

# Recovery of Thyroid Function After 26 years Post Thyroidectomy for Graves' disease with evidence of Active Remnants

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## Introduction:

- Treatment options for Graves' disease include antithyroid drugs, radioiodine ablation and surgery.
- Thyroid surgery for Graves' disease commonly falls into one of three categories: 1) total thyroidectomy, which aims to achieve complete macroscopic removal of thyroid tissue; 2) bilateral subtotal thyroidectomy, in which bilateral thyroid remnants are left; and 3) unilateral total and contralateral subtotal thyroidectomy, or the Dunhill procedure.
- Total thyroidectomy removes target tissue for the thyroid-stimulating hormone receptor antibody. It controls hyperthyroidism at the cost of lifelong thyroxine replacement. Subtotal thyroidectomy leaves a thyroid remnant and may be less likely to lead to complications, however a higher rate of recurrent hyperthyroidism is expected and revision surgery would be challenging
- We present a case of thyroid function recovery more than two decades after subtotal thyroidectomy with active remnants and positive TSH receptor antibodies.

## Investigations:

- Repeat thyroid function showed TSH of 0.01 (0.3-4.2) milliunit/L, free T3 of 4.3 (2.5-5.7) pmol/L, free T4 of 14.5 (9-23) pmol/L and a positive TSH receptor antibody level of 2.9 (<0.4) unit/ml.
- She underwent a thyroid ultrasound that showed three hypervascular nodules (thyroid remnants) in the thyroid bed (Fig 1).
- A Tc-99m uptake scan was suggestive of multiple toxic nodules: two large nodules in the left with high increased tracer uptake and another smaller nodule in the right mid pole of the thyroid with low level activity (Fig 2).

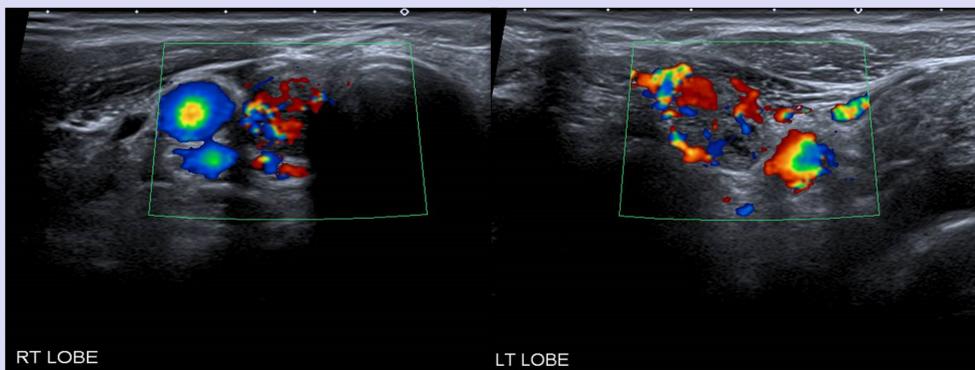


Fig 1: Thyroid US showing three hypervascular thyroid nodules (1 in the right and 2 in the left).

## Management:

- Levothyroxine was withheld in October 2017
- Serial TFT's done subsequently showed evidence of euthyroidism with her latest results in July 2018 (Fig 3) showing TSH of 0.64 (0.3-4.2) milliunit/L, free T4 of 11.7 (9-23) pmol/L and TSH receptor antibody level of 1.5 (<0.4) unit/ml.
- She remains under regular surveillance as she is at high risk of Graves' disease recurrence.

## Discussion:

- In the past subtotal thyroidectomy was commonly performed. Current guidelines recommend that if surgery is chosen as treatment for Graves' disease, total thyroidectomy is the preferred surgery.
- This is due to the fact that total thyroidectomy has a nearly 0% risk of recurrence, whereas subtotal thyroidectomy may have an 8% chance of persistence or recurrence of hyperthyroidism at 5 years.
- A recent Cochrane review showed that total thyroidectomy was more effective than subtotal thyroidectomy techniques (both bilateral subtotal thyroidectomy and the Dunhill procedure) at preventing recurrent hyperthyroidism (OR 0.14 (95% CI 0.04 to 0.46) with follow up period range from 6 months to 6 years.
- A recent study from a single centre followed retrospectively 385 patients who underwent bilateral subtotal thyroidectomy and 57 patients who underwent the Hartley-Dunhill operation with median postoperative follow-up time of 72 months (range 12-144 months). This study found that persistent or recurrent hyperthyroidism was observed in 119 (28.7%) patients with euthyroid state achieved in only 19.3% of patients.
- This case illustrates that clinicians should be aware of the risk of Graves' disease recurrence with previous subtotal thyroidectomy.

## References:

1. Liu et al. Thyroid surgery for Graves' disease and Graves' ophthalmopathy. Cochrane Database of Systematic Reviews 2015. Issue 11. Art. No: CD010576.
2. Lin et al. The long-term outcomes of thyroid function after subtotal thyroidectomy for Graves' hyperthyroidism. Journal of Surgical Research 2017, 220:112-118.

## Case:

- A 56 year old lady was referred to our endocrine service for further management of levothyroxine replacement.
- She was diagnosed with Graves' disease 26 years ago and underwent subtotal thyroidectomy as definite treatment.
- Post-operatively, she was commenced on 100mcg of levothyroxine and continued to have regular follow up with her GP.
- It was noted that her levothyroxine dose had to be reduced to 50 mcg daily over a period of 10 years due to persistently suppressed TSH levels with free T4 levels within the normal range.
- In January 2015, her thyroid function showed a picture suggestive of over-replacement with TSH <0.01 (0.3-4.2) milliunit/L, free T3 of 6.3 (2.5-5.7) pmol/L and free T4 of 24 (9-23) pmol/L. Therefore, her levothyroxine dose was further decreased to 50 mcg on alternate days by her GP.
- In November 2016, she was seen in our endocrine clinic while on the above levothyroxine regimen.
- She didn't report any symptoms related to thyrotoxicosis or over-replacement.

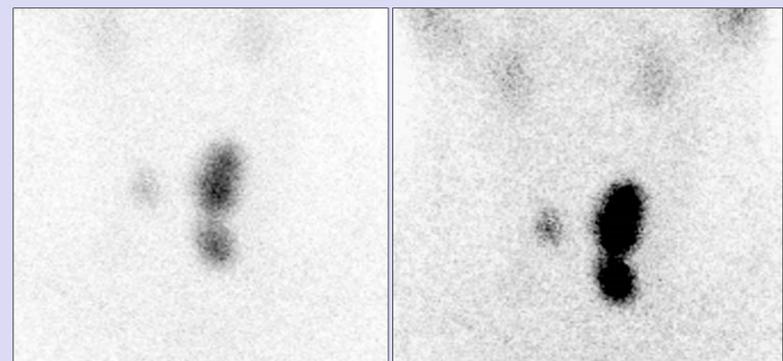


Fig 2: Tc-99m Uptake scan showing high uptake in the nodules

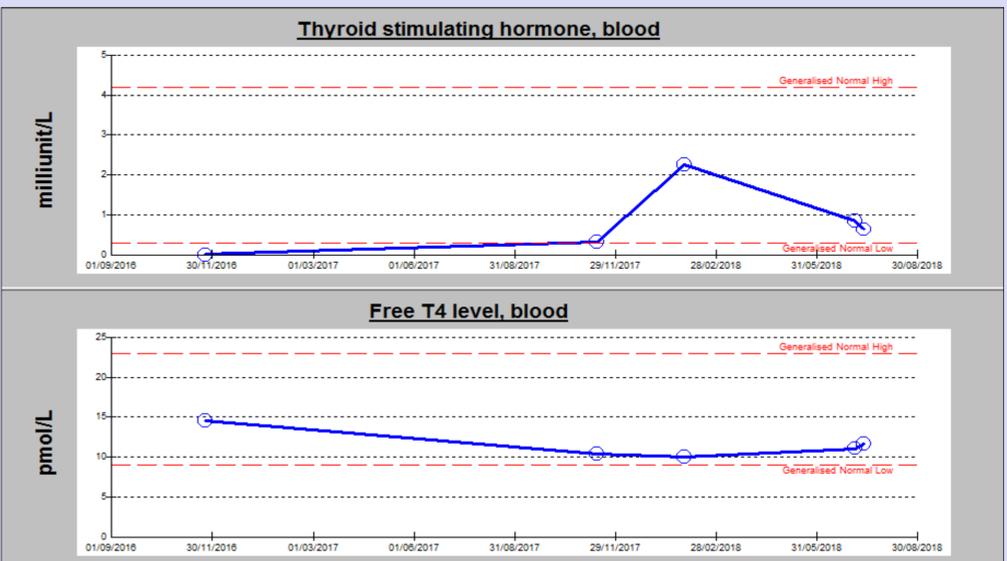


Fig 3: Serial Free T4 and TSH changes after stopping thyroxine