Left coronary artery anomaly associated with unstable angina pectoris

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Citation

L Özdemir, E Yeter, E Bozkurt. *Left coronary artery anomaly associated with unstable angina pectoris*. The Internet Journal of Cardiology. 2007 Volume 6 Number 1.

Abstract

A male patient in whom the four branches of the left coronary artery arise from a single coronary ostium at the left sinus valsalva of the aorta is presented here. A single coronary ostium that gives rise to the left anterior descending artery, intermediate artery, obtus marginal artery and left circumflex artery is extremely rare. The patient's right coronary artery was normal, and there was no evidence of congenital heart disease. Here we describe the patient's clinical and angiographic findings with a literature review.

INTRODUCTION

The common causes of unstable angina pectoris (UA) are (1) reduced myocardial perfusion due to coronary artery luminal narrowing caused by a fragment of an atherothrombotic plaque, (2) dynamic obstruction, which may be due to intense focal spasm of a segment of an epicardial coronary artery, (3) severe narrowing without spasm or thrombosis, (4) arterial inflammation caused by or related to infection, which may result in arterial narrowing, plaque destabilization, rupture, and thrombogenesis, (5) in the case of secondary UA, the precipitating condition is extrinsic to the coronary arterial bed [1]. However, less common causes also exist and these should be kept in mind in the diagnosis and treatment of UA.

Here we describe a patient in whom a rare coronary artery anomaly was found incidentally during a work-up for UA. The incidence of abnormal aortic origin of the coronary arteries is low, having been found in approximately 0.64 percent of births [2] and in 0.17 percent of asymptomatic children and adolescents who were referred for and underwent echocardiography [3]. A review of 5000 consecutive coronary angiograms, performed in adults mostly for the evaluation of angina pectoris, yielded 25 (0.5%) examples of congenital anomalies of the coronary arteries [4]. Although most anomalies are benign, some are associated with myocardial ischemia, ventricular arrhythmias, syncope, or sudden death, and therefore early recognition is vital [5,6,7]. The coronary artery anomaly in our patient involved the presence of a single coronary ostium giving rise to the left anterior descending artery, intermediate artery, obtus marginal artery and left circumflex artery in the left sinus Valsalva. This type of anomaly is exceedingly rare.

CASE REPORT

A 39-year-old male came to our hospital with a complaint of chest pain. His family history was positive for chest pain, and the patient himself had a history of smoking. Electrocardiography showed no abnormalities suggesting myocardial ischemia. Cardiac enzymes were normal. Transthoracic echocardiography likewise showed no abnormalities. Since the patient had been previously diagnosed with unstable angina pectoris in the presence of atherosclerosis risk factors, an exercise test was not planned and the patient was referred for coronary catheterization. Coronary angiography revealed a solitary coronary ostium at the left sinus valsalva, which gave rise to all three coronary arteries (Figure 1). The path of the right coronary artery was normal (Figure 2). Despite several additional angiographic projections, no significant luminal narrowing was visible. Although there was angina pectoris in the absence of significant coronary disease, no myocardial ischemia was found in the myocardial perfusion study. The patient was given no medication for chest pain.

Figure 1

Figure 1: The left main coronary artery is absent and the four major branches originate from a single ostium at the left sinus Valsalva. LAD, left anterior descending artery; IM, intermediate artery; OM1, obtus marginal artery 1, LCx, left circumflex artery

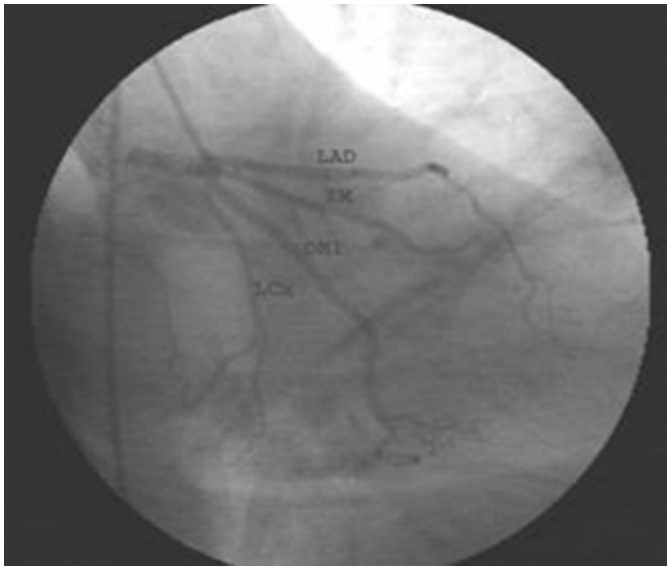
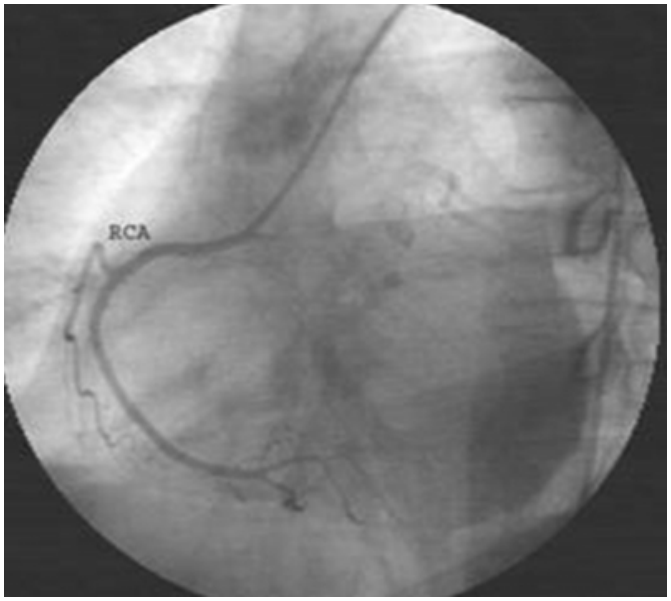


Figure 2

Figure 2: The patient's right coronary artery.



DISCUSSION

Coronary artery anomalies are rarely seen as an isolated defect in the adult patient. We report a rare coronary anomaly that has been classified by Angelini as type A1, defined as an absent left main trunk (split origination of LCA) [8]. We have found no reports of this anomaly in which all four branches of the left main coronary artery originate in a single coronary ostium in the left sinus valsalva of the aorta.

Although patients with coronary artery anomalies are generally asymptomatic, clinical symptoms may include angina pectoris, syncope, ventricular tachycardia, cardiac arrest, myocardial infarction and sudden death in the absence of coronary artery disease, depending on the specific anomaly [9]. Although our patient had chest pain characterized as unstable angina pectoris, a myocardial perfusion study revealed no ischemia. Since we found no narrowing of the coronary artery lumen, the chest pain was not attributed to the presence of the coronary anomaly. However, we could not clarify whether the chest pain was ultimately due to compression or a steal phenomenon.

Presently, coronary angiography is used to diagnose coronary artery anomalies and to exclude atherosclerotic coronary disease. Medical and surgical treatments can be selected according to the pathologic, anatomic and clinical severity of coronary anomalies. Sometimes patients with significant anomalies are discouraged from performing heavy exercise and competitive sports, at least until surgical correction is performed. For our patient, pharmacological treatment was not given for chest pain since no clues regarding ischemia were found.

In summary, we report a rare coronary artery anomaly in which a single coronary ostium gives rise to the four branches of the left coronary artery and this anomaly is associated with angina pectoris.

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