Aberrant Origin of Right Coronary Artery from Left Coronary Sinus and Course between the Great Arteries Diagnosed by 64-Slice Computed Tomography

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Citation

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Abstract

A woman 62 years old, with atypical chest pain was sent to our Institute to rule out pulmonary thrombo-embolism. An enhanced chest multi-detector computed tomography (MDCT) discarded pulmonary embolism, but origin of the right coronary artery from the left coronary sinus and course between aorta and main pulmonary artery were demonstrated by coronary angiography MDCT.

INTRODUCTION

Anomalous origin of right coronary artery from the left coronary sinus and course between the aorta and main pulmonary artery was reported for the first time by White and Edwards in 1948 [1].

The incidence of this anomaly is less than 1% so it is considered an infrequent coronary anomaly [2].

Although conventional coronary angiography is the gold standard for the diagnosis of coronary stenosis, the diagnosis accuracy of coronary anomalies is near 100% by magnetic resonance or multi-detector computer tomography (MDCT)[3]. The reconstruction obtained with MDCT has advantages for the diagnosis of coronary anomalies especially by detecting the origin and course of coronary arteries and their relationships to other structures. In addition, as arterial catheterization is not necessary, complications are infrequent by magnetic resonance and MDCT [4] .Magnetic resonance does not need iodide contrast but time consuming is high and the equipment not easy available.

In this paper we present a patient with origin of right coronary artery from the left coronary sinus and course between the aorta and the main pulmonary artery diagnosed by coronary MDCT.

CASE REPORT

A woman 62 years old, with controlled arterial hypertension medicated with beta blockers and aspirin, with atypical chest pain, mild dyspnea and bloody sputum was sent to our Institute in order to rule out pulmonary thrombo-embolism. Physical examination was unremarkable. A small ill-defined ground glass opacity in right lower lobe was detected on the chest X-ray film. ECG and transthoracic echocardiogram were normal. The patient was sent for 64 slice CT(Somatom Sensation, Forchheim Siemens). A contrast- enhanced chest multi-detector computed tomography (MDCT), ruled out embolism and other thoracic abnormalities except aberrant origin and course of the right coronary artery (Fig.1). Coronary angiography was performed after one week. All coronary segments were visualized without stenosis. Ventricular function was normal and the only abnormality detected was the aberrant origin of right coronary artery from the left coronary sinus coursing between the aorta and the left main pulmonary artery.

Figure 1

Figure1. Chest contrast-enhanced MDCT. In Axial view at the level of the aortic root abnormal course of the right coronary artery (arrow) is detected. AO: aorta; MPA: main pulmonary artery

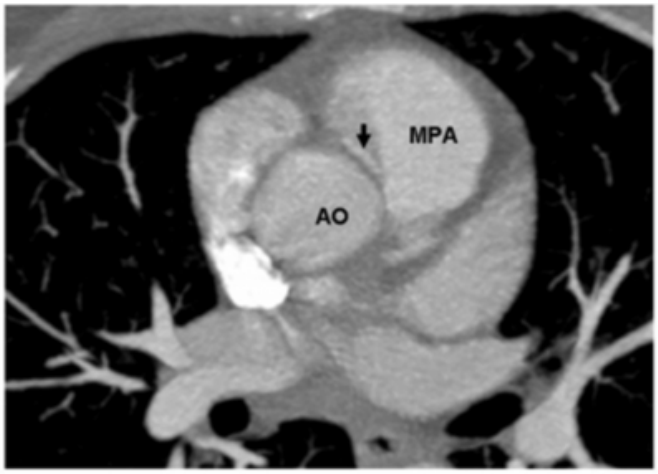
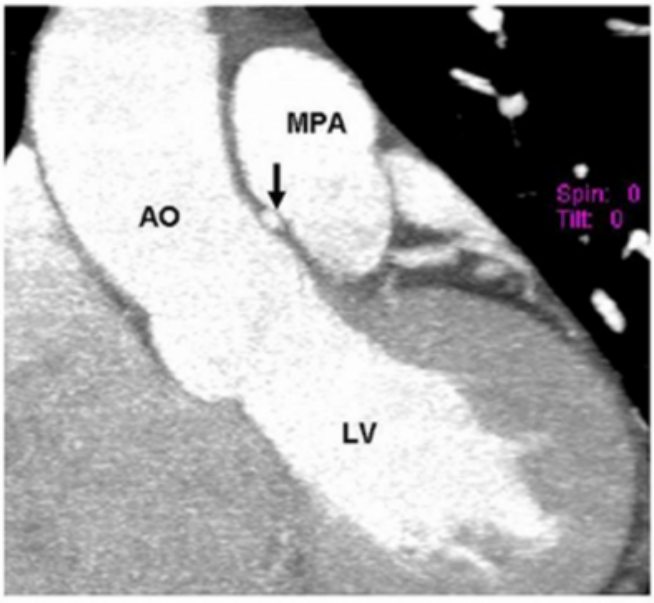


Figure 2

Figure 2. Coronary angiography by MDCT. Coronal view. An anomalous coronary artery (arrow) between aorta (AO) and main pulmonary artery (MPA).

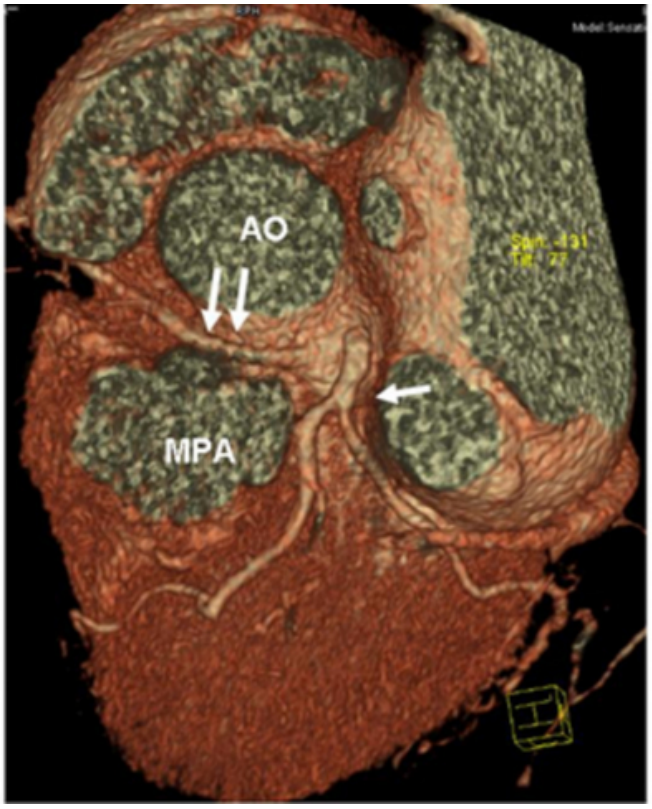


LV: Left ventricle.

A volume-rendered Spider view confirmed the origin of the right coronary artery from the left sinus of Valsalva near the origin of left coronary artery.

Figure 3

Figure 3. Volume rendered Spider view. Right coronary artery (Double arrow). Left coronary artery (single arrow). AO: Aorta. MPA: Main pulmonary artery



DISCUSSION

The prevalence of anomalous origin of right coronary artery from the left coronary sinus of Valsalva and its course between the aorta and main pulmonary artery or subvalvular portion of the right ventricle is low [2], but we are sure that the prevalence of coronary anomalies will increase with the availability of MDCT and its accuracy in the detection of coronary anomalies[3]. Clinical symptoms and course of patients with aberrant origin and abnormal course of right coronary artery may be benign, but up to 30% of patients present important morbidities as angina, myocardial infraction and even unexpected sudden death, including young athletes [5-6-7] justifying the misnomer of “malignant origin” of the right coronary artery [8].

Often it is not easy to explain the possible mechanisms of ischemia presented by these patients without coronary stenosis. The most accepted are: compression of the coronary artery between the great arteries during exercise, acute angle take-off of the coronary artery as it emerges from the aorta and the flap-like closure of the ostium of the coronary artery [5].

In our patient, coronary ischemia was not documented and we are not sure if the anomalous artery detected is responsible of the mild symptoms referred by the patient or if it is an incidental finding. As no structural abnormalities were seen in the anomalous coronary artery, if there is association of the anomaly with her clinical symptoms the only explanation is compression of the coronary by the great arteries during exercise or coronary spasm. Treatment is difficult to decide in these patients, there is no consensus, although some authors prefer surgical revascularization [9-10]

Medical treatment was decided in our patient with beta blockers and aspirin and she and her family advised of risks. She will be followed by ambulatory consultation.

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