

# Proksimal Sağ Koroner Arterden Köken Alan Sirkumfleks Koroner Arter Anomalisi; İki Olgu Sunumu

*Anomalous Origin of Circumflex Coronary Artery Arising From Proximal Right Coronary Artery; Report of Two Cases*

Arif Duran<sup>1</sup>, Serkan Öztürk<sup>2</sup>, Tolga Memioğlu<sup>2</sup>, Tarık Ocak<sup>1</sup>

<sup>1</sup>Abant İzzet Baysal Üniversitesi Tıp Fakültesi Acil Tıp AD, Bolu

<sup>2</sup>Abant İzzet Baysal Üniversitesi Tıp Fakültesi Kardiyoloji Ad, Bolu

**Yazışma adresi:** Serkan ÖZTÜRK, Abant İzzet Baysal Üniversitesi, Tıp Fakültesi, Kardiyoloji AD, 14280 Golkoy Bolu/Türkiye, Tel:+903742534656-3194, Fax:+903742534615, Email: drserkan69@hotmail.com

**Geliş tarihi / Received:** 03.04.2012

**Kabul tarihi / Accepted:** 19.07.2012

## Özet

Konjenital koroner anomaliler yaklaşık %1-2 oranında görülebilmektedir. Koroner anjiyografi yaygınlaştıktan sonra bu anomalilerle daha sık karşılaşılmaktadır. Koroner anomaliler asemptomatik olabileceği gibi anjina, senkop, miyokard enfarktüsü ve özellikle gençlerde ölüme yol açabilmektedir. Bu yazıda koroner arter anomalisi olan, kararsız anjina kliniği ve elektrokardiyografide inferiyor ST değişikliği ile acil servise başvuran iki hastayı sunuyoruz.

**Anahtar kelimeler:** Koroner anomaliler, acil servis, miyokard enfarktüsü

## Abstract

Congenital coronary anomalies can be seen in approximately 1-2%. Clinical evidence of coronary artery anomalies may go up, an asymptomatic condition, angina, syncope, myocardial infarction and cardiac death especially young adults. Herein we report that two patients with coronary artery anomaly; left circumflex coronary artery (LCx) originating from the proximal right coronary artery, who admitted to the emergency room with unstable angina and ST segment alterations in inferior leads on electrocardiography.

**Key words:** Coronary anomaly, emergency service, myocardial infarction

## Introduction

Congenital anomalies in the origin of epicardial coronary arteries are rarely seen. The prevalence of coronary artery anomalies is obtained by autopsy or angiographic series, so the true incidence is unknown (1). Approximately 1-2% is observed around the community. 80% of the benign but especially against the right or the left coronary artery arising from the leaves of coronary anomalies are serious. Clinical evidence of coronary artery anomalies may go up, an asymptomatic condition, angina, syncope,

myocardial infarction and cardiac death especially young adults (2).

Herein, we report two patients with coronary anomaly, one of them left circumflex coronary artery (LCx) originating from the proximal right coronary artery (RCA) and the other LCx originating from right coronary sinus, of which they admitted to the emergency room with unstable angina and ST segment alterations in inferior leads on electrocardiography.

## Case 1

A 31-years-old man with prior history of

hyperlipidemia type 2A (total cholesterol and LDL levels are higher, HDL level is lower, triglyceride level is normal) was admitted to the cardiology department because of dyspeptic complaints that new onset continuous and persistent nausea, backache within interscapular area and epigastric pain. His symptoms had begun after a psychogenic stress and following a strenuous activity. Electrocardiography was performed in a few minutes and seen sinus rhythm, ST elevations in D2-D3-aVF leads and ST depressions in D1-aVL leads. Basal ECG features were early repolarization and 1 mm ST elevation in D2 lead. Cardiac markers such as CK, CK-MB, Troponin I were analyzed and results found in normal range. Also, after 6 hours of admission cardiac enzymes were normal. Echocardiography was performed and seen normal left ventricular systolic function with normal segmental motions. Also, after 6 hours of admission, only nausea was continuing and the other symptoms decreased. He had used atorvastatin for type 2A hyperlipidemia and broke it about 8 months before. On admission his blood pressure was 120/80 mmHg and heart rate was 70 beat per minute. Cardiac auscultation was unremarkable and the chest was clear.

Diagnostic coronary angiography was performed from the right brachial approach. The anomalous origin of LCx artery from the from right coronary sinus was revealed (Figure I). Distal segment of RCA has atherosclerotic plaques. Patient was followed-up for eight months and he was asymptomatic.

### Case 2

A 82-year-old man with no prior history of coronary artery disease, was admitted to the cardiology department because of chest pain and positive myocardial perfusion scintigraphy for ischemia. He was on treatment for hypertension

and chronic obstructive lung disease. His complaints were typical for ischemic heart disease and conforms unstable angina pectoris. His symptoms had begun after a mild effort for walking around. Electrocardiography revealed sinus rhythm without ischemic changes. Cardiac markers such as CK, CK-MB, Troponin I were in normal range. Also, after 6 hours of admission cardiac markers were in normal range. Echocardiography was performed for evaluate ventricular function. It was revealed normal left ventricular systolic functions with normal segmental motions. He was on treatment of acetyl salicylic acid 100 mg, perindopril 10 mg, meprobamat-nitrate, salmeterol inhaler. On admission his blood pressure was 145/90 mmHg, and heart rate was of 81 beat per minute. Cardiac auscultation was unremarkable. Pulmonary sounds were rough on auscultation.

Coronary angiography was performed from the right femoral approach. It was revealed the anomalous origin of LCx artery which arising from proximal RCA (Figure II). Else, there was a 20% stenosis after right ventricular branch of RCA. There were %50 stenoses following first diagonal branch of LAD and ostium of the first diagonal branch. Medical treatment was decided for these lesions. He has been followed up for six months with a treatment that appropriate dose rosuvastatin, acetyl salicylic acid, perindopril, meprobamat-nitrate, salmeterol inhaler. Patient was asymptomatic on follow-up period.

### Discussion

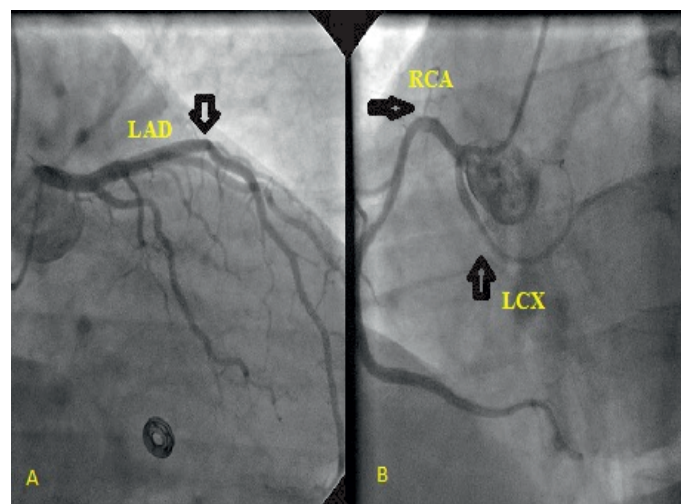
Congenital coronary artery anomalies are rare and usually detected incidentally during diagnostic coronary angiography. In a large study, the incidence of coronary artery abnormalities reported as from 0.6 to 1.3% (1). Anomalous origin of the LCx artery from the RCA most common congenital coronary artery anomalies in reported angiographic series. Although anomalous origin of the LCx artery is usually benign, sometimes may cause angina pectoris, myocardial ischemia/infarction, syncope, arrhythmia, heart

failure and sudden death (2-4). In our cases first diagnosis assessed as unstable angina pectoris, and improvement was observed with anti-ischemic therapy in contrast to significant stenosis. The pathophysiological mechanism of these clinical situations is still controversial. There are some candidate pathological variables. These, the presence of a slit-like coronary ostium, the value of the angle where the coronary artery take-off from aorta, the length of the coronary artery within the aortic wall, the presence of fibrous ridge in coronary ostium and degree of displacement of abnormal coronary artery from appropriate sinus Valsalva (5).

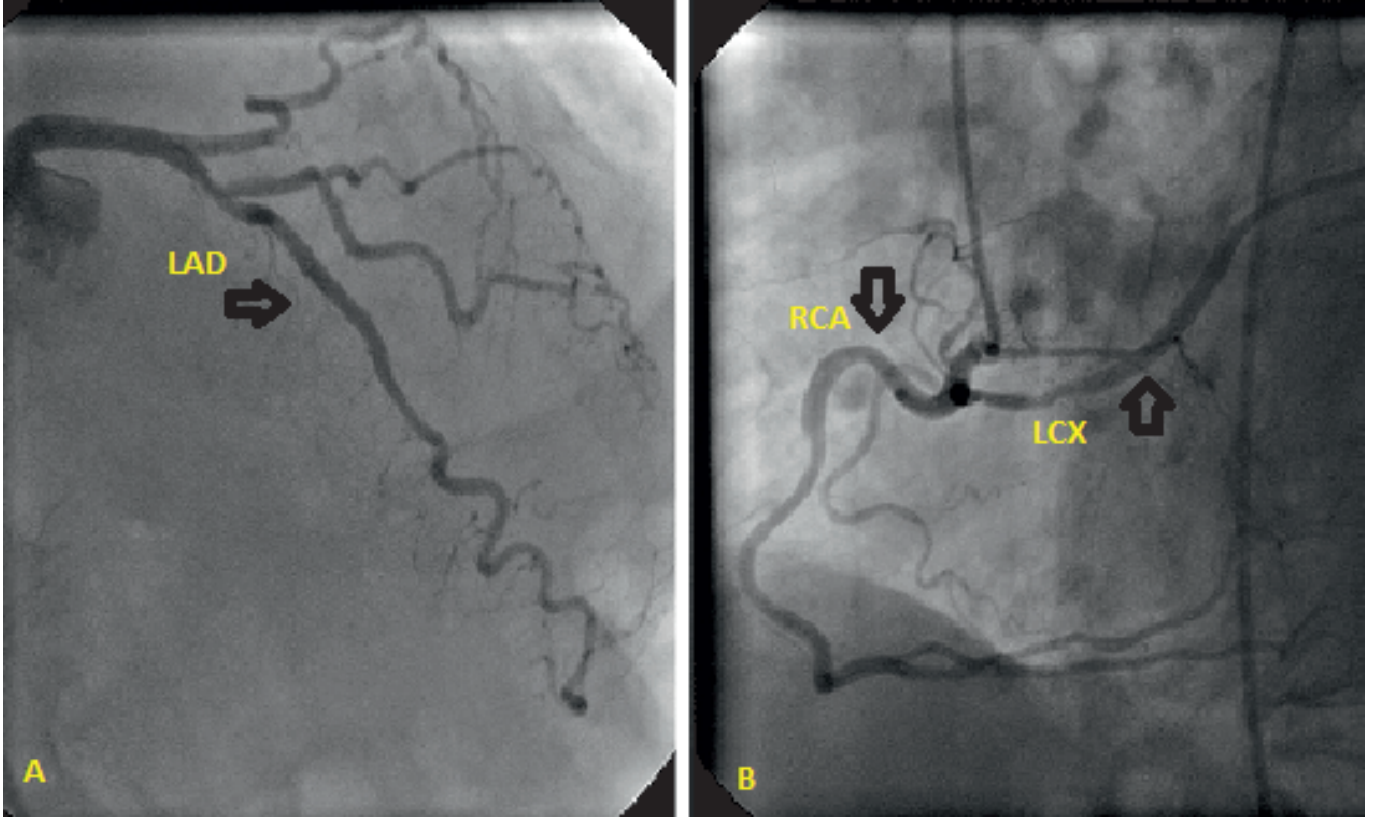
Other predisposing factors such as altered flow patterns related to interarterial segments of LCx, spasms, coronary endothelial damage, psychogenic stress and strenuous activity and obstructive atherosclerosis, makes it difficult to estimate the etiologic causes of myocardial ischemia. In the first case, there may be several factors contributing to acute coronary syndrome. We thought that angina was occurred due to coronary spasms of the anomalous LCx and also due to angulated take-off from the aortic sinus. Chest pain terminated dramatically after antithrombotic and intravenous nitrate therapy within ten minutes in this case. Coronary artery spasm is dynamic and reversible stenosis of an epicardial coronary artery. Coronary spasms can be caused by excessive sympathetic discharge and extreme stress. Although, ST segment elevation was seen at the emergency room and it was completely resolved after treatment. Whereas, the second case had also severe atherosclerotic stenosis at LCx artery which had take-off anomaly. Both of them might be cause ischemia. Although patient with severe LCx lesions but he refused invasive treatment. So medical treatment administrated and chest pain resolved.

In case series of patients with abnormal right or left coronary artery the clinical course heterogeneity is reported. Therefore, sudden death can occur in some patients, but many also take up to a normal life. The sudden cardiac death is a particular risk for each patient. And therefore difficult to determine individualized treatment decisions (6). Prophylactic surgical correction require for more thought to the young patients, sudden cardiac death due to anomalies that may occur regardless of the patient' age. Risk of sudden death due to coronary anomaly in an elderly patient is likely to be low, but the exact size of risk is not known (7).

Finally, arising from the contralateral coronary artery or contralateral coronary sinus navigating between the aorta and the pulmonary artery for patients with uncorrected coronary artery, thought the risk of exercise-related sudden cardiac death, it's wise to avoid violent sports activity and stress. Although medical treatment has been given to both of our patients, definitive treatment options should be considered for patients with coronary anomaly may be different for each patient.



**Figure I.** **A)** Shows that left descending coronary artery (LAD), **B)** Shows the presence of anomalous origin of circumflex coronary artery (LCx) from the right coronar sinus.



**Figure II.** A) Shows left anterior descending coronary artery (LAD), B) Shows the presence of anomalous origin of the circumflex coronary artery (LCx) from the proximal right coronary artery (RCA).

*Yazarlarla ilgili bildirilmesi gereken konular (Conflict of interest statement) : Yok (None)*

### References

- 1) Yamanaka O, Hobbs RE. Coronary artery anomalies in 126,595 patients undergoing coronary arteriography. *Cathet Cardiovasc Diagn.* 1990;21:28-40.
- 2) Selcoki Y, Er O, Eryonucu B. Coexistence of myocardial infarction with normal coronary arteries and a left circumflex artery anomaly originating from the right coronary artery with a bridge in the left anterior descending artery. *Clinics (Sao Paulo).* 2009;64(7):707-10.
- 3) Taylor AJ, Byers JP, Cheitlin MD, Virmani R. Anomalous right or left coronary artery from the contralateral coronary sinus: "high-risk" abnormalities in the initial coronary artery course and heterogeneous clinical outcomes. *Am Heart J* 1997;133:428-35.
- 4) Piovesana P, Corrado D, Verlato R, Lafisca N, Mantovani E, DiMarco A, et al. Morbidity associated with anomalous origin of the left circumflex coronary artery from the right aortic sinus. *Am J Cardiol* 1989;63:762-3.
- 5) Maron BJ, Poliac LC, Roberts WO. Risk for sudden Cardiac death associated with marathon running. *J Am Coll Cardiol.* 1996;28:428-31
- 6) Barth CW, Roberts WC. Left main coronary artery originating from the right sinus of valsalva and coursing between the aorta and pulmonary trunk. *J Am Coll Cardiol* 1986;7:366-73.
- 7) Fernandes ED, Kadivar H, Hallman GL, Reul GJ, Ott DA, Cooley DA. Congenital malformations of the coronary arteries: The Texas Heart Institute experience. *Ann Thorac Surg* 1992;54:732-40