A Case of Eosinophilic Heart Disease Diagnosed by Endomyocardial Biopsy Findings

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SUMMARY

A rare case of early stage eosinophilic heart disease was diagnosed by endomyocardial biopsy findings, despite the relatively low peripheral eosinophil blood count (640/mm³).

Additiona Indexing Words:
Eosinophilic heart disease Cationic protein Degranulated eosinophil

In recent years heart disease with eosinophilia has been called "eosinophilic heart disease" and this disease has aroused great interest. However, the pathological findings of this disease are very scanty, especially during the early stages. We report a case in which eosinophilic invasion of myocytes, with resulting myocardial damage was verified by endomyocardial biopsy findings at an early stage.

CASE REPORT

History: A 22-year-old man was admitted to a nearby hospital with complaints of precordial pain. Cardiomegaly was detected on physical examination. For a more extensive examination he was transferred to our hospital. He had twice suffered from pneumothorax at the ages of 19 and 20. Soon after operation for the second pneumothorax, he complained of precordial pain at rest once a week. This has continued for the past 2 years. He had no history of allergic or parasitic disease.

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Fig. 1. Chest x ray and ECG on admission showing cardiomegaly (CTR: 60%) and high voltage.

Physical examination: Height was 160 cm. Body weight was 54 kg. The heart rate was regular at 60 beats/min. No rales were heard in either lung. Cardiac auscultation revealed no extra sounds and no murmurs. Abdominal examination disclosed no abnormal findings.

Laboratory examination: The peripheral eosinophil blood count was not markedly elevated (640/mm³). Bone marrow puncture was performed after the diagnosis of "eosinophilic heart disease" was made, but the eosinophil count was normal. Stool examination for ova and parasites was negative. IgE count was 1360/ml. The chest roentgenogram revealed an abnormal-sized heart (CTR: 60%); high voltage was the only abnormality apparent on the electrocardiogram (Fig. 1). MRI demonstrated no thrombus in the left ventricle (Fig. 2).

Cardiac catheterization: Left ventriculography disclosed slight hypokinesis in the circumference (Fig. 3). Right ventriculography disclosed normal wall motion but enlargement of the right ventricle (Fig. 4). Coronary and pulmonary angiograms were normal. Left ventricular end-diastolic pressure was 14 mmHg and the ejection fraction was 56%.

Biopsy findings: Right ventricular endomyocardial biopsy showed a faintly stained thrombus adjacent to myocytes between which no endomyocardium existed. Numerous eosinophils invaded the thrombus and myocytes just under the thrombus. No eosinophils invaded normal myocytes (Fig. 5). Another specimen taken from the same lesion showed degeneration and disappearance of myocardium (Fig. 6). From these findings, we
Fig. 2. MRI (magnetic resonance imaging) demonstrating no thrombus in a left ventricle.

Fig. 3. Left ventriculography. Wall motion was slightly hypokinetic in the circumference.

concluded that direct eosinophilic invasion of the myocardium was the cause of the myocardial necrosis.
Fig. 4. Right ventriculography. Wall motion was normal but right ventricle is dilated.

Fig. 5. Right ventricular endomyocardial biopsy revealed thrombus adjacent to myocytes and numerous eosinophils invading the thrombus and myocytes (hematoxylin and eosin = 160).
Fig. 6. Right ventricular endomyocardial biopsy taken from the same lesion as Fig. 5 showing degeneration and disappearance of myocardium (azan×100).

**DISCUSSION**

Since the first publication of heart disease with eosinophilia, Löffler's endomyocarditis, much knowledge has been obtained about the relationship between eosinophils and myocardial damage. At the present time it is believed that eosinophils invade not only myocytes but also the endocardium, and this disease is generally called "eosinophilic heart disease".

The disease has three pathological stages, namely necrotic, thrombotic early stages and a late fibrotic stage. Eosinophilic invasion of myocytes is recognized only in the early stages.

Cardiac lesions are present in a large number of hypereosinophilic syndrome cases, but eosinophilic invasion of myocytes has only rarely been documented on myocardial biopsy, even during the early stages. Therefore, little information is available about the relationship between eosinophils and the myocardium.

In this case, even though the eosinophil count in the peripheral blood was only 640/mm³, many eosinophils invaded myocytes. So we concluded that this case was in an early stage, namely the "necrotic stage" or "thrombotic stage". Spry et al showed in vitro that eosinophils in the peripheral blood are activated by immune complexes and become degranulated, and that eosinophil granule proteins, mainly cationic protein, injure the myocardium in vivo. They suggested that the number of degranulated eosinophils in the peripheral blood is a clue to the early diagnosis of this disease. Un-
Fortunately, we could not examine our case with regard to this point. Since steroids are known to prevent the worsening of this disease,\textsuperscript{7-9} we administered prednisone to this patient and are now observing him carefully.

\textbf{References}

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