Cardiac Tamponade as the Initial Presentation of Thymic Carcinoma — A Case Report

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Thymic carcinoma is a rare tumor in the anterior mediastinum, which is often seen in adults over 40 years old. Typically, it is asymptomatic for a prolonged period of time. An incidental finding of a mass on a chest x-ray film is the most common presentation. Symptomatic patients often complain of chest pain, cough or other upper respiratory symptoms. Pericardial effusion may be present occasionally, but cardiac tamponade is rarely seen. There are only scattered reports of thymic carcinoma presenting with cardiac tamponade. We report a 65-year-old woman with thymic carcinoma who had an episode of near-syncope due to cardiac tamponade. Emergent pericardiocentesis terminated the life-threatening condition. Fine needle biopsy showed a poorly differentiated epidermoid thymic carcinoma. Computed tomography of the chest also proved that tumor extended to the chest wall, pericardium, aorta, pulmonary arteries and superior vena cava.

Key Words: Cardiac tamponade • Thymic carcinoma

INTRODUCTION

Thymic tumor is the most common primary tumor of the anterior mediastinum.1-4 Thymic tumors include thymomas, which are usually relatively slow growing, and thymic carcinomas, which often behave more aggressively.2,3 Thymic carcinoma accounts for 2 to 6% of thymic tumors.2,3 The usual initial presentation includes cough, chest pain, phrenic nerve palsy, or superior vena cava syndrome.2,3 Cardiac tamponade as the first presentation in thymic carcinoma is very rare.5 We report such a case.

CASE PRESENTATION

A 65-year-old, previously healthy woman noticed progressive exertional dyspnea and orthopnea for 2 weeks. Because of an episode of near-syncope and diaphoresis, she came to our emergency room. On arrival, her temperature was 36.8 °C, pulse rate 130 per minute, respiratory rate 26 per minute, and blood pressure 89/56 mmHg. She had bilateral jugular venous engorgement. The heart sounds were distant, and no murmur or rub was appreciated. The breath sounds were normal bilaterally. A palpable 3 × 4-cm lump was detected on the left upper chest. The abdomen was soft and non-tender, and the liver and spleen were not palpable. The BUN was 12 mg/dL, creatinine 0.9 mg/dL, sodium 139 meq/dL, potassium 3.6 meq/dL, hemoglobin 12.7 mg/dL, and white blood cell count 8400/mm3. The chest film showed a water-bottle appearance of the heart shadow (Figure 1). The electrocardiogram had low voltage in all leads. Cardiac tamponade was suspected. Emergent two-dimensional echocardiography demonstrated a massive pericardial effusion, right ventricular diastolic collapse, and an exudative coating attached to the right ventricular free wall (Figure 2A). Pulsed-wave Doppler recording showed an up to 33% change in transmitral inflow velocity during respiratory cycle (Figure 2B). The minimum velocity was 0.5 m/s and the maximum velocity was 0.8 m/s.
Pericardiocentesis yielded approximately 1200 cc of bloody fluid, after which the patient’s hemodynamic condition improved. Cytology and culture of the fluid were unrevealing. Computed tomography of the chest demonstrated a heterogeneous mass in the anterior mediastinum with extension to the chest wall, invasion of the great vessels and pericardium, and a resultant pericardial effusion. M = mass; Ao = aorta; Pul = pulmonary trunk; SVC = superior vena cava; RV = right ventricle; LV = left ventricle. Given the extent of the lesion, radical resection was not attempted, and the patient was treated with radiotherapy and chemotherapy. She was later readmitted with severe septicemia and died 6 months after the initial diagnosis of thymic carcinoma.
DISCUSSION

Thymic carcinoma is an entity distinct from the more common and relatively less aggressive benign thymoma. The age distribution for patients with thymic carcinoma is broad, ranging from 10 to 76 years. At presentation, nearly one third of patients are asymptomatic, and the tumor is often discovered by routine chest radiography. Symptoms that do occur are generally related to the anterior mediastinal mass effect, with chest pain, cough, dyspnea, and other upper respiratory complaints being the most common. Occasionally, patients present with superior vena cava syndrome, hoarseness, and weight loss. Cardiac tamponade as the presenting manifestation of thymic carcinoma is an extremely rare occurrence. In a review of the literature, only three reported cases similar to our patient were found.

The anterior mediastinum is completely shielded body cavity, so unless a tumor there is quite large, it is difficult to detect. This is why more than 90% of patients with thymic carcinoma are not diagnosed until the tumor is in an advanced stage. The pleura, innominate vein, pericardium, and lung are the structures most commonly invaded by these tumors. The absence in our patient of long-standing respiratory symptoms and the lack of a mass on the chest x-ray film made the diagnosis more obscure. Our patient did not seek for medical help until the development of an episode of near-syncope. It was only when the mass seen on computed tomography was biopsied that a definitive diagnosis of thymic carcinoma was made, which then explained the pericardial effusion with which she presented.

The prognostic implications of pericardial or pleural involvement are not clear, with some authors suggesting it does not predict a worse outcome. In contrast, invasion of the superior vena cava, pulmonary vessels or aorta does indicate a poor prognosis. Invasion of a great vessel not only precludes complete resection of the tumor but also indicates likely hematogenous spread. Overall, tumor grade, tumor stage, and resectability constitute the most reliable predictors of prognosis in thymic carcinoma. Complete resection is still the best treatment, with the completeness of resection being the major prognostic factor. The five-year survival rate for all patients with thymic carcinoma varies from 30 to 50%. In our patient, the tumor had already invaded the great vessels and was unresectable when she first presented. So while it may not have been the pericardial involvement itself that led to her demise within 6 months of diagnosis, she clearly already had a grim prognosis by the time the thymic carcinoma was discovered.

In a patient with a malignant tumor and pericardial effusion, the differential diagnosis includes malignant effusion and benign idiopathic, drug-induced, tuberculosis-related, or radiation-induced pericarditis. The diagnosis of malignant pericardial effusion is made by means of pericardiocentesis. The results of cytologic studies are generally positive in 60 to 90% of patients with any type of malignancy, but positive cytologic results in patients with thymic carcinoma are reportedly lower. In a series of 38 cases of thymic carcinoma, the diagnosis required histologic examination of a biopsy or surgical specimen. Based on these studies and our own experience with this patient, we recommend fine needle biopsy or surgical biopsy rather than pericardiocentesis if a pericardial effusion is thought to be secondary to thymic carcinoma. Our patient had a negative cytologic result and thus needed a needle biopsy to confirm the diagnosis. However in cases of tamponade, such as this patient had, pericardiocentesis is necessary for its therapeutic effect.

There has only been limited experience of echocardiography in cases of thymic carcinoma metastatic to the pericardium, with rare reports of a pericardial hyperechogenic mass being seen. Unlike some benign primary cardiac neoplasms, there are no echogenic features specific enough to diagnose metastatic tumor invading the pericardium on the imaging study alone. On the other hand, echocardiography may provide important hemodynamic information and detect the presence of tamponade. Both right ventricular diastolic collapse and marked respiratory variation in the mitral inflow velocity as demonstrated in our case, are suggestive of cardiac tamponade. In this potentially life-threatening situation, emergent pericardiocentesis is clearly indicated.

Pericardial malignancy originated from primary cardiac tumors is uncommon. The common origins are cancers of the lung and breast, melanoma, and lymphoma. From this patient, we learn that thymic carcinoma should be included in the differential diagnosis in patients with an anterior mediastinal mass and...
pericardial effusion.

REFERENCES

胸腺癌以心包膜填塞為最初表徵 —— 一病例報告

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胸腺癌是前縱隔腔極為少見的腫瘤，好發於四十歲以上之成人。一般而言，它會先有一段長時間的無症狀期。最常見的表現是無意間在胸部 x 光片發現腫塊。有症狀的病人常抱怨胸痛、咳嗽以及其他上呼吸道的症狀。心包膜積水偶而可見於此類病人，但心包膜填塞就非常少見。只有零星個案被報導。我們在此報導一個六十五歲女性胸腺癌案例：病人有暈眩的產生，其原因為心包膜填塞。緊急心包膜抽水救回此病人。細針病理切片証實為分化不好的上皮細胞胸腺癌。電腦斷層証實腫瘤擴散至胸壁、心包膜、主動脈、肺動脈以及上腔靜脈。

關鍵詞：心包膜填塞、胸腺癌。