



Malignant Anomalous Course of Right Coronary Artery

Cakir M*, Bakirci EM, Degirmenci H and Karayumak MR

Department of Cardiology, Erzincan Binali Yildirim University, Turkey

*Corresponding author: Cakir M, Faculty of Medicine, Department of Cardiology, Erzincan Binali Yildirim University, Erzincan/Turkey; E-mail: dr.murat24@gmail.com

Abstract

Nowadays, Coronary Computed Tomography (CT) angiography with use which is one of the non-invasive imaging methods in the exclusion of coronary artery disease an increase in the incidence of coronary arteries has been observed. Coronary artery anomalies are the second most common cause of sudden cardiac death, especially in young athletes. Although 20% of patients have myocardial ischemia, syncope, ventricular arrhythmia, sudden cardiac death, it is generally benign and asymptomatic. In this case report, our aim is to reveal the contribution of coronary CT angiography in the investigation of cardiac ischemia.

Keywords: Coronary computed tomography angiography; Coronary artery anomalies; Cardiac ischemia

Introduction

Coronary artery anomalies and variants are rare congenital cardiac disease. Although the frequency is below 1%, patients may become symptomatic under heavy exercise and severe emotional stress. The abnormal course of coronary arteries is divided into malignant and benign. While 51% of sudden deaths at a young age were responsible for cardiac abnormality, the most common of these was coronary artery abnormality (61%).

Table 1: Anomalous course of coronary arteries.

Bening Course	Malignant Course
Prepulmonic course	Inter-arterial course of the left coronary artery
Retroaortic course	Inter-arterial course of the right coronary artery
Transseptal course	
Intra-atrial course of the right coronary artery	

Received date: 01 July 2021; **Accepted date:** 06 July 2021; **Published date:** 10 July 2021

Citation: Cakir M, Bakirci EM, Degirmenci H, Karayumak MR (2021). Malignant Anomalous Course of Right Coronary Artery. SunText Rev Cardiovasc Sci 1(1): 105.

Copyright: © 2021 Cakir M, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Malignant coronary artery anomalies are usually seen between the pulmonary artery and aorta and are mostly demonstrated by autopsies after cardiac death in young athletes [1-5]. In this case, we present a right coronary artery patient with malignant left sinus Valsalva between the pulmonary artery and aorta (Table 1).

Case Report

The 64-year-old non-smoker, with diabetes mellitus, hypertension and previously Covid-19, was admitted to our clinic with complaints of chest pain for 1 year according to physical stress and decreases with rest cardiovascular classification (CCS 2). The patient was comfortable and painless on cardiac examination. Blood pressure was 135/76 mmHg, pulse 82 beats / minute, and oxygen saturation at room air 98%. Other physical examination, routine blood tests, chest radiography were found to be normal. There was no abnormality in his electrocardiography. Transthoracic echocardiographic examination revealed mild global left ventricular hypertrophic findings as pathological findings in the patient without coronary artery disease and cardiac catheterization. Ejection fraction was evaluated as normal. The patient was referred to the radiology department for coronary CT angiography. The coronary CT angiography device used in our hospital was shot with 128-slice double detector, high voltage 70-110 kVp, 825 mass, coverage 64-0.6 mm and rotation time 0.33 s

(Brilliance-128, Siemens, and The Germany). In the coronary CT angiography report, the right coronary artery (RCA) was observed, leaving the left sinus from the Valsalva anteriorly between the pulmonary artery and the aorta. In addition, there was a middle segmented muscular bridge in the left anterior descending artery (LAD) and the circumflex was found to be normal. Diagnostic coronary angiography was performed and the

malignant course of the right coronary artery was confirmed. There was also a muscular Bridger in the left anterior descending artery (LAD). A middle-aged patient without critical stenosis of his coronary arteries and severe exertional angina was discharged after conservative medical treatment. In the control examination, it was understood that it was asymptomatic and that it was beneficial from the medical conservative approach (Figures 1-3).

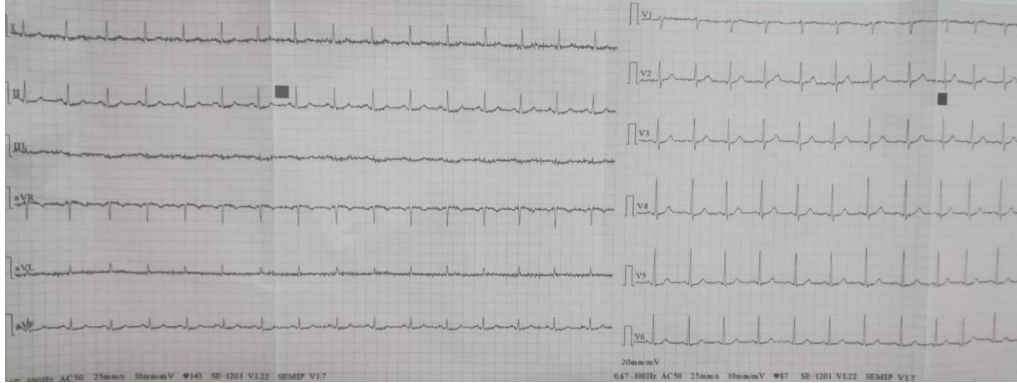


Figure 1: The patient's electrocardiography is in normal sinus rhythm.

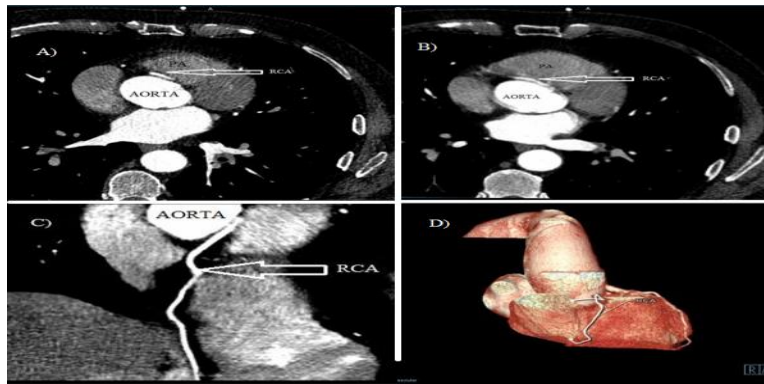


Figure 2: The patient's Multislice CT Coronary Arteries, A and B: The right coronary artery is located between the aorta and the pulmonary artery , C and D: 3D view of the right coronary artery.



Figure 3: The image on the left shows the right coronary artery(RCA), while the right figure shows the LAD (Left anterior descending artery) and CX (circumflex artery)

Discussion

Malignant anomaly of the interatrial located right coronary artery in the population is between 0.03-0.2, and it is more common than left coronary artery anomaly. However, it is more common in left coronary artery anomalies, ventricular arrhythmia and sudden cardiac death. The pathophysiology of coronary artery anomalies and variants are not clearly known [6-12]. In several hypotheses, it can be expressed as the compression of the right coronary artery between the aorta and the pulmonary artery and the artery being under pressure in the intramural cleft of the aorta. It is detected incidentally in coronary artery angiography or non-invasive tests. The treatment modality of coronary artery anomalies is still controversial in the literature. The heart team should determine the treatment algorithm according to the patient's symptom, age, participation in competitive sports, and the anatomy of the coronary artery. If the patient is asymptomatic and middle-aged in the abnormal course of the right coronary artery, conservative medical treatment, exercise restriction and close follow-up can be kept. Although there is not enough information in the guidelines, intracardiac defibrillator (ICD) therapy may be considered in malign coronary artery anomalies to prevent ventricular arrhythmia and sudden cardiac death. In the treatment options can be listed surgical revascularization, percutaneous coronary intervention, and conservative medical treatment. Among the surgical techniques, the most frequently used roof opening method is recommended, where the intramural segment in the aorta is opened and coronary osteal re-implantation is anatomically possible. In addition, coronary artery bypass surgery can be considered as an alternative. While percutaneous coronary intervention is recommended as an alternative to surgery, there is no study demonstrating its superiority to each other. Percutaneous coronary intervention mortality was found to be less than 15% at 5-year follow-up.

Conclusion

Although it is a rare pathology, malignant anomalies and variations of coronary arteries should be kept in mind in patient groups with myocardial ischemia. Coronary CT angiography, which is one of the non-invasive methods, can contribute to the reduction of mortality and morbidity in early diagnosis and treatment. In this case report, our aim was to emphasize the importance of multislice coronary CT angiography in coronary artery anomaly.

References

1. Gräni C, Kaufmann PA, Windecker S, Buechel RR. Diagnosis and management of anomalous coronary arteries with a malignant course. *Interv Cardiol.* 2019; 14: 83-88.
2. Satija B, Sanyal K, Katyayni JK. Malignant anomalous right coronary artery detected by multidetector row computed tomography coronary angiography. *Cardiovasc Dis Res.* 2012; 3: 40-42.
3. Angelini P, Velasco JA, Flam S. Coronary anomalies: Incidence, pathophysiology and clinical relevance. *Circulation.* 2002; 105: 2449-2454.
4. Anand M, Rahalkar, Mukund D, Rahalkar. Pictorial essay: Coronary artery variants and anomalies. *Indian J Radiol Imaging.* 2009; 19: 49-53.
5. Kastellanos S, Aznaouridis K, Vlachopoulos C, Tsiamis E, Oikonomou E, Tousoulis D, et al. Overview of coronary artery variants, aberrations and anomalies. *World J Cardiol.* 2018; 10: 127-140.
6. Krishnan R, Marwah V, Gupta T, Kalyanpur A. Images: Malignant right coronary artery - 64-slice CT. *Indian J Radiol Imaging.* 2008; 18: 126-127
7. Narayanan MA, DeZorzi C, Akinapelli A, Haddad TM, Smer A, Baskaran J, et al. Malignant course of anomalous left coronary artery causing sudden cardiac arrest: A case report and review of the literature. *Case Rep Cardiol.* 2015; 806291.
8. Daniel JB, Radswiki. Anomalous course of coronary arteries.
9. Ali N, Baggan K, Khan S, Maharaj P, Ali R. Missed myocardial infarction in a vicenarian with malignant anomalous right coronary artery causing acute coronary syndrome: A case report. *J Med Case Rep.* 2021; 15: 166.
10. Ayalp R, Mavi A, Sercelik A, Batyraliev T, Gumusburun E. Frequency in the anomalous origin of the right coronary artery with angiography in a Turkish population. *Int J Cardiol.* 2002; 82: 253-257.
11. Lembcke A, Diibel HP, Elgeti T, Rutsch W. Multislice spiral computed tomography of a malignant single coronary artery. *Eur J Cardiothorac Surg.* 2007; 32: 801.
12. Trivellato MD, Angelini P, Robert D, Leachman MD. Variations in coronary artery anatomy: Normal versus abnormal. *Cardiovasc Dis.* 1980; 7: 357-370.