Images in Cardiovascular Surgery Article
E Medicine and Public Health. 2025; Vol 03; 52- 53
eISSN 3023-3305

Emerging Medicine and Public Health EMPH

Circumflex Coronary Artery Originating from the Pulmonary Artery: A Rare Clinical Entity

Emre Oteyaka MD [1], Okan Kuguoglu MD [1], Irem Islek MD [2], Prof. Dr Cengiz Erol [2], Prof Dr Murat Ugurlucan [3], Prof Dr Halil Turkoglu *[1]

[1]Istanbul Medipol University Faculty of Medicine, Department of Cardiovascular Surgery, Bagcilar / Istanbul, Turkey.
[2]Istanbul Medipol University Faculty of Medicine, Department of Radiology, Bagcilar / Istanbul, Turkey.
[3]Biruni University Faculty of Medicine, Department of Cardiovascular Surgery, Bagcilar / Istanbul, Turkey.

*Corresponding author: Halil Turkoglu, Prof., MD; eoteyaka@gmail.com

Received: 24 January 2025; **Revised:** 03 March 2025; **Accepted:** 07 March 2025; **Published:** 13 March 2025

Image

Pediatric coronary anomalies are relatively rare. Anomalous left coronary artery from the pulmonary artery (ALCAPA) or anomalous right coronary artery from the pulmonary artery (ARCAPA) are known anomalies. Among coronary artery anomalies, the Left Circumflex artery (LCx) is the most common abnormality, with an incidence of approximately 20 percent, and it typically originates from the Right Coronary Artery (RCA) [1]. Left circumflex artery arising from the pulmonary artery (LCx) is exceedingly rare [2,3]. In adult patients, ALCAPA has been reported to cause sudden cardiac arrest in case reports [4]. Therefore, surgical treatment of coronary anomalies should be immediately considered.

A 30-year-old male patient was admitted to our clinic with complaints of palpitations and chest pain. Upon physical examination, the patient's heart exhibited hyperdynamic activity. The patient had previously undergone surgery 14 years ago for subaortic stenosis and was known to have a bicuspid aortic valve. A strong suspicion of an aortic pathology prompted us to conduct an echocardiogram, which revealed significant bicuspid aortic valve regurgitation and an ascending aorta measuring 4.7 cm. CT angiography confirmed that the LCx originated from the right pulmonary artery (**Figure 1**) and identified a root aneurysm in the ascending aorta, along with thickening of the aortic leaflets. As a result, a Bentall procedure and a CX anastomosis were planned. As a result, a Bentall procedure and a CX anastomosis were planned. As the surgical technique, the aortic valve was resected. Both coronary arteries were prepared as button. The Cx coronary artery arising in the right pulmonary artery was divided from the pulmonary artery. The end was clipped. The No: 27 mechanical valve was sutured into the No: 30 dacron graft. The conduit aorta with valve was anastomosed with individually pledgeted sutures. Left coronary and right coronary arteries were anastomosed to the conduit with 5/0 prolene. Distal aorta anostomosis was performed with prolene continuous suture.

We present an illustrative case in Figure 1, showing the left circumflex artery arising from the right pulmonary artery in the preoperative CT angiogram of our patient. There are well-established aortic collateral circulations supplying the left circumflex artery and its branches, with blood flow directed from the left circumflex artery to the pulmonary artery. Additionally, the presence of a bicuspid aortic valve and aortic valve thickening is evident.

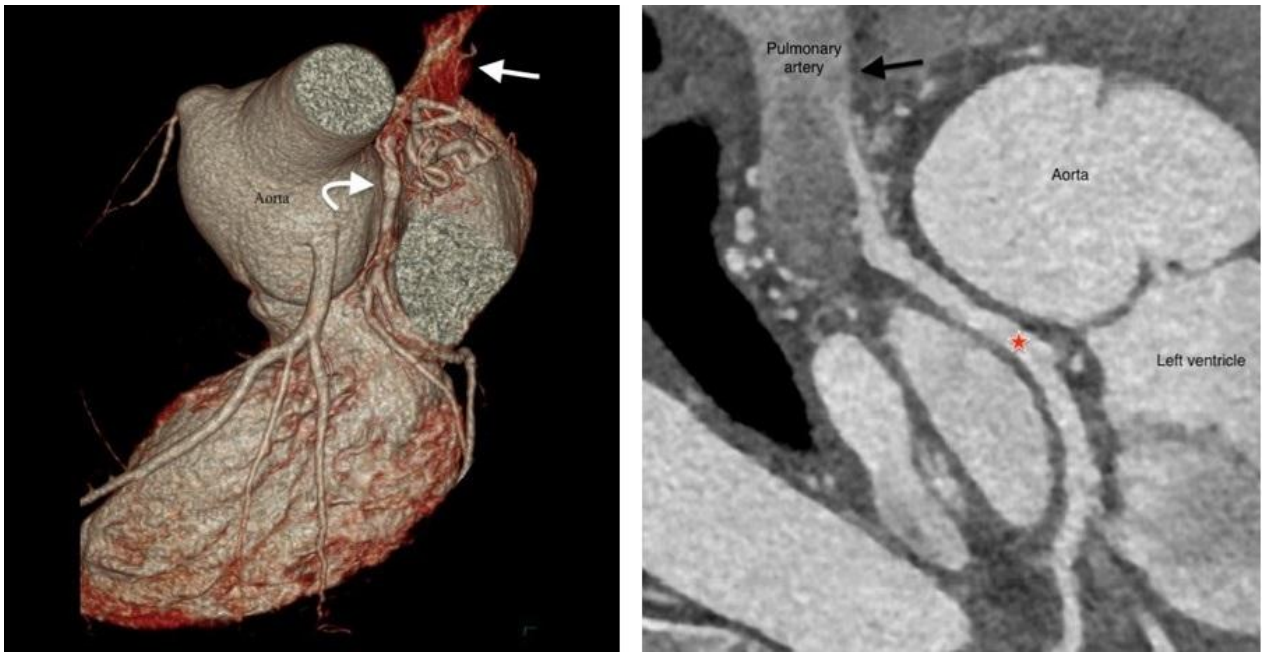

Figure 1: Cardiac 3D image obtained by Multidetector Computed Tomography (a) shows that the left circumflex artery (curved white arrow) originates from the pulmonary artery (white arrow) and then travels in the left atrioventricular groove. The hyperdense appearance in the oblique reformat image (b) where the left circumflex artery (star) opens to the pulmonary artery (black arrow) indicates that the flow in the left circumflex artery is towards the pulmonary artery.

IRB Approval

N/A (Single case report)

Funding Statement

None

Conflict of interest

None

References

[1] Angelini P., Velasco J.A., Flamm S. Coronary anomalies: Incidence, pathophysiology, and clinical relevance. Circulation. 2002;105:2449–2454.

[2] Boutsikou M., Shore D., Li W., Rubens M., Pijuan A., Gatzoulis M.A., Babu-Narayan S.V. Anomalous left coronary artery from the pulmonary artery (ALCAPA) diagnosed in adulthood: Varied clinical presentation, therapeutic approach and outcome. Int. J. Cardiol. 2018;261:49–53.

[3] Beyaz MO, Coban S, Ulukan MO, Dogan MS, Erol C, Saritas T, Erdem A, Akdeniz C, Ugurlucan M, Akcevin A, Turkoglu H. Current Strategies for the Management of Anomalous Origin of Coronary Arteries from the Pulmonary Artery. Heart Surg Forum. 2021 Jan 20;24(1):E065-E071.

[4] Prandi FR, Zaidi AN, LaRocca G, Hadley M, Riasat M, Anastasius MO, Moreno PR, Sharma S, Kini A, Murthy R, Boateng P, Lerakis S. Sudden Cardiac Arrest in an Adult with Anomalous Origin of the Left Coronary Artery from the Pulmonary Artery (ALCAPA): Case Report. Int J Environ Res Public Health. 2022 Jan 29;19(3):1554.