Cardiac Tamponade Due to a Rupture of the Coronary Arteriovenous Aneurysm - A Case Report -

We experienced an unusual case of cardiac tamponde caused by a rupture of the coronary arteriovenous aneurysm in a 54-year-old woman. The patient was suffered from sudden chest pain and syncope, and was intially managed by pericardiocentesis following an echocardiogram which revealed a massive pericardial effusion with signs of cardiac tamponade. She was referred to our hospital under the impression of aortic dissection with cardiac tamponade. She underwent an emergency operation and was found to have a 2×2 cm sized bleeding cystic mass protruding from the proximal anterior descending coronary artery. The aneurysm was excised and the openings connected with the coronary artery and right ventricular outflow tract were closed with sutures from the inside of aneurysm. Subsequent coronary arteriography supported the diagnosis. *(JKMS 1997; 12 : 143~5)*

Key Words : *Cardiac tamponade, Coronary arteriovenous aneurysm*

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INTRODUCTION

A coronary arteriovenous fistula is a rare clinical condition with an abnormal connection between coronary arteries and the heart chambers or large vessels (1). The majority of patients with coronary arteriovenous fistula are asymptomatic. However, potential complications include pulmonary hypertension and congestive heart failure when there is a large left-to-right shunt, infective endocarditis, myocardial ischemia distal to the fistula due to decreased coronary blood flow, and a rupture or thrombosis of the fistula. We encountered and surgically treated a patient with cardiac tamponade due to a rupture of the coronary arteriovenous fistula.

CASE REPORT

A 54-year-old woman with a history of hypertension was admitted to a local emergency room with chest pain and syncope. An echocardiogram revealed a massive pericardial effusion with signs of cardiac tamponade. After pericardiocentesis, she was referred to our hospital under the diagnosis of aortic dissection with cardiac tamponade. On admission she was awake and alert, and the blood pressure was 85/65 mmHg and pulse rate 140 beats/min. A pulsus paradoxus was not apparent. The initial cardiac examination revealed normal first and second heart sounds without murmur. Breathing sound was decreased in the right lower lung field. An electrocardiogram recorded a sinus tachycardia. A chest radiograph and a two-dimensional echocardiogram revealed pericardial effussion without a sign of cardiac tamponade. The hemoglobin was 10.1 mg/dl, platelet count 151.00 $\times 10^3/\mu l$, white blood cell count $11.6 \times 10^3/\mu l$ and the cardiac enzyme levels were normal. A chest computed tomography scan revealed a large amount of pericardial effusion and a 2-cm sized enhanced area on the left side of the ascending aorta and behind the pulmonary artery. This appeared to be a vascular aneurysm abutting the left anterior descending artery (Fig. 1).

The patient was taken to the operating room for an immediate exploration. The operative finding showed a 2×2cm sized-bleeding cystic mass just anterior to the left atrial appendage, which was protruding from the proximal left anterior descending coronary artery. The aneurysm was excised, the openings connected to the coronary artery and right ventricular outflow tract were closed with sutures from the inside of the aneurysm. A cardiac catherization was performed two weeks after the operation. There was 3% O_2 step-up between the right ventricle and pulmonary artery, with an 1.1:1 left to right shunt ratio. The left ventricular angiography was normal, but the selective left coronary angiography revealed a stump of the preexisted arteriovenous aneurysm and a small remnant fistula connected to the pulmonary artery (Fig. 2). The right coronary angiography also showed a fistula between the proximal right

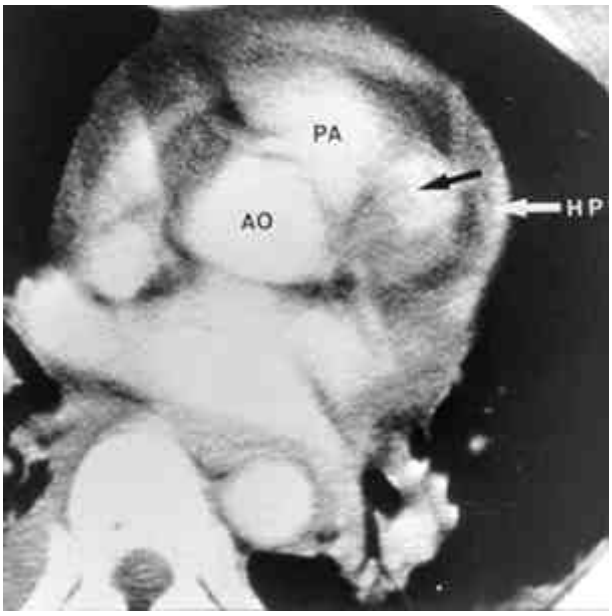

Fig. 1. A chest computed tomography shows an abnormal enhanced area (black arrow) on the left side of the ascending aorta and behind the pulmonary artery. Due to continuous pericardial drainage, only mild hemopericardium (white arrow) is noted. AO, Acending aorta; PA, pulmonary artery; HP, hemopericardium.

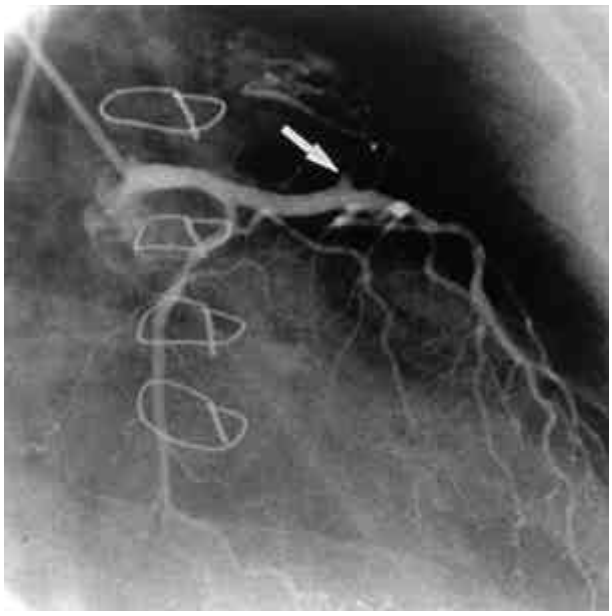

Fig. 2. A selective left coronary angiography reveals a remnant of the arteriovenous aneurysm (arrow). There still remains a faint arteriovenous fistula connected to the pulmonary artery (above the arrow).

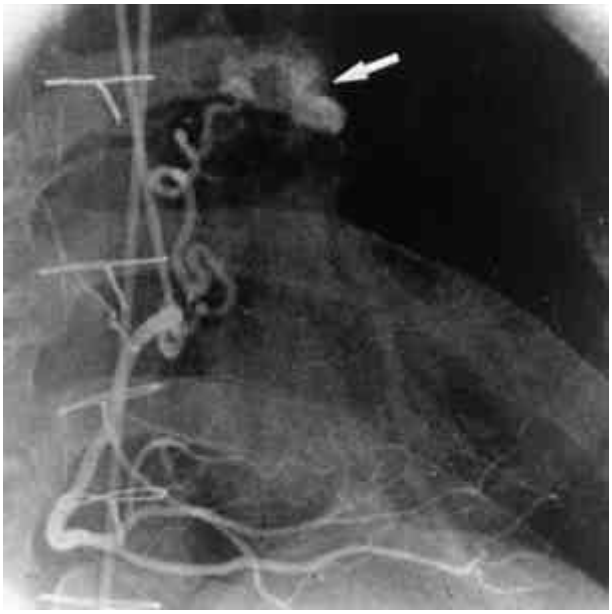

Fig. 3. The right coronary angiography shows a tourtous vessel originating from the proximal right coronary artery, which drains into the main pulmonary artery (arrow).

coronary artery and the main pulmonary artery (Fig. 3). Despite these findings, the postoperative hospital course was smooth and she was discharged on the 15th hospital day. The patient has been doing well for 16 months follow-up postoperatively.

DISCUSSION

The first case of congential coronary arteriovenous fistula was reported by Krause in 1865 (2). Among the clinical manifestations, coronary steal phenomenon is rare. A significant shunt flow through the fistula, however, may eventually result in congestive heart failure. According to one study, subacute infective endocarditis was reported in approximately 10% of patients (3). A rupturing of the coronary arteriovenous fistula leading to cardiac tamponade is a rare occurrence. Habermann et al. (4) reported only one patient with sudden death due to a rupturing of the coronary arteriovenous fistula at autopsy. Our patient developed a sudden onset of cardiac tamponade due to a rupture of the coronary arteriovenous aneurysm, and the correct diagnosis was only possible after an emergent surgery was performed. Therefore, this entity should be suspected in nontraumatic acute cardiac tamponade due to hemopericardium that is not associated with aortic dissection. Coronary arteriovenous fistula originates slightly more often from the right than from the left coronary artery (5). Although bilateral coronary arteriovenous fistula accounts for only 5% of all fistulas, they are unique in their tendency to terminate in the pulmonary artery. Most coronary arteriovenous fistulas drain into the right heart chambers or the pulmonary artery, while there are rare instances in which the fistula drains into the left

heart chambers.

Since Björk and Crafoord (6) reported the first successful ligation of a fistula between the left coronary artery and the pulmonary artery in 1947, the management of coronary arteriovenous fistula has been controversial, especially regarding operative intervention in asymptomatic patients. There is little information available as to the natural history of coronary arteriovenous fistula with or without surgery. Jaffe et al. (7) reported six patients with coronary arteriovenous fistula followed for $3_{1/2}$ to 17 years without operation. As they concluded that little anatomic and functional changes occurred in patients with small-to-moderate shunt, small amount of remnant shunt postoperatively in our patient may be justified. Operative intervention should be undertaken in the presence of large left-to-right shunt and symptoms of heart failure (8). Definitive surgical correction is safe and effective, with good long-term results (9). Surgical therapy should also be considered in patients with a fistula which contains a large associated aneurysm in order to prevent later symptoms or complications.

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