



Thyroid Cancer With Cardiac Metastasis Presented With New Onset of Atrial Fibrillation

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Atrial fibrillation (Af) is frequently seen in the emergency department (ED), and the main concern of which is the potential to lead to blockage of blood flow. Cardiac tumors can also present with Af, which are often overlooked due to the rarity but clinically significant. A 70-year-old woman presented at our ED with intermittent palpitation and dizziness for several weeks. She has an underlying disease of right thyroid follicular carcinoma status-post surgery many years ago, but no history of heart disease. Her electrocardiogram (ECG) showed Af, and the transthoracic echocardiography showed a huge mass occupying the left atrium. The patient underwent an open-heart surgery with tumor excision. The pathology revealed metastatic thyroid follicular carcinoma. The patient recovered smoothly, and her ECG showed normal sinus rhythm after the operation. Most cardiac secondary tumors remain clinically silent and are often diagnosed postmortem. These conditions are rare but clinically significant; therefore, the physician should always raise suspicion of metastatic cardiac tumor as the differential diagnosis when patient presents with an unexplained Af.

Key words: atrial fibrillation, thyroid cancer

Introduction

Atrial fibrillation (Af) is an irregular heartbeat that the atria beat chaotically, irregularly and out of coordination with the ventricles of the heart. The main concern with Af is the potential to develop blood clots within the atria of the heart, which then circulate to other organs and lead to blockage of blood flow. Af is frequently seen in the emergency department (ED) and is usually related to abnormalities or damage to the heart's structure. Only about one-tenth of patients who died of cancer showed cardiac spread at postmortem examination had presented with cardiac involvement symptoms or findings.¹ Cardiac tumors can also present with Af which are often overlooked due to the rarity. We present a 70-year-old woman presented with new onset Af, eventually diagnosed as metastatic cardiac tumor originally from thyroid cancer.

Case Report

A 70-year-old woman presented at our ED with intermittent palpitation and dizziness for several weeks. She was initially treated at the ear-nose-throat outpatient clinic with no improvement. She has an underlying disease of right thyroid follicular carcinoma status-post surgery many years ago, but no history of heart disease. Her heart rate was around 100 beats per minute, blood pressure 137/90 mmHg, and respiratory rate 17 breaths per minute on arrival. Breathing sounds were clear and symmetric bilaterally, but her heartbeat was irregularly irregular. Other physical examination findings were unremarkable. Her electrocardiogram (ECG) revealed Af (Fig. 1) and chest X-ray indicated cardiomegaly. Her blood tests including renal, liver, and cardiac enzymes were normal. Computerized tomographic brain scan was arranged

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for prolonged dizziness, which revealed no evidence of structural lesion. The transthoracic echocardiography demonstrated a huge 6.7×2.9 cm mass occupying the left atrium (Fig. 2), dilated left atrium size, mild mitral regurgitation with pressure gradient 26 mmHg and normal ejection fraction. The patient was then admitted to cardiovascular surgery ward for further management. She went on to have an open-heart surgery with tumor excision. The pathology report revealed metastatic thyroid follicular carcinoma. The patient recovered smoothly, and her ECG revealed normal sinus rhythm after the operation.

Discussion

Af is the most frequently encountered arrhythmia in ED, and the estimated global age adjusted prevalence was 0.5% in 2010, representing nearly 33.5 million individuals.² As the population ages globally, Af is predicted to affect 6–12 million people in the USA by 2050 and 17.9 million in Europe by 2060.^{2,3} Although embolic stroke is the most concerned complication, Af also has been linked with increased risk of myocardial infarction, heart failure, pulmonary embolism, chronic kidney disease, and mortality.⁴ The

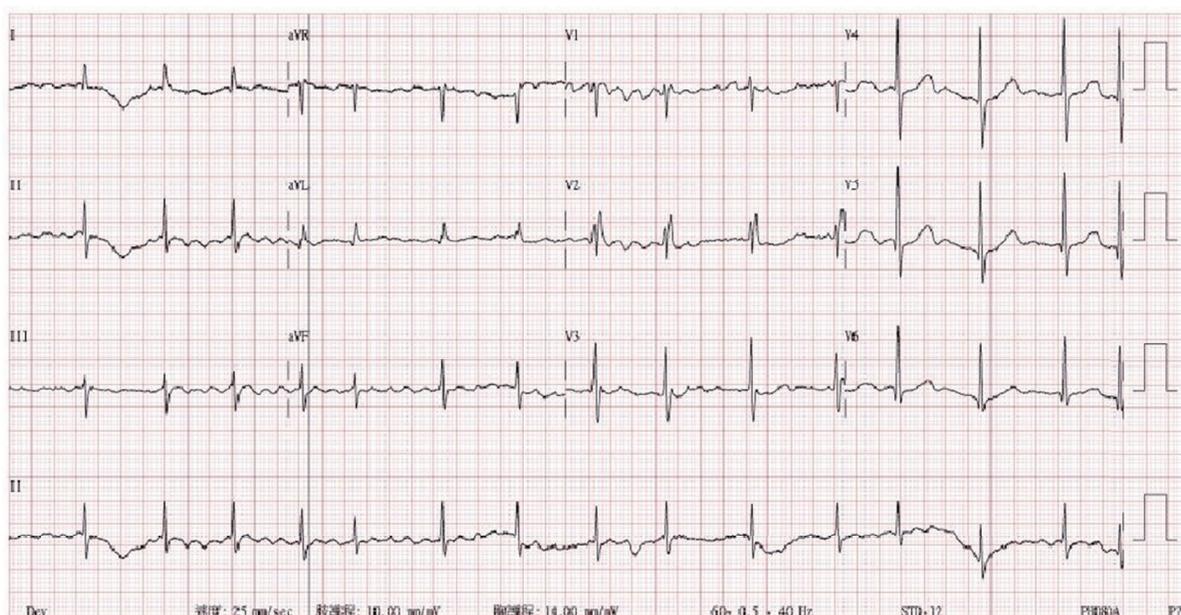


Fig. 1. The 12-leads electrocardiogram revealed atrial fibrillation.

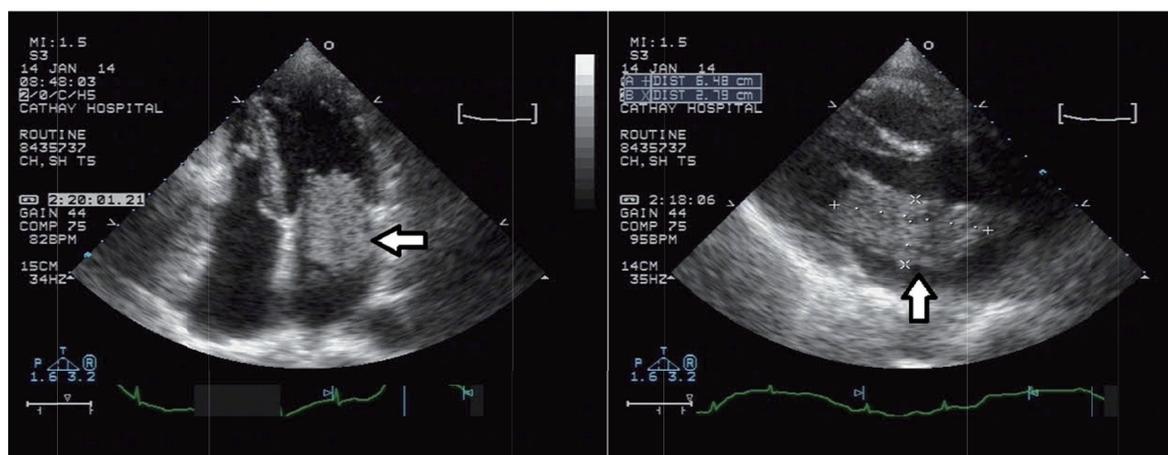


Fig. 2. The transthoracic echocardiography revealed a huge 6.7×2.9 cm mass occupying the left atrium (left: apical view, right: para-sternal long axis view).

common causes of Af are due to changes of the heart tissue, which most often related with high blood pressure or ischemic heart disease.⁴ Other factors such as aging, infection, genetics, or cardiac tumor may also cause Af by changing the cardiac tissue or structure.⁴

The incidence of Af contributes by cardiac tumor is not commonly seen in clinical practice. Among them, the reports of Af cause by metastatic cardiac tumor were limited in recent literature. Usually, the metastatic tumor reaches the heart via hematogenous or lymphatic spread or by direct or transvenous invasion.¹ Endocardial metastases are usually the result of the hematogenous spread with intracardiac chambers growth.⁵ The intracardiac chambers growth cause atrial overload or ventricular hypertrophy, which secondarily increased the chamber diameter and altered conduction, could lead to abnormal electrocardiography findings.⁶ Echocardiography, computerized tomography, and magnetic resonance imaging are feasible diagnostic tools for the evaluation of the intracardiac tumors. Echocardiography is best for assessment of the tumor's effect on flow dynamics, whereas cardiac magnetic resonance imaging is useful for detection of tumor infiltration and tissue characterization. Because of the limitation by the cost of these diagnostic tools, the diagnosis remains late. Therefore, ECG plus emergency point-of-care ultrasound could be a practical tool for the early screening. Cates et al. reported that the ECG changes most commonly seen in metastatic cardiac tumor are T wave inversion, ST segment elevation, new atrial arrhythmia, and low voltage.⁷

Most cardiac secondary tumors remain clinically silent (over 90%) and are often diagnosed postmortem.⁸ These conditions are rare but clinically significant, when Af was detected as the main presentation of metastatic cardiac tumor. Therefore, the physician should always raise suspicion of metastatic cardiac tumor as the differential diagnosis when patient presents with an unexplained Af.

In conclusion, any new ECG changes should raise the suspicion of cardiac metastases in patient who is clinically stable with preexisting cancer but no cardiac symptoms suggestive of ischemia.

Conflicts of Interest Statement

None of the authors have any conflicts to disclose.

Financial Disclosure

None.

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