A Rare Type of Coronary Anomalies: Twin Circumflex Arteries

Nadir Bir Koroner Arter Çıkış Anomalisi: İkiz Circumflex Arter

Cihan Öztürk, Melik Demir, Burcu Çakır, Ahmet Kenan Yalta

Trakya University Faculty of Medicine, Department of Cardiology, Edirne, Turkey

ABSTRACT

Coronary artery anomalies have been mostly diagnosed incidentally in clinical practice. In this context, anomalous origin of the circumflex (Cx) artery has been relatively frequent compared with other anomalies. However, twin circumflex (Cx) arteries have been very rarely encountered to date. In a previous study, it was reported that the incidence of Cx arteries originating from the left and right coronary sinuses ranged from 0.19% to 0.29%. Clinically, this anomaly is generally considered a benign pathology. However, in the case of a possible acute coronary syndrome or unstable angina pectoris, it may cause difficulties in diagnosis and treatment. In this paper, we report a 58-year-old male patient admitted with angina pectoris in whom the coronary angiogram (CAG) demonstrated twin Cx arteries (two separate arteries stemming from the left and right coronary systems) along with a critical stenotic lesion in the right coronary artery (RCA).

Key words: Coronary artery anomalies, twin circumflex arteries, circumflex anomalies

ÖZET

Koroner arter anomalileri klinik pratikte çoğunlukla tesadüfen teşhis edilmektedir. Bu bağlamda sirkumfleks (Cx) arterin anormal orijini diğer anomalilere göre nispeten daha sık görülmektedir. Ancak bugüne kadar ikiz sirkumfleks (Cx) arterlere çok nadir rastlanmıştır. Daha önce yapılan bir çalışmada sol ve sağ koroner sinüslerden kaynaklanan Cx arterlerin görülme sıklığının %0.19 ile %0.29 arasında değiştiği bildirilmişti. Klinik olarak, bu anomali genellikle iyi huylu bir patoloji olarak kabul edilir. Ancak olası bir akut koroner sendrom veya kararsız angina pektoris durumunda tanı ve tedavide zorluklara neden olabilir. Bu yazıda, anjina pektoris ile başvuran ve koroner anjiyografide (KAG) ikiz Cx arterleri (sol ve sağ koroner sistemlerden çıkan iki ayrı arter) ile birlikte sağ koroner arterinde (RCA) kritik bir stenotik lezyon gösteren 58 yaşında bir erkek hasta sunuldu.

Anahtar Kelimeler: Koroner Arter Çıkış Anomalisi, İkiz Circumflex Arter, Circumflex Anomalisi

INTRODUCTION

Anomalous origin of the circumflex (Cx) coronary artery has been occasionally encountered on coronary angiogram (CAG) during daily clinical practice. However, double or twin Cx arteries (each originating from a separate ostium) have been very rarely reported to date(1, 2). In this paper, we report a case of twin Cx arteries (one artery arising from the left main coronary artery (LMCA) and the other from the right coronary system).

CASE REPORT

A 50-year-old male presented with exercise angina. His electrocardiogram (ECG) demonstrated no evidence of ischemic changes. Physical examination was unremarkable. He also had hypertension as a risk factor. CAG was performed due to a clinical suspicion of unstable angina pectoris. The LMCA, left anterior descending (LAD), and circumflex artery (LCx) arteries were normal (Figure 1A). However, a second Cx artery (RCx) stemming from the right sinus of Valsalva was opacified during CAG of the right coronary artery (RCA)(Figure 1B). There was also a 90% stenosis involving the 2nd segment of the RCA that was successfully managed with the implantation of a drug-eluting stent (Figure 1C). There was no ischemic change in the patient's ECG (Fig. 1D) and patient was discharged after an uneventful clinical follow-up.

DISCUSSION

Coronary artery anomalies have been clinically silent in most cases. However, they also have the potential to

Corresponding author: Cihan Öztürk, Trakya University Faculty of Medicine, Department of Cardiology, Edirne, Turkey
E-mail: dr.cihanozturk@gmail.com
Eskisehir Med. J. 2022; 3(2):239-241.
Received date:21.02.2022 Accepted date:20.06.2022
Authors: Cihan Öztürk (ORCID: 0000-0001-8694-1693), Melik Demir (ORCID: 0000-0003-1711-6707), Burcu Çakır (ORCID: 0000-0002-0190-7670), Ahmet Kenan Yalta (ORCID: 0000-0001-5966-2488)

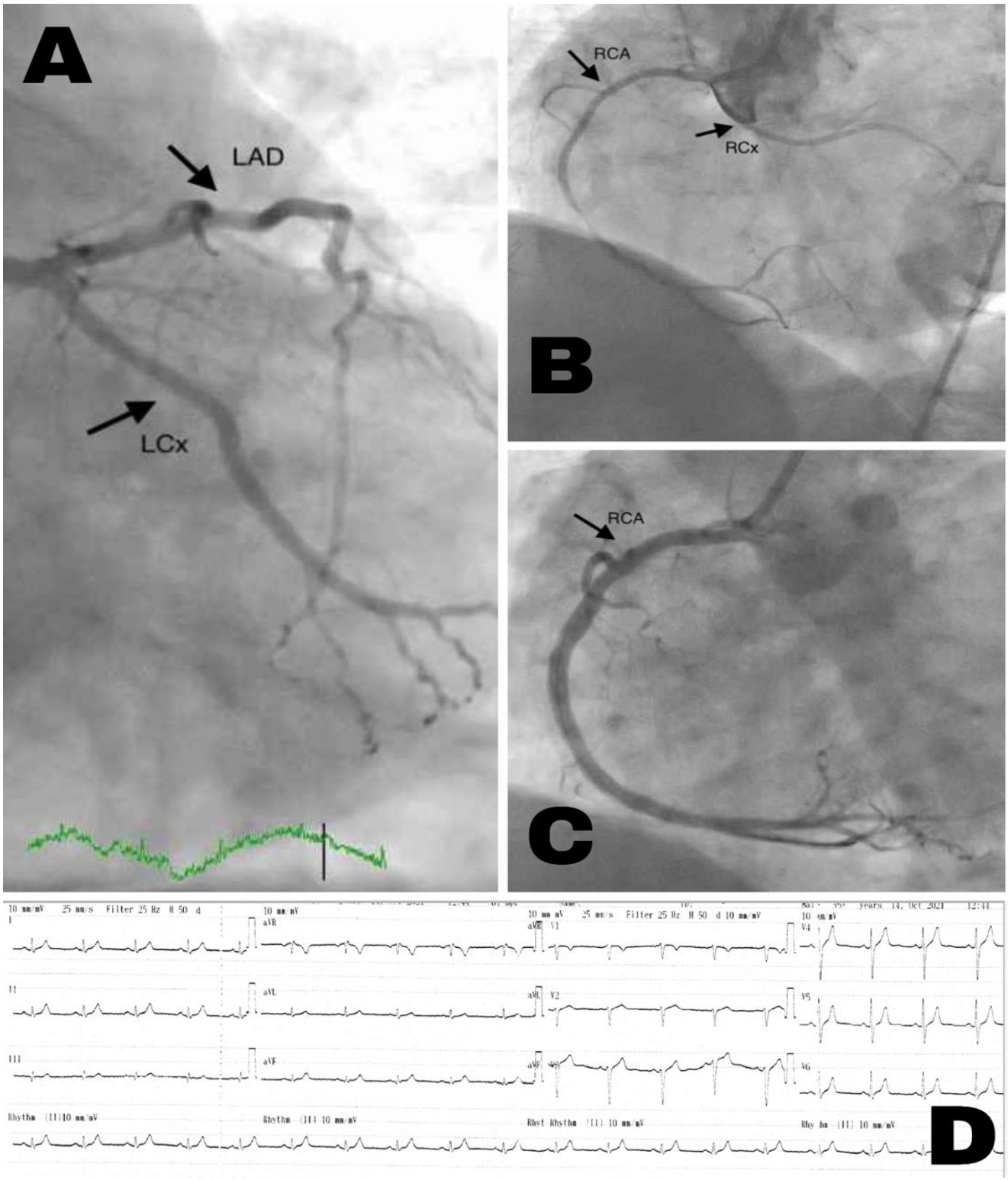

Figure 1A. Left main coronary (LMCA), left anterior descending artery (LAD), and circumflex artery (LCx) in caudal views. **1B.** RCx stemming from the right coronary ostium. **1C.** RCA after stent implantation. **1D.** ECG without ischemic changes

induce chest pain, arrhythmias as well as heart failure. Moreover, these anomalies have been the common triggers of sudden cardiac death (SCD) among young athletes (3). Of note, twin Cx arteries arising from both the left and right coronary systems have been very rarely encountered. Accordingly, a previous study reported that the incidence of Cx arteries stemming from the left and right coronary sinuses ranged between 0.19% and 0.29% (4). Clinically, this anomaly is generally regarded as a benign pathology (5). However, evolution of atherosclerosis might be relatively frequent in the Cx artery stemming from the right coronary system in comparison to the one originating from the LMCA (6).

In a previous case report, a patient with twin Cx arteries was reported to be hospitalized with an acute inferior myocardial infarction due to LCx artery occlusion along with an existing severe stenosis in the RCx artery, both of which were successfully managed with percutaneous coronary intervention (7). On the other hand, twin Cx arteries were free of any luminal stenoses in our case. In such cases, the experience of the angiographer is of utmost importance. In other terms, angiographic detection of RCx originating from the right coronary system might be possibly missed due to the selective engagement of the catheter into the RCA. This might possibly lead to the underdiagnosis of this anomaly in clinical practice potentially accounting for its underreporting in the literature as well. Therefore, catheter manipulations might be necessary to engage RCx particularly in highly suspicious cases (for instance; emerging vascular shadows potentially associated with RCx during RCA angiogram). In addition, an existing RCx artery is also of critical importance in patients undergoing cardiac surgery. In this context, it might be vital to inform surgeons on the abnormal course of RCx (including retroaortic) to avoid accidental cross-clamping or incision of the artery (8).

CONCLUSION

In conclusion, twin Cx arteries have been quite rare in the current literature. Repetitive catheter manipulations might be necessary during CAG in an effort to properly obtain RCx images. However, clinical relevance of this anomaly still needs to be established.

Informed Consent: The authors report that patient consent was provided for publication of the images used herein.

Conflict of Interest: The authors declare that they have no conflict of interest.

Funding: This study was not supported by any funding.

REFERENCES

1. Van der Velden L, Bär F, Meursing B, Ophuis TO. A rare combination of coronary anomalies. Netherlands Heart Journal. 2008;16(11):387-9.

2. Wilkins CE, Betancourt B, Mathur VS, Massumi A, De Castro CM, Garcia E, et al. Coronary artery anomalies: a review of more than 10,000 patients from the Clayton Cardiovascular Laboratories. Texas Heart Institute Journal. 1988;15(3):166.

3. Maron BJ. Sudden death in young athletes. New England Journal of Medicine. 2003;349(11):1064-75.

4. Yorgun H, Hazırolan T, Kaya EB, Gürses KM, Evranos B, Canpolat U, et al. The prevalence of coronary artery anomalies in patients undergoing multidetector computed tomography for the evaluation of coronary artery disease. Turk Kardiyoloji Dernegi Arsivi: Turk Kardiyoloji Derneginin Yayin Organidir. 2010;38(5):341-8.

5. Frescura C, Basso C, Thiene G, Corrado D, Pennelli T, Angelini A, et al. Anomalous origin of coronary arteries and risk of sudden death: a study based on an autopsy population of congenital heart disease. Human pathology. 1998;29(7):689-95.

6. Click RL, Holmes DR, Vlietstra RE, Kosinski AS, Kronmal RA. Anomalous coronary arteries: location, degree of atherosclerosis and effect on survival—a report from the Coronary Artery Surgery Study. Journal of the American College of Cardiology. 1989;13(3):531-7.

7. Karabay KO, Uysal E, Bağırtan B, Vural M. A case of twin circumflex arteries associated with acute myocardial infarction. Turk Kardiyol Dern Ars. 2010;38:496-8.

8. Hendiri T, Alibegovic J, Bonvini RF, Camenzind E. Successful angioplasty of an occluded aberrant coronary artery: a rare cause of acute myocardial infarction. Acute cardiac care. 2006;8(2):125-7.

Cite as: Ozturk C, Demir M, Cakir B, Yalta AK. A Rare Type of Coronary Anomalies: Twin Circumflex Arteries. Eskisehir Med J. 2022;3(2):239-241.