

A novel malignant anomaly of the coronary arteries (Bali's girdle)

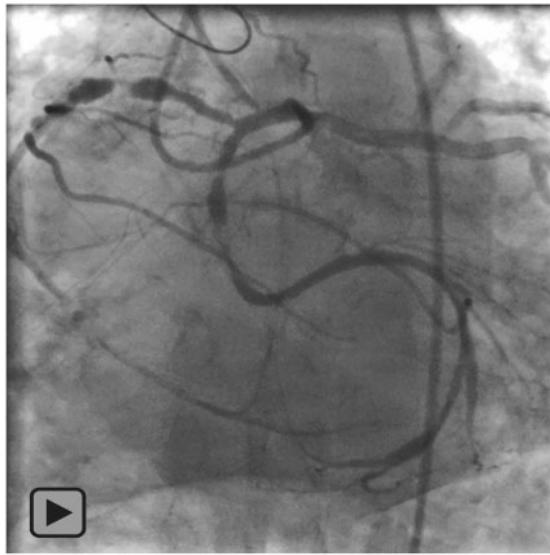
Harinder Kumar Bali ^{1*}, Amreen Dhindsa ¹, Surinder Kumar Bali ², and Kapil Kumar Chattree¹

¹Paras Hospitals, Panchkula 134109, India; and ²Government Medical College, Jammu, 180004, India

Received 31 December 2020; first decision 19 January 2021; accepted 7 April 2021

A 58-year-old man presented with complaints of retrosternal chest pain and diaphoresis. Electrocardiogram revealed ST depressions in leads V2–V5. Two-dimensional echocardiography revealed an ejection fraction of 45% with moderate mitral regurgitation. Troponin-I

levels were 24.1 ng/mL (normal 0–0.4 ng/mL). A diagnosis of non-ST-elevation myocardial infarction was made. Coronary angiography



Video 1 Coronary angiogram showing the left circumflex originating from proximal right coronary artery, with the right coronary artery itself having an anomalous origin from the left coronary sinus. There is proximal to mid long segment diffuse disease in anomalous left circumflex with maximum stenosis of 95% and dominant anomalous right coronary artery with proximal 85% stenosis.



Figure 1 Multidetector computed tomography coronary angiography (two-dimensional axial) showing the anomalous origin of the right coronary artery from the left coronary sinus, close to the origin of the left anterior descending. The proximal part of right coronary artery is seen to follow an inter-arterial course between the aortic root and pulmonary trunk, and continues in the right atrio-ventricular groove. The left circumflex is seen to arise as a proximal branch of this anomalous right coronary artery and has a retroaortic course, with the proximal right coronary artery and left circumflex forming a loop around the aorta.

* Corresponding author. Tel: +91 9872735983, Email: hkbalipgi@gmail.com

Handling Editor: Elad Asher

Peer-reviewers: Richard Alexander Brown and Milenko Zoran Cankovic

© The Author(s) 2021. Published by Oxford University Press on behalf of the European Society of Cardiology.

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited. For commercial re-use, please contact journals.permissions@oup.com

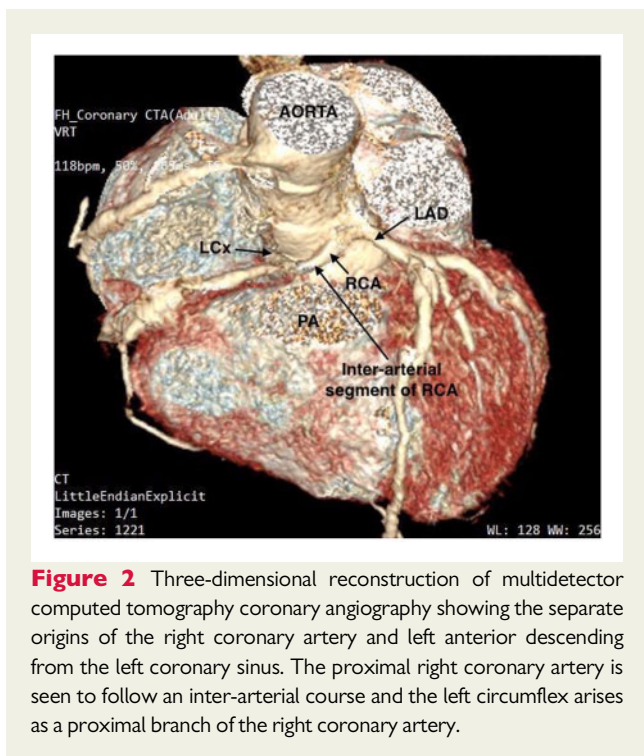


Figure 2 Three-dimensional reconstruction of multidetector computed tomography coronary angiography showing the separate origins of the right coronary artery and left anterior descending from the left coronary sinus. The proximal right coronary artery is seen to follow an inter-arterial course and the left circumflex arises as a proximal branch of the right coronary artery.

revealed triple vessel coronary artery disease along with a unique coronary artery anomaly (see *Video 1*). The left anterior descending (LAD) had an anomalous high origin above the aortic sinus. Right coronary artery (RCA) originated from the left coronary sinus (LCS), close to the LAD ostium. The left circumflex (LCx) arose as a proximal branch of the anomalous RCA. Multidetector computed tomography (MDCT) was done. The examination was carried out by a 128-slice computed tomography with 0.8 mm acquiring thickness and 0.35 s rotation time. 100 mL of non-ionic contrast was injected at 5 mL/s. In view of atrial fibrillation, image quality was reduced. However, MDCT further confirmed the anomalous origin of RCA

from LCS, close to the origin of LAD (*Figures 1 and 2*). The RCA had a slit-like orifice. It followed an inter-arterial course between the great vessels and continued in the right atrioventricular groove (*Figure 2*). The LCx arose as a proximal branch of this anomalous RCA. It followed a retro-aortic course coursing behind the aortic annulus, into the left atrioventricular groove, such that the RCA and LCx formed a girdle around the aorta (*Figures 1 and 2; Supplementary material online, Figure S1*). The patient underwent coronary artery bypass grafting with saphenous venous graft to LAD and RCA. He later underwent percutaneous intervention to native LCx.

Coronary artery anomalies are encountered in approximately 1% of all patients undergoing cardiac catheterization.¹ The most frequent is LCx originating from either the proximal RCA or right coronary sinus, having a prevalence of 0.17–0.45%.² An anomalous RCA arising from LCS is relatively rare with an incidence of 0.1%.³ Though isolated cases of the above anomalies have been reported, as per our knowledge, this is the first reported case of both anomalies occurring together.

Supplementary material

[Supplementary material](#) is available at *European Heart Journal - Case Reports* online.

Consent: The authors confirm that written consent for submission and publication of this case report including images and associated text has been obtained from the patient in line with COPE guidance.

Conflict of interest: None declared.

Funding: None declared.

References

1. Taylor AJ, Rogan KM, Virmani R. Sudden cardiac death associated with isolated congenital coronary artery anomalies. *J Am Coll Cardiol* 1992;**20**:640–647.
2. Türkoğlu S, Ünlü S, Taçoy GA, Özdemir M. Right coronary artery originating from the left: do not miss the diagnosis! *Cardiol Res Pract* 2018;**2018**:1210791.
3. Ali M, Hanley A, McFadden EP, Vaughan CJ. Coronary artery anomalies: a practical approach to diagnosis and management. *Heart Asia* 2011;**3**:8.