

What's Your Diagnosis?

Complete Heart Block in a Patient With Metastatic Papillary Thyroid Carcinoma

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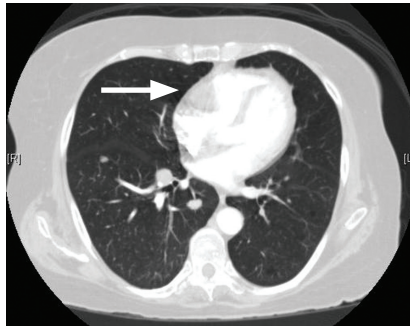
Following a 2-day history of exertional dyspnea and palpitations, diagnostic images revealed a soft tissue mass in the right ventricular overflow tract. Can you guess the cause?

A 74-year-old woman presented with a 2-day history of exertional dyspnea and palpitations. Her past medical history was significant for metastatic papillary thyroid carcinoma treated with total thyroidectomy and radioactive iodine ablation with levothyroxine for chronic suppressive therapy.

On examination, the patient was afebrile with an oxygen saturation of 98% on room air, heart rate of 92 beats/min, and blood pressure of 100/54 mm Hg. There was trace bilateral lower extremity edema, and her cardiopulmonary examination was unremarkable. The laboratory studies showed a white blood cell count of 24,300/ μ L (3,400-9,800); platelets 86,000/ μ L (142,000-362,000); thyroid stimulating hormone 0.009 mIU/L (0.4-4.1); free T4 2.07 ng/dL (0.8-2.0); thyroglobu-

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Figure 1. Computed Tomography Angiogram of the Chest

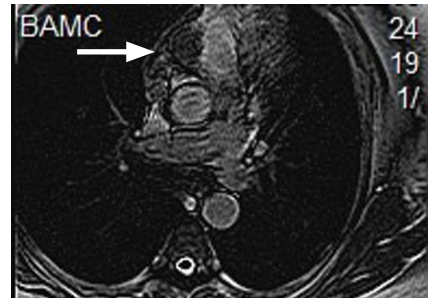


A 2.6-cm soft tissue mass is visible in the right ventricular outflow tract (arrow).

lin antibody titer < 1:10 (< 1:160); thyroid microsomal antibody titer < 1:100 (< 1:1600); and thyroglobulin 17.9 ng/mL (2.0-35.0). Her initial troponin T was undetectable.

An electrocardiogram showed a first-degree atrioventricular block and subsequently a new intermittent third-degree atrioventricular block. A computed tomography angiogram (Figure 1) and cardiac magnetic resonance imaging (Figure 2) revealed a 2.6-cm soft tissue mass in the right

Figure 2. Cardiac Magnetic Resonance Imaging



A low-intermediate T1 intensity lesion is visible (arrow) within the right ventricle, just distal to the tricuspid valve.

ventricular outflow tract along with multiple pulmonary emboli and previously diagnosed pulmonary metastases. A positron emission tomography (PET) scan (not shown) revealed a 3.5-cm PET-avid lesion within the right ventricular outflow tract.

- What is your diagnosis?
- How would you treat this patient?

OUR TREATMENT

Diagnosis and Discussion

This patient experienced complete heart block due to a cardiac tumor from papillary thyroid carcinoma metastasis. Complete heart block is not an unprecedented symptom of metastatic disease, but to our knowledge this is the first reported case of heart block secondary to metastatic papillary thyroid cancer.¹ In general, metastatic cardiac tumors, usually associated with cancers of the breast and lung, melanoma, and lymphoma, are more common than are primary cardiac tumors and are often asymptomatic and discovered mostly postmortem.^{2,3} The frequency of thyroid metastasis to the heart has been reported to be as low as 0% to 2%, and a review of the literature demonstrated only 13 total cases in the past 30 years.

Theoretical mechanisms for invasion into the heart include lymphatic spread, hematogenous dissemination, or direct right ventricular invasion from the thoracic duct. It has been suggested that the lower blood flow to the myocardium (240 mL/min) relative to bone (600 mL/min) or the brain (750 mL/min) is the reason for a lower likelihood of cardiac involvement in metastatic disease.³ Given the findings in this case, evi-

dence of cardiac conduction abnormalities in the setting of papillary thyroid cancer should raise suspicion for cardiac metastatic disease.

Case Outcome

In this patient, a permanent pacemaker was implanted for high-grade atrioventricular block, with resolution of the palpitations. The pulmonary emboli were concomitantly treated with enoxaparin, and the patient was discharged to a rehabilitation facility. Her prognosis was extremely poor given that survival with cardiac metastasis from any type of cancer is limited to a few weeks to months.³ She was to be reevaluated for experimental chemotherapy after reconditioning. However, not long after discharge she was readmitted in respiratory failure and died. ●

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Author disclosures

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