To the Editor: Anomalous right coronary artery (RCA) is rare and usually originates from the left sinus of Valsalva. An anomalous RCA arising from the left anterior descending (LAD) coronary artery is extremely rare. It is important to be aware of coronary anomalies because they may be associated with potentially serious cardiac events. Therefore, we report a rare case of an anomalous origin of the RCA from the mid left anterior descending artery (mLAD), which presented with acute myocardial infarction just proximal to the origin of the RCA, jeopardizing both the LAD and RCA.

A 42-year-old man who was deaf and mute was referred to the emergency room for the evaluation of progressive substernal chest pain that had lasted for three days. Initial electrocardiography indicated sinus tachycardia and deep T wave inversion at the anterior precordial lead and pathological Q waves in the inferior limb leads, suggesting that he might have had a recent myocardial infarction at the left ventricle inferior wall and anterior wall ischemia. Chest radiography showed cardiomegaly without pulmonary congestion, and his blood pressure was 120/80 mmHg with a heart rate of 108 beats/min. Coronary angiography was performed within an hour. During the coronary angiogram, several attempts at engaging the RCA failed. We considered several possible anomalous origins of the RCA and tried to engage it at various positions but were unsuccessful. We shifted to the left coronary system. The left coronary angiogram showed that the anomalous RCA, as a separate branch, emanated from the mLAD, proceeded anterior to the pulmonary trunk, and finally advanced to the right atrioventricular groove. Between the first septal perforator and the branching of the anomalous RCA, there was a tandem tight stenotic lesion in the mLAD. The thrombolysis in myocardial infarction (TIMI) flow grade to the main LAD was III, but the TIMI flow grade to the anomalous RCA was slightly decreased, with a flow between II and III. We performed percutaneous coronary intervention (PCI) with a 6 Fr XB™ guiding catheter (Cordis, USA) and a Runthrough™ guidewire (Terumo, Japan) using a right radial artery approach. After ballooning with a 2.5 mm × 20.0 mm Maverick™ balloon (Boston Scientific, USA), intravascular ultrasound (IVUS)-guided stenting was performed at the mLAD, not crossing, but just above the origin of the anomalous RCA, with a 4.5 mm × 16.0 mm Liberte™ stent (Boston Scientific). We included additional wiring at the RCA because the TIMI flow grade at the anomalous RCA was diminished from TIMI II–III to I–II after stenting at the LAD most likely due to the distal embolization of microthrombi in the RCA territory or the extrusion of the stent strut to the origin of the anomalous RCA. In addition, we opened the origin of the anomalous RCA by adjusting the stent strut and bifurcation carina with a small balloon (2.5 mm × 20.0 mm) and minimal pressure. Finally, sequential ballooning was performed at the mLAD with a noncompliant balloon. After confirming that there were no protruding stent struts, via IVUS and no complications, RCA flow was recovered after an intracoronary injection of 2 mg of nicorandil [Figure 1a-1e]. Several days after PCI, computed tomographic coronary angiography revealed the RCA arising from the mLAD and running anteriorly to the pulmonary artery and right ventricular outflow tract, heading to the right atrioventricular groove [Figure 1d]. Three days later, he was discharged without any complications or residual chest pain and was prescribed aspirin, clopidogrel, ramipril, bisoprolol, and atorvastatin.

Most coronary artery anomalies are asymptomatic and are found incidentally during coronary angiography or computed tomographic coronary angiography. Their prevalence is less than 1.3% based on published studies.[1] An anomalous RCA is rare, with an incidence of less than 3%. Various anomalous origins of the RCA have been reported, including the left anterior sinus with variable courses, ascending aorta above the sinus level, descending thoracic aorta, left main coronary artery, left circumflex coronary artery (LCX), pulmonary arteries, and below the aortic valve.[2] Among them, an anomalous RCA from the LAD is very rare. Similar to our case, most anomalous RCA courses are anterior to the pulmonary trunk and therefore are clinically benign.[3]
There are several reports on myocardial infarction and PCI involving an anomalous RCA with various origins, including an anteriorly displaced origin within the right coronary sinus, in the ascending aorta, left coronary sinus, and LCX in a dual LAD anomaly. Commonly noted in these cases were delayed reperfusion due to difficulties in finding the anomalous RCA ostium and more serious sequelae due to technical difficulties during the procedures. It has not been established whether some types of coronary anomalies predispose an artery to atherosclerotic stenosis at the proximal segment.

Among the myocardial infarctions observed with coronary anomalies, those involving an anomalous RCA from the LAD are extremely rare. One aspect of the clinical importance of an anomalous RCA arising from the LAD, as in our case, is that accelerated atherosclerosis proximal to the origin of the RCA could jeopardize the myocardium in both the LAD and RCA territory. If total occlusion at the origin of the anomalous RCA is present, making it difficult to intervene in the masked occluded coronary artery, and the operator is not aware of the possibility of anomalies during the coronary angiography, the outcomes will be disastrous.

Our case is unique in that culprit lesion was located just proximal to the origin of anomalous RCA and it made bifurcation lesion which warranted complex PCI. We implanted stent at proximal-LAD crossing the origin of anomalous RCA, followed by sequential ballooning at RCA and LAD due to slow flow phenomenon.

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**Conflicts of interest**
There are no conflicts of interest.

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