Cardiac Imaging

Myocardial Ischemia as an Indication for Surgical Intervention in Sinus Valsalva Aneurysm

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A 69-year-old male was admitted to the emergency department because of acute retrosternal chest pain lasting for 15 minutes, accompanied by diaphoresis and nausea. Although he had been diagnosed in our department with a large aneurysm of the right sinus of Valsalva (ASV) two years before, incidentally during a routine checkup, he decided not to proceed to surgical correction and remained without medical monitoring during this period. At that time he was evaluated by transthoracic and transesophageal echocardiography (Figure 1A), as well as magnetic resonance imaging (Figure 1B,C), and the diameter of the aneurysm was found to be 5.41 cm. Coronary angiography was negative for coronary artery disease, while opacification of the right coronary artery was not feasible because of the size of the aneurysm (Figure 1D). On admission, he had a normal electrocardiogram and physical examination revealed no significant abnormality. His blood pressure was 130/85 mmHg and heart rate was 78 beats per minute. Laboratory tests were within normal limits, except for cardiac troponin, which was elevated (5.8 pg/L, normal values <0.1) and indicated ischemia of the heart muscle. Transthoracic echocardiography was immediately performed to examine the current status of the aneurysm and to investigate any myocardial wall motion abnormalities. The results indicated mild hypokinesia of the basal and medial inferior left ventricular wall, while the aneurysm was found to have expanded compared to the previous study, having a diameter of 7.1 cm, but with no rupture evident. The patient was referred for CT angiography in order to exclude the presence of abruption of the aorta and for further evaluation of the size of the ASV, which was again found to be enlarged, in accordance with the transthoracic echocardiography measurements. The patient was finally admitted to the intensive care unit for continuous monitoring; no ongoing ischemia was recorded and cardiac enzymes decreased during the following hours. The patient was evaluated by the cardiothoracic medical team of the hospital and surgery was planned for the next day. The operation was successful. During the procedure the right coronary artery was found to be compressed and stretched by the giant aneurysmal mass. Ten days after initial admission the patient was discharged from the hospital.

Aneurysms of the sinuses of Valsalva constitute an uncommon pathological entity, with a prevalence of 0.09% in a series of 8138 autopsies in individuals.[1] Either congenital or acquired, they are found more often in the right coronary sinus and

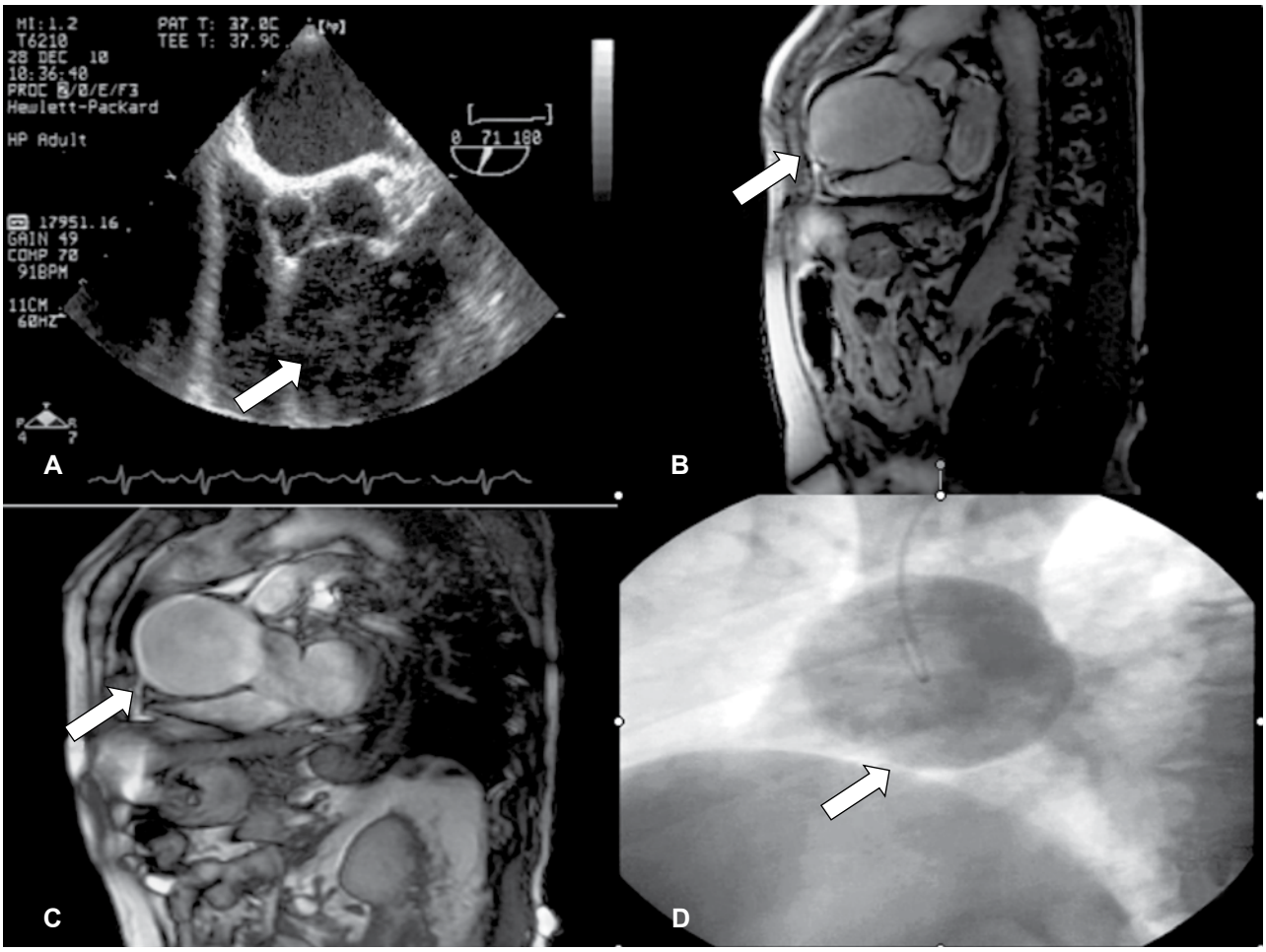

Figure 1. Transesophageal echocardiography showed a large mass in close relation to the right coronary sinus (A). Magnetic resonance imaging revealed the existence of a large aneurysm originating from the right sinus of Valsalva (B,C). Coronary angiography again showed the abovementioned aneurysm, but delineation of the right coronary artery was not feasible because of the size of the aneurysm (D).

less often in the non-coronary and the left coronary sinus.[2] The clinical presentation depends on the hemodynamic status of the lesion. Usually, only the unruptured ones that are found incidentally during surgery or autopsy are clinically silent.[3] However, when an unruptured ASV increases to such a degree as to provoke symptoms, a large variety of clinical presentations can arise, with sudden cardiac death and coronary ostial obstruction being the most catastrophic for the patient.[4]

Surgical repair was initially introduced for the complete correction of this pathological variation and still remains a reliable approach, especially in cases where unexpected prompt expansion is observed during follow up. In addition, transcatheter occlusion with the Amplatzer duct occluder has been applied in several cases with favorable anatomy, with very good short- and long-term results.[5] Special concern is required before the decision about correction, in order to exclude several other clinical entities that may mimic a true ASV.[6,7] Although ruptured aneurysms have a clear indication for repair—the mean survival rate has been estimated at 3.9 years[8]—controversy still exists regarding the exact time of intervention in the case of unruptured aneurysms. This controversy results from the fact that the mean age of diagnosis of unruptured aneurysms is 45 years, with 21% of patients experiencing no signs and symptoms.[9] However, in the case where the size of an unruptured aneurysm causes ischemia, due to obstruction of coronary ostia, and consequent malignant arrhythmias or obstruction of the ventricular outflow tract, intervention has a clear and urgent indication.

In our report, a patient with a giant unruptured aneurysm of the right sinus of Valsalva remained asymptomatic until the age of 69 years and was admit-

ted for surgical repair at the time when the right coronary artery became compressed because of the size of the mass. Our case strengthens the trend towards surgical intervention for an unruptured ASV in the presence of ischemia or obstruction of myocardial function, as it remains a safe and effective method in well experienced cardiothoracic centers.

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