

ATA Trainees' Educational Track Case Studies – Thyroid Function

**Case Study #9**  
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30 yo lady with Hx of GERD, lichen sclerosus comes for evaluation of hyperthyroidism. She is currently taking Omeprazole, Cetirizine, prn Clobetasol cream, no supplements. Family history is significant for hypothyroidism in maternal aunt. Physical exam, vitals wnl. (THYROID: smooth, non-tender, 15 gram, firm and No palpable nodules, R lobe mildly enlarged)

She lost about 5-8 lb in the last 1 month, denies any palpitations, diarrhea, insomnia, irritability, tremors, neck pain, no prior IV contrast imaging, 6 weeks prior had a really bad cold, missed work for 1 week.

Office thyroid US showed a mildly enlarged thyroid, heterogenous structure, no nodules, mildly increased vascularity

TFTs before the referral showed hyperthyroidism. Repeated TFTs at the time of the consult showed euthyroidism and positive TSI. Decided to monitor her and she developed frank hypothyroidism and she was started on Levothyroxine 75 mcg, which kept her in euthyroid state till now.

TRABs, microsomal and anti TG Ab which were sky rocket at the time of the diagnosis are slowly coming down.

| Component           | Latest Ref Rng      | 10/31/2012       | 11/26/2012       | 12/19/2012      | 1/9/2013          | 3/15/2013         | 5/7/2013 | 6/27/2013         | 10/7/2013        |
|---------------------|---------------------|------------------|------------------|-----------------|-------------------|-------------------|----------|-------------------|------------------|
| T4                  | 5.0 - 11.0 ug/dL    | 10.6             |                  |                 |                   |                   |          |                   |                  |
| T4 Uptake           | 0.70 - 1.20         | 0.93             |                  |                 |                   |                   |          |                   |                  |
| FTI                 | 6.0 - 11.0 ug/dL    | <b>11.4 (H)</b>  |                  |                 |                   |                   |          |                   |                  |
| TSI                 | <150 % Normal       |                  | <b>761 (H)</b>   | <b>1506 (H)</b> | <b>1710 (H)</b>   | <b>789 (H)</b>    |          | <b>194 (H)</b>    |                  |
| TBI                 | <1.0 U/L            |                  |                  | <1.0            | <b>1.3 (H)</b>    | <1.0              |          | <b>1.2 (H)</b>    | <1.0             |
| TSH                 | 0.400 - 5.500 uU/mL | <b>0.156 (L)</b> | <b>0.014 (L)</b> | 4.000           | <b>67.880 (H)</b> | 2.140             | 2.970    | 1.370             | 1.870            |
| Free T4             | 0.7 - 1.8 ng/dL     |                  | <b>2.0 (H)</b>   | 0.7             | <b>0.4 (L)</b>    | 1.5               |          | 1.4               | 1.4              |
| Free T3             | 1.8 - 4.6 pg/mL     |                  |                  | 1.8             | <b>1.6 (L)</b>    | 2.9               |          | 2.5               |                  |
| Microsomal Antibody | <5.6 IU/mL          |                  |                  |                 | <b>1692.6 (H)</b> | <b>826.9 (H)</b>  |          | <b>151.5 (H)</b>  | <b>59.3 (H)</b>  |
| Thyroglobulin Ab    | <14.4 IU/mL         |                  |                  |                 | <b>4208.7 (H)</b> | <b>3356.2 (H)</b> |          | <b>1295.7 (H)</b> | <b>688.9 (H)</b> |

??? Patient with subacute thyroiditis with very high TRABs, microsomal ABx and anti TG levels, who developed hypothyroidism and ABx levels very slowly coming down.

I guess not all hyperthyroidism with positive TRABs point towards Graves disease. I wonder if the patient was seen when she was frankly hyperthyroid and the ABx were available, what would have been the course of action

**Case Study #11**  
**Jelena Maletkovic, MD**  
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**Los Angeles, CA**

The patient is a 52 year old woman with history of severe CAD, status post multiple stents, CABG, also hypertension, hyperlipidemia, diabetes mellitus, ESRD on dialysis, paroxysmal A fib, recently diagnosed with AIT type 1, now admitted with chest pain and hypotension (56/26), diagnosed with ACS, managed conservatively.

Endocrine consult is called for management of thyrotoxicosis in the setting of elevated LFT's on methimazole.

Prior to this admission the patient was diagnosed on AIT type1 and started on methimazole with TSH 0.014 (nl 0.35-4.94), Free T3 11.4 (nl 1.71-3.71), Free T4 4.35 (nl 0.7-1.48). Thyroid-Stimulating Immunoglobulin 106 (nl <122%), TPO 2.9 (neg), and thyroglobulin <0.9 (neg). Thyroid ultrasound shows two cystic nodules around 1cm each.

On admission the patient has abnormal LFT's: AST 81, ALT 547, TB 5.3 and methimazole is stopped. With liver failure, kidney failure, heart failure on pressors this patient is not a surgical candidate. The patient is also not a candidate for any more methimazole or PTU. Not a candidate for radioactive iodine treatment with history of 3 years treatment with amiodarone.

On admission thyroid functions are confusing. (labs on 9/20, 9/21, 9/22).

|                       | Ref. Range                         | 4/4/2012<br>05:15 | 9/20/2013<br>16:20 | 9/21/2013<br>04:00 | 9/22/2013<br>05:05 | 9/26/2013<br>05:28 |
|-----------------------|------------------------------------|-------------------|--------------------|--------------------|--------------------|--------------------|
| TSH                   | Latest Range:<br>0.3-4.7<br>mIU/mL | 1.1               |                    | <0.02 (L)          |                    |                    |
| Free T3,<br>Automated | Latest Range:<br>249-405<br>pg/dL  |                   |                    |                    | <45 (L)            | >2900 (H)          |
| T3,Total              | Latest Range:<br>85-185 ng/dL      |                   | >650 (H)           |                    |                    |                    |
| Free T4,<br>Automated | Latest Range:<br>0.8-1.6 ng/dL     |                   | >7.8 (H)           |                    |                    | >7 (H)             |

Questions for discussion:

--we can not explain thyroid function tests on admission - lab error?

--the patient is clinically not thyrotoxic.

--is there a treatment of her thyrotoxicosis that we can offer?

**Case Study #12**  
**Washington University in St. Louis**  
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**St. Louis, MO**

A 71-year-old woman with a history of well-controlled type 2 diabetes, hypertension, hyperlipidemia, hypothyroidism and remote history of breast cancer status post lumpectomy, chemotherapy and radiation, presents with a one-month history of heat intolerance, palpitations, tremors, dyspnea on exertion and chest pain on exertion. She had noted a weight loss of about 46 pounds over the last year with 20 pound loss in the last three months. She went to a new primary care provider and was noted to have tachycardia to the 120s in the office and was advised to go the ED for further evaluation.

She reports a diagnosis of hypothyroidism at age 18, on thyroid replacement since that time. She never had a diagnosis of Graves' disease and never received a radioactive iodine treatment. Pharmacy records confirm that she was on 200 micrograms per day of Levothyroxine for many years in the past. This was decreased to 175 mcg six times per week in 2010 and increased to 175 mcg daily 3 months prior to admission (~15% increase in dose). Thyroid studies at the times of these dose changes were not available.

She was noted on admission to have a **thyroid-stimulating hormone** of **0.04 mIU/ml** (0.35-5.5), **free T4** of **9.37 ng/dl** (0.9-1.8) and a **free T3** of **greater than 15 pg/ml** (2.3-4.2). Troponin was elevated at 1.14 ng/ml (0.00-0.24).

She denies any preceding history of a viral illness or neck pain at any point. She denies taking any supplements and denies that her levothyroxine pills looked any different. She has taken all of her pills in the morning and nothing has changed in the way she takes her medication. She was not taking and had never taken Amiodarone. She lives in a rural area but denies any recent ingestion of meat from a local uncertified butcher. Her last dose of Levothyroxine was 24 hours prior to admission. She has no thyroid or other endocrine disease in the family.

Exam was notable for normal temperature, heart rate of 100, blood pressure of 135/45. Weight is currently 160 lbs. She had no proptosis, stare or lid lag, and extraocular movements were intact. She had no conjunctival injection. The thyroid was small but palpable without nodularity. Cardiovascular exam was normal. Extremities were notable for trace edema bilaterally. Reflexes were 2+ with normal relaxation. She was noted to have a fine tremor.

She had a CT chest/abd/pelvis with contrast in the ED prior to the return of the thyroid labs looking for malignancy, which precluded doing an RAI uptake. Given her initial presentation of NSTEMI, in addition to stopping Levothyroxine, she was started on Propranolol 40 mg TID and Methimazole 20 mg daily given the possibility of endogenous overproduction of thyroid hormone. A thyroid stimulating immunoglobulin and thyroglobulin level were sent to further evaluate this possibility. When these returned normal, the Methimazole was stopped. The patient's troponin trended down to 0.15. She

had an echocardiogram showing a normal EF and no regional wall motion abnormalities, and she was discharged with plan for outpatient evaluation.

She had a repeat FT4 of 1.9 ng/dl (0.9-1.8) after one week off of Levothyroxine and Methimazole. She had a repeat TSH and FT4 after being off of Levothyroxine and Methimazole for 6 weeks that were normal - TSH 1.25 mIU/ml (0.35-5.5) and FT4 1.04 ng/dl (0.9-1.8). What accounts for this apparent return of thyroid function after 50 years on replacement? How frequently would you monitor thyroid function going forward?