

BACKGROUND

- Thyroid dysfunction, both hyperthyroidism and hypothyroidism, can lead to the development of cardiomyopathy.
- We present a patient with acute on chronic decompensated heart failure – the chronic heart failure from long term hyperthyroidism and the acute presentation from profound hypothyroidism.

CASE PRESENTATION

History of Presenting Illness:

- 23-year-old female with history of Graves' disease s/p thyroidectomy and iatrogenic hypothyroidism on levothyroxine, history of Graves' associated tachycardia mediated nonischemic cardiomyopathy with an LVEF of 20% and LVIDD 6cm presented to ED after being lost to follow up for 1 year with profound lethargy.

Physical Exam:

- Vitals signs with hypotension and tachycardia.
- Exam otherwise notable for lethargy, tachycardia with RRR, diminished breath sounds at bilateral lung bases, and 1+ bilateral pitting edema to ankles.

Labs:

- Lactic acidosis of 7.1 mmol/l, elevated creatinine of 1.44 mg/dl from baseline 0.9 mg/dl with poor urine output, TSH of >100 miu/l with free T4 0.03 ng/dl.

Echocardiogram:

- LVEF 15%, LVIDD 6.6cm, moderate reduction in RV systolic function with TAPSE 1.6cm and RVIDD 5.5cm.
- Severe mitral regurgitation and tricuspid regurgitation.

Right Heart Catheterization:

- RA 27 mmHg, PA 44/32 (37) mmHg, PCWP 32 mmHg
- PA Sat 14%; Fick Cardiac Index 1.3 L/min/m², PAPi 0.44.

Management:

- Initiated on inotrope and had placement of CP and RP impella for biventricular support → improvement in cardiac index to 2.58 L/min/m².
- With concerns for worsening cardiomyopathy and shock in the setting of profound hypothyroidism, started on IV levothyroxine (T4) and IV triiodothyronine (T3).
- After achieving a euthyroid state in a few days, she was able to be weaned off inotropes and mechanical support.
- Eventually discharged home on 125mcg of oral Levothyroxine daily.

Thyroid dysfunction – Hyper or Hypothyroidism – can cause Cardiomyopathy.

In patients with preexisting Cardiomyopathy:

1. Maintaining euthyroid state is essential in preventing decompensation
2. If decompensation occurs, restoration of euthyroid state is essential for recovery

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DISCUSSION

- The mechanism by which thyroid dysfunction causes cardiomyopathy is not fully understood.
- However, thyroid hormone or lack thereof is known to cause alterations in multiple parameters including preload, afterload, heart rate, cardiac muscle contractility, and even cardiac gene expression.
- As illustrated by this case, the impact of changes in thyroid function in patients with preexisting heart failure can be even more pronounced and devastating.
- As such, maintaining a euthyroid state is essential in preventing decompensation of heart failure and if decompensation has occurred, restoration of a euthyroid state is essential for recovery.

FIGURE 1



Figure 1: Video replay of apical 4 chamber view of patient's echocardiogram on admission.

DISCLOSURE INFORMATION

There are no disclosures to report on behalf of any of the authors.