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## Research Article

# THE LEFT MAIN CORONARY ARTERY ANOMALY WITH ORIGINATING FROM RIGHT SINUS OF VALSALVA IS NOT ALWAYS BENIGN: A RARE CASE WITH CARDIAC ARREST

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### ABSTRACT

Left main coronary artery (LMCA) anomaly originating from right sinus of valsalva is congenital malformation that is very rarely seen. It has various clinic presentation in real life. This anomaly can remain silent for many years or can cause syncope, myocardial infarction and sudden cardiac death in young patients. In this case, we talked about an old patient with this anomaly presenting with cardiac arrest due to myocardial infarction.

#### Key Words:

Cardiac arrest, coronary anomaly, myocardial infarction, sinus valsalva, syncope

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## INTRODUCTION

Coroner artery anomalies are rare congenital malformations that are observed as 0.3%- 1.3% in population who undergo coronary angiography procedure<sup>(1)</sup>. Coronary anomalies can be seen single or can accompany congenital heart diseases<sup>(2)</sup>. The most common form of coronary artery anomalies is the origin of the circumflex artery from the it must be right sinus of valsalva<sup>(3)</sup>. The origin of left main coronary artery from the right sinus of valsalva is one of the most rare anomalies that is reported as 0.009%- 0.015%<sup>(4)</sup>. Although this anomaly is presented at birth, it may be silent until adulthood and it is usually detected incidentally during coronary imagings<sup>(1,5)</sup>. If LMCA draw a path between aortic root and right ventricular outflow tract (RVOT), it may have bad end points due to poor prognosis. Poor prognosis indicators are related with myocardial ischemia, syncope, heart failure, ventricular fibrillation and sudden cardiac death<sup>(1)</sup>. So we decided to report an old patient with cardiac arrest who had LMCA anomaly originating from right sinus of valsalva in angiographic imagings.

#### Case Report

A 70-year-old male patient who was planned carotid angiography due to syncope was consulted to the cardiology department because of cardiac arrest. Cardiopulmonary

resuscitation was performed for five minutes to him. His electrocardiogram was consistent with myocardial infarction (NSTEMI). There was no significant wall motion abnormality in bedside echocardiography. After general evaluation, he was urgently taken to the coronary angiography laboratory. During coronary angiography, vital signs of him were normal. His blood pressure was 120/70 mmhg and his pulse rate was 80/min. During coronary angiography we observed that the left main coronary artery originated from the right sinus of valsalva and it included long lesion with 40%-50% stenosis. Except this, we have viewed that left anterior descending artery included widespread plaques, circumflex coronary artery was normal and right coronary artery had 40%-50% lesion in coronary angiographic imagings. Coronary intervention procedure was not planned for him because the left anterior descending coronary artery and the circumflex coronary artery fed with retrograde coronary blood flow. After angiography, he was transferred to coronary intensive care unit. The patient remained attached to the mechanical ventilator for 3 days during hospitalization. We planned him an ambulatory rhythm holter EKG and CT coronary angiography after he was separated from the mechanical ventilator. But he did not accept both of them and although all life-threatening conditions were explained to him, the patient wanted to be discharged.

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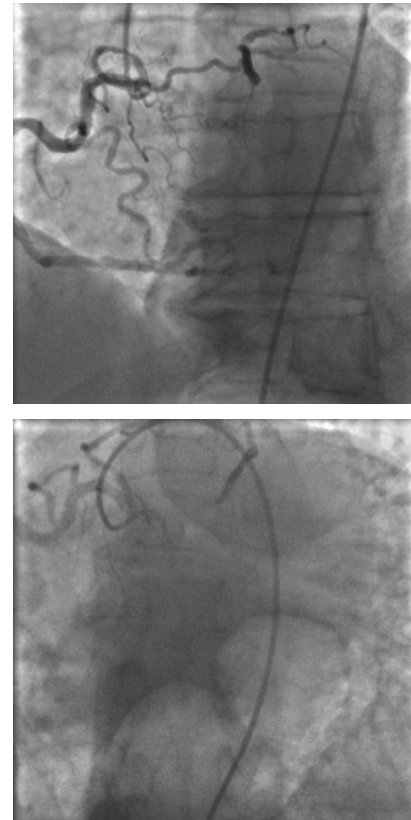
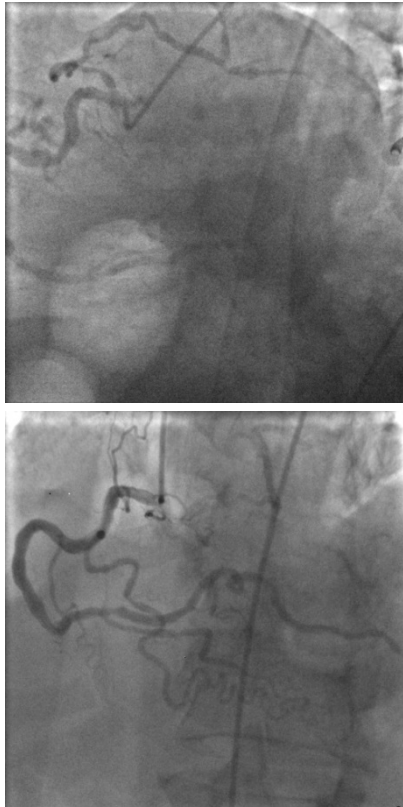
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## DISCUSSION

It is estimated that coronary anomalies are seen nearly 0,64% at birth<sup>(4)</sup>. The incidence of abnormal originated of LMCA from right sinus of valsalva is less common and it is usually incidentally detected in coronary angiographic imagings<sup>(6)</sup>. The origin of the LMCA from right sinus valsalva can be classified according to its relation with aortic root, pulmoner truncus and pathway to left. If LMCA turns anteriorly in front of RVOT, it is type A, if LMCA lies between tha aortic root and RVOT, it is called type B. The other forms are type C and type D. When LMCA passes through the crista supraventricularis of the septum, the type is C category or it turns posterior behind aorta, it is classified type D. <sup>(7,8)</sup>.The least observed form is type B and this form may be malignant and may cause sudden cardiac death<sup>(5)</sup>. Hypothesis that this type has a poor prognosis has been proposed. One of hypothesis is about exercise. According to hypothesis, the exercise may increase the pressure between aorta and pulmoner truncus and this pressure may impair coronary blood flow <sup>9</sup>. The others are acute angulation of origins of arteries and miyocardial remodelling. <sup>(6)</sup>. All of the forms can be seen at right anterior oblique position by the dot and eye method defined by Serato *et al* in coronary angiography<sup>(10)</sup>.

The most common symptoms are chest pain and syncope during exercise in this anomaly. It is one of the reasons for sudden death in young athletes. When the records of sudden death of 286 athletes were examined, the second most common reason of death was anomalous originated LMCA from righ sinus of valsalva (13%)<sup>(11,12)</sup>. Especially when younger patients present with syncope, myocardial ischemia or ventricular arrhythmias, this anomaly must be suspected<sup>(3)</sup>.

**Figure.** The images of left main coronary anomaly originating from right sinus of valsalva in coronary angiography



The gold diagnostic method is coronary angiography. But angiography provides only two-dimensional views so it does not show the complex structure of vessels. Also the relation between coronary anomalies with aorta and RVOT may not be detected by angiography<sup>(10)</sup>. So some alternative non invasive imaging methods are recommended such us CT coronary angiography or MR angiography<sup>(13)</sup> because of providing three-dimensional views, showing other accompanying anomalies and identifying coronary pathways<sup>(1)</sup>.

The benefits of surgery in asymptomatic patients are not clear<sup>(3)</sup>. If the patients presented with ventricular tachyarrhythmia or myocardial infarction, the surgery is usually required. The surgical intervention includes such as coronary artery bypass grafting (CABG) or unroofing of the coronary artery that prevents the compression of the artery in its interarterial course<sup>(14)</sup>.

In our case, the patient's clinic presentation was cardiac arrest with NSTEMI. He might die with no cardiac resuscitation. Also he had syncope attacks in his past story. We thought that his syncope attacks were not only related with carotid artery diseases. The other reason was LMCA anomalous with originating from right sinus of valsalva. We could not see his CT coronary angiography but the patient had type B in our view. Because he had syncope attacks and finally he presented with cardiac arrest due to heart attack and he had poor prognosis.

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### Conflicts of interest

There are no conflicts of interest.

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