

## Coronary artery anomaly

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Coronary artery anomaly includes a wide range of congenital abnormalities involving the origin, course, and structure of epicardial coronary arteries. These abnormalities occur in <1% of the general population. In adults, the clinical interest in coronary anomalies relates to their occasional association with sudden death, myocardial ischemia, congestive heart failure, or endocarditis.<sup>1</sup>

A 45-year-old lady had a typical anginal pain one year ago that was accentuated recently. There were no significant symptoms earlier. She was a well-nourished female with 7 successful pregnancies. She was no major risk factors such as hypertension, diabetes, hyperlipidemia, smoking and positive family history of coronary artery diseases. There were no abnormal finding on examination of head, neck, abdomen and extremities. The chest was symmetric with normal breath sound. Heart examination was completely normal. Resting electrocardiography and transthoracic echocardiography were showed no abnormal findings. At stage 2 of stress test, the patient was complaining from chest discomfort and ischemic type ST-T changes. She was in functional class II late of New York Heart Association. Coronary arteriography showed abnormal left coronary ostium in the right sinus of Valsalva. The left main trunk was originated from the ostium near to the ostium of right coronary artery. The left main trunk was very long and situated anterior to right ventricular outflow tract and pulmonary trunk. There were no atherosclerotic plaques in all coronary arteries and all of them were completely normal. The left main trunks had a long course and during systole, it bends after branching from the ostium. The ostium of the left main had a slit like and obtuse take off from the right sinus of Valsalva (Figure 1). She scheduled for coronary artery bypass graft due to inducible ischemia during exercise test and possibility of sudden cardiac death. Median sternotomy was performed without any complication. After opening of pericardial space, there was a long left main artery just anterior to right ventricular out flow tract that it was branched at the beginning of interventricular groove. Some part of the anterior segment of left ventricle had a small size scar tissue that it may be due to an old anterior infarction. The large left internal mammary artery was dissected and connected to the left anterior descending artery. The patient was pump off successfully and after a few days, she was discharged from the hospital in good condition.

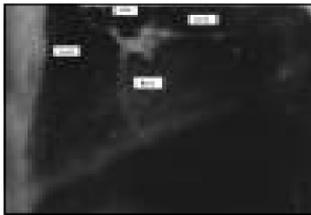


Figure 1 - Lateral view of coronary arteriography. Note to the position of 3 coronary arteries (LAD - left anterior descending artery, LCX - left circumflex artery, RCA - right coronary artery) and upward take off and anterior loop of the left main (LM).

Postoperation course of the patient was good with no problems. She was evaluated by stress test 3 months after operation without any evidence of ischemia and chest discomfort. When the left main coronary artery originates from the right coronary sinus of Valsalva, or vice versa, the anomalous artery takes 1 of 4 aberrant pathways to reach its proper vascular territory. These pathways are type A (such as anterior to the right ventricular outflow tract), type B (such as between the aorta and pulmonary trunk), type C (such as through the supraventricular crest portion of the septum), and type D (such as dorsal to the aorta). Although this classification is not according to relative incidence of the diseases. Type C is the most common and then D, A and B are common consequently. These 3 pattern A, C and D are usually harmless but type B is very dangerous.<sup>2</sup> Isolated coronary artery anomalies (excluding innocuous variants) 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. Most coronary artery anomalies are clinically silent and do not affect the quality of life or lifespan of the affected individuals. Specific forms of anomaly, such as the origin of the left main coronary artery from the pulmonary trunk, the aberrant course of the arteries between the great vessels in association with anomalous and slit like ostium, and large coronary artery fistulas, may be associated with sudden death, myocardial ischemia, or congestive heart failure. There are rare report of ischemia and sudden cardiac death among type A. In most of these patients, the ostium of the left main was slit like, and the artery was tangential to the aortic root and the adherent to it for approximately 1.5 centimeter.<sup>3</sup> 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.

No differences have been reported in the incidence of specific coronary artery anomalies among male and female subjects. In older individuals, symptoms are reported in <30% of patients before a diagnosis of coronary anomaly is made. These symptoms rarely raise clinical suspicion for diagnosis of coronary artery anomalies.<sup>4</sup> Tomographic or semitomographic techniques like transthoracic and transesophageal echocardiography, ultra fast computed tomography, magnetic resonance imaging (MRI) and magnetic resonance angiography (MRA) have been used with increasing success.<sup>5,6</sup> Definitive diagnosis of coronary artery anomalies requires selective arterial angiography via catheterization. Surgery is the only definitive treatment for coronary artery anomalies but in children is less advisable. If there are symptoms indicating myocardial ischemia associated with one of the known dangerous anomalies it would prudent to do a coronary bypass graft. This approach might be suitable for adults. Our patient had a typical A pattern of anomaly with slit like and obtuse take off of the left main ostium. She was operated successfully without any complication. The main cause of ischemia in our patient was anomalous origin of left main ostium. Aortic root injection was used for detection of obtuse take off of the left main from abnormal origin.

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