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Acute Heart Failure in Hypothyroidism: A Rare Clinical Presentation and Management Case Study

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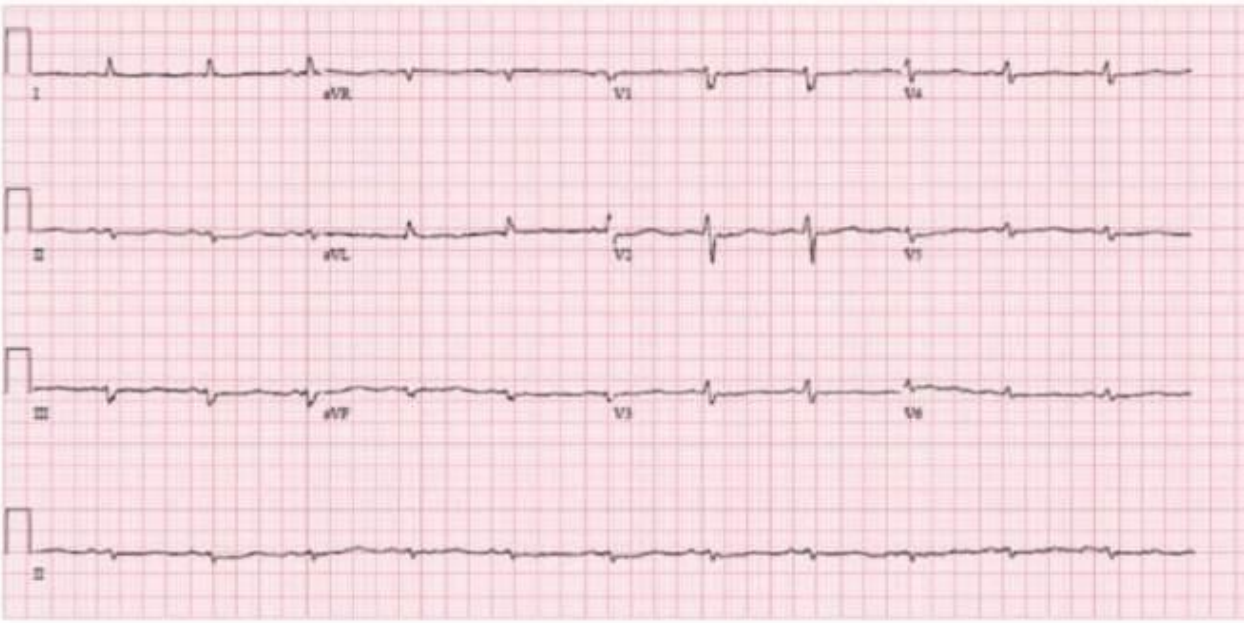
Abstract: ***A 45-year-old female presented with syncope and symptoms suggestive of hypothyroidism. Despite severe hypothyroidism, she lacked classic signs of myxedema or coma. Cardiac assessment revealed severe left ventricular systolic dysfunction (LVSD) with normal coronary arteries. Treatment with low-dose levothyroxine and heart failure therapy led to significant improvement in symptoms and cardiac function within a month. This case highlights the importance of early recognition and management of hypothyroidism-induced heart failure, emphasizing its reversible nature with timely thyroid replacement therapy. Clinical examination revealed anemia and pedal edema. Her BP was 100 / 70 & PR – 66/min SPO2 – 94% at RA. ECG Showed sinus rhythm, Low voltage, no evidence of ischemia. TSH levels were 225 mIU/L, and free T3 levels were <0.02 ng/dL. Thyroglobulin & thyroid microsomal antibodies were positive. Laboratory investigations showed mild Anemia, normal renal function and electrolytes. NT pro BNP & D-dimer elevated. Mental status intact & showed no features of myxedema or coma. Echo showed Severe LV SD – 34%. Mild PHT. CAG - Normal Epicardial Coronaries, started on Low dose Levothyroxine & Guideline directed medical therapy for heart failure. After One month follow up her symptoms improved. She had lost around 5 Kg weight. NT Pro BNP & D-dimer became Normal. Ejection Fraction improved.***

Keywords: hypothyroidism, acute heart failure, left ventricular dysfunction, thyroid replacement therapy, cardiovascular effects

1. Introduction

Our case describes a patient who was profoundly hypothyroid yet had no features of myxedema or coma & showed significant improvement with thyroid replacement therapy. The improvement in Cardiac Contractility demonstrates the reversible nature & LVSD improved with restoration of thyroid function. The initiation of an appropriate LT4 dose is important to prevent arrhythmias.



ECG shows Low Voltage Complexes

This study underscores the critical need for thyroid function assessment in patients presenting with unexplained cardiac dysfunction

2. Discussion

Thyroid dysfunction and Cardiovascular dysfunction are almost synonymous with each other. Changes in the thyroid hormone levels lead to cardiac dysfunction.

There are changes in the Cardiac parameters with hypothyroidism. Thyroid hormone, specially T3 is fairly known to impact contractility and vascular resistance.

Adverse cardiovascular events due to endothelial dysfunction and increased cholesterol levels are known in subclinical thyroid dysfunction. Cardiac output can significantly decreased by 30 to 50 % in hypothyroidism, and other effects like bradycardia, diastolic dysfunction and narrow pulse pressure are seen. Subclinical hypothyroidism can lead to atrial fibrillation, cardiovascular disease and mortality.

Ripoli et al[5] showed the systolic dysfunction is associated with subclinical hypothyroidism, and replacement therapy can improve it.

3. Conclusion

Hypothyroidism is a reversible cause of heart failure, underscoring the importance of comprehensive cardiac assessment, including ECG, echocardiography, and NT-proBNP levels, in hypothyroid patients. Regular follow-up and appropriate thyroid replacement therapy are essential for improving cardiac function and preventing complications.

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