

Shauna Blois, DVM, Diplomate ACVIM, Ontario Veterinary College

## Weight Loss, Polyphagia, & Ataxia in a Cat

A 15-year-old, spayed female domestic shorthair cat presents with a 2-month history of weight loss and polyphagia and a 1-day history of ataxia.



**History.** The owners had noticed that the cat was becoming thin over the past 2 months, despite an increase in appetite. This morning the cat collapsed acutely and then appeared to be unable to move its hindlimbs. This indoor-only cat lives in southern Ontario, Canada, and has no history of travel outside of this area.

**Physical Examination.** The cat is quiet and alert upon examination. Tachycardia is noted (heart rate, 220 beats/min), but respiratory rate and temperature are normal. A mass (approximately 1.5 cm diameter) is palpable in the ventral midcervical region. The body condition score is 2.5 of 5.

T4 = thyroxine

The cat can stand with support, has voluntary movement in all 4 limbs, but has delayed placing and hopping reflexes in the hindlimbs that are worse on the left than the right. The remainder of the neurologic examination is normal, and no pain is elicited along the spine. The systolic blood pressure, measured via Doppler on the right mid antebrachium, is 195 mm Hg.

**Laboratory Analysis.** A complete blood count, serum biochemical profile, total T4 level, and urinalysis are performed. The only abnormality is a marked elevation in total T4 (12.35 mcg/dL; reference range, 1–4.3 mcg/dL or 159 nmol/L; reference range, 13–55 nmol/L).

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### ASK YOURSELF...

1. What are the differential diagnoses in this case?
2. Where is the lesion localized?
3. What is the significance of the blood pressure measurement?
4. What are possible consequences of hypertension in this cat?

## Diagnosis: Hyperthyroidism

Hyperthyroidism is a common feline endocrinopathy, affecting up to 1 in 300 cats. The median age at diagnosis is 13 years, and the condition can result in multisystemic clinical signs. More than 98% of cases are due to nonmalignant changes of the thyroid, such as adenomas or hyperplasia.

### Further Diagnostics, Treatment, & Outcome.

Survey spinal radiographs in this case were normal. Spinal magnetic resonance imaging was declined by the owner. The cat was hospitalized for monitoring and received IV fluids for 24 hours. Treatment with amlodipine and methimazole was initiated.

The cat began ambulating with support over the next 24 hours, and began walking unassisted within the next 3 weeks. Mild ataxia persisted at a recheck 3 months after initial diagnosis. A vascular event was considered the most likely differential diagnosis in this case because of the improvement noted in response to supportive care.

**Mechanism of Action.** Increased levels of circulating thyroid hormones affect almost all organ systems. Along with typical signs of hyperthyroidism—weight loss, polyphagia, restlessness, poor hair coat, polyuria, and polydipsia—hyperthyroid cats can show evidence of associated organ damage, such as cardiovascular abnormalities (eg, systolic murmur detected on physical examination or, less commonly, dyspnea secondary to congestive heart failure) and occasionally gastrointestinal signs (eg, intermittent vomiting).

The exact mechanism of hypertension developing secondary to hyperthyroidism in cats is unknown. Thyroid hormone excess is thought to cause beta-cell upregulation, leading to increased heart rate and cardiac output and resulting in an increase in blood pressure. In addition, increased stimulation of the renin-angiotensin-aldosterone system may contribute to hypertension in hyperthyroidism.<sup>1,2</sup>

### DID YOU ANSWER...

1. Hyperthyroidism is the most likely differential diagnosis in light of the clinical description. Other differential diagnoses for cats with weight loss and polyphagia include diabetes mellitus, gastrointestinal disease, or malnutrition.
2. The neurologic deficits localize the lesion to the thoracolumbar spinal cord. Differential diagnoses include a vascular event (hemorrhage or infarct), disk disease, neoplasia, and aortic thromboembolism. Aortic thromboembolism was considered unlikely because of the presence of palpable femoral pulses bilaterally. In addition, the hindlimbs were not painful or swollen on palpation and had a palpably normal temperature.
3. A systolic blood pressure that is persistently  $\geq 160$  to 170 mm Hg in an awake, unstressed cat is consistent with hypertension. It can be difficult to accurately measure blood pressure in cats and dogs because stress will falsely elevate the readings.
4. Hypertension can occur in hyperthyroid cats and may damage vascular organs, such as the eyes, kidneys, heart, and nervous system.



**Treatment.** Hyperthyroidism can be treated medically or surgically, or can be cured with radioactive iodine. Before treatment, the patient should be fully assessed to identify concurrent disease. Occult chronic renal insufficiency or heart disease may coexist with hyperthyroidism and will influence treatment plans.

Medical management of hypertension includes calcium-channel blockers, such as amlodipine (total dose, 0.625–1.25 mg PO Q 12–24 H, titrated as needed); ACE inhibitors, such as benazepril (0.25–0.5 mg/kg PO Q 12–24 H); or

beta-blockers, such as atenolol (total dose, 6.25–12.5 mg Q 12 H). Beta-blockers may prove especially useful in hyperthyroid cats because of the effects of thyroid hormone on beta-receptors. Single-agent antihypertensive therapy may not be sufficient in controlling blood pressure in hypertensive cats, and it is common to combine medications for optimal therapy. ACE inhibitors are the least effective therapy for hypertension in cats.

Specific therapy for CNS vascular events in hyperthyroid cats has not been described.

ACE = angiotensin-converting enzyme; CNS = central nervous system; T4 = thyroxine

Because hypertension may be a causative factor in these events, control of hypertension is indicated. With proper nursing care, anecdotal experience suggests that neurologic deficits may begin to resolve within 3 to 4 weeks or more.

**Discussion.** Hyperthyroidism is reported to be associated with the development of secondary hypertension. Hypertension was once thought to be common in cats with hyperthyroidism, with one report showing hypertension in 87% of hyperthyroid cats.<sup>2</sup> However, more recent reports suggest that a smaller proportion of hyperthyroid cats (up to 25%) are hypertensive.<sup>1,3</sup>

Hypertension may resolve with control of the hyperthyroid state. However, because hypertension can lead to end-organ damage, antihypertensive treatment is indicated in cats that show evidence of ocular or CNS deficits or those with moderate to severe persistent hypertension (ie, systolic blood pressure  $\geq$  160–170 mm Hg on 2 or more occasions).<sup>4</sup> In cats without evidence of end-organ damage, hypertension should be treated medically if it does not resolve once euthyroidism is achieved. Be aware that hypertension may first occur in cats whose T4 is controlled even if they did not have hypertension while hyperthyroid. In addition, one study reported that incidence of hypertension was greater in hyperthyroid cats after treatment than before treatment.<sup>3</sup>

Persistent hypertension may result in end-organ damage, including CNS vascular events. Head tilt, paresis, and paralysis have been associated with CNS vascular events in hyperthyroid cats.<sup>1</sup> Overall, neurologic clinical signs associated with feline hyperthyroidism are uncommon but should be considered in cats displaying neurologic abnormalities, especially those with concurrent hypertension. ■

See Aids & Resources, back page, for references, contacts, and appendices.

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**Shauna Blois**, DVM, Diplomate ACVIM, is a faculty member at Ontario Veterinary College, University of Guelph. Her clinical and research interests include transfusion medicine and small animal endocrinology. Dr. Blois received her DVM from the Atlantic Veterinary College (University of Prince Edward Island). After completing a small animal rotating internship, she pursued a small animal internal medicine residency/Doctor of Veterinary Science program at Ontario Veterinary College. As a veterinary student, Dr. Blois won the NAVC Purina College Challenge in 2004.

**Kirk N. Gelatt**, VMD, is distinguished professor of comparative ophthalmology at University of Florida College of Veterinary Medicine. He is also an editor for *Veterinary Ophthalmology*. Dr. Gelatt's research interests include canine glaucomas, inherited cataracts in the dog, clinical pharmacology of drugs that change intraocular pressure, and ophthalmic surgery. He has received numerous awards, including the American Kennel Club Career Achievement Award, the Mark L. Morris, Sr. Lifetime Achievement Award, and, most recently, the Bourgelatt International award from the British Small Animal Veterinary Association.

**Louisa Rahilly**, DVM, Diplomate ACVECC, is an emergency and critical care specialist at Cape Cod Veterinary Specialists, Buzzards Bay, Massachusetts. Her areas of expertise include sepsis, fluid therapy, trauma, respiratory disease, shock and stabilization, mechanical ventilation, and pain management. Dr. Rahilly received her DVM from Tufts University and completed an internship at University of Minnesota Veterinary Medical Center and a residency in emergency and critical care at University of Pennsylvania Matthew J. Ryan Veterinary Hospital.

**David M. Vail**, DVM, Diplomate ACVIM (Oncology), is professor of oncology, a member of the Paul Carbone Comprehensive Cancer Center, and director of the Center for Clinical Trials and Research at the University of Wisconsin–Madison School of Veterinary Medicine. He has published over 100 manuscripts and 40 book

chapters in comparative oncology. Dr. Vail is coeditor of the textbook *Small Animal Clinical Oncology*, North American journal editor for *Veterinary and Comparative Oncology*, president of the Canine Comparative Oncology and Genomics Consortium, and a founding member of the Comparative Oncology Trials Consortium. He received his DVM from University of Saskatchewan and completed an oncology residency at Colorado State University.

**Lori S. Waddell**, DVM, Diplomate ACVECC, is an adjunct assistant professor in the intensive care unit of the University of Pennsylvania Matthew J. Ryan Veterinary Hospital. Her current areas of interest include colloid osmotic pressure and coagulation in critically ill patients. Dr. Waddell received her DVM from Cornell University and completed an internship at Angell Memorial Animal Hospital, Boston, Massachusetts. After her internship, she worked as an emergency clinician in private practice, then completed a residency in emergency medicine and critical care at University of Pennsylvania.

**Matthew D. Winter**, DVM, Diplomate ACVR, is an assistant professor of diagnostic imaging in the department of small animal clinical sciences at University of Florida. His research interests focus on radiology and he has published numerous articles on imaging and small animal internal medicine topics. Dr. Winter received his DVM from Cornell University and completed a residency in radiology at Tufts University.

**Kevin Wright**, DVM, is the cofounder of Arizona Exotic Animal Hospital, Mesa, Arizona. He has published over 150 articles on exotic pet and zoological medicine and has been a featured speaker at both national and international veterinary conferences. Dr. Wright received the NAVC Conference's Exotic Speaker of the Year award in 2009 and was named the 2008 Exotic DVM of the Year by *Exotic DVM Veterinary Medicine*. He received his DVM from University of Florida and completed a residency in zoological medicine at University of Pennsylvania (in a joint program with the Philadelphia Zoo). ■