

Very rare anomalous right coronary artery as a terminal extension of left circumflex artery: a case of single coronary artery

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SUMMARY

In a type of single coronary artery, anomaly of right coronary artery originating from left circumflex coronary artery as a terminal extension is extremely rare. It has previously been reported mostly in young adult patients. We herein present the oldest case with a single coronary artery with anomalous right coronary artery arising from distal left circumflex artery and severe atherosclerotic stenosis in the left anterior descending artery.

Key words: Coronary artery anomaly, left circumflex artery, right coronary artery

ÖZET

Sol sirkumfleks arterin devamı olarak seyreden oldukça nadir bir sağ koroner arter anomalisi: tekli koroner arter olgusu

Sağ koroner arterin sol sirkumfleks arterin uç uzantısı olarak devam ettiği tekli koroner arter anomalisi oldukça nadir görülür. Daha önce bildirilen olgular nispeten genç erişkin hastalardır. Bu olgu sunumunda sol ön inen arterinde aterosklerotik lezyonu bulunan ve sağ koroner arterin sol sirkumfleksin devamı olarak devam ettiği en yaşlı olguyu sunduk.

Anahtar kelimeler: Koroner arter anomalisi, sol sirkumfleks arter, sağ koroner arter

Introduction

The situation with single coronary aortic ostium for whole coronary blood flow is called a single coronary artery (1). This is an extremely rare anomaly and reported in 0.024% to 0.066% of cases performed conventional coronary angiography (2). This kind of anomaly has shown many variations in coronary origination and distribution. Herein, we describe an extremely rare case of severe atherosclerotic single coronary artery with an anomalous right coronary artery arising from the distal part of the left circumflex artery.

Case Report

A 72-year-old woman was admitted to our hospital with exertional angina pectoris (CCS class II) lasting for 6 months. She had a history of hypertension for 10 years. On her physical examination blood pressure was 140/80 mmHg, and heart rate was 70 bpm and regular. A 12-lead resting electrocardiogram and routine biochemical values were within normal limits. Transthoracic echocardiography did not demonstrate any regional wall motion abnormality with normal left ventricular function. Because of the typical chest pain on exertion a treadmill exercise test was performed. During treadmill exercise test, 2 mm downsloping ST segment depression in leads V5 and V6 was observed at the stage-3. Subsequently, the patient underwent selective coronary angiography. Conventional coronary angiography revealed that the left anterior descending artery (LAD) and left circumflex artery (CX) originated from their usual coronary sinus but the right coronary artery (RCA) arose as a terminal extension of left circumflex artery and followed retrogradely the course of the normal RCA territory (Figure 1A,B). Nevertheless, RCA was not cannulated in its usual location, then we performed aortography (Figure 2). It showed the absence of right coronary ostium. Therefore, we noticed that all three coronary arteries originated from the left coronary cusp.

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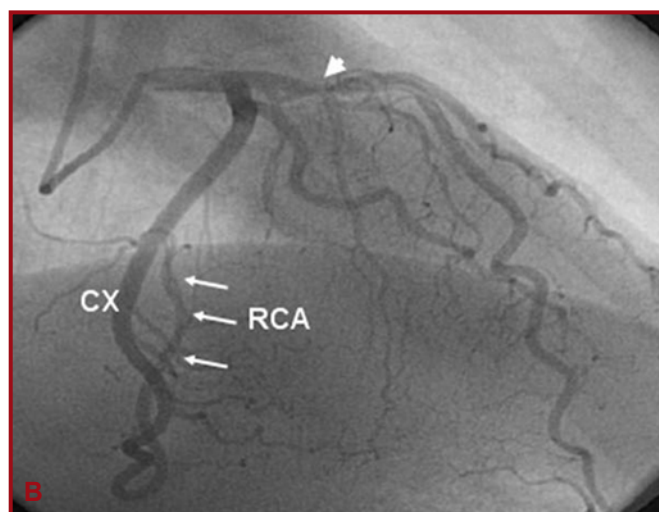
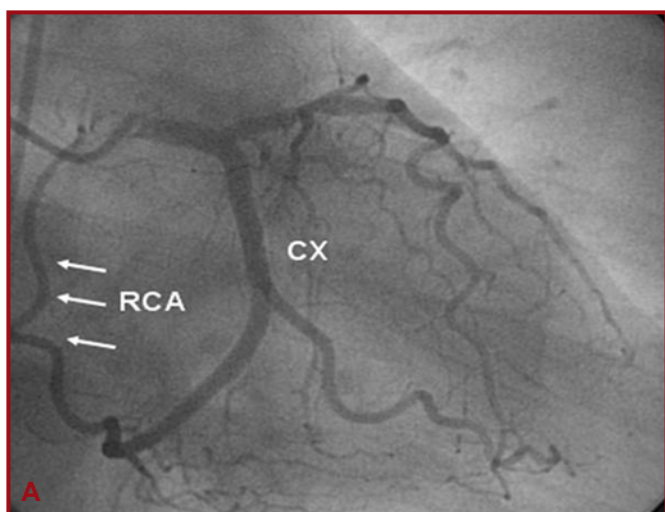


Figure 1. Left coronary angiography shows anomalous RCA arising as a terminal extension of left CX at RAO 65° caudal 70° (A), RAO 15° cranial 70° (B). Arrow head shows atherosclerotic stenosis in the mid segment of the LAD and white arrows show anomalous RCA. RCA: Right coronary artery; CX: Circumflex coronary artery; LAD: Left anterior descending artery; RAO: Right anterior oblique

In addition, we observed a trifurcation lesion of 90% diameter stenoses in midsegment of LAD at the level of first septal branch and the first diagonal branch. Percutaneous coronary intervention decision was made, but the patient did not accept any coronary intervention after being informed about the options and potential risks. The patient was, then, discharged with a proper medical treatment.

Discussion

In many angiographic series, the incidence of congenital coronary artery anomalies may show discrepancies. The incidence of anomalous RCA in congenital coronary anomalies is variable in different populations, with the highest incidence in Indian (0.46%) and the lowest incidence in German (0.04%) populations (3,4). Nonetheless, it was reported by 0.09% in the Turkish population with no mention of single coronary artery (5).

Single coronary artery is defined as a single coronary aortic ostium to deliver blood flow to all three coronary arteries and shows some degree of coronary origination and distribution differences. Single coronary artery shows somewhat associations with other congenital cardiac anomalies such as bicuspid aortic valve and coronary arteriovenous fistula (6). Although several case reports have been published showing the arising of RCA from the LAD (7), there are relatively less data about the arising of RCA as an extension of the CX. According to the single coronary artery classification in literature by Lipton et al. (1), our case is classified as Grup L1 since RCA arose as a terminal extension of CX.

Single coronary artery anomalies which were found incidentally during conventional coronary angiography remain mostly asymptomatic. It may not cause any disorder in the blood distribution unless there is a stenotic lesion. Ten cases have been reported describing the arising of RCA as an extension of the CX in the literature (Table 1) (8-15), and none of these had any atherosclerotic lesion. In our case, the patient had an atherosclerotic stenosis in LAD. Because of no association between specific coronary artery anomaly and coronary artery disease, we considered that atherosclerotic process in the LAD of the patient was only a co-incidence. To the best of our knowledge, it

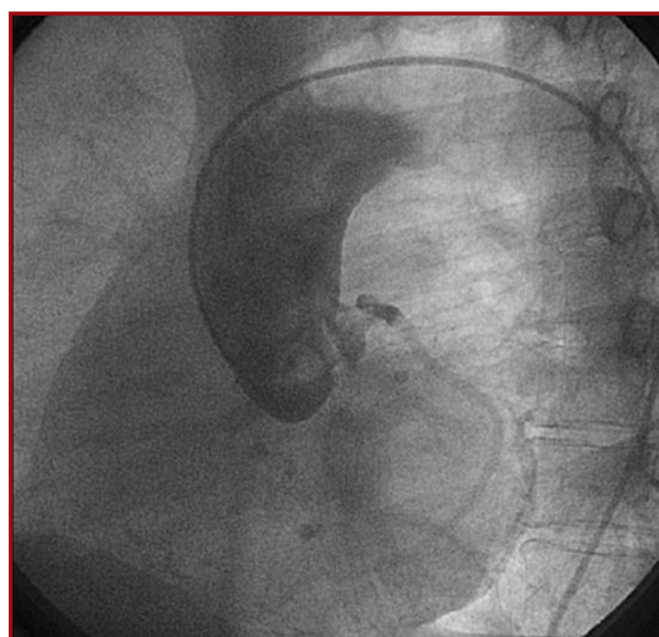


Figure 2. Aortography demonstrates no right coronary artery from the right sinus of Valsalva

Table I. Series related to 10 cases of anomalous origin of right coronary artery arising from left circumflex artery

References	Patient number	Origin	Other cardiovascular anomalies
Tavernarakis (8)	1	Peripheral segment	-
Neuhas (9)	3	AV branch	-
Turhan (10)	1	Terminal extension	-
Cademartiri (11)	1	Terminal extension	-
Berberie (12)	1	Terminal extension	-
Tanriverdi (13)	1	Terminal extension	-
Shojaie (14)	1	Terminal extension	-
Çelik (15)	1	Terminal extension	-

is the first case showing this co-incidence. Our case was the oldest one among these cases with RCA anomaly arising from CX and it might be the reason for atherosclerosis in the LAD.

In conclusion, the RCA arising as a terminal extension of left CX is a relatively uncommon congenital coroner artery anomaly. The cardiologist should be kept in mind the likelihood of this and the other possible anomalies when performing a coronary angiography to make an accurate and complete diagnosis.

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