Absence of the left coronary artery complicated with acute myocardial infarction: a case report

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Case presentation

A 67-year-old Asian female with no family history of heart disease was admitted to the Department of Psychosomatic Diseases at our hospital on 30 November 2024, primarily for intermittent anxiety and a 2-week history of general malaise but also headache, stomachache, backache, a sensation of choking and throat pain, dyspnoea, and, occasionally, a feeling of impending death. After attending a psychiatric hospital she was diagnosed with anxiety and prescribed oral flupentixol and melitracen tablets, zaleplon and oxazepam. Upon admission to the department, symptomatic interventions including anxiolytics and sleep aids were administered. On 3 December 2024 at 9:01 am, the patient abruptly encountered back pain. During the episode, the patient appeared to be choking but reported no perspiration or chest pain. Urgent electrocardiogram revealed ST segment elevation of 0.2 to 0.25 mV in the augmented vector right lead and depression of 0.2 to 0.35 mV in lead I, augmented vector left lead, lead II, and leads V1 to V5 (Fig 1). The high-sensitivity troponin was 0.061 ng/mL (normal, <0.016 ng/mL). In view of the suspected acute myocardial infarction, the patient was transferred to the Coronary Care Unit. Emergency coronary angiography revealed 90% stenosis in the proximal segment of the right coronary artery (RCA). The left anterior descending artery (LAD) and left circumflex artery were obscured in various angiographic views, while the blood flow in the distal segment of the RCA could be observed. Intravascular ultrasound examination of the RCA revealed a minimum lumen area of 2.59 mm^2 at the lesion site, with a plaque burden of 91%. Subsequent to balloon dilation, a single everolimus-eluting stent (PROMUS Element Plus; Boston Scientific, Marlborough [MA], United States) was implanted. Postoperatively there was no residual stenosis at the RCA lesion site, and distal blood flow was classified as TIMI III (the Thrombolysis in Myocardial Ischemia Trial III) [Fig 2a-d]. Postoperatively, the patient reported no pain in the precordial region or back.

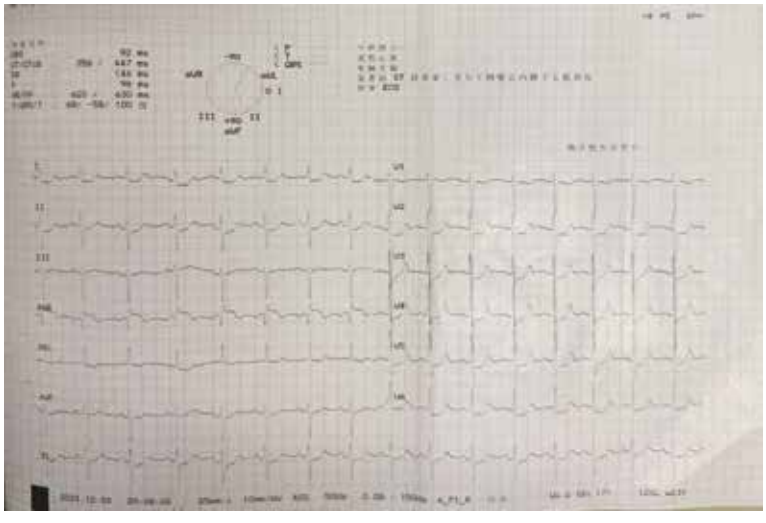

FIG 1. Electrocardiogram of the patient at presentation

Coronary computed tomography angiography (CTA) [Fig 2e and f] revealed that the left main trunk, LAD, and left circumflex artery did not arise from the left coronary sinus. The RCA originated from the right coronary sinus. These results aligned with the findings of coronary angiography. Echocardiography revealed that the left ventricular ejection fraction was 60% with mild mitral regurgitation and reduced left ventricular diastolic function. The patient's condition improved after treatment and she was discharged home on 10 December. At 1-month follow-up, the patient reported no chest tightness, shortness of breath, or precordial pain, and ECG showed no signs of ischaemia.

Discussion

A single coronary artery (SCA) is an uncommon coronary artery anomaly (CAA). The congenital absence of the left coronary artery (LCA) is an uncommon subtype of SCA, occurring with an incidence rate of 0.024%, with no discernible gender disparity.[1] In 1979, Lipton classified SCA into types I, II, and III based on coronary origin, branching

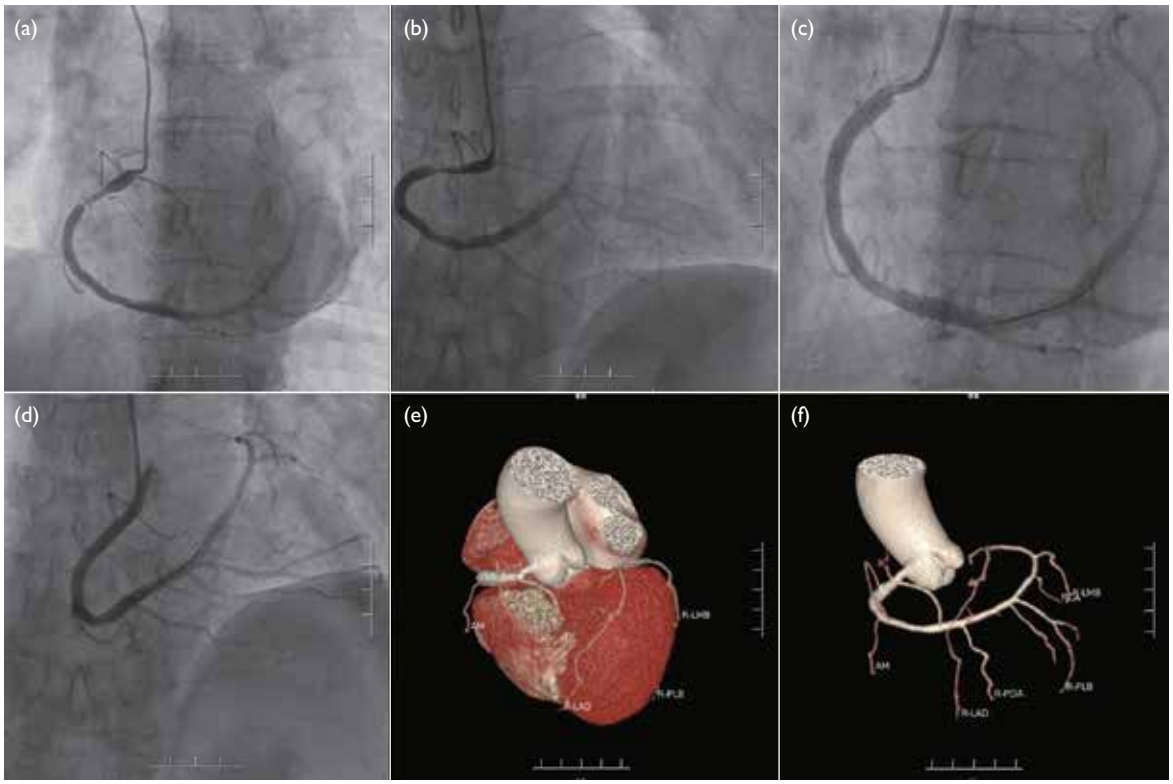

FIG 2. Coronary angiography images of the patient from different projections. Preoperative (a) left anterior oblique view and (b) anteroposterior view of the right coronary artery (RCA). Postoperative (c) left anterior oblique view and (d) anteroposterior view of the RCA. Volume-rendered coronary computed tomography angiography images. (e) Coronary artery tree. (f) Heart and coronary arteries

pattern, and disease course.[2] In our patient, the single RCA was type R-I. As myocardial ischaemia is the aetiology of cardiovascular events induced by CAAs, coronary angiography is vital. Prior to percutaneous coronary intervention, a meticulous assessment of the surgical treatment strategy is essential.

The SCA form of CAA typically presents with no clinical symptoms and lacks specificity. Our patient exhibited cardiac-related symptoms, including backache, a sensation of choking, throat pain, and dyspnoea. Nonetheless the simultaneous occurrence of symptoms such as headache, stomachache and general malaise prompted a diagnosis of anxiety disorder. Coronary angiography was conducted to assess the extent of vascular stenosis but revealed the absence of an LCA, complicated by 90% stenosis in the proximal segment of the RCA. The lesion in the proximal segment of the patient's RCA was comparable to that in the left main trunk. Thereafter, under intravascular ultrasound guidance, the coronary artery lesions were assessed, and a therapeutic approach was planned. Coronary CTA is crucial for identifying aberrant openings and congenital anomalies and unequivocally confirmed the congenital absence of the LAD in our patient. Secondary prevention of coronary heart disease is essential for these patients, ensuring proper maintenance of the lumen in the distal vessels of the RCA that supply the anterior and lateral walls.

Conclusion

The congenital absence of the LCA is an uncommon condition with an often non-specific clinical presentation. Clinically, if patients exhibit symptoms of angina pectoris or electrocardiogram alterations indicative of ischaemia, coronary CTA or coronary angiography should be promptly conducted to exclude congenital cardiovascular malformations. This enables clinicians to accurately diagnose and implement appropriate management.

Author contributions

All authors contributed to the concept or design of the study, acquisition of data, analysis or interpretation of data, drafting of the manuscript, and critical revision of the manuscript for important intellectual content. All authors had full access to the data, contributed to the study, approved the final version for publication, and take responsibility for its accuracy and integrity.

Conflicts of interest

All authors have disclosed no conflicts of interest.

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Ethics approval

The study was approved by the Institutional Review Board of The First Teaching Hospital of Tianjin University of Traditional Chinese Medicine, China (Ref No.: TYLL2024[Z]). Written informed consent was obtained from the patient for all treatments and procedures, and for the publication of this case report (including the accompanying clinical images).

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