Case report

Congenital left circumflex artery fistula drainage into left ventricle

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Abstract

Congenital communication between left coronary artery to left ventricle is a rare anomaly. A 52-year-old male patient visited our institution complaining of paroxysmal palpitation and echocardiography revealed a large fistula draining into the left ventricle. Coronary angiography and computed tomography (CT) scanning confirmed the fistula located between the left circumflex coronary artery (LCX) and left ventricle (LV). A simple fistula ligation was performed, and postoperative three-dimensional coronary CT scanning confirmed the patient got a complete cure.

Keywords: Coronary artery fistula; Circumflex coronary artery; Left ventricle

1. Introduction

Congenital coronary artery fistula, which corresponds to 0.2—0.4% of the congenital heart defects [1], is a rare and unusual coronary artery abnormality in which blood is shunted into a cardiac chamber, great vessel or other structure, bypassing the myocardial capillary network. Most reported cases are about right coronary artery involved, right coronary to right cardiac chamber fistulas, but the fistula between left coronary artery and left ventricle is still considerably rare. The following we presented is such a case, with impressive radiographic presentations, as well as good result of surgical correction.

2. Case report

A 52-year-old male patient visited our institution, complaining of paroxysmal palpitation, no chest pain or other symptoms. Upon physical examination, blood pressure was recorded at 135/70 mmHg and pulse rate was 72 beats per minute. Upon precordial auscultation, there was a low and remote diastolic murmur heard near the left fourth intercostal space. The results of the blood test were normal with no indication of inflammation or elevated numbers of the white blood cells. The chest roentgenogram failed to find any abnormalities, but the 24-h electrocardiography showed paroxysmal supraventricular tachycardia, without ST segment alteration. Transthoracic echocardiography revealed a turbulent flow between the left circumflex coronary artery (LCX) and the left ventricle (LV). To obtain detailed information, three-dimensional CT scan was performed and a clear fistula was delineated, originating from the LCX and draining into the LV, and there was an obvious vascular ring formation, consisting of the left anterior descending artery and the LCX (Fig. 1(A)). Further left-heart catheterization showed normal right coronary artery, as well as the left anterior descending artery. However, the LCX was a bit tortuous and there was an obvious fistula draining into the LV. Proximal to the fistula, the LCX was dilated aneurysmally (Fig. 1(B)).

After a thorough preoperative preparation, the patient underwent a surgical exploration via standard median sternotomy. Because of the fistula’s hidden location, originating from the proximal segment of the LCX and entering the deeper subepicardial layer nearby the appendage of the left atrium, difficult to be exposed on beating heart, cardiopulmonary bypass was adopted to avoid compromising the stability of hemodynamics during surgical manipulation. Venous cannulae were inserted into the superior and inferior vena cava, and an arterial cannula was inserted into the ascending aorta. After cardiopulmonary bypass was initiated, the aorta was cross-clamped. Cardiac arrest was achieved by using antegrade blood cardioplegia. The fistula was dissected and exposed well and finally closed with simple ligation (Fig. 1(C)). The postoperative course of this patient was uneventful, and palpitations did not occur during close postoperative follow-up; another computed tomography (CT) scanning showed the patient got a complete cure (Fig. 1(D)).
3. Discussion

Congenital coronary fistula is a rare heart disease, most of which originate from the right coronary artery and drain into a right heart chamber or into the pulmonary artery. Such a congenital LCX-LV fistula is even more uncommon. Clinical presentations of patients with coronary artery-to-ventricular fistula depend on factors, including type of fistula, shunt volume, site of the shunt, and presence of other cardiac pathologies. The majority of patients are asymptomatic and are often identified incidentally during echocardiography or coronary angiography for other cardiac disease. The uncharacteristic clinical presentations may include fatigue, dyspnea, orthopnea, angina, endocarditis, arrhythmias, myocardial ischemia or acute myocardial infarction. In this case, the only symptom of this patient is supraventricular tachycardia, which was caused by LCX-LV communication and disappeared with the end of the abnormal shunt.

Like other types of coronary arterial fistula, the possible complications for patients with LCX-LV fistula involve heart failure, myocardial ischemia, infective endocarditis, arrhythmias, rupture, thrombosis, and arterial aneurysm formation. In our case, such complications did not occur, and the cardiac function had not been compromised too much, almost at the normal level, which might benefit from the excellent anastomosis between the LAD and the LCX. Of course, small shunt volume between the LCX and the left ventricular cavity was another possible reason.

There are several possible treatments for coronary artery-to-ventricular fistula, including surgical correction and transcatheter coil embolization. Spontaneous closure of coronary artery fistula, although uncommon, has also been reported. With regard to this special case, due to the frequent occurrence of palpitation in this patient and our less experience on interventional therapy for such diseases, surgical correction is optimal, with satisfactory result.

4. Conclusion

Congenital left coronary artery to left-ventricular fistulae is a really unusual anomaly and coronary angiography and three-dimensional CT scanning can provide enough diagnostic information regarding the diseased artery, fistula location and size, as well as the status of the other coronary artery. Surgical correction and interventional closure are the main therapeutic options, with satisfying outcome.

References


Fig. 1. Three-dimensional CT scanning revealed a fistula originating from LCX and draining into the left ventricular cavity (A). Coronary angiography showed a fistula between LCX and left ventricular cavity. The LCX was a bit tortuous and dilated aneurysmally, proximal to the fistula and the LAD was normal, whose extremity anastomosed with LCX, constructing a complete vascular ring (B). In an intraoperative view the relationship between the fistula and the LCX was illustrated (C). Postoperative CT image showed there was no communication between the LCX and the left ventricle (D). F: fistula; LCX: left circumflex artery; LAD: left anterior descending artery; LV: left ventricle.