Mass Vet Referral Hospital in Woburn.  
Tuesday April 22, 2008, 7:00 - 9:00pm at Bulger Animal Hospital in N. Andover.  
Wednesday April 30, 2008 7:00 - 9:00 pm Mass Vet Referral Hospital in Woburn.

For more information and to sign up, please contact Betsy Hensley, CVT at [bhensley@intownvet.com](mailto:bhensley@intownvet.com), or call: (978)651-2278.



### Upcoming Symposium for Doctors, Techs, Residents, Students, Interns:

Join us on Sunday April 13 at the Hilton Woburn for our Imaging Symposium. (6CE)

Register with Sommer at [referringvets@intownvet.com](mailto:referringvets@intownvet.com), or by calling (781)305-2240.  
Symposium is free to students, interns & residents.

Doctors & Techncians: \$75.00 after 3/30/08.

[www.InTownVet.com/InTown/RDVMEvents.html](http://www.InTownVet.com/InTown/RDVMEvents.html) for more information

### 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](http://www.InTownEssexVet.com)

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

**Dr. Karen Campbell practices at  
Massachusetts Veterinary Referral Hospital in Woburn.**

## **Improved Ability to Diagnose Acromegaly in Cats Reveals It May Be More Common Than We Think**



**Karen L. Campbell, DVM, DACVIM**

Feline acromegaly has been considered a rare condition characterized by chronic excessive growth hormone secretion (GH) and insulin-resistant diabetes. Published reports on this disease have been gradually increasing since it was first described thirty years ago. Recent studies have suggested the condition may be more common than previously suspected and have validated measuring insulin-like growth factor-1 (IGF-1) as a useful test for diagnosing feline acromegaly. In many frustrating feline diabetes cases, acromegaly may be the complicating factor. In these cases, more frequent screening for acromegaly may be warranted.

### **Physiology/Pathophysiology**

Growth hormone (GH) is synthesized and secreted by the anterior pituitary gland and secretion is pulsatile. It has direct lipolytic and diabetogenic actions which promote catabolism. Growth hormone also controls secretion of IGF-1, a polypeptide hormone which is produced in the liver, and mediates most of growth hormone's effects such as growth promotion and insulin-like effects.

Feline acromegaly is a chronic disease of excessive GH secretion from a functional pituitary adenoma, causing insulin-resistant diabetes mellitus, and overgrowth of connective tissue, bone and viscera.

### **Signalment**

Typically about 90% of affected cats are male. There is no breed predilection. The age range is 4 – 17 years with a median and mean age of 9 and 10 years, respectively.

### **Clinical Signs**

Clinical signs are attributed to:

- The catabolic effects of GH
- The anabolic effects of IGF-1
- Growth of a pituitary macroadenoma

The earliest symptoms are polyuria, polydipsia and polyphagia from concurrent diabetes mellitus. Initially there may be weight loss from diabetes, but later despite persistent hyperglycemia, weight gain may predominate from the effects of IGF-1. Over time a typical cat may become large, with a large head and abdomen, broadened facial features and a clubbed appearance to the paws. About a third of cats have prognathia inferior (protruding mandible). There may be palpable organomegaly (liver and kidneys) and oropharyngeal soft tissue thickening may cause respiratory stridor or distress. Cardiovascular abnormalities may include a heart murmur or gallop rhythm; in later stages of disease, symptoms of congestive heart failure may develop. About 40% of cats may have degenerative arthropathy, though half of them are not symptomatic. There may be neurologic symptoms of thalamic or hypothalamic compression or invasion such as stupor, adipsia, anorexia, temperature dysregulation, circling, seizures, behavior changes, etc. The concurrent diabetes may cause a peripheral neuropathy, weakness, ataxia and a plantigrade stance.



*Fig. 1: Note the change in facial features in this cat with acromegaly.*

*Journal of Veterinary Internal Medicine Sept. - Oct. 2007; vol. 21, Issue 5:899-905  
Feline Acromegaly: An Underdiagnosed Endocrinopathy?  
S.J.M. Niessen et al.*

### **Clinical Pathology**

An elevated glucose, cholesterol, ALT and ALP with glycosuria are typical due to the diabetes mellitus. A mild erythrocytosis due to the anabolic effects of IGF-1 on the bone marrow; mild hyperphosphatemia without azotemia, -2-

due to GH-induced renal phosphate reabsorption, and hyperglobulinemia may be seen. Renal azotemia and proteinuria may develop due to a glomerulonephropathy induced by chronic uncontrolled diabetes mellitus or GH excess.

## Imaging

Radiographic findings reflect IGF-1's anabolic effects. They may include increased oropharyngeal soft tissue, spinal spondylosis deformans, enlarged mandible, hyperostosis of the bony calvarium, hepatomegaly or renomegaly. Periarticular and periosteal reactions and osteophytes from degenerative arthropathy may be seen. Cardiomegaly, and in advanced cases, pleural fluid or pulmonary edema may be seen. Abdominal ultrasound

will detect eventual a d r e n o m e g a l y . Echocardiogram may identify hypertrophic cardiomyopathy. With CT or MRI plus contrast agent, a mass > 1 cm can be seen in a majority of cats at the time of diagnosis. However, failure to see a mass does not rule out the disease, especially early in the clinical course.

Although acromegaly and Cushing's disease are the primary differential diagnoses for severe insulin-resistant feline diabetes mellitus with adrenomegaly, acromegalics have normal ACTH stimulation and low dose dexamethasone suppression test results. They may have mildly elevated urine cortisol to creatinine ratios due to the effect of the poorly controlled diabetes on cortisol levels. The physical exams of these animals are quite different: Cushing's disease patients' exams indicate severe debilitation with weight loss and fragile skin, acromegalics' physical exam findings include a large cat with the broadening of facial and bony features described above.

## Definitive Diagnosis

There is no single diagnostic test with 100% sensitivity or specificity for diagnosing feline acromegaly. Currently a diagnosis of acromegaly is made based on a combination of typical conformational abnormalities, persistent weight gain in an insulin-resistant diabetic cat, elevated serum IGF-1 concentrations and documentation of a pituitary mass on CT or MRI.

## Treatment

The treatment of choice for cats is cobalt radiation, 45 – 48 Gray total, 5 days a week, for three weeks. The response is unpredictable and can range from no response to a partial decrease in mass size or GH levels, an increased response to insulin, or a dramatic improvement in mass size and clinical response. Improvement may take 6 months or longer after radiation, and in those that respond well, insulin resistance usually recurs within 12 – 24 months. The most common complication of treatment is hypoglycemia from decreased insulin resistance. The change can be sudden and life threatening. There are medical treatments used for humans with acromegaly such as the dopamine agonist, bromocriptine, an analog of somatostatin called octreotide, and a GH receptor antagonist called pegvisomant. While they are 70 – 90% effective in humans, the first two have not been effective



Fig. 2: Contrast agent highlights this pituitary mass.

## Hormonal Evaluation

A commercially available radioimmunoassay to measure GH in cats has not been available in the U.S. for many years, but is available in the Netherlands. In people single, random baseline GH concentrations are not helpful because the hormone has a short half-life and is released in episodic bursts. Therefore, some acromegalic patients may actually have normal GH levels. There are approximately 55 published case reports of acromegaly in cats since 1981 and in every report, all acromegalic cats had clearly high serum GH levels. However, slightly high GH levels have also been seen in some diabetic cats without acromegaly. For this reason, a single, GH determination is both inconvenient to obtain, and may also be misleading.

In people, determination of IGF-1 is a very useful test for acromegaly. IGF-1 has a long half-life, remains relatively constant for most of the day, is considered to reflect overall GH secretion over the past 24 hours and baseline concentrations correlate closely with clinical signs. Assays are commercially available at many labs. A recent

in cats, and the third has not been tested. The treatment of choice in people is surgery. Those with a tumor <1 cm have a better prognosis. Sixty percent of people have a normal GH level post-op. This treatment has not been reported for cats.


### Prognosis

Typical survival from time of diagnosis is 1.5 to 3 years because the mass grows slowly. Therefore the short-term prognosis is guarded to good, while the long-term prognosis is poor. Insulin resistance will be present, but fluctuates in severity, making diabetes hard to control and putting the patient at risk for hypoglycemic crisis due to administration of large doses of insulin. Do not give in excess one unit per pound of insulin per injection. Other than hypoglycemia, typical causes of death include congestive heart failure, renal failure, neurologic symptoms or respiratory upper airway distress, all due to tissue overgrowth.

### Prevalence

In a recent prospective study to evaluate the use of IGF-1 and feline GH to diagnose acromegaly, veterinary practices were asked to collect serum from diabetic cats for fructosamine determinations. Fructosamine and

IGF-1 were determined in 184 cats with variably controlled diabetes, and GH was determined when available. Fifty nine cats (32%) had markedly high IGF-1 concentrations. Of these cats, 18 were subsequently allowed by their owners to be imaged and acromegaly was confirmed in 17 (9.2%) of those cats. This suggests acromegaly is widely underdiagnosed. If that is true, it is still unclear which cats should be screened for acromegaly.

All reported acromegalic cats have had difficult to control diabetes. Therefore, any diabetic cat with clinical features of acromegaly, or any difficult to control diabetic cat may warrant testing for acromegaly. Lack of typical phenotypic changes should not exclude acromegaly as a possible cause of insulin-resistant diabetes, as many cats in the cited study did not have these typical phenotypic changes. Nevertheless, other prospective studies of a large population of diabetic cats should be done to confirm acromegaly is as common as the recent study suggests. 

### References Available Upon Request

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