



Calm Before the Storm: Bradycardia due to Hypothyroidism

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Introduction

- Hypothyroidism can present in a variety of manners.
- Screening for hypothyroidism is not recommended by the USPSTF, but certain populations are at increased risk for the disease.

Case Description

- A 65 year old man presented to the emergency department after experiencing **an episode of lightheadedness** when rising from a chair, **without any falls or loss of consciousness**.
- PMH:** osteomyelitis of the skull, traumatic brain injury, remote history of **pediatric cranial tumor treated with cranial irradiation**
- PSH:** successful incision and drainage of a scalp abscess for recurrent osteomyelitis 14 days prior
- Exam:** afebrile, **pulse 35-61**, blood pressure 85-125/63-92, respiratory rate 10-17. Post-surgical incisions present on scalp.

Labs

CBC + BMP: unremarkable

TSH: 111

Free T4: 0.2

Thyroid peroxidase antibody: 2401.0

PM cortisol 4.0

AM cortisol 5.7

Hospital course

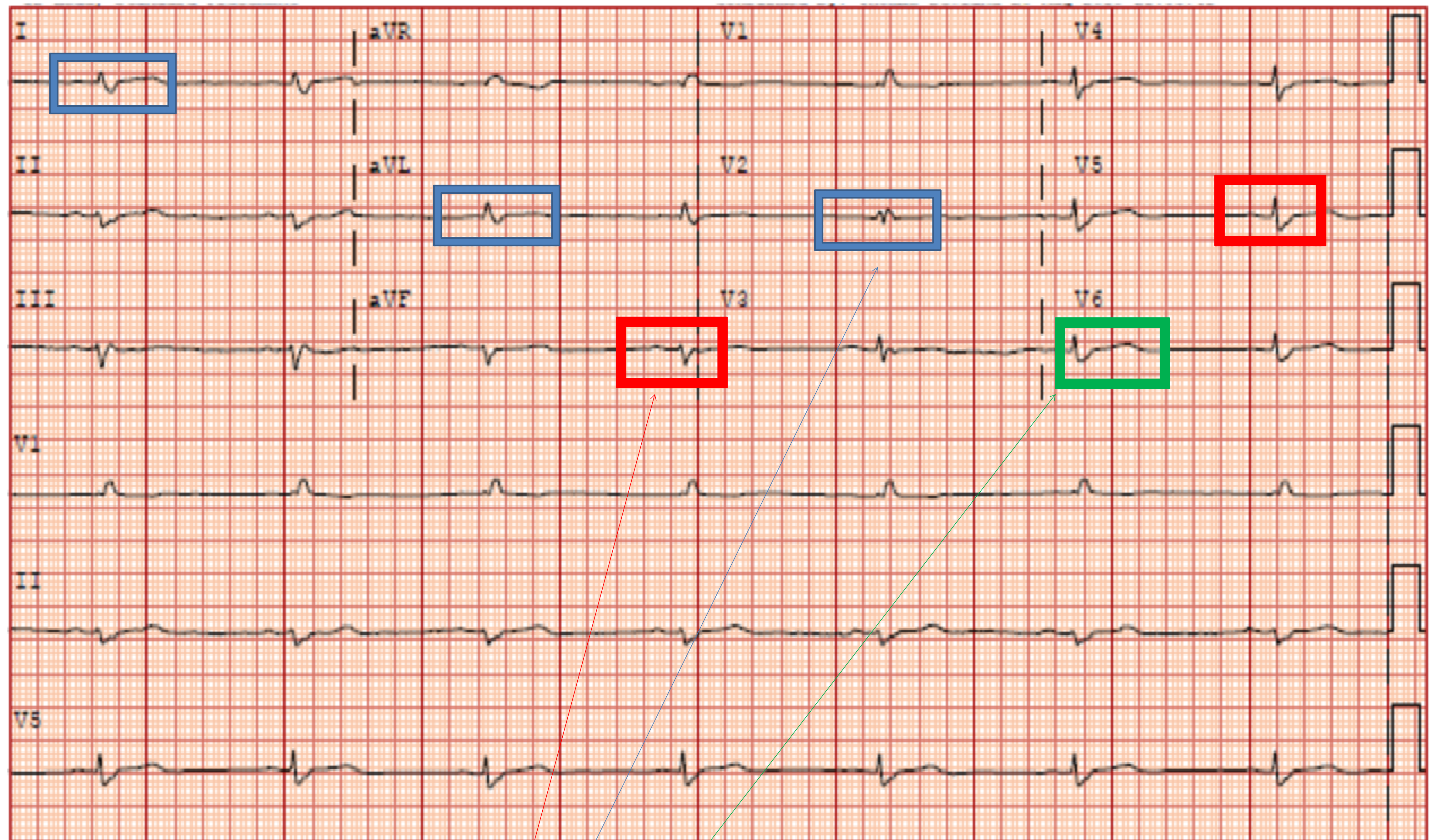
- Started on oral levothyroxine

- Started on IV hydrocortisone with **concern for adrenal insufficiency**, but it was discontinued after a **normal cosyntropin stimulation test**.

References

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- Popoveniuc G, Chandra T, Sud A, et al. A diagnostic scoring system for myxedema coma. Endocr Pract. 2014;20(8):808-817.
- Shrivastava P, Tiwari A. ECG & Echocardiographic Changes in Newly Diagnosed Primary Hypothyroidism. International Journal of Contemporary Medical Research. 2017;4(3). https://www.ijcmr.com/uploads/7/7/4/6/77464738/ijcmr_1325_march_30.pdf.
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ECG Findings



The patient's ECG demonstrates several classic findings seen in hypothyroidism:³

- low voltage
- RBBB
- prolonged QTc
- sinus bradycardia

The ECG did not show T wave inversion, another classic finding.

Teaching Points

- Screening for hypothyroidism is not recommended, but certain populations are at increased risk.
- The diagnosis for myxedema coma is typically based off of the presence of mental status changes, hypothermia, and a precipitating event.
- Classic ECG findings include sinus bradycardia, prolonged QTc, RBBB, low voltage, and T wave inversion
- Patient presenting with myxedema coma should be treated with mineralocorticoids until adrenal insufficiency can be ruled out.

Discussion

Should this patient have been screened for hypothyroidism?

- This patient had few signs or symptoms consistent with hypothyroidism and had recently tolerated surgery with no adverse outcomes.
- He underwent cranial radiation for a tumor as a child, a risk factor for hypothyroidism.¹
- USPSTF has concluded that there is not enough evidence to warrant screening even in the presence of risk factors. Other risk factors include type 1 diabetes, Down's syndrome, and family history of thyroid disease.¹

Was this patient in myxedema coma?

- Specific diagnostic criteria currently do not exist, but diagnosis is often based off of the presence of mental status changes, hypothermia, and a precipitating event.²
- This patient was determined to have untreated primary hypothyroidism without myxedema coma.¹

How was the patient treated?

- The patient was initially treated with levothyroxine and hydrocortisone. In patient's presenting with acute hypothyroidism, adrenal insufficiency must be considered.
- Central hypothyroidism must be ruled out, and primary adrenal insufficiency can also coexist with primary hypothyroidism.⁴