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A 40-year-old man presented with a lump at the neck for 3 years. He reported palpitation, dyspnea and weight loss of 6 kg over the preceding 4 months. He got tested with thyroid function and showed primary hyperthyroidism. He was treated with MMI for 3 years and had euthyroid symptom. He had history of HIV and HBV coinfection and been treated with Tenofovir, Lamivudine and Efavirenz. He took medication regularly and had well controlled disease with high CD4 and low viral load for the last year. He also had history of alcohol withdrawal seizure but reported about quitting alcohol and being seizure free for the last 6 months.

The clinical examination showed the temperature 36.2°C, the blood pressure 110/55 mmHg, the heart rate 98 beat per minute, the respiratory rate 10 breaths per minute. He appeared comfortable but thin stature with the BMI 17.58. There were no exophthalmos and no lid lag or retraction. The thyroid gland showed a large nodule at the right lobe. No nail acropachy or pretibial swelling was observed.

The thyroid function test and complete blood count were unremarkable. The ultrasound of the thyroid showed a 4.1 cm isoechoic mass with internal calcification at the right lobe and unremarkable left lobe (Figure 1). The technetium-99m pertechnetate thyroid scan showed a large hot nodule at the right lobe with the faintly seen left lobe (Figure 2).

What is your recommended management for this patient?



Figure 1 Ultrasound of the thyroid



Figure 2 Technetium-99m pertechnetate thyroid scan

DISCUSSION

The diagnosis of this patient was toxic adenoma with the thyroid scan showing a hot nodule at the right lobe and decreased uptake at the left lobe. The differential diagnoses would be Graves' disease with a cold nodule and a toxic multinodular goiter. The thyroid scan can help distinguish the diagnoses. Graves' disease with a cold nodule will show diffuse increased uptake of the thyroid gland with photon deficit area as a nodule. A toxic multinodular goiter will show heterogeneous uptake of the thyroid gland¹.

The ultrasound showed a 4.1 cm thyroid mass with almost completely solid composition, isoecho-genicity, wider-than-tall shape, smooth margin and punctate echogenic foci. According to the Thyroid Imaging, Reporting and Data system (TI-RADS)², this mass was in the TI-RADS 4 category, meaning moderately suspicious for thyroid cancer. If a mass size is 1.5 cm or larger, the fine needle aspiration should be done. In this case, the patient should be advised to undergo fine needle aspiration first. If the result suggested malignancy, thyroidectomy should be performed. But if the histology showed no malignancy, radioactive iodine (RAI) would be the most effective modality.^{3,4}

Antithyroid drugs are unlikely to cure toxic adenoma but may induce remission in Graves' disease. Advanced age with comorbidity and low life expectancy may prefer the lifelong antithyroid drugs. Surgery with lobectomy or isthmectomy is usually performed with good effectiveness, but also carries risk of hypoparathyroidism and recurrent laryngeal nerve injury which could cause symptomatic hypocalcemia and hoarseness, respectively. Surgery may be suitable for large goiter size and suspected coexisting thyroid cancer. Both surgery and RAI have the risk of hypothyroidism. RAI treatment requires patients to take low iodine diet a week before and radiation precaution a week after. RAI has been used extensively to treat hyperthyroidism for a very long time. The concern about cancer mortality of RAI was

seen in the recent large retrospective cohort study⁵, but the flaw was issued regarding the comparison between the patients receiving RAI and normal population was not appropriate and the comparison between patients receiving RAI, antithyroid drugs and surgery was not done⁶. On the contrary, there was no association between cancer mortality and RAI in the past studies^{7,8}.

After the diagnosis of toxic adenoma has been made, the physician and the patient should discuss each of the treatment modality, including benefit, risk and logistics. This discussion will set the best decision for the patients.

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