Pericardial Effusion in a Patient with Hypothyroidism Successfully Treated Without Pericardiocentesis

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Abstract
Hypothyroidism presenting with pericardial effusion is commonly seen. Complete resolution of effusion without pericardiocentesis after thyroid hormone supplement is not reported in literature. We are reporting a case of 70-year-old female presented with breathlessness. She was diagnosed to have moderate pericardial effusion secondary to hypothyroidism. Her symptoms and pericardial effusion completely resolved after 1 month therapy of thyroid hormone without pericardiocentesis. Her QRS voltages on electrocardiogram improved with thyroid hormone supplement. There is no recurrence of symptoms and pericardial effusion after follow-up of 1 year.

Key words: Hypothyroidism, Pericardiocentesis, Pericardial effusion, QRS voltages, Thyroid hormone supplement

INTRODUCTION
Hypothyroidism is the most common pathological hormone deficiency.¹ It is more common in women and its incidence increases with age. Common signs and symptoms of hypothyroidism include lethargy, cold intolerance, weight gain, constipation, dry skin, alopecia, hoarse voice, bilateral lower limb swelling, and hoarseness of voice of 15 days duration. Initially, she had dyspnea on heavy work which later progressed to dyspnea on routine work. On examination, she was conscious oriented, obeying verbal commands. Pulse was 60/min blood pressure - 120/80 mm of Hg. On auscultation heart sounds were muffled, ankle reflexes were delayed bilaterally, SpO₂ was 98% without O₂, electrocardiogram (ECG) showed low voltage complexes, chest radiogram showed marked cardiomegaly, arterial blood gas was normal, and 2D ECHO showed moderate pericardial effusion with no signs of cardiac tamponade.

CASE REPORT
A 70-year-old elderly female presented on August 24, 2015, with a history of breathlessness on exertion, repetitive bilateral lower limb swelling, and hoarseness of voice of 15 days duration. Initially, she had dyspnea on heavy work which later progressed to dyspnea on routine work. On examination, she was conscious oriented, obeying verbal commands. Pulse was 60/min blood pressure - 120/80 mm of Hg. On auscultation heart sounds were muffled, ankle reflexes were delayed bilaterally, SpO₂ was 98% without O₂, electrocardiogram (ECG) showed low voltage complexes, chest radiogram showed marked cardiomegaly, arterial blood gas was normal, and 2D ECHO showed moderate pericardial effusion with no signs of cardiac tamponade.

All routine tests are done to rule out the cause of pericardial effusion. Keeping in mind her symptoms and signs and low voltages in ECG, thyroid function tests (TFTs) are also done and they found to be grossly abnormal which included T₃ – 30 ng/dl, T₄ - 2.0 μg/dl, and thyroid-stimulating hormone (TSH) - more than 40 mIU/L. which was indicative of hypothyroidism. The patient was put on tablet levothyroxine 100 μg OD. Patient felt symptomatically better and was discharged from hospital on August 31, 2015. Repeat 2D ECHO done on follow-up on October 07, 2015, suggestive of normal size cardiac chambers, no pericardial effusion with good left ventricle systolic function. TFT done after 3 months of discharge showing T₃ - 140 ng/dl, T₄ - 10.1 μg/dl, and TSH - 5.6 mIU/L. The patient is coming to follow-up and fine till now a
decreased synthesis of albumin. Increased permeability of capillaries results in loss of albumin in intravascular compartments through increased transcapillary escape rate of albumin, eventually leading to reduced plasma volume. Thus, the consequent increase in concentration of albumin in extravascular compartment causes increased interstitial fluid volume and impaired lymphatic drainage.5,6 Normally, there is 10-50 ml of fluid present between visceral and parietal layers of pericardium, which is produced by pericardium through ultrafiltration of plasma. The above-mentioned pathological mechanisms cause an increase in the volume of the pericardial fluid leading to moderate to severe pericardial effusion. As in our patient, the moderate to severe pericardial effusion can be completely cured without pericardiocentesis only with thyroid hormone supplement. Because of insidious and nonspecific characteristics of the signs and symptoms of hypothyroidism along with rare occurrence of moderate to severe pericardial effusion in some patients, the possibilities of hypothyroidism may be overlooked in the differential diagnosis.7

**DISCUSSION**

Any defect in hypothalamic-pituitary-thyroid axis may result in the development of hypothyroidism. Hypothyroidism is associated with some cardiovascular findings such as increased systemic vascular resistance, decreased cardiac contractility, decreased cardiac output, atherosclerosis, coronary artery disease, and pericardial effusion. Pericardial effusion can be detected in 25% of hypothyroid patients.4 Hypothyroidism leads to decreased synthesis of albumin. Increased permeability of capillaries results in loss of albumin in intravascular compartments through increased transcapillary escape rate of albumin, eventually leading to reduced plasma volume. Thus, the consequent increase in concentration of albumin in extravascular compartment causes increased interstitial fluid volume and impaired lymphatic drainage.5,6 Normally, there is 10-50 ml of fluid present between visceral and parietal layers of pericardium, which is produced by pericardium through ultrafiltration of plasma. The above-mentioned pathological mechanisms cause an increase in the volume of the pericardial fluid leading to moderate to severe pericardial effusion. As in our patient, the moderate to severe pericardial effusion can be completely cured without pericardiocentesis only with thyroid hormone supplement. Because of insidious and nonspecific characteristics of the signs and symptoms of hypothyroidism along with rare occurrence of moderate to severe pericardial effusion in some patients, the possibilities of hypothyroidism may be overlooked in the differential diagnosis.
diagnosis of moderate to severe pericardial effusion. As hypothyroidism is treatable cause of moderate to severe pericardial effusion the diagnosis must be established and treatment should be promptly started.\(^7\) In patients with unexplained pericardial effusion, TFTs and ECHO should always be performed. After obtaining euthyroid status with treatment, pericardial effusion slowly disappears, preventing unnecessary pericardiocentesis in these patients.\(^8\)

REFERENCES