ESC European Society of Cardiology

European Heart Journal - Case Reports (2020) **4**, 1–2
doi:10.1093/ehjcr/ytaa198

FLASHLIGHTS
Coronary heart disease

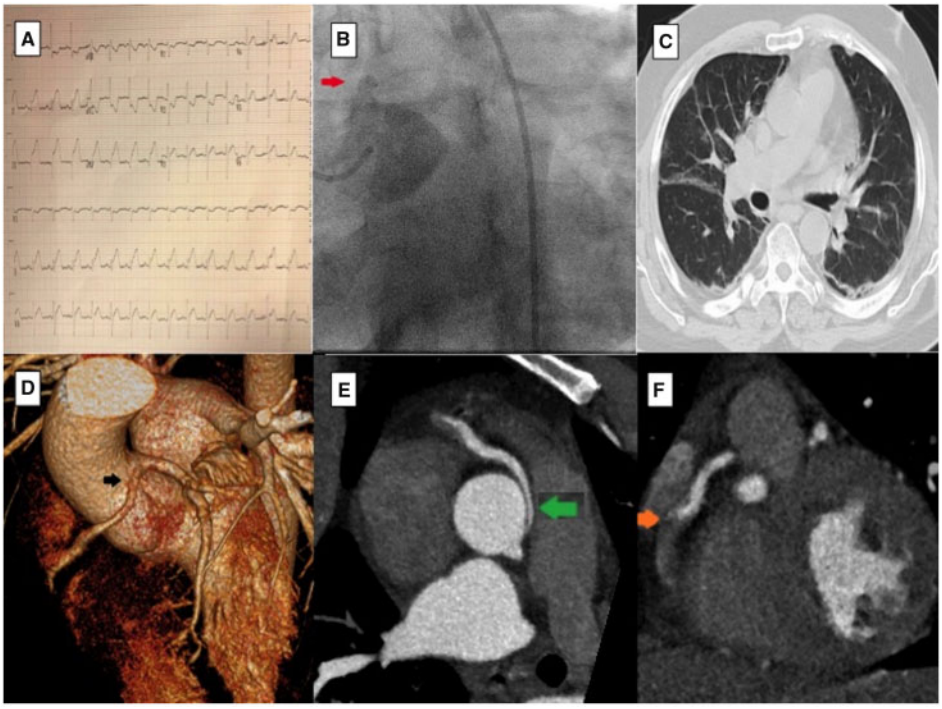
ST-elevation myocardial infarction in a young patient with anomalous right coronary artery and COVID-19 pneumonia

Aakash Garg *, Hisham Hakeem , Michael Divita , Jagpreet Grewal , Marc Cohen, and Alan Lapa

Division of Cardiology, Newark Beth Israel Medical Center, NJ, USA

Received 15 May 2020; first decision 27 May 2020; accepted 10 June 2020; online publish-ahead-of-print 5 July 2020

Keywords STEMI • Anomalous RCA • Coronary ectasia • COVID-19 • Case report



(*A*) Electrocardiogram showing ST-segment elevations in inferior leads (II, III, aVF); (*B*) angiography showing the anomalous RCA origin off the left cusp; (*C*) CT chest depicting bilateral peripheral ground-glass opacities; (*D* and *E*) CCTA 3D rendering and oblique views of the anomalous RCA depicting acute angle take-off from the left cusp with an interarterial course; (*F*) oblique CCTA view of the anomalous RCA showing an ectatic mid-segment with total thrombotic occlusion. CCTA, coronary CT angiogram; RCA, right coronary artery.

* Corresponding author. Division of Cardiology, Newark Beth Israel Medical Center, 201 Lyons Avenue, Newark, NJ 07112, USA. Email: drgarg.aakash@gmail.com, Twitter handle: @Dr_AGarg_MD
Handling Editor: Mohamed Farag
The video is available in the online version of this article

A 35-year-old obese male [body mass index (BMI) 35 kg/m^2] with no prior medical history presented with acute-onset substernal chest pain. He had chills, cough, and dyspnoea that started a week previously. He denied any prior history of chest pain or syncope. He was afebrile, heart rate 104 b.p.m., and blood pressure 100/54 mmHg. Physical examination was unremarkable except for mild distress. The electrocardiogram was suggestive of acute infero-posterior ST-elevation myocardial infarction (STEMI) (*Panel A*).

An emergent coronary angiography showed no significant stenosis in the left coronary arteries but was suggestive of an anomalous right coronary artery (RCA) origin from the left coronary cusp (LCC) (*Panel B*). Despite multiple attempts with different catheters, selective engagement of the RCA was unsuccessful. The possibility of myocarditis in this young patient without obvious risk factors and resolution of chest pain influenced the decision against further attempts at RCA engagement via alternative access. Further, thrombolytic therapy was not administered due to similar concerns; dual antiplatelet therapy and unfractionated heparin were initiated. A transthoracic echocardiogram (TTE) revealed inferior wall hypokinesis with mildly reduced left ventricular ejection fraction and normal right ventricular function. His PCR was positive for SARS-CoV-2.

To further evaluate the aetiology of the patient's presentation, a coronary computed tomography angiogram (CCTA) was planned but was delayed until the following day due to logistic challenges during the COVID-19 pandemic. CCTA confirmed anomalous take-off of the RCA from the LCC with an interarterial course (*Panel C*). Interestingly, the anomalous RCA had ectasia in the mid-segment with total occlusion due to extensive thrombus (*Panels D–F*). Further, chest CT scan showed diffuse ground-glass opacities consistent with COVID-19 pneumonia.

The patient had resolution of ST-elevation and remained free of chest pain. His troponin I peaked at 29 ng/mL, C-reactive protein (CRP) was 0.9 mg/dL (<0.3 mg/dL), and D-dimer was elevated at 2.25 mg/L (<0.5 mg/L). On Day 3, he was discharged on guideline-directed medical therapy with outpatient follow-up.

Anomalous coronary arteries with an interarterial course are usually associated with angina or sudden cardiac death. STEMI due to acute thrombosis at the ectatic coronary segment within a culprit anomalous RCA has not been reported previously. Coronary ectasia and acute angle take-off of an anomalous RCA could be associated with intermittent disturbances of blood flow and stasis. The prothrombotic milieu associated with COVID-19-mediated cytokine release, as evident by elevated D-dimer and CRP, plausibly explains acute thrombotic occlusion in this patient.

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

Conflict of interest: none declared.