

Case Report

Single coronary artery: a case report

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Abstract. In single coronary artery anomaly, there is single coronary artery ostium from which both coronary arteries arise with essentially normal peripheral distribution. In this case, we presented a 50-year-old male patient with single coronary artery who underwent coronary angiography. A 50 year-old caucasian male patient referred to the hospital for evaluation of palpitation and atypical chest pain. Myocardial perfusion scintigraphy (MPS) imaging revealed a mild ischemia at the midanteroseptum. We performed a cardiac catheterization and coronary angiography demonstrated a single coronary artery originating from the right sinus of Valsalva. Isolated single coronary arteries are relatively rare anomaly with a variable clinical presentation. This anomaly occasionally has been associated with sudden death. The case is interesting because of MPS demonstrated mild mid-anterior septum ischemia but coronary angiography images revealed no stenotic lesions and the single coronary artery did not travel in between the aorta and pulmonary artery.

Key words: Single coronary artery, ischemia, angiography

1. Introduction

The term coronary artery anomaly refers to a wide range of congenital abnormalities involving the origin, course, and structure of epicardial coronary arteries. Coronary artery anomalies are observed in 0.3-1.3% of patients undergoing diagnostic coronary angiography, in approximately 1% of routine autopsy examinations, and in 4-15% of young people who experience sudden death. In the general population, the incidence of a single coronary artery is approximately 0.024% to 0.04% (1). In single coronary artery anomaly, there is only one coronary artery ostium from which both coronary arteries arise with essentially normal peripheral distribution. The ostium is usually located at the left sinus of Valsalva. This anomaly may be an isolated anomaly or associated with the other cardiovascular anomalies. In this case, We

presented a case of single coronary artery anomaly which originated from right sinus of Valsalva.

2. Case report

A 50 year-old caucasian male patient referred to the hospital for evaluation of palpitation and atypical chest pain. In examination, blood pressure was 110/70 mmHg, heart rate was 84 beats/minute; and a 1/6 degree apical pansystolic murmur was heard. The patient's functional capacity was II according to the New York Heart Association classification. He had hyperlipidemia and a positive family history for coronary artery disease. The chest X-ray was normal. Electrocardiography (ECG) showed sinus rhythm, normal axis and nonspecific ST segment and T wave changes. Two-dimensional echocardiography (TDE) was performed by an experienced cardiologist who is specialized in congenital heart disease and echocardiography. TDE revealed a mild mitral and pulmonary regurgitation and a vessel crossing the pulmonary artery was visualised, suggesting a coronary artery anomaly. (fig. 1); in addition the left ventricle was not dilated and systolic function was normal with an ejection fraction of 65%. 24 hours ambulatory ECG monitoring was unremarkable. MPS imaging revealed a mild ischemia at the midanteroseptum (fig. 2).

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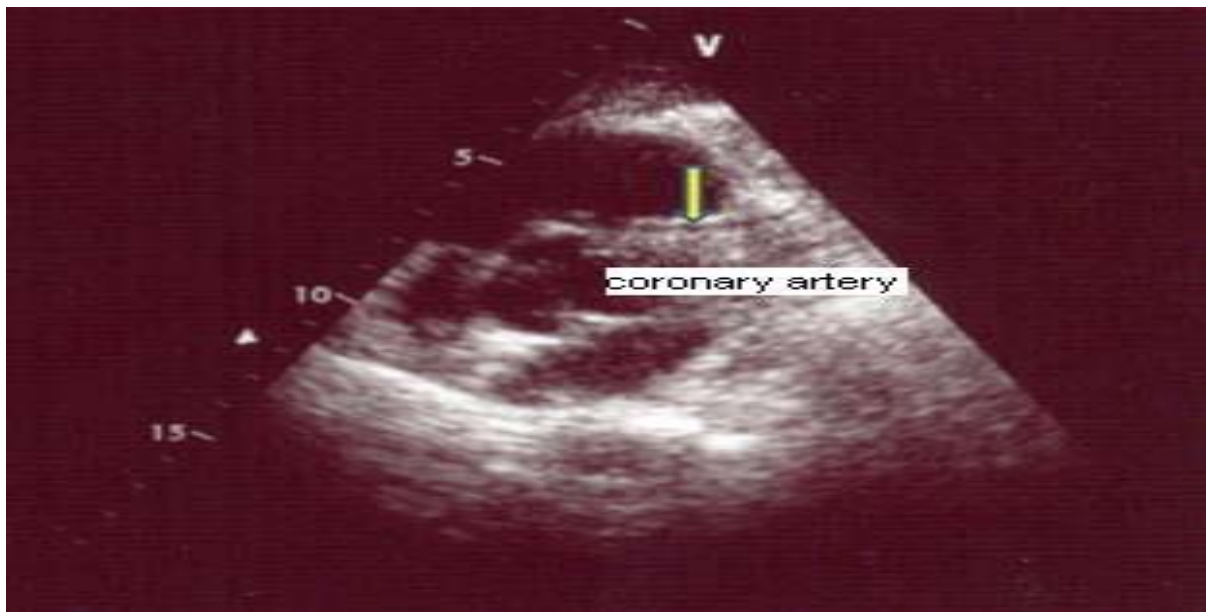


Fig. 1. Two-dimensional echocardiography showed an abnormal coronary course which originated from right sinus of Valsalva and crosses the heart anterior to the pulmonary artery.

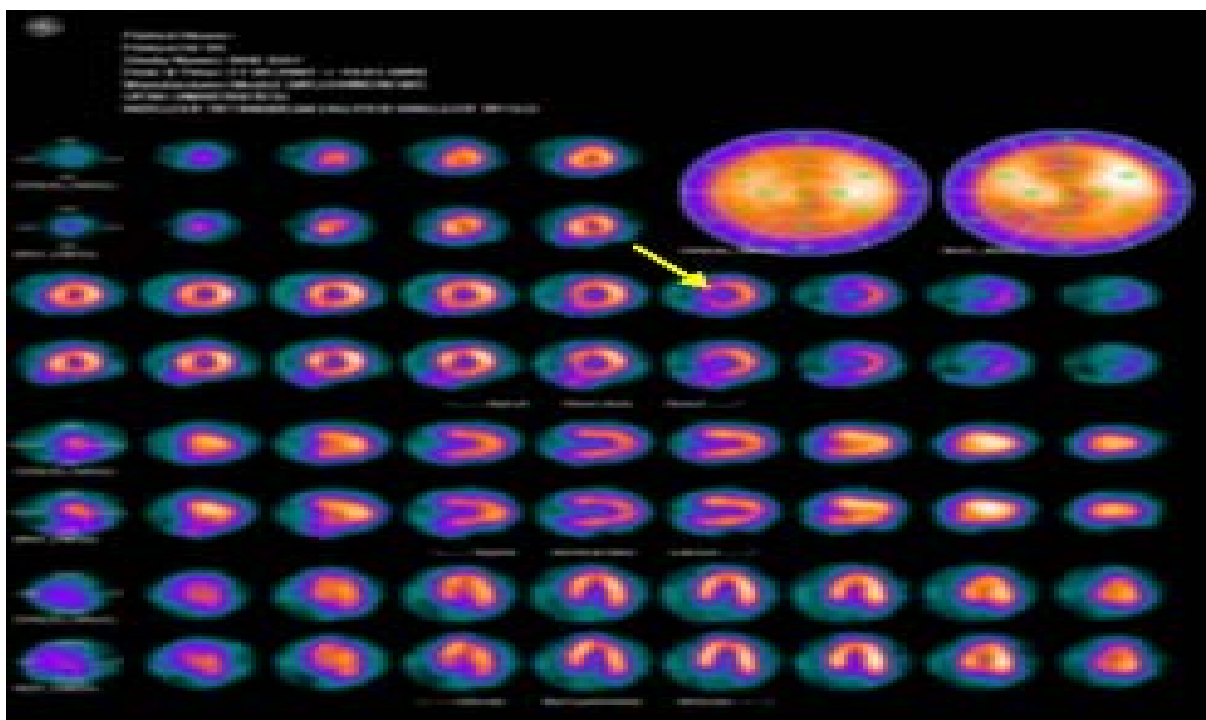


Fig. 2. Myocardial perfusion scintigraphy imaging revealed a mild ischemia at the mid-anterior septum.

Considering that transthoracic echocardiography is not sufficient to establish a diagnosis of coronary artery anomaly, we performed a cardiac catheterization and coronary angiography which demonstrated a single coronary artery originating from the right sinus of Valsalva. From the

proximal part of this anomalous coronary trunk(ACT), the right coronary artery arised. The ACT then courses anteriorly and divides into circumflex (CX) and the left anterior descending artery (LAD).

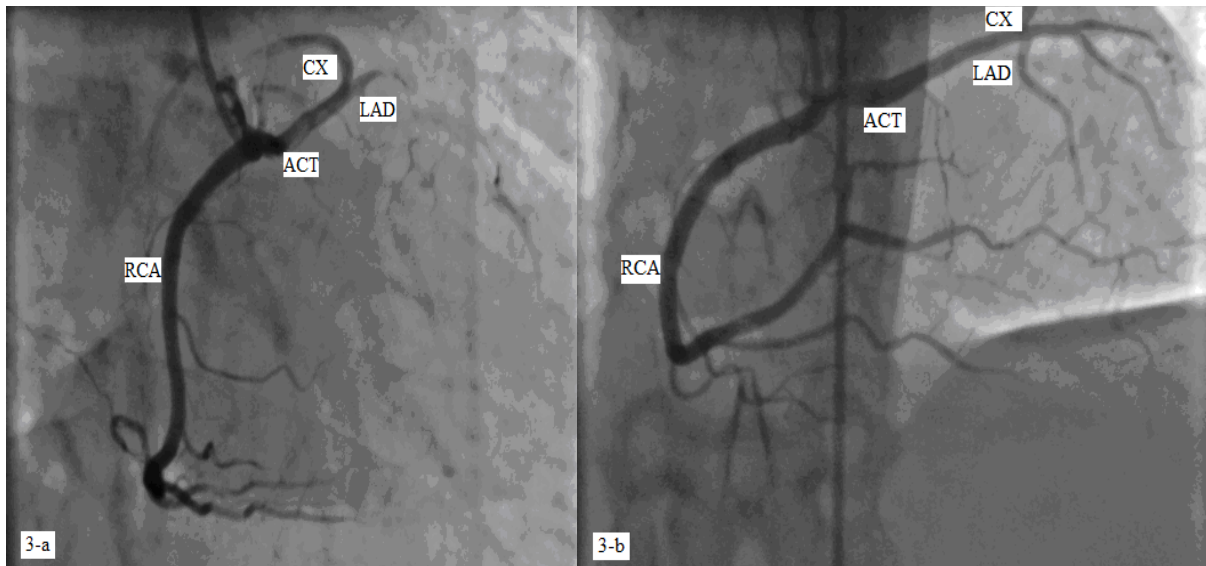


Fig. 3. Single coronary artery originating from the right sinus of Valsalva. RCA: right coronary artery, ACT: anomalous coronary trunk, LAD: left anterior descending, CX: circumflex

There were no atherosclerotic lesions in the coronary arteries (fig. 3). In order to better define the course of the single coronary artery, we performed a multislice computerized tomography (MCT) which confirmed the anterior course of ACT. It crosses the heart anterior to the pulmonary artery (PA) and divides into LAD and CX arteries without any compression by the aorta and the pulmonary artery. The patient is currently on follow up with medical treatment for two years.

3. Discussion

Isolated single coronary artery occurs in about 0.024% to 0.04% of the population (1). The entire coronary artery system may originate from a single ostium in the aorta. This solitary ostium is either located in the left or right coronary sinus Valsalva of the aorta. Four aberrant pathways to reach its proper vascular territory were described. These pathways are designated as type A (Anterior to the right ventricular outflow tract), type B (Between the aorta and pulmonary trunk), type C (Cristal, coursing through the crista supraventricularis portion of the septum), and type D (Dorsal or posterior to the aorta) (2).

In the literature, rare reports attribute myocardial ischaemia to the coronary anomaly itself (3). Isolated single coronary artery occasionally has been associated with sudden death. This presentation has been observed in association with the origin of the left main or right coronary arteries from the opposite sinus of Valsalva and the type B course of the anomalous vessel. This particular anomaly often is

associated with a slit-like ostium and an obtuse take off of the proximal portion of the aberrant coronary artery.

This combination may result in ischemia during exertion due to the stretching of the affected vessel that compromises blood flow at the ostium of the vessel. Increased cardiac output during exercise may also distend the ascending aorta and the pulmonary trunk and contribute to decreased blood flow through the anomalous coronary artery (4,5). The prognosis in single coronary artery is unclear, and there are no guidelines for treatment of the condition. Revascularization is recommended only if there is substantial atherosclerosis and documented ischemia (6). Hence, medical therapy, including statin and acetyl salicylic acid were recommended to our patient.

The gold standard diagnostic method is coronary angiography. Nevertheless, it is very important to define the course of the ACT and in that regard some misinterpretations of the coronary angiography are possible. Therefore, additional noninvasive imaging methods have been suggested like magnetic resonance imaging or MCT (4).

Due to the anterior course of the ACT, the patient is currently on follow up with medical treatment for two years. The case is interesting because MPS demonstrated mild mid-anterior septum ischemia but coronary angiography and CT images revealed no stenotic lesions and the single coronary artery did not travel in between the aorta and pulmonary artery.

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