Massive Pericardial Effusion in a Case of Acute Pericarditis with Slight ST-Segment Elevation of Short Duration

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ABSTRACT

We present the case of a 77-year-old woman who suffered from chest pain. Her white blood cell count was 10,200/ μ L and C-reactive protein level was 5.5 mg/dL. There was no electrocardiogram abnormality up to 5 hours after admission. At 15 hours, slight ST-segment elevation occurred, but this disappeared on day 4. Imaging revealed slight pericardial effusion. Nonsteroidal anti-inflammatory drugs and antibiotics were administered. However, the pericardial effusion, inflammatory response, and bilateral heart failure worsened. Pericardiotomy on day 6 released 350 mL of fluid, and symptoms improved. Viral pericarditis was assumed. Massive pericardial effusion is rare in cases of acute viral pericarditis, as is slight, short-duration ST-segment elevation.

KEYWORDS: Acute pericarditis, ST-segment elevation, viral pericarditis

In case of acute pericarditis, ST-segment elevation is usually observed in various leads, and the elevation is typically moderate and concave, and lasts for ~1 week.¹⁻⁵ T-wave inversion occurs subsequently and normalizes after a few months in many cases.^{1,6-10} In our patient, ST-segment elevation was not observed for the first 5 hours after the onset of chest pain. Slight ST-segment elevation developed 15 hours later, which then disappeared 3 days later. However, X-ray computed tomography (CT) and echocardiography showed both pleural effusion and an increase in the circumferential pericardial effusion from 20 to 25 mm. Pericardiotomy was thus performed. The patient's serum echovirus 22 NT antibody titer was increased 32-fold. We hope to increase awareness of the rare possibility of massive

pericardial effusion combined with slight, short-duration ST-segment elevation in cases of acute viral pericarditis.

CASE REPORT

On April 15, 2009, a 77-year-old woman came to our hospital complaining of sudden but continuous chest pain and shortness of breath. Electrocardiography (ECG) showed no abnormality, but she was admitted for further examination. Her medical history and family history were noncontributory. Blood test results were as follows: white blood cell (WBC) count, 10,200/ μ L; creatine kinase, 47 IU/L; aspartate aminotransferase, 13 IU/L; alanine aminotransferase, 8 IU/L; lactate dehydrogenase, 115 IU/L; troponin T, negative; total

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Figure 1 Massive pericardial effusion. Echocardiogram is on the left and computed tomogram on the right.

cholesterol, 213 mg/dL; creatinine, 0.6 mg/dL; C-reactive protein (CRP), 5.5 mg/dL; N-terminal pro brain natriuretic peptide, 2710 pg/mL; blood sugar, 154 mg/dL; and hemoglobin A_{1c}, 5.6%. There was no evidence of thyroid disease, collagen disease, or malignant tumor. Physical examination revealed a body temperature of 38.4°C, blood pressure of 111/74 mm Hg, and pulse rate of 90/min. There was no clear pericardial friction rub upon auscultation. Admission chest X-ray films revealed a cardiothoracic ratio of 69% and mild pulmonary congestion. There was no ECG abnormality up to 5 hours after admission. However, at 15 hours, slight ST-segment elevation was observed in most leads. Echocardiography and X-ray CT showed circumferential pericardial effusion of a few millimeters. Acute pericarditis was suspected, and nonsteroidal anti-

inflammatory drugs and antibiotics were administered. On April 18, the patient's WBC count and CRP level elevated to 14310/ μ L and 54.3 mg/dL, respectively, and the bilateral heart failure worsened. However, the ST-segment elevation had disappeared. On April 20, X-ray CT and echocardiography showed both pleural effusion and an increase in the circumferential pericardial effusion from 20 to 25 mm (Fig. 1). Pericardiectomy was thus performed on day 6. The bilateral heart failure and inflammatory response improved after drainage of 350 mL of clear, yellow pericardial fluid. The patient's serum echovirus 22 NT antibody titer was increased 32-fold, and the pericarditis was thought to be of viral origin. Subsequent ECG changes were T-wave inversion on April 21 and normalization on June 4 (Fig. 2).

Figure 2 Electrocardiogram of the patient. Slight ST-segment elevation was seen in most leads.

DISCUSSION

ECG changes occur in ~80% of cases of acute pericarditis.¹¹ ST-segment elevation is usually observed in various leads, and the elevation is typically moderate and concave, and lasts for ~1 week.¹⁻⁵ T-wave inversion occurs subsequently and normalizes after a few months in many cases.^{1,6-10} The ST/T ratio is usually greater than 0.25^{4,11,12} in cases of acute pericarditis, but the elevation was small at 0.1 to 0.2 mV in our case. The reported cause of the ST-segment elevation is abnormal myocardial repolarization due to the spread of inflammation to the myocardium on the epicardial side (perimyocarditis).^{1,4,7} In our patient, ST-segment elevation was not observed for the first 5 hours after the onset of chest pain. Slight ST-segment elevation developed 15 hours later and then disappeared after 3 days. The reason was thought to be a slight spread of inflammation to the myocardium although pericardial inflammation was severe in our case. Massive pericardial effusion is rare in acute viral pericarditis.^{13,14} We also consider massive pericardial effusion to be rare with only a short duration of slight ST-segment elevations.

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