

Rowan University

Rowan Digital Works

Stratford Campus Research Day

27th Annual Research Day

May 4th, 12:00 AM

Mixed Beri's: High Output Heart Failure from Severe Anemia and Thiamine Deficiency

Rohan Umrani
Rowan University

Hiral Amin
Rowan University

Ashley Pinckney
Rowan University

Charles Yang
Rowan University

Daniel Tran
Rowan University

Follow this and additional works at: https://rdw.rowan.edu/stratford_research_day



Part of the [Cardiology Commons](#), [Cardiovascular Diseases Commons](#), [Diagnosis Commons](#), [Emergency Medicine Commons](#), [Internal Medicine Commons](#), [Nutritional and Metabolic Diseases Commons](#), [Pathological Conditions](#), [Signs and Symptoms Commons](#), and the [Therapeutics Commons](#)
Let us know how access to this document benefits you - share your thoughts on our [feedback form](#).

Umrani, Rohan; Amin, Hiral; Pinckney, Ashley; Yang, Charles; and Tran, Daniel, "Mixed Beri's: High Output Heart Failure from Severe Anemia and Thiamine Deficiency" (2023). *Stratford Campus Research Day*. 12. https://rdw.rowan.edu/stratford_research_day/2023/may4/12

This Poster is brought to you for free and open access by the Conferences, Events, and Symposia at Rowan Digital Works. It has been accepted for inclusion in Stratford Campus Research Day by an authorized administrator of Rowan Digital Works.

Mixed Beri's: High Output Heart Failure in the Setting of Severe Anemia and Thiamine Deficiency

Rohan Umrani DO, Hiral Amin DO, Ashley Pickney DO, Charles Yang DO, Daniel Tran DO
 Virtua Health, Department of Cardiovascular Disease

BACKGROUND

- Severe anemia and thiamine deficiency can independently result in high output heart failure (HOHF) through different mechanisms.
- Whole blood thiamine levels and iron studies are not routinely performed in patients with alcohol dependence at risk of heart failure.

CASE PRESENTATION

- HPI: 63-year-old male with alcohol use disorder consuming 18 drinks/week presented with progressive shortness of breath and lower extremity edema for the past several months.
- Vitals: BP 146/77, HR 97, T 97.4°F, SpO2 98% RA
- Physical Exam: Anasarca, JVD, Lancisi's sign, midsystolic murmur.
- Labs:

134	105	13	99	4.3	3.0	86
3.9	22	1.39				

PT 17.7 s, INR 1.5, PTT 440.4 s

Lactate 3.4 mmol/L

Ferritin 5 ng/mL, Iron 14 ug/dL

TIBC 448, Transferrin 320 mg/dL

Thiamine 26 nmol/L

Hemoccult positive stool

- TTE: LVEF 30-35%, mildly dilated LV, SV 103 ml, CI 4.3 L/min/m² (Figure 1)
- Cardiac Catheterization: no significant obstructive coronary disease. (Figure 2)
- Colonoscopy: bleeding diverticulosis and hemorrhoids.
- Diagnosis: critical iron deficiency anemia due to lower GI bleed and severe thiamine deficiency.
- Treatment: parenteral thiamine infusions, intravenous iron sucrose, and blood transfusions.

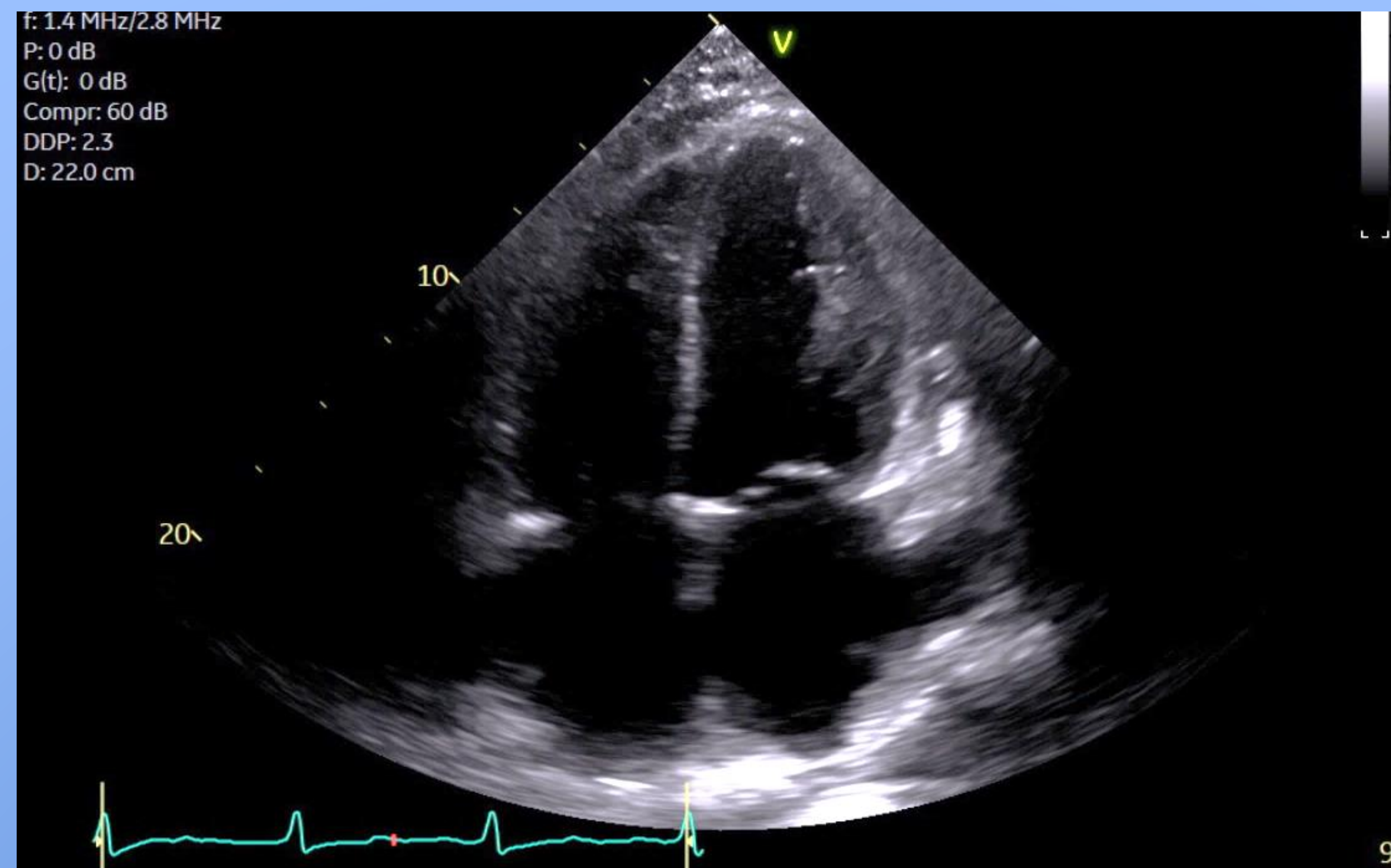


Figure 1. Mild LV dilation and reduced LVEF of 30-35%.



Figure 2. Coronary angiogram showing no obstructive disease.

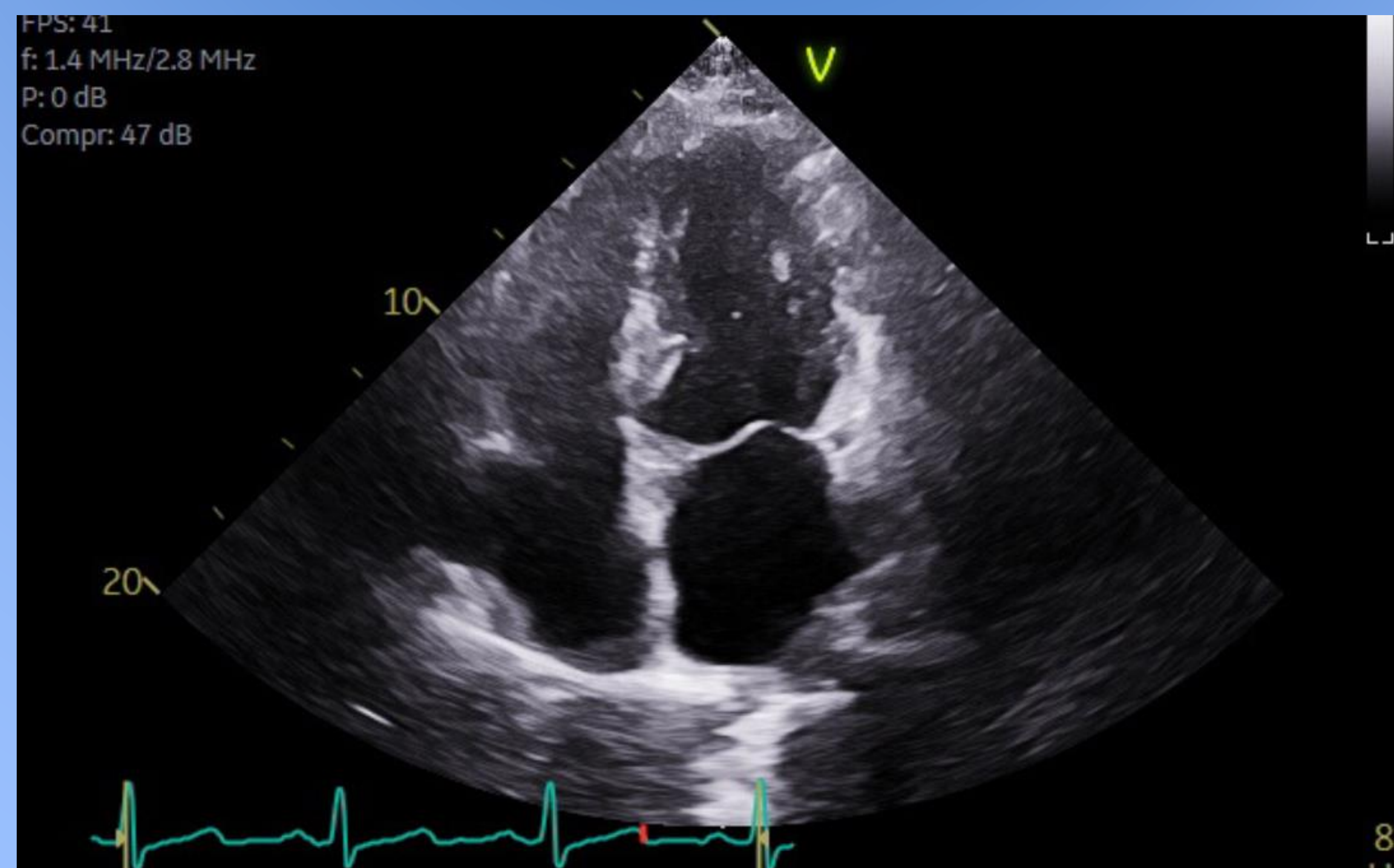


Figure 3. LVEF recovered to 50-55% at 5 month follow up.

DISCUSSION

- Severe alcoholism can cause myelosuppression and increase bleeding risk contributing to both thiamine deficiency and anemia. This in turn can precipitate heart failure.
- Cardiac catheterization excluded ischemic etiology of new onset cardiomyopathy prompting further investigation into alternative causes.
- Iron studies and whole blood thiamine levels can elucidate underlying pathophysiology to direct medical therapy.
- The diagnosis of HOHF is supported in the setting of severe anemia and concomitant cardiac Beri Beri.
- Repeat echocardiogram at 5 months demonstrated recovered LVEF to 50-55% and improvement in both LV dilation and diastolic dysfunction (Figure 3).

CONCLUSION

- HOHF is generally reversible with etiology-directed medical therapy.
- In patients with chronic alcohol use, routine testing of whole blood thiamine to assess for occult vitamin deficiency should be considered.
- Threshold levels and potential synergistic effects of iron deficiency and thiamine deficiency on HOHF remains to be determined.

REFERENCES

- Anand I, McMurray JJV, Whitmore J, et al. Anemia and Its Relationship to Clinical Outcome in Heart Failure. *Circulation*. 2004;110:149-154.
- Attaluri P, Castillo A, Edris H et al. Thiamine Deficiency: An Important Consideration in Critically Ill Patients. *Am. J. M. Sc.* 2018; 356 (4): 382-390.
- Mehta PA, Dubrey SW. High output heart failure. *Q J Med.* 2009; 102:235-241.