

A Case Report of Twin Circumflex Arteries Associated with Acute Coronary Syndrome

Akut Koroner Sendrom ile İlişkili İkiz Sirkumfleks Arter Anomalisine Dair Bir Olgu Sunumu

Süleyman Sezai YILDIZ,^a
Murat AVŞAR,^a
Mehmet Mustafa CAN,^a
Asım ENHOŞ,^a
Mustafa Hakan DİNÇKAL^a

^aClinic of Cardiology,
Bağcılar Training and
Research Hospital, İstanbul

Geliş Tarihi/Received: 25.03.2013
Kabul Tarihi/Accepted: 10.07.2013

Yazışma Adresi/Correspondence:
Mehmet Mustafa CAN
Bağcılar Training and
Research Hospital,
Clinic of Cardiology, İstanbul,
TÜRKİYE/TURKEY
mehmetmustafacan@yahoo.com

ABSTRACT The incidence of coronary artery anomalies in patients undergoing coronary angiography varies from 0.6% to 1.5%. Many of these anomalies are clinically benign; however, others are associated with serious morbidity. We describe the case of a patient in whom evaluation of acute coronary syndrome revealed twin circumflex coronary arteries arising from the left main and right coronary arteries, respectively. We discuss the clinical importance of this anomaly and review the literature concerning current views and therapy.

Key Words: Coronary vessels; abnormalities; acute coronary syndrome

ÖZET Koroner anjiyografi yapılan hastaların %0,6-1,5'inde koroner arter anomali insidansına rastlanır. Bu anomalilerin çoğu selim olmasına rağmen bir kısmı ciddi morbidite ile ilişkilidir. Biz burada akut koroner sendrom tanısıyla başvuran hastada sol ve sağ koroner arterin her ikisinden de köken alan ikiz sirkumfleks koroner arterlerini sunmak istedik. Bu anomalinin klinik önemini güncel bilgiler ve tedavi işiği altında anlatmak istedik.

Anahtar Kelimeler: Koroner damarlar; anomalilikler; akut koroner sendrom

Turkiye Klinikleri J Case Rep 2013;21(4):164-6

The incidence of coronary artery anomalies (CAA) in patients undergoing coronary angiography varies from 0.6% to 1.5%.¹⁻⁵ Many of these anomalies are clinically benign; however, others are associated with serious morbidity.

We describe the case of a patient in whom evaluation of acute coronary syndrome revealed twin circumflex coronary arteries arising from the left main and right coronary arteries, respectively. We discuss the clinical importance of this anomaly and review the literature concerning current views and therapy.

CASE REPORT

A 66-year-old man was admitted to our hospital with a recent history of palpitations and dizziness. He had no specific past medical history, but he was a smoker. The electrocardiogram reveals monomorphic sustained ven-

tricular tachycardia without hemodynamic compromise. After antiarrhythmic medications, the ECG obtained during sinus rhythm was revealed ST-segment elevation in leads D2, D3, and AVF together with ST-segment depression in the precordial leads. The patient was hospitalized with the diagnosis of acute inferior wall myocardial infarction and received dual antiplatelet therapy (aspirin 100 mg/day and clopidogrel 600 mg once). Afterwards, he underwent coronary angiography for primary percutaneous coronary intervention (PCI). In this patient coronary angiography revealed the left mainstem had a normal origin and divided into the left anterior descending (LAD) and left circumflex (LCX) arteries (Figure 1a). There was non-critical lesions in the first diagonal of the LAD and LCX mid segment. In right coronary angiography, there was another Cx (RCx) arising from the proximal part of the right coronary artery (RCA) with a significant thrombotic lesion in the proximal segment (Figure 1b). Primary percutaneous coronary intervention (PCI) including balloon angioplasty and stenting was successfully performed for the RCx lesion (Figure 1c).

Cardiac angiography with multislice computed tomography (MSCT) was performed to determine the origins and courses of the coronary arteries. Because it's more advanced technology, and the use of MSCT, has proven better in the evaluation of coronary anomalies due to its faster, safer, and highly accurate.⁴ In our case, it showed double Cx arteries arising from the left main and RCA, respectively. As usual, the LCx arising from the left main coronary artery coursed within the left atrioventricular groove and supplied the left part of the lateral wall of the left ventricle (Figure 1d). The Cx originating from the RCA (anomaly Cx) coursed between the left atrium and the aorta, and supplied the right part of the lateral wall of the left ventricle (Figure 1d). After primary PCI, the patient was discharged without symptom.

DISCUSSION

Coronary anomalies should be recognised during routine coronary angiography. Normally, the left mainstem coronary artery (LMCA) originates from

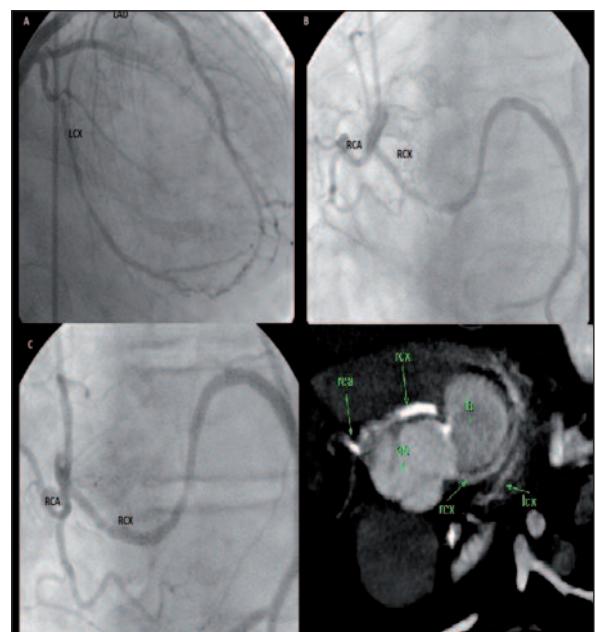


FIGURE 1: 1a: The left mainstem had a normal origin and divided into the left anterior descending (LAD) and left circumflex (LCX) arteries, 1b: In right coronary angiography, there was another Cx (RCx) arising from the proximal part of the right coronary artery (RCA) with a significant thrombotic lesion in the proximal segment, 1c: Successfully stenting performed for the RCx lesion, 1d: Multislice computed tomography showed double Cx arteries arising from the left main and RCA, respectively. As usual, the LCx arising from the left main coronary artery coursed within the left atrioventricular groove and supplied the left part of the lateral wall of the left ventricle.

the left sinus of valsalva and gives rise to the LAD and CX arteries. The CX artery courses within left atrioventricular groove and provides one to three obtuse marginal branches. They supply the lateral free wall of the left ventricle. The most frequently found anomalies include a CX artery with a separate origin of the LAD and CX arteries, followed by a CX artery arising from the right sinus of Valsalva or the RCA.⁵ Coronary artery anomalies are rare. In a large series of 126 595 patients undergoing coronary angiography at the Cleveland Clinic, the incidence of coronary anomalies was found to be 1.3%. In this series, the most common anomaly was separate ostia of the left anterior descending and left circumflex arteries (0.41%). The next most common anomaly was origin of the circumflex from the right coronary artery or right sinus of Valsalva (0.37%).¹ This anomalies are thought to be benign and are usually clinically silent. It was observed in the Coronary Artery Surgery Study

that the incidence of coronary anomalies was found to be in 73 of 24,959 patients.⁶ In this study, the most frequently found anomaly was origin of the Cx artery from the RCA or right sinus of valsalva and in the majority of patients was chest pain consistent with angina pectoris. And it was observed in the same study that the incidence of stenosis was greater in the Cx arteries originating from the right coronary sinus compared to normal Cx arteries originating from the left main coronary artery. In cases where the anomalous circumflex originates from either the RCA or the RCS, its course is always retro-aortic. The posterior course of the anomalous circumflex coronary artery may predispose this vessel to atherosclerosis in patients with coronary disease.⁷

There have been only a few case reports on twin Cx arteries. Tuncer et al. and Tekbas et al. reported a case of dual Cx arteries both originating from the left coronary system.^{8,9}

Dual Cx arteries originating from the left and right coronary systems, as in our case, have been reported in only three cases.⁹⁻¹¹ However, cardiac MSCT was used in only a case for determined the origins and courses of the coronary arteries.¹¹ In our case, an anomalous Cx artery was infarct related artery and it has not been reported to date. The patient was suffering from acute inferior wall myocardial infarction. Balloon angioplasty and stenting were successfully performed for the Cx artery originating from the RCA.

Although most CAAs are clinically benign, some may cause chest pain, arrhythmia, heart failure, and sudden death. Most CAAs are diagnosed incidentally during conventional angiography. Cardiac angiography with MSCT was performed to determine the origins and courses of the coronary anomalies. Even though CAAs are benign, the operators must be awake during conventional angiography and surgeons must avoid accidentally crossclamping or transecting the artery during surgery.

REFERENCES

- Yamanaka O, Hobbs RE. Coronary artery anomalies in 126,595 patients undergoing coronary arteriography. *Cathet Cardiovasc Diagn* 1990;21(1):28-40.
- 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. *Tex Heart Inst J* 1988;15(3):166-73.
- Baltaxe HA, Wixson D. The incidence of congenital anomalies of the coronary arteries in the adult population. *Radiology* 1977;122(1):47-52.
- Çilingiroğlu S. [Evaluation of coronary artery anomalies with angiography in Turkish adult population]. *Turkiye Klinikleri J Cardiovasc Sci* 2009;21(3):363-9.
- Angelini P, Villason S, Chan AV Jr, Diez GJ. Normal and anomalous coronary arteries in humans. In: Angelini P, ed. *Coronary Artery Anomalies: A Comprehensive Approach*. 1st ed. Philadelphia, PA: Lippincott Williams & Wilkins; 1999. p.27-79.
- Click RL, Holmes DR Jr, 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. *J Am Coll Cardiol* 1989;13(3):531-7.
- Attar MN, Moore RK, Khan S. Twin circumflex arteries: a rare coronary artery anomaly. *J Invasive Cardiol* 2008;20(2):E54-5.
- Tuncer C, Batyaliev T, Yilmaz R, Gokce M, Eryonucu B, Koroglu S. Origin and distribution anomalies of the left anterior descending artery in 70,850 adult patients: multicenter data collection. *Catheter Cardiovasc Interv* 2006;68(4):574-85.
- Tekbas EO, Cakici M, Yuce M, Alici H, Davutoglu V. Twin circumflex arteries with left sinus of valsalva origin: a case report. *Int J Angiol* 2011;20(2):101-2.
- van der Velden LB, Bär FW, Meursing BT, Ophuis TJ. A rare combination of coronary anomalies. *Neth Heart J* 2008;16(11):387-9.
- Karabay KO, Uysal E, Bagirtan B, Vural M. A case of twin circumflex arteries associated with acute myocardial infarction. *Turk Kardiyol Dern Ars* 2010;38(7):496-8.