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Cardiovascular Imaging In-a-Month

●What is the Cause of a Woman's Progressive Dyspnea ?

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CASE

A 69-year-old woman was admitted to our hospital because of progressive exacerbation of dyspnea. She had no history of arrhythmia such as atrial fibrillation except for taking vasodepressors. Despite tachypnea, arterial blood gas analysis indicated hypoxemia. Chest radiography did not show pulmonary edema, but showed slight cardiomegaly (**Fig. 1**). Laboratory evaluation detected only slight elevation of B-type natriuretic peptide (252 pg/m*l*). Transthoracic echocardiography showed enlargement of the right ventricle and mass formation in the pulmonary artery (**Fig. 2**).

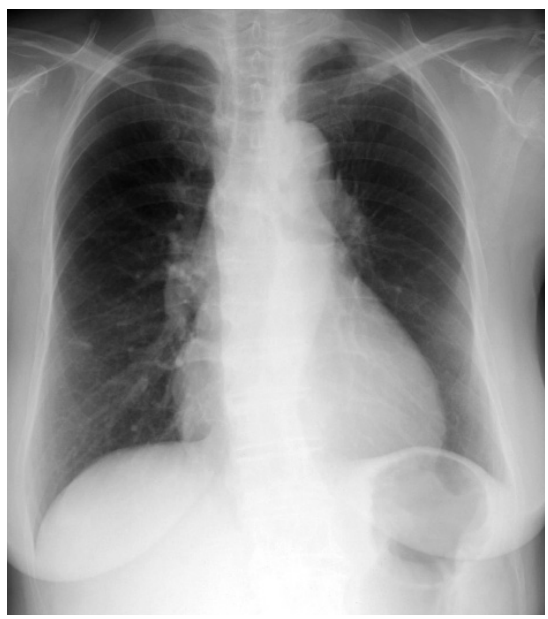

Fig. 1

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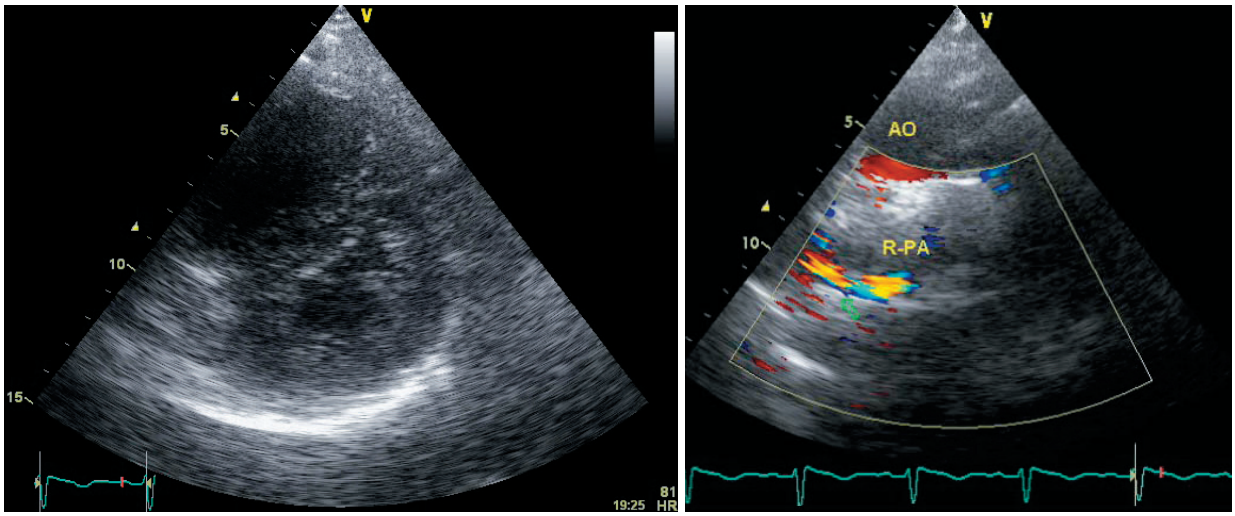

Fig. 2

Point of Diagnosis

Electrocardiography showed slight ST-T segment elevation in leads V_2 to V_4, and T waves were inverted in leads Ⅱ, Ⅲ, aV_F. At first, hypoxemia with tachypnea made us suspect pulmonary thromboembolism. Transthoracic echocardiography demonstrated enlargement of the right ventricle and mild tricuspid regurgitation. Transtricuspid estimated right ventricular pressure was 59 mmHg. Further sonographical scanning revealed stenosis of the right pulmonary artery with high flow jet accompanying the mass lesion. Focusing on the adjacent mass, we could clearly distinguish the vessel wall of the pulmonary artery and aorta from the mass lesion.

These findings suggested that the cause of stenotic pulmonary artery was tumor compression rather than mass invasion or intrapulmonary thrombosis, but whether the tumor was malignant or benign was impossible to judge by only echocardiography.

In order to make the correct diagnosis, we performed enhanced computed tomography, which revealed mass lesion in front of the tracheal bifurcation, resulting in encasement of the bilateral pulmonary arteries (**Fig. 3**). Subsequently, lung perfusion scanning proved complete regional flow defect of the left pulmonary artery (**Fig. 4**).

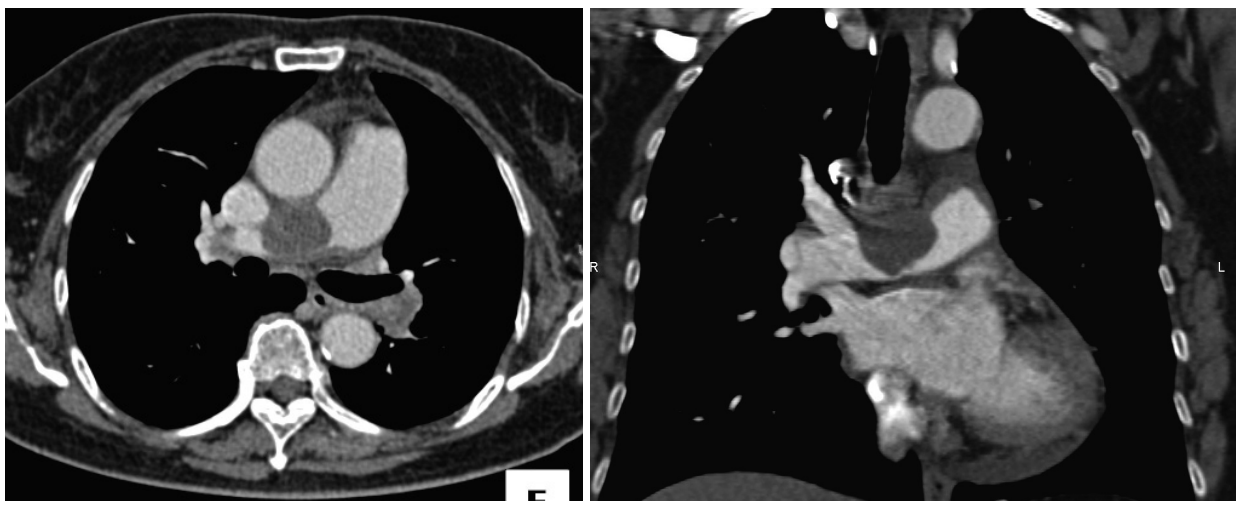

Fig. 3

We were concerned about sudden death caused by further progressive interruption of pulmonary perfusion, so immediately consulted pulmonologists, who performed lung biopsy guided computed tomography. The diagnosis was lung carcinosarcoma.

Lung carcinosarcoma is one of the primary pulmonary sarcomas which may arise from any mesenchymal tissues in the lung, such as leiomyosarcoma, pulmonary artery angiosarcoma, and pulmonary blastoma. The similarity of their origin makes it difficult to distinguish between these tumors pathologically. Carcinosarcoma is rare and has a poor prognosis. Carcinosarcoma sometimes directly involves the pulmonary artery, and 2/3 patients die within 2 years because of its high malignant grade. Finally we concluded that tumor invasion to the pulmonary artery was the main cause of her dyspnea. Discrimination between carcinosarcoma and pulmonary thromboembolism is very difficult but necessary for the therapeutic strategy. Since tumor compression and invasion to the pulmonary artery and respiratory tract sometimes results in hemodynamic catastrophe, prompt diagnosis and therapy are required. When encountering patients complaining of dyspnea, we should take into consideration the possibility of tumor invasion as well as cardiovascular disease.

Diagnosis: Carcinosarcoma of lung

Key Words: Neoplasms (lung); Pulmonary embolism; Pulmonary artery; Echocardiography, transthoracic; Computed tomography

Fig. 4

Fig. 1 **Chest radiograph on admission**
No pulmonary edema was present but cardiomegaly was detected.

Fig. 2 **Transthoracic echocardiograms**
Right ventricular enlargement and compressed right pulmonary artery close to the pulmonary main trunk accompanied by high flow jet (pressure gradient : 59 mmHg) were found.
Left: Parasternal short-axis view. *Right*: Pulmonary artery level.
AO = aorta; R-PA = right pulmonary artery.

Fig. 3 **Computed tomography scans with contrast medium**
Mass lesion was found in front of the tracheal bifurcation, resulting in encasement of the bilateral pulmonary arteries.
Left: Axial view. *Right*: Coronal view.

Fig. 4 **Lung perfusion scan**
Defect of blood flow to the left lung lobe was found.