

Anomalous right coronary artery arising from the distal left circumflex coronary artery



Distal sirkumfleks arterden çıkan sağ koroner arter anomalisi

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Introduction

Single coronary artery (SCA) is a rarely encountered congenital anomaly of coronary artery tree in which only one coronary artery arises from the aorta by a single coronary ostium, supplying the whole heart (1). Single coronary artery is reported to be seen in 0.024% to 0.066% of the people who undergo diagnostic coronary angiography (2-4). We report a patient with SCA, in whom the right coronary artery (RCA) originates from the distal left circumflex coronary artery (LCX).

Case report

A 57-year-old man was admitted with the complaint of typical chest pain on exertion for 8 months. On physical examination, his arterial blood pressure was 140/90 mm Hg and heart rate was 67 bpm. Resting electrocardiogram revealed voltage criteria of the left ventricular hypertrophy. At stage-3 of the treadmill exercise test, he experienced burning sensation on the retrosternal region associated with 1 mm. ST segment depression in leads V5 and V6 and the test was prematurely stopped. Transthoracic echocardiography showed concentric left ventricular hypertrophy and normal left ventricular function without any regional wall motion abnormality. He underwent selective coronary angiography. On the left coronary angiography, 40% diameter stenoses in proximal and mid segments of left anterior descending coronary artery (LAD) were observed. Left circumflex coronary artery was a dominant vessel and had luminal irregularities. Interestingly, RCA arose from the distal LCX and followed the course, retrogradely, of the normal RCA territory (Fig. 1, 2. Video 1. See corresponding video/movie images at www.anakarder.com). The distal portion of RCA was terminated near the right sinus of Valsalva. Since we were not able cannulate RCA in its usual location, we performed aortography, which showed the absence of right coronary ostium. Subsequent myocardial perfusion imaging did not demonstrate signs of exercise-induced ischemia. Then, the patient was discharged with the medical treatment including angiotensin converting enzyme inhibitors (a daily dose of 10 mg ramipril), 40 mg/day atorvastatin and 100 mg/day aspirin and 40 mg/day isosorbide mononitrate with Class-II functional capacity. The patient has been asymptomatic on treatment at 12-month follow-up.

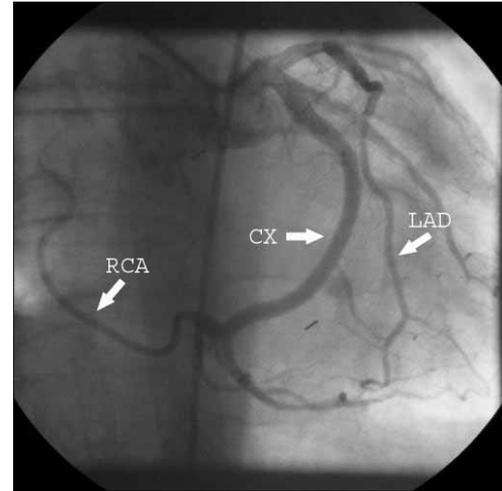


Figure 1. Anteroposterior caudal view demonstrates that the right coronary artery originating from the distal left circumflex coronary artery and followed the course, retrogradely, of the normal right coronary artery territory

CX - circumflex coronary artery, LAD - left anterior descending coronary artery, RCA - right coronary artery

Discussion

When a single aortic ostium provides blood flow for all of the coronary arteries, the condition is called SCA (5). Single coronary artery is a relatively rare congenital anomaly of the coronary tree and is commonly associated with other congenital cardiac anomalies such as bicuspid aortic valve (1), coronary arteriovenous fistula (1) and transposition of great arteries (2). 'Single left' coronary artery consists of the majority of the cases (5).

The primary classification for SCA should be based on the location of the single ostium, not on the nature of SCA only (5). Up to now, only few cases regarding this anomaly have been reported (6-8). In this case, the left coronary artery had a normal distribution, with RCA originating

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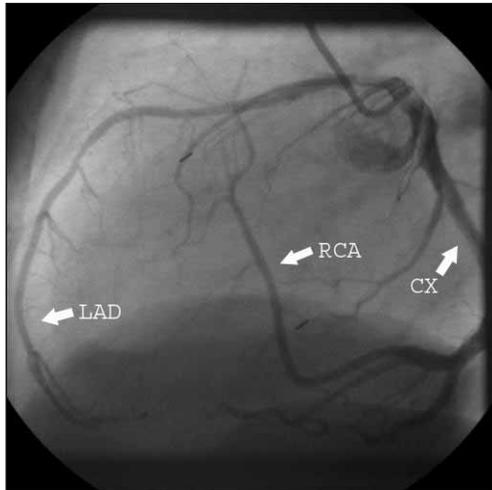


Figure 2. Left lateral view demonstrates that the right coronary artery originating from the distal left circumflex coronary artery and followed the course, retrogradely, of the normal right coronary artery territory

CX - circumflex coronary artery, LAD - left anterior descending coronary artery, RCA - right coronary artery

as a continuation of the LCX and called L-1 subtype according to Lipton classification (3).

Although there have been some cases of SCA accompanied with congestive heart failure, acute myocardial infarction and sudden cardiac death, SCA has generally been regarded as a benign anomaly (9). Sudden cardiac death was reported in only 5 cases of SCA of L-1 subtype (10). However, in our case, no inducible myocardial ischemia was observed in myocardial perfusion imaging and we showed that SCA had no ostial ridge or tangential origin during coronary angiography which make the anomaly more susceptible to aforementioned complications. Indeed, coronary blood flow is not affected by a single proximal trunk that provides coronary flow to the entire heart, unless congenital or acquired obstructive disease is present in the proximal mixed trunk (5).

Although this type of SCA described herein is known to be mostly benign form of isolated congenital coronary anomaly, there are some therapeutic concerns need to be exactly clarified especially during percutaneous or surgical coronary revascularization procedures (5). In

the presence of Lipton R-1 single coronary artery, even the temporary ostial obstruction by means of large guiding catheters or bulky instruments would be poorly tolerated and might be associated with ischemic symptoms. Therefore, percutaneous intervention of the common trunk is relatively contraindicated, not only because of the increased periprocedural risk but, more significantly, because of the risk of restenosis which may result in sudden cardiac death (5).

Conclusion

We presented an extremely rare variety of SCA, RCA arising from the distal LCX in this case report. We believe that all cardiologists should be aware of anatomical variations in coronary circulation for making accurate diagnosis and selecting best treatment option.

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