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A Case of Pericardial Effusion and Cardiac Tamponed with Hyperthyroidism

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Abstract

Pericardial effusion is rarely associated with hyperthyroidism, but we discuss the case of a patient with hyperthyroidism that developed pericardial effusion and cardiac tamponade.

Case definition: A 69 year-old woman visited the hospital complaining mainly that she felt there was a lump in her throat. She had not received any treatments since being diagnosed with hyperthyroidism two years previously. The chest radiograph indicated cardiac hypertrophy and pericardial effusion on the left side of the heart. Tests showed that the level of her thyroid-stimulating hormone was low but her free thyroxine level was normal. Echocardiography revealed pericardial effusion and cardiac tamponade. One thousand milliliters of fluid was removed during pericardiocentesis.

Discussion: About 11 cases of pericardial effusion associated with hyperthyroidism have been recorded. However, in some reports the patients suffered from bloody pericardial effusion and cardiac tamponade, which was related to the drug heparin that they took. Like our patient, those in the other reports did not take anticoagulants.

Keywords: Abstract sections; Move; Research articles; Rhetorical structures

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Introduction

Hyperthyroidism and cardiac disorders are almost common conditions [1]. Chances for the development of sinus tachycardia, premature ventricular contraction, and atrial fibrillation increase with increases in thyroid hormones [2,3]. The risk factors increasing atrial fibrillation include age, late diagnosis of subclinical hyperthyroidism, and simultaneous heart failure and cardiac ischemia [4,5].

Subclinical hyperthyroidism increases the left atrial volume over time (cardiomyopathy). The mechanism of this disorder is the direct effect the thyroid hormone has on the heart and on the adrenergic system that increases cardiac function followed by hypertrophy due to the excessive cardiac output and increased activity of the rennin-angiotensin system [6,7]. Despite these common cardiac disorders, pericardial effusion associated with hyperthyroidism is still rare so that few articles contain case reports [8,9]. We report the case of a patient with pericardial effusion and cardiac tamponade that developed following hyperthyroidism.

Case Definition

A 69 year-old woman feeling she had a lump in her throat was admitted to the hospital. She complained of dyspnea, insomnia, and weight loss (which had started two years previously). There was no history of sudden death, smoking, and drinking alcohol in her family, and she was not taking any drugs. She had normal conditions in the physical examination. Her blood pressure was 140/90, heart rate 120 beats per minute, respiratory rate 18 breaths per minute, and temperature 38°C. On admission day, the following were observed in the numerous tests. Chest-X ray indicated a clear increase in heart cavity volume and pleural effusion on the left side (Figure 1). Electrocardiography showed sinus rhythm together with periods (episodes) of atrial fibrillations (Figure 2).

Results of blood tests were as follows: TSH: 0.2, T3:71, T4:12.1, Hb: 12.2, HCT: 39, Alb: 2.8

Thyroid ultrasound studies indicated that there were numerous thyroid nodules smaller than one centimeter, and both thyroid lobes were enlarged.

The echocardiography performed on the admission day showed that she had pericardial effusion and normal mitral and aortic valves. Her cardiac output was 60%.

The patient had cardiac tamponade with the classic signs that included jugular vein distension, pulses paradoxes, and muffled heart sounds.

Figure 1. Chest-X ray.

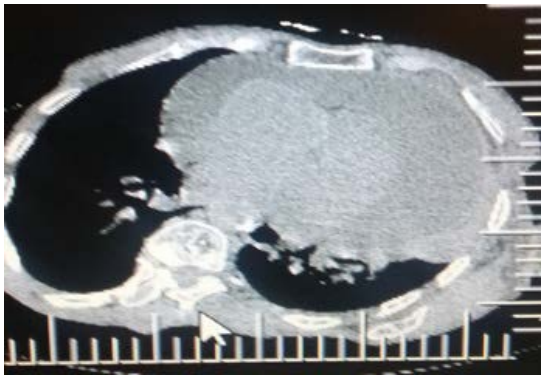

Figure 2. HRCT.

Pericardiocentesis was performed by placing a pericardial drain (pigtail catheter), and about 1000 milliliters of a yellow-citrine fluid was drained during the procedure. Analysis of tests on pericardial fluid showed that no aerobic or anaerobic bacteria grew in the blood and pericardial fluid culture.LDH fluid: 1674

On the third day of hospitalization, the patient complained of dyspnea and fever that were cured by using oxygen therapy and administering intravenous acetaminophen (paracetamol) injection. On the fourth day of hospitalization, the pericardial drain was removed and echocardiography was performed, which showed mild pericardial effusion. Pericardial blood and fluid culture did not indicate bacterial growth. The patient's heart rhythm had converted to sinus rhythm, and she was discharged. Follow up after the discharge indicated that she was re-hospitalized four weeks later due to pericardial effusion and about 840 milliliters of fluid was drained in the pericardiocentesis procedure.

Chest CT scan was performed without injecting a contrast agent. The observed cuts from the throat indicated that the thyroid gland was larger than normal and it had expanded to the superior and anterior mediastinum. Therefore thoracic surgery was proposed for the patient.

Discussion

Pericardial effusion associated with hyperthyroidism happens in about 3-6 percent of patients [10]. However, in our review of literature we only found 11 cases reporting pericardial effusion associated with hyperthyroidism. Like our patient, six of the patients in the reports had suffered from serous effusions [8,11,12]. Similar to our patient, seven of the patients had Graves' disease [1,8,9,11,13] and six had atrial fibrillation. Our patient had serous, nonhemorrhagic effusion and atrial fibrillation [8,9,12].

The mechanism of pericardial effusion associated with hyperthyroidism is still unknown. Authors of previous articles suggested the hypothesis that this mechanism was similar to those of hyperthyroidism associated with myxedema and associated with thyroid associated ophthalmopathy [8,9,14].

In a study on hypothyroidism, intravascular and extravascular protein shifts and also reduced lymphatic drainage were observed. Hyperthyroidism may have a similar pathology [15].

In cases of pericardial effusions, presence or absence of cardiac tamponade necessitates emergency pericardiocentesis. Our patient had developed cardiac tamponade and, therefore, pericardiocentesis was performed. Some previous studies reported cases in which pericardial effusions were treated simply by treating hyperthyroidism [8,11,12].

Echocardiography is usually used to diagnose pericardial effusions. The effusion may sometimes be related to malignancies or to tuberculosis. In a study in the United States, 64 percent of pericardial effusions were bloody and malignancies and tuberculosis were the causes in 26 and 1 percent of the cases, respectively [16]. In another study, 70 percent of the pericardial effusions were bloody and resulted from malignancies [17]. Other studies reported that tuberculosis and malignancies were the causes of pericardial effusions in about 13-45.6% and 4-28.6% of the cases, respectively.

None of these etiologies was involved in the case of the patient reported in the present study because no bacteria grew in blood and pericardial fluid cultures and cytological studies did not indicate presence of malignant cells. Therefore, the pericardial effusion could not be cured by treating hyperthyroidism.

In this article, we introduced a patient with hyperthyroidism that had developed nonhemorrhagic pericardial effusion, cardiac tamponade, and atrial fibrillation. This is a rare case and so far only 11 such cases have been reported. Our patient was like those previously reported with the difference that she suffered from nonhemorrhagic pericardial effusion and developed extensive pericardial effusion and cardiac tamponade again four weeks after the initial pericardiocentesis.

Physicians should keep in mind that cases of pericardial effusion and cardiac tamponade associated with hyperthyroidism are rare, yet they may happen.

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