

## Cardiovascular Imaging In-a-Month

### ●A 34-Year-Old Man With Fever and Cardiomegaly

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#### CASE

A 34-year-old man was admitted to our hospital because of fever, productive cough and progressive dyspnea. He had a temperature of 38.3°C, systolic blood pressure of 78 mmHg and pulse rate of 114/min. Further findings were pulsus paradoxus of 10 mmHg, muffled heart sounds and tender hepatomegaly. Pericardial friction rub was not audible.

Laboratory studies revealed a white blood cell count of 23,700/mm<sup>3</sup> with 83% polymorphonuclear leukocytes, and C-reactive protein of 26.6 mg/dl. Electrocardiography showed sinus tachycardia, low voltage in the limb leads, and broad elevation of ST segments except for aVR. Chest radiography revealed an enlarged cardiac shadow (65% of the cardiothoracic ratio) with bilateral pleural effusion and an abnormal infiltration in the right lung field. Two-dimensional parasternal echocardiograms taken on admission are shown in **Fig. 1**.

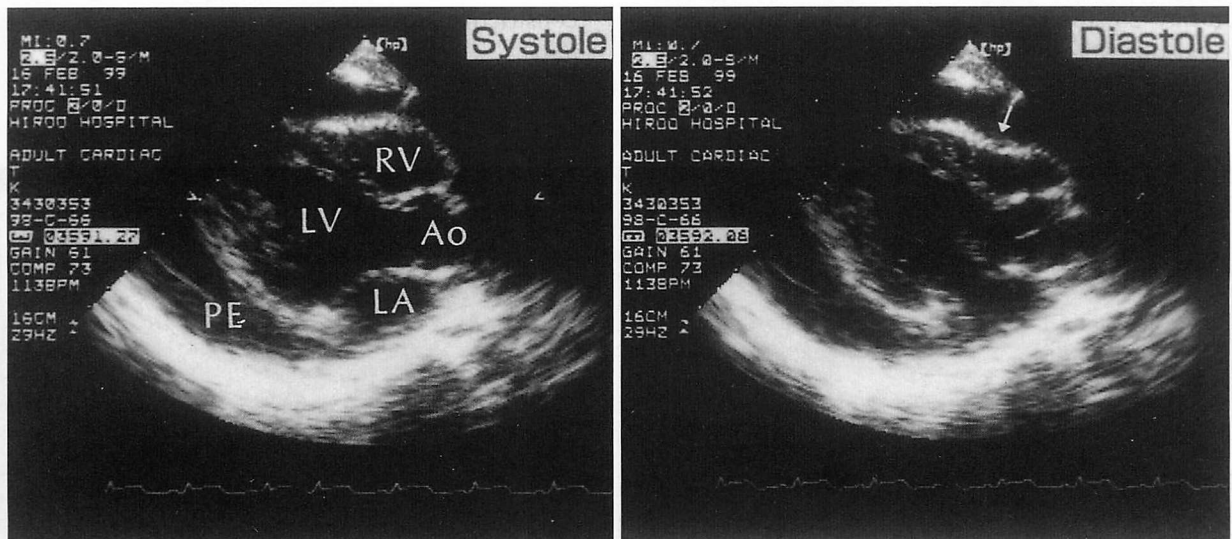


Fig. 1

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### Points for Diagnosis

Two-dimensional echocardiography showed massive pericardial effusion with right ventricular diastolic collapse, indicating cardiac tamponade (**Fig. 1–right**).

Purulent yellow exudate was aspirated from the pericardial space and yielded *Streptococcus pneumoniae*. Antibiotic therapy of 2 g/day of cefotiam and 12 million U/day of benzylpenicillin was started, and additionally continuous pericardiocentesis using an 8.3 F pigtail catheter was performed on day 2 because of increased pericardial effusion. The pleural effusion was drained simultaneously. Pulsus paradoxus disappeared soon after the start of pericardial drainage, the patient's fever gradually lowered, and the cardiac silhouette returned to normal size. However, the patient complained of palpitation (heart rate of 100/min) and dyspnea on exertion.

Two-dimensional echocardiography on day 9 revealed layered thickening of the pericardium, especially around the apex, with decreased pericardial effusion (**Fig. 2**). Pulsed Doppler echocardiography showed shortened deceleration time of early mitral and tricuspid flow velocity, which suggested a progression to constrictive pericarditis (**Fig. 3**). On day 23, thickening of the pericardium and a septal dip were observed on two-dimensional and

M-mode images (**Fig. 4**).

Cardiac catheterization was performed on day 24. The mean right atrial pressure, right ventricular diastolic pressure, pulmonary diastolic artery pressure, and pulmonary artery wedge pressure were nearly equal, in a range of 18–23 mmHg. The right ventricular pressure curve showed a dip and plateau pattern. Pericardiectomy was performed on day 43. During surgery, extensive thickening of the pericardium up to 5 mm was seen, with tight adhesion around the apex. After the pericardiectomy, the patient's heart rate returned to normal, and he was discharged 25 days after the operation in good condition.

In this era of antibiotics, the incidence of pneumococcal pericarditis has decreased<sup>1)</sup>, which is generally associated with pneumonia, empyema, chest trauma, or postoperative infection<sup>1,2)</sup>. The current report describes a comparatively rare pneumococcal pericarditis that developed rapidly into constrictive pericarditis. More attention should be paid to the possibility of constrictive changes during the recovery phase of acute pericarditis<sup>3)</sup>, and repeated two-dimensional and Doppler echocardiographic examinations are mandatory for detecting unusual constrictive processes.

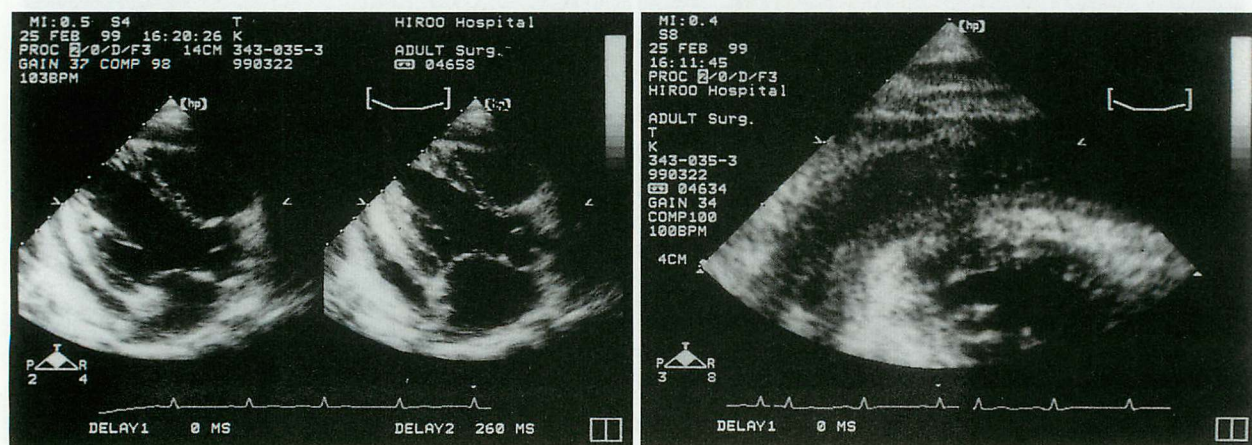


Fig. 2



**Diagnosis:** Acute pneumococcal pericarditis with rapid progression to pericardial constriction

**Acknowledgement**

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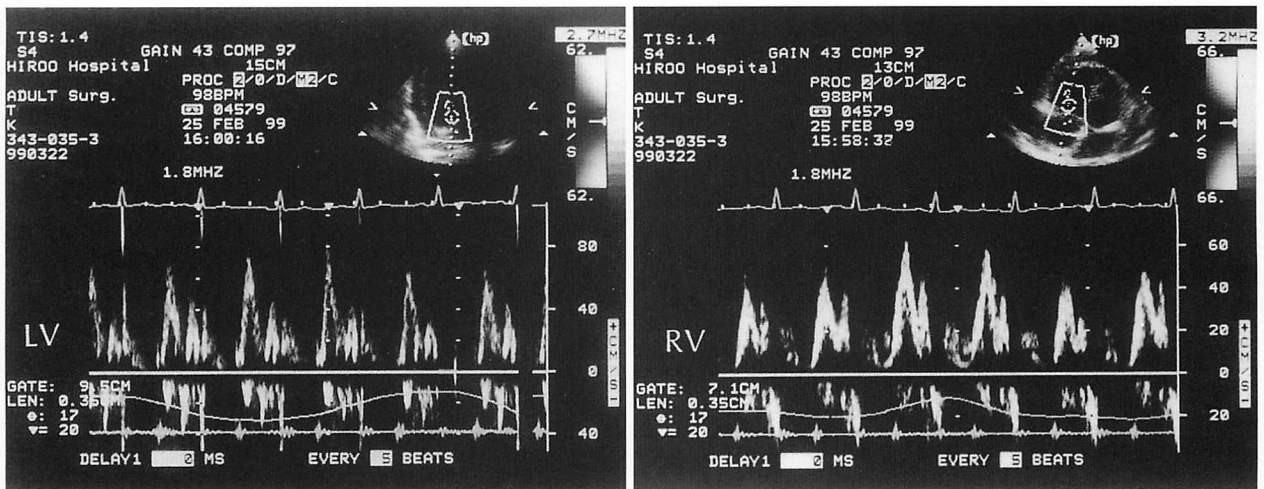


Fig. 3

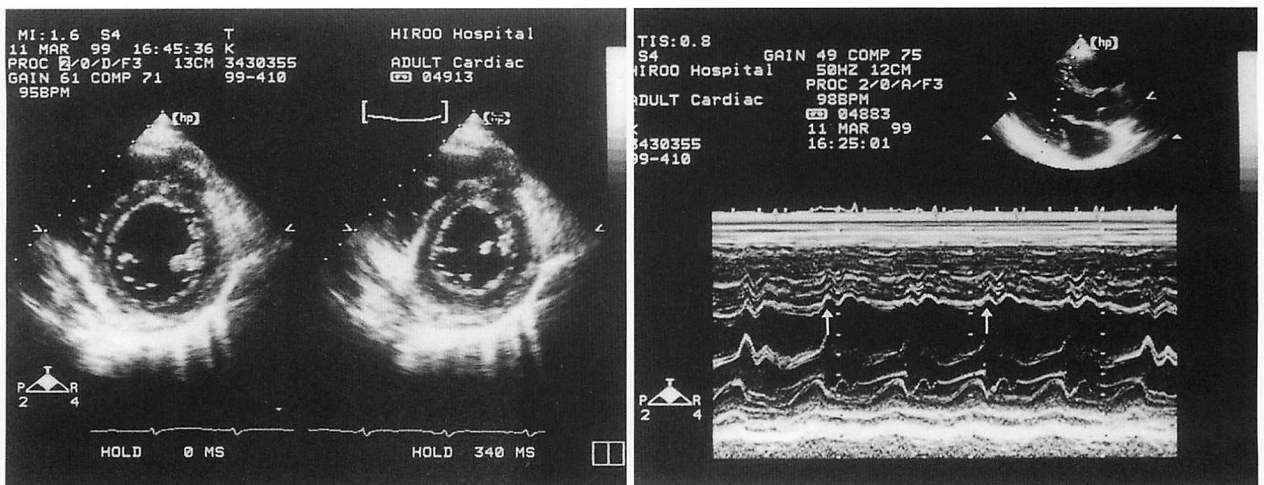


Fig. 4

**Fig. 1 Echocardiograms taken on admission**

Systolic phase shows massive pericardial effusion in both the anterior and posterior sides (*left*). Diastolic phase shows right ventricular diastolic collapse (*right; arrow*).

PE = pericardial effusion; LV = left ventricle; RV = right ventricle; LA = left atrium; Ao = aorta.

**Fig. 2 Echocardiograms taken on day 9**

Pericardial effusion is decreased (*left*). Layered thickening of the pericardium around the apex is seen

(*right*).

**Fig. 3 Pulsed Doppler echocardiograms taken on day 9**

The deceleration times of early mitral (*left*) and tricuspid (*right*) flow velocity have shortened, which indicates progression to constrictive pericarditis.

**Fig. 4 Echocardiograms taken on day 23**

Short-axis views show thickening of the pericardium and disappearance of echo free space (*left*). The M-mode image indicates a septal dip (*right; arrow*).