Feline Hyperthyroidism

Extended version

Classic case: 10 year old cat, poor body condition, increased appetite and weight loss

Presentation: #1 endocrine disease in cats
  - 95% are cats over 8 yr, no gender predilection
  - Weight loss with polyphagia
  - Hyperactivity, nervousness
  - Poor body condition, unkempt fur, decreased grooming
  - Panting, tachypnea
  - PU/PD, ± vomiting & diarrhea, increased fecal volume
  - Tachycardia
  - Heat avoidance, cool-seeking
  - Palpable thyroid gland(s) along trachea (thyroid slip)
    - normal thyroids are NOT palpable
  - “Thyroid storm”
    - Intense sympathetic discharge in response to restraint or other stressful event
    - severe tachycardia or severe bradycardia
    - severe systemic hypertension
  - “Apathetic” hyperthyroidism (<10%)
    - depression, lethargy, weakness, anorexia
  - COMMON concurrent problems
    - Cardiac – HCM, congestive heart failure, systolic murmur, arrhythmias
    - Systemic hypertension – systolic BP > 180 mmHg
    - Renal failure – often masked by hyperthyroidism
    - Hypokalemia – neck ventroflexion, weakness

DDX:
Renal failure, cardiomyopathy, hepatic insufficiency, diabetes mellitus, gastrointestinal lymphoma, inflammatory bowel disease, pancreatic insufficiency

Test of choice:
- **Palpation**: enlarged thyroid gland (30% unilateral, 70% bilateral)
- **Serum total thyroxine** (TT₄) is test of choice
  - Elevated TT₄ is diagnostic for 95% of cats (euthyroid sick may bring it down to upper part of normal reference range)
  - If TT₄ normal and clinical signs support hyperthyroidism
    - Recheck TT₄ in 2-3 weeks
    - Serum Free T₄ by equilibrium dialysis
      - Increased Free T₄ with high-normal TT₄ supports hyperthyroidism
      - More sensitive than TT₄, but 6-12% are false positive
- **Technetium scanning** (radioactive isotope Tc99m)
  - Functional thyroid tumors take up radioactive isotope more than normal or atrophied tissue
  - Confirms diagnosis, identifies location, ectopic thyroid or metastatic disease
  - Important if considering thyroidectomy
Feline Hyperthyroidism

Extended version

Rx of choice: Several options depending on clinical status, client preference, compliance

- **Methimazole** (Tapazole) – this is used **regardless** of long-term treatment choice
  - Inhibits production of T₃, T₄ without destroying thyroid tissue
  - Treatment will unmask renal failure if present
  - If **sole** treatment, will require **lifelong** treatment and client compliance
  - Adverse effects (16-20% of cases) – usually reversible
    - Vomiting, anorexia, pruritis of head/neck, depression
    - Leukopenia, agranulocytosis, thrombocytopenia, IMHA, hepatopathy

- **Radioactive iodine** ($^{131}$I): **Treatment of choice**
  - Long term control – potentially curative
  - Emits β and γ radiation
    - Destroys functional thyroid tissue
    - Spares normal or atrophic thyroid tissue
    - Atrophy secondary to lack of TSH or decreased iodine concentration
  - Disadvantage – special handling, special facility and post-treatment isolation
  - Riskier for older and male cats

- **Surgical Thyroidectomy** – potentially curative if normal or no ectopic tissue
  - Bilateral or unilateral thyroidectomy
    - If unilateral – potential for recurrent hyperthyroidism in contralateral gland
  - Complications
    - Iatrogenic hypoparathyroidism (bilateral surgery)
      - Preserve some parathyroid tissue to prevent hypocalcemia
      - Transient hypocalcemia may occur postop due to disrupted blood flow
      - Treat with Ca**⁺⁺ gluconate, **NOT** Ca**⁺⁺ chloride
    - Laryngeal paralysis, Horner’s syndrome

- **Hill’s Prescription Diet® y/d™ feline thyroid health** – **Controversial**, must be sole diet

- **Thyroid storm** A factor to consider when choosing treatment
  - In some cats with chronic, severe hyperthyroidism, the risk of "thyroid storm" outweighs the risk of iatrogenic hypothyroidism due to treatment
  - Ensure calm environment
  - ± mild sedation (not acepromazine)
  - If bradycardia treat with LOW dose atropine
  - May be acutely fatal
Feline Hyperthyroidism

Extended version

**Prognosis:**
- Without renal failure
  - Good to excellent
  - Many cured with thyroidectomy and $^{131}$I
  - Methimazole requires life-long treatment
- With renal failure
  - Good short-term,
  - Guarded to poor long-term

**Prevention:**
- Early screening
- Some studies have shown a connection between certain ectoparasiticides and hyperthyroidism
- Avoid canned cat foods (increased iodine in fish, liver, giblet flavors)
- Prevent thyroid storm with beta-blockade
  (IF can be given with minimal stress and **NO hypokalemia** present – can cause sudden death)

**Pearls:**
- Purebreds significantly LESS likely to have hyperthyroidism than mixed breeds
- Benign thyroid neoplasia or adenomatous hyperplasia (< 2% thyroid carcinoma)


**My Notes:**