26 Year-old Female and 86 Year-old Male with Congestive Heart Failure

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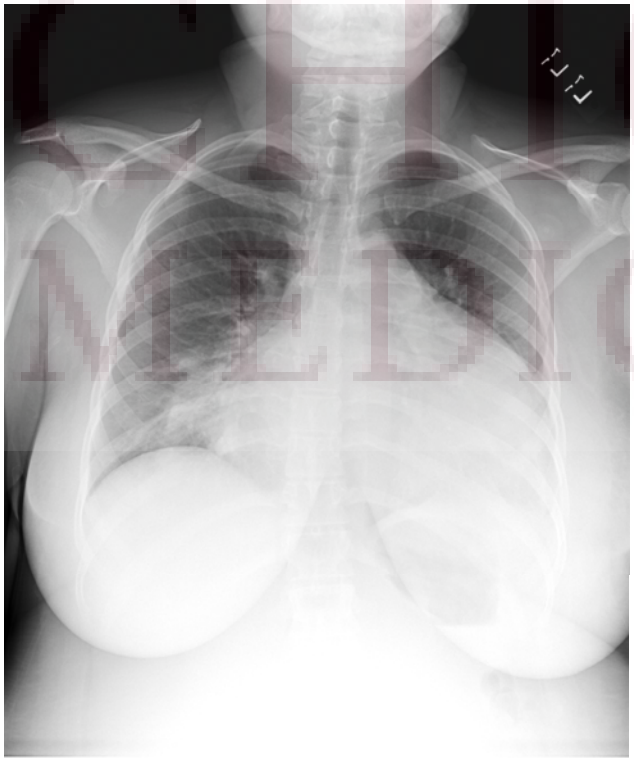
Endorama

September 6, 2012

History of Present Illness

- 26 yo female with PMHx sig. for papillary thyroid cancer and hypertension who presented with 2 days of worsening dyspnea on exertion, orthopnea, and 2 weeks of pedal edema.



BNP: 4373

TSH: 18.91

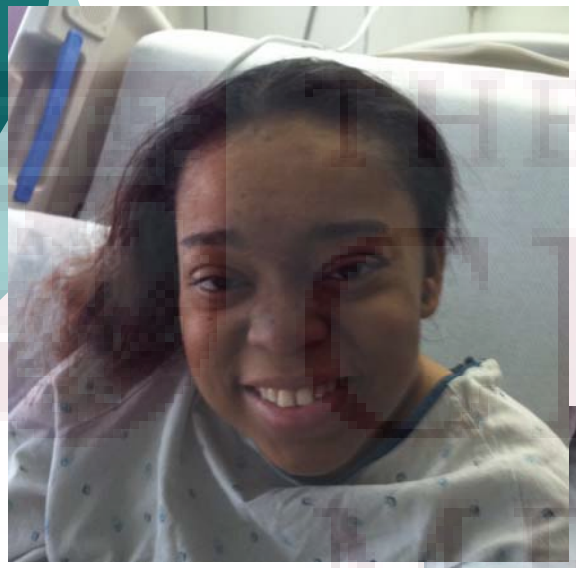
Past Medical History

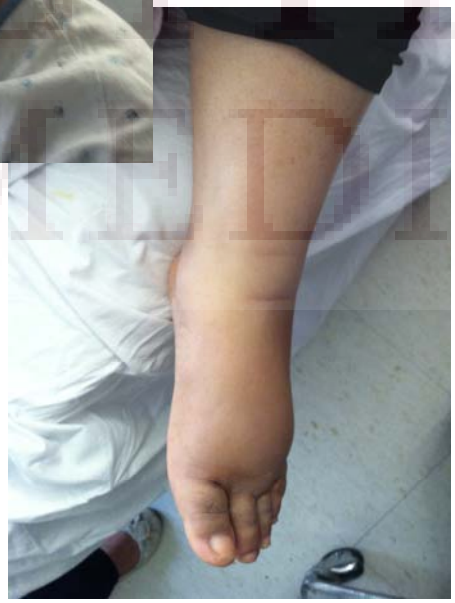
- Papillary thyroid cancer
  - Dx in 7/2000
  - Thyroidectomy in 9/2000 at Cook County
    - 22/35 positive LNs
  - RAI with 100 mCi in 9/2000 with negative post ablation scan in early 2001
  - 7/2002 TBS negative (TSH 111, Tg 1)
  - 12/2003 TBS negative (TSH 195, Tg <1)
- Postsurgical hypothyroidism
  - Has been on LT4 200 mcg daily for the past year.
  - Stopped taking for 3-4 weeks.
  - Restarted 2 weeks prior to admission.
- Past Medical History:
  - Papillary thyroid cancer
  - Hypertension, dx in 2008
  - Iron deficiency anemia
- Home Medications:
  - Levothyroxine 200 mcg daily
  - Iron supplement

Past Medical History

- Family History:
  - Mother and father with HTN.
  - Father died from CHF at age 63.
  - 3 sisters, one with HTN diagnosed in her 30s
  - No history of thyroid disease or cancer.
- Social History:
  - Lives with mother and sister.
  - Last worked in 2006 in a medical supply center.
  - Denies tobacco, drug use.
  - Has 1 alcoholic drink per month.
- ROS:
  - Improving fatigue
  - 20 lb weight gain in past 2 weeks
  - Stable appetite
  - Dry skin in past 2 weeks
  - No heat/cold intolerance, bowel changes, tremors, palpitations
  - Regular menses, LMP 1 week ago

Physical Exam



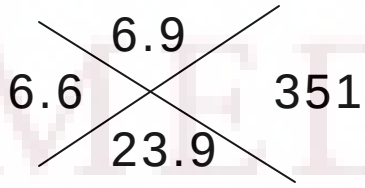


- BP 143/92 | Pulse 105 | Temp 97.9 °F (Tympanic) | Resp 18 | Ht 157.5 cm (5' 2") | Wt 85.276 kg (188 lb) | BMI 34.39 kg/m2 | SpO2 94%
- Constitutional: Fatigued. Myxedematous face.
- Eyes: Conjunctivae clear. Sclerae anicteric. Pupils are equal, round, and reactive to light. Extraocular movements are intact.
- ENT: Mucous membranes moist.
- Neck: Supple. No cervical LAD. No thyroid tissue palpated.
- Cardiovascular: Regular rhythm, tachycardic. No murmurs appreciated. Intact distal pulses.
- Respiratory/Chest: Normal respiratory effort. Rare basilar crackles.
- Gastrointestinal/Abdomen: Normoactive bowel sounds. Soft, nontender, nondistended.
- Musculoskeletal/extremities: Peripheral edema, some pitting.
- Neurological: Normal deep tendon reflexes in biceps, decreased in Achilles.
- Skin: Skin is warm and dry. Acanthosis nigrans noted.

Labs

134 100 26
3.9 20 1.1 101
Ca 8.9

Total protein 6.7, alb 3.9
Tbili 0.8, alk phos 143
AST 82, ALT 124



Urine preg neg

TSH 18.91
fT4 1.64 (0.9-1.7)
T4 9.9 (5-11.6)
T3 66 (80-195)
rT3 806 (160-353)

Tg 2

A1c 5.8%

Echocardiogram

- LV normal in size.
- Moderate concentric LV hypertrophy.
- LV EF of 23.6%, global systolic dysfunction
- Unable to assess LV diastolic function due to tachycardia.
- RV normal in size.
- Normal RV performance.
- LA and RA moderately dilated.
- Moderate size pericardial effusion without significant hemodynamic compromise.

History of Present Illness

- 86 yo Greek man with PMHx sig. for atrial fibrillation, diastolic heart failure, HTN, DM2, and laryngeal cancer who was initially admitted to St. Mary's Hospital for worsening shortness of breath, pedal edema, and abdominal distension, transferred here for further management of heart failure.
  - TSH 99
  - Reports that he was on a “thyroid medication” for borderline thyroid problem for 2-3 years, which he stopped taking about 10 years ago.
  - Per the family, he had a surgical biopsy for his laryngeal cancer in April 2012, though this may have been more of a resection. It is unclear if it involved the thyroid. He also had XRT for 2-3 weeks in May 2012.
  - Prior to his hospitalization, weight had been stable. Appetite remains good. Developed cold intolerance since April. Reports constipation, requiring Miralax in the past 2 months. No skin/hair changes, anxiety, depression.

Past Medical History

- Past Medical History
  - Oropharyngeal cancer
  - Diastolic heart failure
    - Dx during hospitalization for CHF 3 months prior.
  - Atrial fibrillation
  - Hypertension
  - Diabetes mellitus type 2
  - Dyslipidemia
  - Chronic kidney disease
  - GERD
  - Lumbar spinal stenosis
  - Osteoarthritis
- Medications:
  - Amlodipine 10 mg daily
  - ASA 81 mg daily
  - Furosemide 40 mg BID
  - Glargine 12 units daily
  - Novolog sliding scale
  - Simvastatin 40 mg daily
  - Tamsulosin 0.4 mg daily
  - Albuterol-ipratropium

Past Medical History

- Social History:
  - From Greece.
  - Lives with his wife, has 4 children.
  - Quit tobacco use 24 years ago.
  - Denies any ETOH use.
- Family History:
  - No history of thyroid problems.
  - Mother with diabetes.
  - Father had hypertension, stroke.

Physical Exam

- BP 121/68 | Pulse 81 | Temp(Src) 35.8 °C (96.4 °F) (Axillary) | Resp 20 | Ht 179.8 cm (5' 10.8") | Wt 84.7 kg (186 lb 11.7 oz) | BMI 26.19 kg/m2 | SpO2 95%
- Constitutional: Patient appears well-developed, well-nourished, in moderate respiratory distress, wearing a high flow mask.
- Eyes: Conjunctivae are not injected. Sclerae anicteric. Pupils are equal, round, and reactive to light. Extraocular movements are intact.
- ENT: Mucous membranes moist.
- Neck: Supple. No thyromegaly or nodules palpated. +JVD.
- Cardiovascular: Irregularly regular rhythm, normal rate. Systolic murmur appreciated. Diminished distal pulses.
- Respiratory/Chest: Normal respiratory effort. Bibasilar crackles.
- Gastrointestinal/Abdomen: Normoactive bowel sounds. Soft, nontender, distended.
- Musculoskeletal/extremities: 2+ peripheral edema.
- Neurological: Difficult to elicit deep tendon reflexes.
- Skin: Skin is warm and dry. Acanthosis nigrans noted.

Labs

144 101 37
4.3 38 2.0 108

Ca 9.4, Phos 3.2, Mg 2.2

Total protein 6.5, alb 4.1
Tbili 0.5, alk phos 75
AST 18, ALT 12

BNP 5943

8.2
3.9 148
26.9

TSH 99.00
fT4 0.31 (0.9-1.7)
T4 2.0 (5-11.6)
T3 38 (80-195)

Neg TPO antibody
Tg antibody pending

Cort stim:
1PM cortisol 18.9, ACTH <5
8AM cort stim:
10.2→25.6→32.4

A1c 8.4%

Echocardiogram

- Mild LV hypertrophy.
- Poor LV diastolic function.
- LV EF 55%.
- Regional wall motion abnormalities in inferior and posterior walls.
- Normal RV performance.
- Mild aortic stenosis.
- Small pericardial effusion.

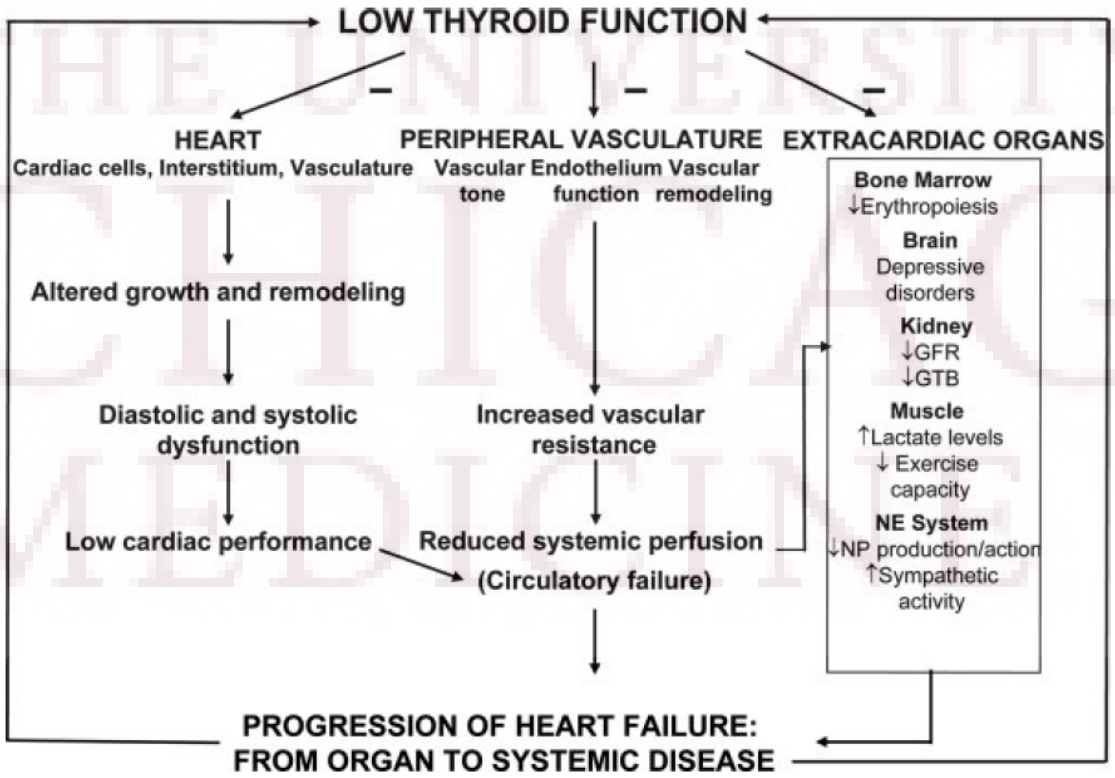
Management

- 26 yo female with PMHx sig. for papillary thyroid cancer, s/p thyroidectomy and RAI, and hypertension.
  - Maintained on LT4 200 mcg daily.
  - Dose later decreased to 137 mcg daily for persistent tachycardia.
  - Renal dopplers negative for RAS.
  - Intensify antihypertensive regimen.
- 86 yo Greek man with PMHx sig for atrial fibrillation, diastolic heart failure, HTN, DM2, and laryngeal cancer.
  - Started on LT4 25 mcg daily.
  - Review prior medical records documenting coronary artery status.

Objectives

- Review the effects of thyroid hormone (or lack of) on the heart.
- Review management of thyroid hormone replacement.

Effects of Low Thyroid Function on the Cardiovascular System



Circulation. 2010 Jul 27;122(4):385-93.

Cardiac s/sxs of Hypothyroidism

- Bradycardia
- Mild HTN, esp diastolic
- Narrowed pulse pressure
- Pericardial effusion
- Myxedema
- Prolonged QTc
  - Risk of ventricular irritability and torsade de pointes
- ↑ total cholesterol, LDL cholesterol
- ↑ CK

N Engl J Med. 2001 Feb 15;344(7):501-9.

Replacement guidelines

- Replacement therapy reverses all the cardiovascular changes.
- Young patients with no evidence of organic heart disease can be given started on replacement dose immediately.
- Older patients with known or ischemic heart disease should initially be given ~25% replacement dose and increase every 6-8 weeks.
  - New or worsening angina or acute MI was rare, and more patients had improved in anginal symptoms.

N Engl J Med. 2001 Feb 15;344(7):501-9.

Thyroid replacement and ischemic heart disease

- Retrospective review of 1503 consecutive patients with myxedema.
  - 90 patients with myxedema and angina.
  - 55 had angina prior to thyroid replacement therapy.
    - Resolved angina in 5 and improved angina in 16.
    - Worsened angina in 9, 6 of whom had MIs during the year following therapy (2 within the first 2 months)
  - 35 developed angina after treatment.
    - 6 developed angina within the 1st month, 1 of whom had an MI at 4 months and 1 died suddenly after 8 weeks of treatment.
    - 6 developed angina within the 1st year, 2 of whom had MIs and 1 died.
    - 23 developed angina after 1 year, 6 of whom had MIs.
- Authors conclude: "The emphasis which has been laid on the improvement of anginal syndrome observed in some patients on correction of associated thyroid deficiency should not obscure the jeopardy in which the patient with angina and myxedema is placed during the inception of replacement."

Prog Cardiovasc Dis. 1961 Jan;3:364-81.

Thyroid replacement

- Crowley et al. studied 15 patients with primary hypothyroidism.
  - Divided into 2 groups:
    - Group 1: Elderly, high risk patients (n=5)
      - TSH 63±26
      - Treated with 25 ug daily, titrated monthly
    - Group 2: Younger, lower risk patients (n=10)
      - TSH 198±142
      - Treated with 50 ug daily, titrated monthly
  - PEP, LVET, and PEP/LVET all normalized with replacement within 6 weeks.
  - All pericardial effusions (9 patients) resolved.
  - One patient from group 1 developed angina.
- Case reports: 2 patients with primary hypothyroidism had EFs of 20 and 25%, which improved to 49 and 47% within 3 months of replacement.

N Engl J Med. 1977 Jan 6;296(1):1-6.
Int Arch Med. 2011 Jun 21;4:20.

References

- Crowley et al. N Engl J Med. 1977 Jan 6;296(1):1-6.
- Gerdes et al. Circulation. 2010 Jul 27;122(4):385-93.
- Keating et al. Prog Cardiovasc Dis. 1961 Jan;3:364-81.
- Khochtali et al. Int Arch Med. 2011 Jun 21;4:20.
- Klein and Okamaa. N Engl J Med. 2001 Feb 15;344(7):501-9.