

Intervention of a Large Diagonal Branch for Acute Myocardial Infarction in a Patient with a New Variant of the Dual Left Anterior Descending Artery

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A 55-year-old man presented to our hospital with substernal chest tightness. The 12-lead electrocardiography showed unremarkable findings, but an elevated troponin I level of 0.198 ng/mL was observed (<0.05 ng/mL), suggesting non-ST elevation myocardial infarction. Transthoracic echocardiography showed a normal left ventricular ejection fraction with hypokinesia of the basal anterior septal wall. Left coronary angiography showed a short left anterior descending artery (LAD) arising from the left main coronary artery and a large diagonal branch without a visible distal LAD (Fig. 1A, B). Severe stenosis was observed in the large diagonal branch of the short LAD with unfavorable angulation, prompting the conclusion of total occlusion of the distal vessel. Contrast injection into the right coronary artery (RCA) revealed another suspicious LAD originating

from the right coronary sinus separately from the RCA and continuing as the mid LAD (Fig. 1C, D). Percutaneous coronary intervention was performed with a sheathless power back-up (SPB) 3.0 guiding catheter (ASAHI Intecc, Nagoya, Japan). A 2.5×29 mm Firehawk sirolimus target eluting coronary stent (Shanghai MicroPort Medical Group, Shanghai, China) was implanted in the short LAD (Fig. 1E, F). After percutaneous coronary intervention with drug-eluting stent implantation, coronary computed tomography angiography confirmed the dual LAD with a long LAD originating from the right coronary sinus, different from the RCA, and coursing between the right ventricular outflow tract and the aortic root, and continuing as mid- to distal LAD (Fig. 2).

A dual LAD is a rare coronary anomaly defined as the

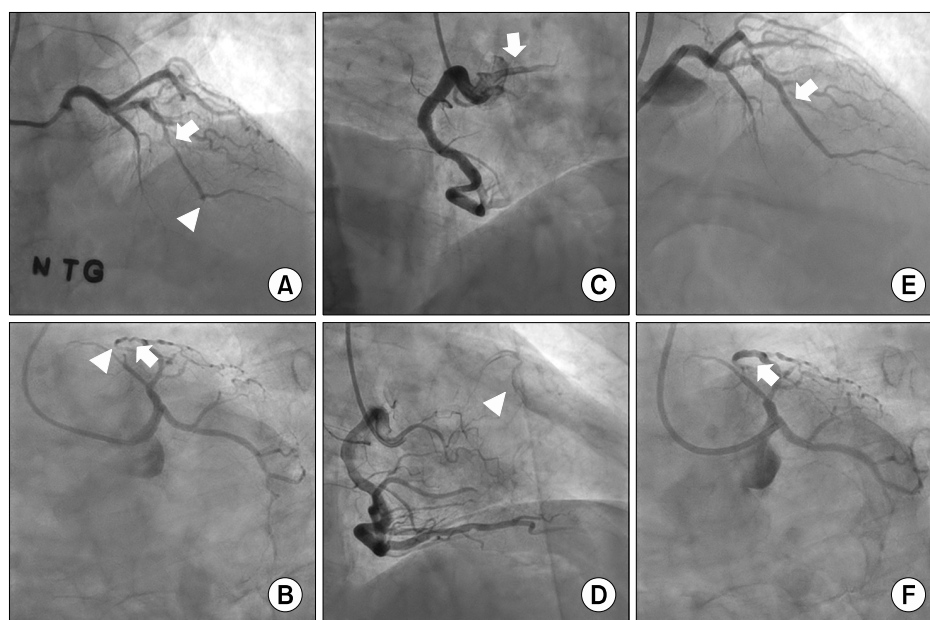


FIG. 1. Coronary angiography. (A, B) Left coronary angiogram shows a short left anterior descending artery (LAD) arising from the left main coronary artery and a big diagonal branch with severe stenosis (arrow) and unfavorable angulation (arrowhead). (C, D) Right coronary angiogram shows a long LAD originating from the right coronary sinus separately from the right coronary artery (arrow) and continuing as mid LAD (arrowhead). (E, F) Left coronary angiograms shows successful revascularization of the big diagonal branch of a short left anterior descending artery (arrow). (A, E) Anterior posterior cranial view. (B, F) Left anterior oblique caudal view. (C, D) Right anterior oblique view.

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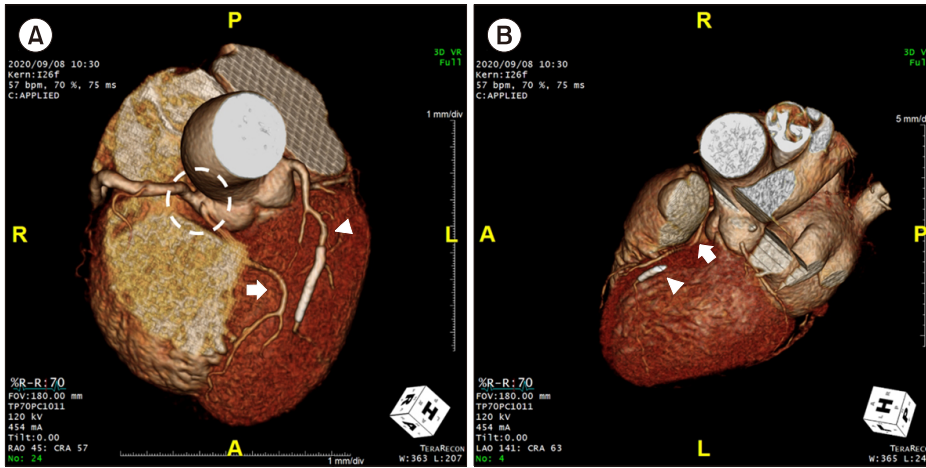


FIG. 2. Three-dimensional coronary computed tomography angiography image demonstrates anomalous dual left anterior descending artery (LAD) with a long LAD originating from the right coronary sinus independently from the right coronary artery, coursing between the right ventricular outflow tract and the aortic route, and continuing as mid- to distal LAD (arrow) and the stented big diagonal branch of the short LAD (arrowhead).

presence of two LADs in the anterior interventricular groove, which may pose a challenging situation for cardiologists.¹ Its reported incidence was 1% and was classified into six angiographic subtypes. Both the short and long LAD originate from the left main coronary artery in types I, II, and III, whereas in type IV, V, and VI, the short LAD originating from the left main coronary artery or left coronary sinus involves the high anterior interventricular groove and the long LAD arising from the RCA or right coronary sinus involves the low anterior interventricular groove. In the present case, the patient had a short LAD originating from the left main coronary artery and a long LAD arising from the right coronary sinus separately from the right coronary artery and continuing as mid- to distal LAD. Failure to recognize the presence of an anomalous long LAD arising from the right coronary sinus separately from the right coronary artery could have mistakenly led to the conclusion of total occlusion of the mid LAD, leading to inappropriate management. To the best of our knowledge, this is the first case of percutaneous coronary intervention of a large diagonal branch for acute myocardial infarction in a patient with a short LAD originating from the left main coronary artery and a long LAD arising from the

right coronary sinus separately from the RCA, which is similar to, but not the same as, type IV, V, or VI dual LAD.²

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CONFLICT OF INTEREST STATEMENT

None declared.

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