Case Study 1

Rufus

Apathetic Hyperthyroidism

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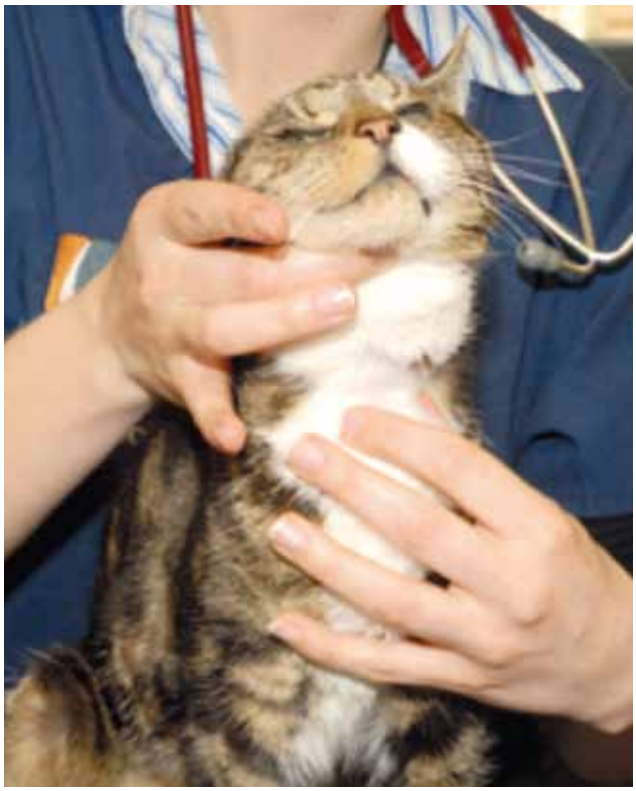
Rufus was a 14 year old male neutered domestic short hair who presented for further investigation of vague clinical signs of a few month history of progressive weight loss, lethargy and inappetence.

On presentation, Rufus was bright and responsive, although in lean body condition. Salient examination abnormalities included a small mobile goitre and a grade II/VI left apical systolic heart murmur, with an intermittent gallop rhythm.

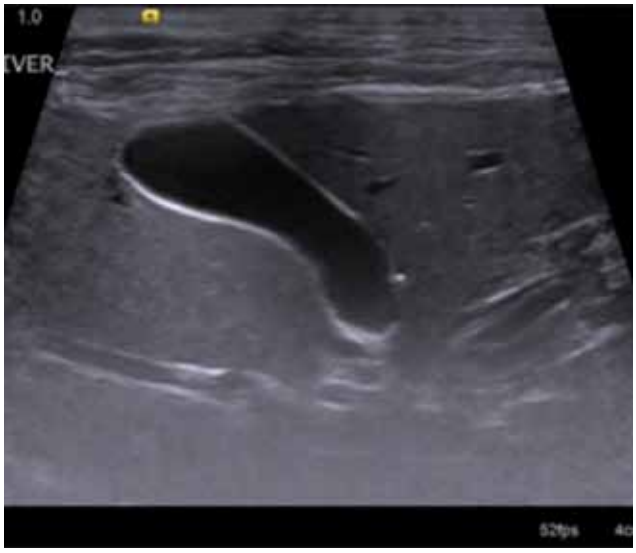


Palpating a goitre.

The presenting signs were non-specific and likely secondary to an underlying systemic disease responsible for the inappetence. More specific problems identified included the goitre and cardiac abnormalities. Despite the absence of classic clinical signs, hyperthyroidism remained a primary differential due the signalment, goitre, weight loss and cardiac auscultation findings.

Screening haematology, biochemistry and total T4 (thyroxine) were performed to evaluate for the possibility of hyperthyroidism, but also to identify the presence of any concurrent disease. Haematology identified a packed cell volume (PCV) in the top quartile of the reference interval (40.9%; ref. 25-45%), which is unexpected in an older, clinically unwell cat, in whom low normal PCV, or even anaemia of chronic disease would be more frequently found. Serum biochemistry documented mild increases in both alanine aminotransferase and alkaline phosphatase activities (73 iu/l; ref. 15-45 iu/l and 66 iu/l; ref. 15-60 iu/l respectively). Evaluation of total T4 identified a value in the upper half of the reference interval (42.9 nmol/l; ref. 15-60 nmol/l).

Clinical disease of almost any aetiology will result in “non-thyroidal illness”; manifested biochemically as suppression of total T4 values. Therefore a total T4 toward the top of the reference interval is inappropriate in an ill cat and likely reflects a total T4 value that would otherwise be supra-normal if



No ultrasonographic hepatic abnormalities to otherwise explain the liver enzyme elevation.

that patient was clinically well. Therefore despite the absence of definitive confirmation of hyperthyroidism, a strong clinical suspicion for this disease was retained. Further supporting factors enhancing this suspicion included:

- Weight loss; reported in > 85% cases.
- Presence of a goitre; reported in 80-95% cases However alternative differentials include non-functional thyroid neoplasia, other neoplasia (e.g. parathyroid), lymphadenomegaly.
- Presence of the systolic murmur and gallop on cardiac auscultation; findings present in > 50% hyperthyroid cats due to the secondary hypertrophic cardiomyopathy arising as a result of the hyperthyroid state.
- Elevated liver enzyme activities; reported in over 90% hyperthyroid cats.
- High-normal PCV; either this or even a mild erythrocytosis is reported in nearly half of hyperthyroid cats. Haemoconcentration as a cause of the elevated PCV was excluded in this case due to the absence of concurrent protein elevation, and normal hydration status on clinical examination.

In the absence of being able to confirm our suspicions with an elevated total T4 value, options at this stage were either to perform further diagnostics to support a diagnosis of hyperthyroidism (e.g. assessment of free T4, dynamic thyroid testing (T3 suppression test), scintigraphy), serially track the identified abnormalities in a few weeks (to assess for progressive disease) or to exclude the possibility of other aetiologies of the clinical signs.

In this case, sufficient differentials remained to warrant excluding an alternative disease that may explain the clinical signs. Additional diagnostics including further laboratory work and abdominal imaging were performed. A unifying underlying aetiology could not be identified.

Repeat assessment of the previously identified abnormalities two weeks later demonstrated a mild progression of the increases in liver enzyme activity and persistence of the other documented changes; serum total T4 remained in the upper half of the reference interval. Having rationally excluded other differentials for the clinical signs, free T4 was assayed at this time and found to be elevated (45.6 pmol/l; ref. 10-40 pmol/l). In the presence of concurrent consistent clinical and laboratory findings, this is consistent with hyperthyroidism; this clinical presentation specifically is indicative of apathetic hyperthyroidism.

The flexibility in dosing afforded by Felimazole® is ideal in cases such as this, where due to the mild clinical and biochemical disease a low starting dose is ideal.

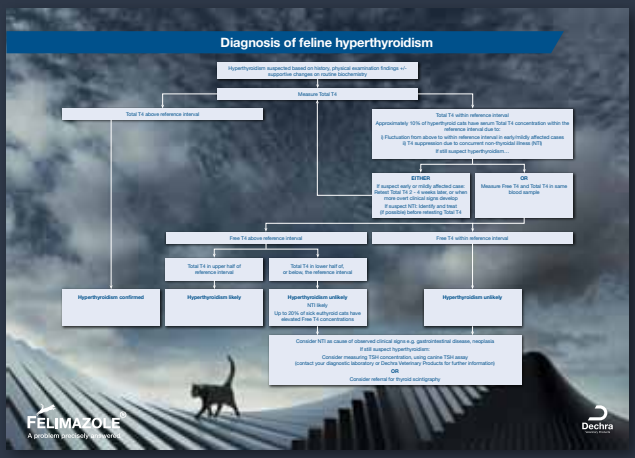
At follow-up three weeks post starting treatment, complete resolution of the presenting signs was reported and Rufus was back to being a cheeky chappy. Previously identified haematological and biochemical changes had normalised and his total T4 was in the desired lower half of the reference interval for a cat on treatment for hyperthyroidism. Rufus is managed with long term Felimazole therapy and has remained clinically well over time. He undergoes the regular monitoring advised for a cat on treatment with Felimazole and has required infrequent (<1/year) dose adjustments.

Apathetic hyperthyroidism

Apathetic (or “masked”) hyperthyroidism is reported in approximately 10% of cases. The typical signs of polyphagia and hyperactivity are replaced by inappetence (or in extreme cases anorexia) and lethargy, usually with concurrent weight loss. Examination and clinico-pathological findings are as for the typical form of the disease, although with the apathetic form given the atypia in presentation, exclusion of concurrent disease is of importance.

The use of free T4 as a diagnostic tool

A reference interval total T4 value is reported in up to 10% of all hyperthyroid cats and up to 40% of those with mild disease, although this would typically be within the upper half of the reference interval. Therefore, in those cases with consistent clinical signs and a high normal total T4, free T4 becomes a useful diagnostic tool as it is elevated in >90% of hyperthyroid cases, even those with clinically mild disease. Elevated free T4 is not definitively diagnostic for hyperthyroidism; false positive results may occur in euthyroid sick cats (up to 20% of euthyroid cats with chronic kidney disease have been demonstrated to have elevated free T4). However, with appropriate case selection (strong clinical suspicion, exclusion of other aetiologies of the clinical signs) assay of free T4 is a valuable diagnostic tool. When a diagnosis of hyperthyroidism is made based upon a free T4 value, assuming a good clinical response to treatment, ongoing monitoring is based upon total T4 values, with the standard aim of achieving a total T4 in the lower half of the reference interval.



For further advice on diagnosing hyperthyroidism please refer to the flowchart ‘Diagnosis of feline hyperthyroidism’ produced by Dechra Veterinary Products.

The treatments and doses described in this case study are entirely at the discretion of the author and are based on their own considerable clinical experience. It is the responsibility of individual prescribing veterinary surgeons to ensure that they comply with local veterinary medicine regulations.

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