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IMAGES IN INTERVENTION

Primary Percutaneous Intervention in a Patient With Anterior and Inferior Wall Myocardial Infarction Because of a Rare Coronary Artery Anomaly

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A 40-year-old male smoker presented with acute myocardial infarction involving the anterior and inferior walls. Electrocardiography showed ST-segment elevation in the anterior leads and the inferior leads, suggesting a probable occlusion of a type III left anterior descending coronary artery (LAD). Coronary angiography showed a single coronary artery originating from the left sinus of Valsalva. The LAD showed thrombus containing 95% long-segment stenosis after the first diagonal with Thrombolysis In Myocardial Infarction (TIMI) flow grade 2 (Fig. 1). A large vessel originating from the mid-LAD just after the stenosis and following the course of the right coronary artery (RCA) had a TIMI flow grade 2 (Fig. 1A). Percutaneous coronary intervention (PCI) of the LAD was carried out by implanting a drug-eluting

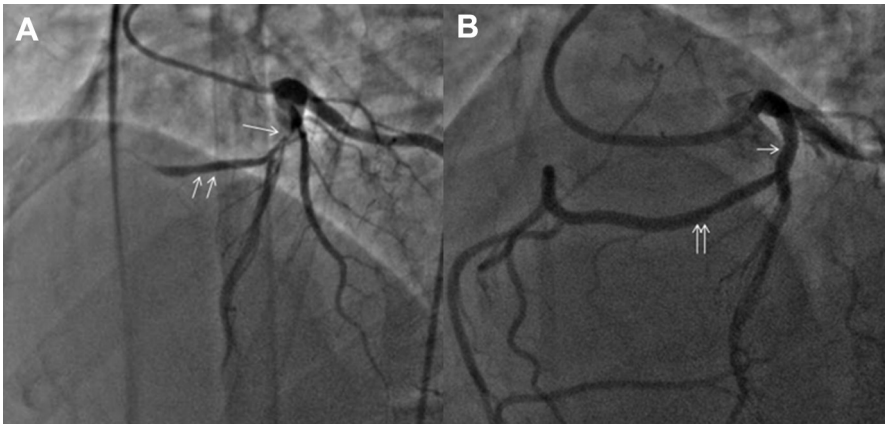

Figure 1. Angiograms Showing Anomalous Origin of the RCA From the Stenosed Mid-LAD Before and After Angioplasty

(A) Angiogram showing the anomalous origin of the right coronary artery (RCA) from the stenosed mid-left anterior descending coronary artery (LAD). Coronary angiogram of the left main coronary artery engaged with a Judkins left 7-F guide catheter in the left anterior oblique cranial view showing critical stenosis in the mid-LAD **(single arrow)** and anomalous origin of the RCA from the mid-LAD **(double arrows)**. Poor opacification of the RCA and distal LAD is evident. **(B)** Angiogram showing good flow in the LAD and the anomalous RCA after angioplasty. Coronary angiogram of the left main coronary artery engaged with Judkins left F-7 guide catheter in the left anterior oblique cranial view after stent deployment in the LAD showing no residual stenosis in the LAD **(single arrow)** and restoration of good flow in the anomalous RCA **(double arrows)**.

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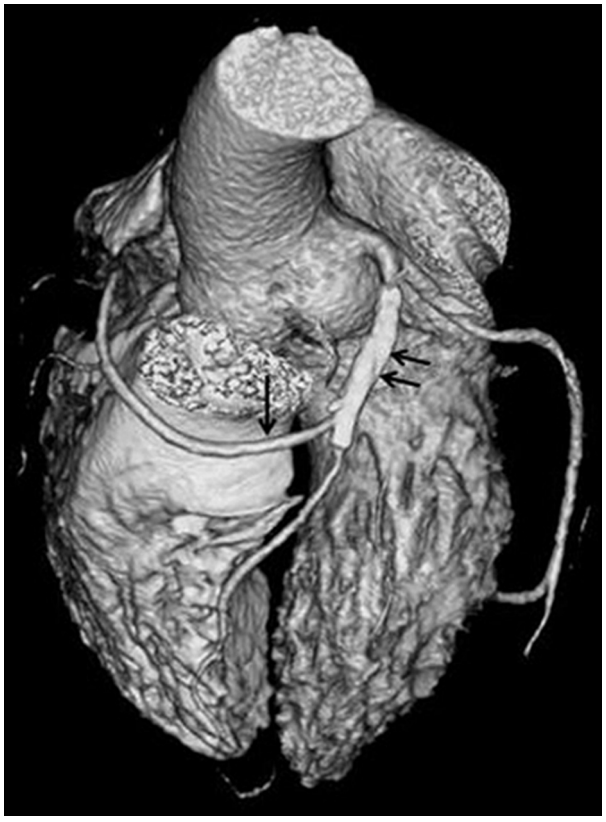

Figure 2. CT Coronary Angiogram (Post-Angioplasty) Showing the Anomalous RCA From the Mid-LAD

Computed tomography (CT) coronary angiogram of the left main coronary artery after deployment of the stent in the LAD showing the anomalous RCA from the mid-LAD coursing anterior to the pulmonary artery and entering the right atrioventricular groove. Abbreviations as in Figure 1.

stent. TIMI flow grade 3 was achieved in both the anomalous RCA and the LAD (Fig. 1B). A computed tomography coronary angiogram done later revealed the anomalous RCA originating from the mid-LAD that coursed to the right, anterior to the pulmonary artery and the right ventricular outflow tract (Fig. 2). The anomalous origin of the RCA from the mid-LAD is one of the rarest coronary anomalies reported to date (1,2). Most of the anomalies of the RCA originating from the LAD are generally considered benign (3). However, ischemia because of this anomaly may be caused by the acute angle made by the anomalous RCA to turn towards the right atrioventricular groove, thereby causing reduced flow velocity (2). The course between the great arteries leading to compression of anomalous artery and atherosclerotic involvement of the vessels (jeopardizing a large amount of myocardium, as in the present case) may also cause angina or infarction (2). While doing primary PCI in such an anomaly, certain technical considerations such as protection of the anomalous RCA with a wire, use of a flexible and steerable wire (keeping in mind the angulated origin of the RCA) and mandatory kissing balloon technique despite having good flow in the RCA (this being a major epicardial artery and not a branch) should be kept in mind. This variant has not been listed in the classification of such an anomaly, but it resembles the IB1 type of Shirani and Roberts' classification (3).

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Key Words: acute myocardial infarction ■ anomalous coronary ■ primary percutaneous intervention.