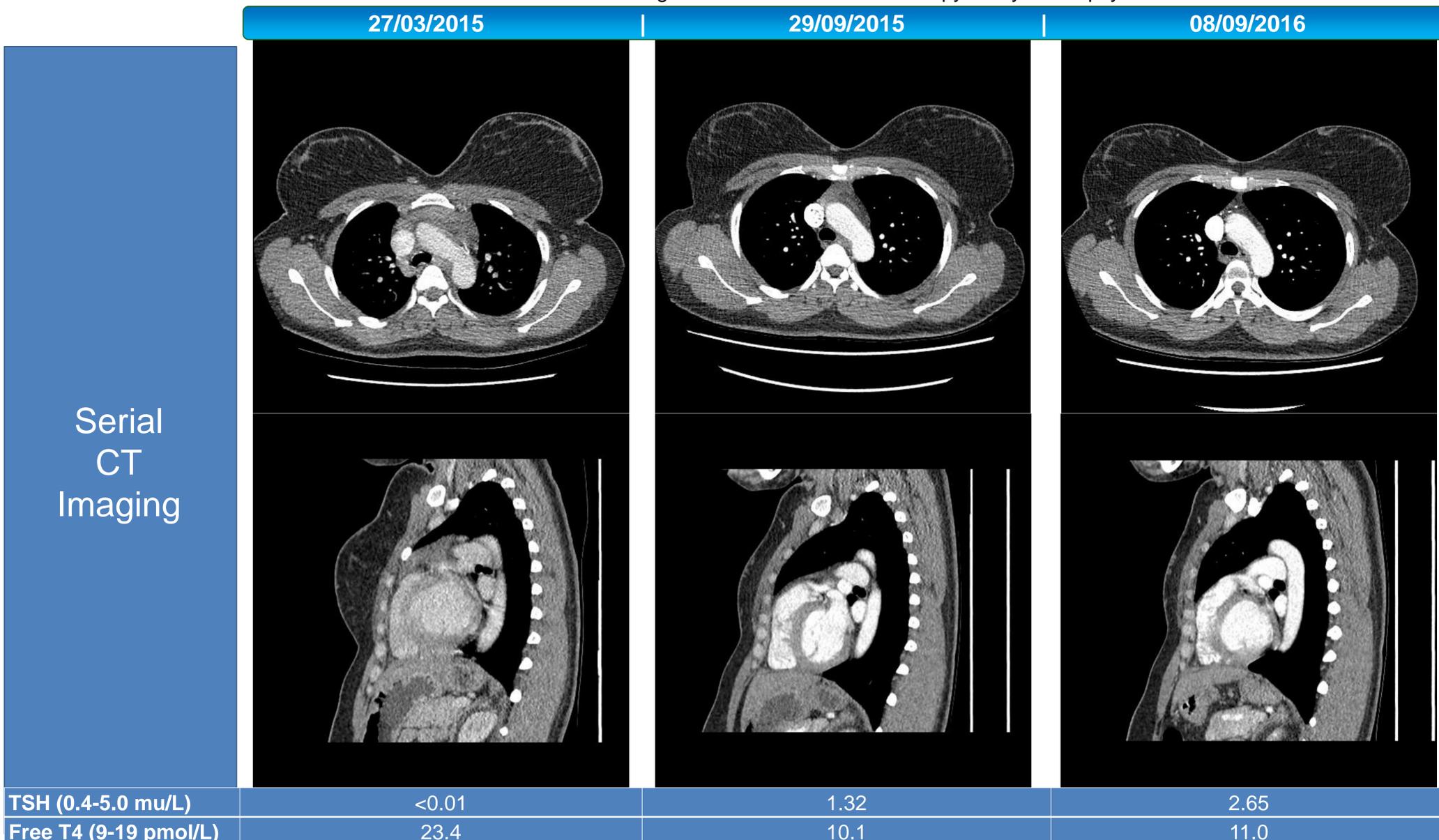


## Case Report

A 37-year-old Nigerian lady was referred to the endocrinology clinic with worsening dyspnoea, weight loss, poor sleep and palpitations over the preceding few months. She had a past history of depression treated with citalopram. She was clinically and biochemically thyrotoxic with a TSH <0.01 mu/L [0.4 - 5] and free T4 49.3 pmol/L [9 - 19]. TSH receptor antibodies were positive. She was commenced on carbimazole 40mg once daily and propranolol 40mg twice daily. After 2 months of therapy her free T4 had improved to 23.4 pmol/L and her therapy was altered accordingly.

Despite significant improvement in her thyroid function, she experienced ongoing dyspnoea, nocturnal sweating and cough. Her general practitioner referred her to the respiratory clinic, where she described occasional haemoptysis after prolonged coughing. Induced sputum testing for Acid-Alcohol Fast Bacilli was negative. A CT scan showed a diffuse soft tissue mass in the anterior and prevascular mediastinum but importantly no lymphadenopathy was evident in her thorax, abdomen or pelvis. Acetylcholine receptor antibodies were negative. She was diagnosed as having thymic hyperplasia as a result of Graves' thyrotoxicosis. The thymic hyperplasia reduced significantly in volume on interval scans after optimal medical management of her thyrotoxicosis, and we were able to reassure her without the need for invasive investigations such as mediastinoscopy or thymic biopsy.



## Discussion

Thymic hyperplasia associated with Graves' disease is rare but has been reported, predominantly as case reports. Identification of an anterior mediastinal mass can raise concern, but thymic hyperplasia with Graves' disease is often asymptomatic, carries a benign prognosis and resolves completely with correction of thyroid function, as in our case.

The differential diagnosis of thymic enlargement on CT imaging is wide, and includes thymic hyperplasia, thymoma and thymic carcinoma, along with other neoplastic and non-neoplastic causes.<sup>1</sup> Thymic hyperplasia with Graves' disease can exist as true hyperplasia with enlargement of the gland itself or as lymphoid hyperplasia, which may cause increased thymic volume in one-third cases.<sup>2</sup> The pathophysiology of thymic hyperplasia in Graves' disease remains unclear. TSH-receptor antibodies have been identified in thymic tissue, suggesting TSH-receptor antibody stimulation as a possible mechanism. Alternatively, the thymus may be stimulated by a direct effect of high circulating thyroid hormone levels.<sup>2-4</sup>

Murakami et al studied thymic appearances on CT imaging for untreated Graves' patients (n=23) and matched controls with no thyroid disease (n=37). They found increased thymic size and density in individuals with Graves' disease compared to controls, both of which significantly reduced after normalisation of thyroid function with methimazole.<sup>3</sup>

A literature review by Dalla Costa et al identified 107 reported cases of thymus enlargement related to Graves' disease. An important finding was that 4 cases were due to thymic neoplasia: 3 cases of thymoma and one T-cell lymphoma.<sup>2</sup> Radiological findings can help to distinguish neoplastic pathology from thymic hyperplasia. With hyperplasia, the thymus usually shows diffuse enlargement with smooth contour, whereas in neoplasia, the thymus may have a nodular contour with necrotic or calcified foci, or local invasion in cases of thymic carcinoma. Magnetic resonance findings can also be useful to distinguish these conditions.<sup>1</sup>

With increased use of cross-sectional imaging, thymic hyperplasia may be reported more frequently in clinical practice. If thymic hyperplasia is identified in a patient with Graves' disease, careful history taking and clinical examination are essential. Providing there are no features concerning for myasthenia gravis or underlying malignancy, further invasive investigation and management is not necessary. Repeat imaging is appropriate to confirm resolution of thymic hyperplasia with treatment of Graves' thyrotoxicosis.

## References

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