

Failure to suppress TSH in thyroid cancer – could it be Addison's disease?

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Background

- Papillary thyroid cancer is the commonest thyroid malignancy.
- Surgery is first-line treatment, followed by radioiodine and long-term, high dose levothyroxine to suppress TSH.
- Physiological levels of cortisol are known to suppress TSH secretion by the pituitary^{1,2,3}; although the mechanism remains unclear. Correspondingly, hypocortisolism may raise TSH levels (Figure 1)^{3,4}.

Case Summary

- A 64 year old woman underwent a near-total thyroidectomy for hyperthyroidism and a right sided cold nodule. At presentation, her TPO antibodies were raised (141 IU/ml).
- Histology showed multinodularity, focal lymphoid infiltrate and multifocal papillary cancer (pT1mpN0pMxR0). Further treatment included radioiodine ablation and TSH suppression with thyroxine.
- TSH remained suppressed at <0.1 mIU/L for 5 years following surgery (at ~250 mcg/day of thyroxine), but later started to rise (Figure 2). The thyroxine dose had to be increased gradually to 350 mcg/day to ensure a low TSH. Non-compliance to treatment was considered unlikely.
- After a further few years at this dose (350 mcg/day; Figure 2), she reported 'severe tiredness' and 'not losing a tan' 8 months after a holiday. Her sister (non-medical background) suggested Addison's disease following an online search based on these symptoms.

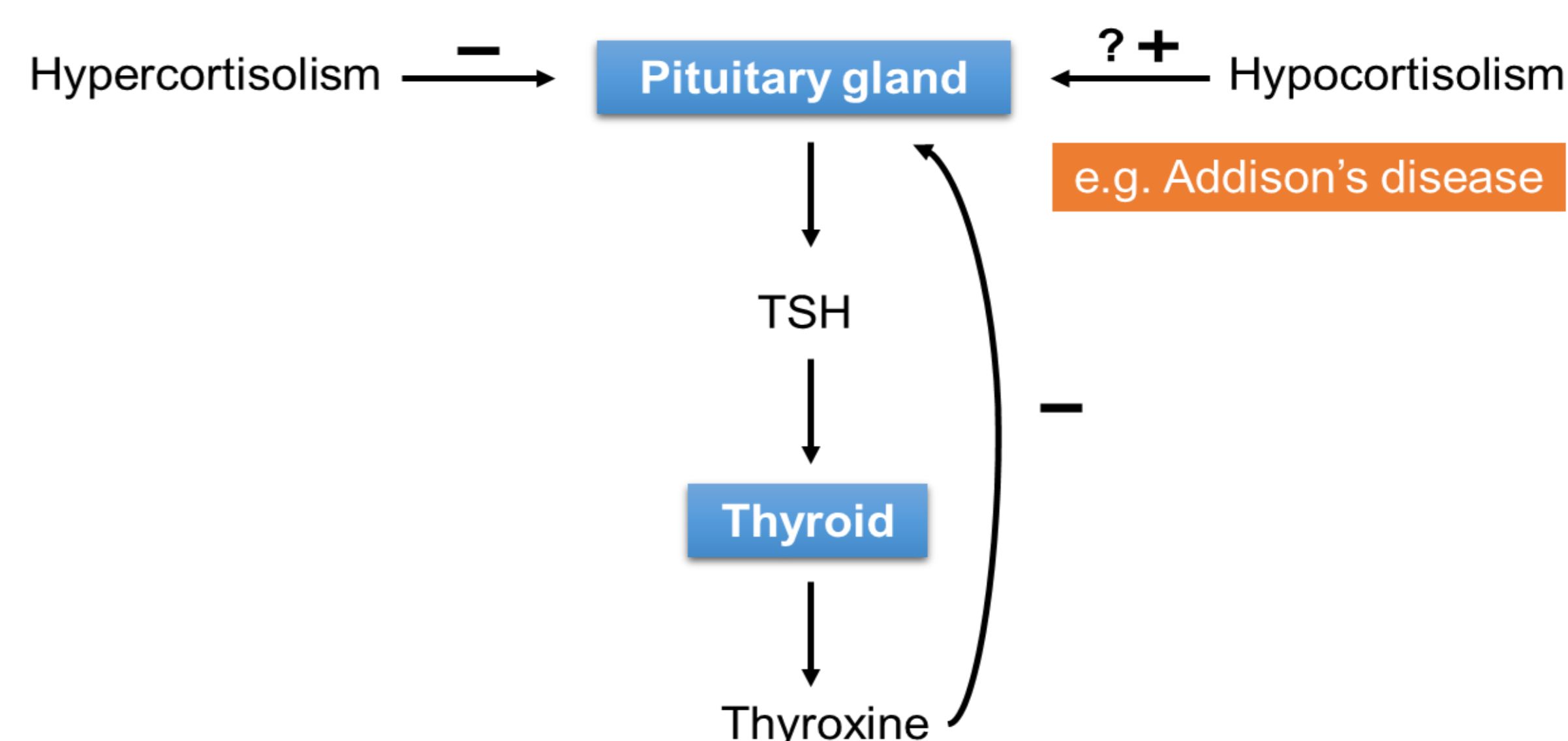


Figure 1 Affect of Cortisol on TSH Levels

- Subsequent examination demonstrated cutaneous and mucosal hyperpigmentation and a short synacthen test (basal and 30 minute cortisol of 61 and 66 respectively; normal response >500 nmol/L at 30 minutes) confirmed the diagnosis.
- After starting hydrocortisone, lower doses of thyroxine (currently 225 mcg/day; Figure 2) were needed for TSH suppression.

Discussion

- The increase in Thyroxine required to suppress TSH in this patient may have been an early sign of Addison's disease.
- In patients on long-term thyroxine, an increasing T4 requirement (either for replacement or TSH suppression) should raise the suspicion of Addison's disease; in addition to more common causes such as non-compliance.
- Adrenal hormone replacement therapy in patients with adrenal insufficiency and apparent hypothyroidism has been shown to normalise thyroid function tests without thyroid hormone replacement⁴.

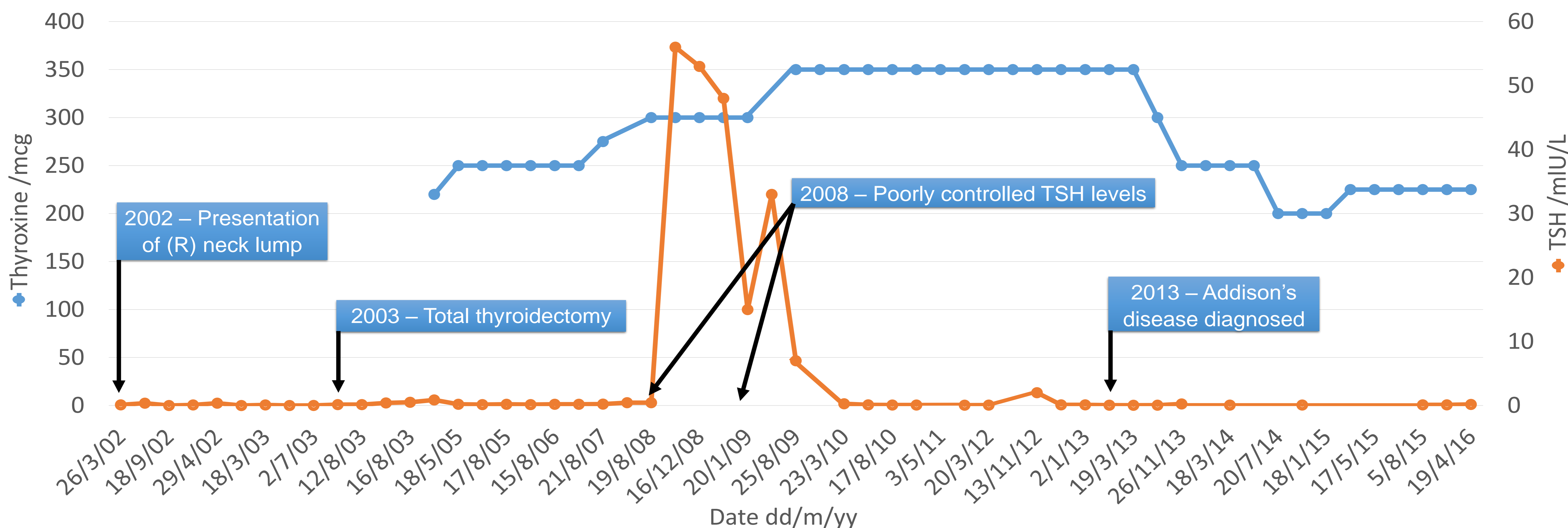


Figure 2 TSH and Thyroxine Dose Timeline

References

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