

Percutaneous Intervention of an Acute Left Main Coronary Occlusion Due to Dissection of the Aortic Root

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The patient is an 86-year-old man who presented to the hospital with 4 h of retrosternal chest pain and an anterior ST-segment elevation myocardial infarction on electrocardiogram. His past medical history included pulmonary sarcoidosis, a bioprosthetic aortic valve implanted in 1997, and long-standing aortic root dilation that had been followed clinically because of high reoperative risk.

He was taken to the cardiac catheterization laboratory for emergent percutaneous coronary intervention but diagnostic coronary angiography was difficult

because of the enlarged aortic root. With a 5-F multipurpose catheter, the left coronary artery was engaged, revealing a total occlusion of the ostial left main coronary artery (LM) (Fig. 1A, Online Video 1A). Subsequent angiography produced transient TIMI (Thrombolysis In Myocardial Infarction) flow grade 1 and then TIMI flow grade 2 through a 99% slitlike lesion of the ostial LM with minimal other obstructive coronary artery disease (Fig. 1B, Online Video 1B). The right coronary artery was normal. An aortogram was then performed, demonstrating a dissection flap adjacent to the LM

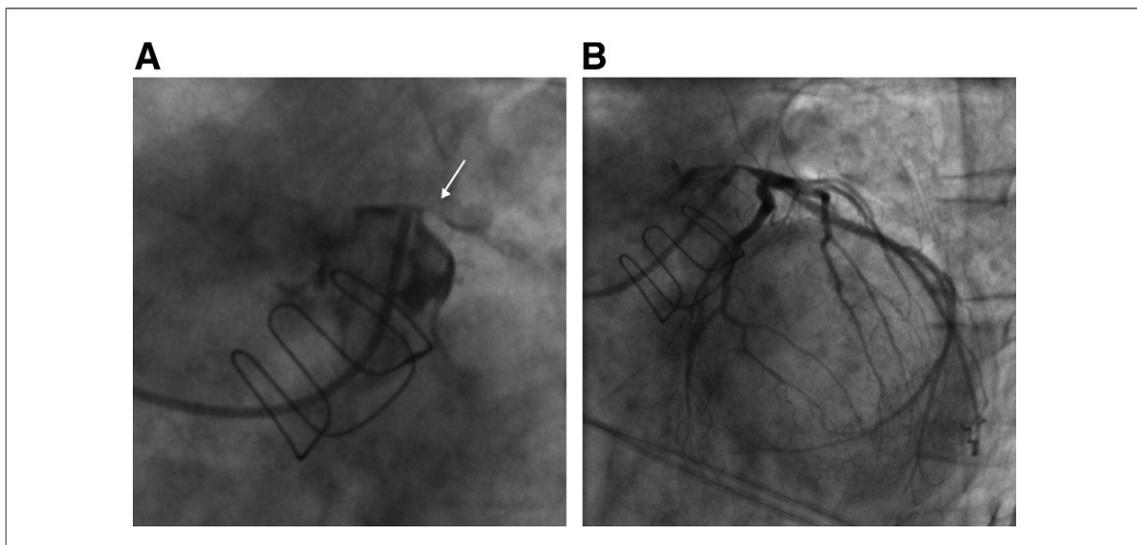


Figure 1. Occlusion of the LM Ostium Due to Aortic Root Dissection Resulting in an Anterior STEMI

Diagnostic coronary angiogram of the left main coronary artery (LM) showing ostial occlusion (**arrow**) of the LM (**A**), then subsequently a 99% slitlike lesion of the ostial LM with minimal other obstructive coronary artery disease (**B**). STEMI = ST-segment elevation myocardial infarction (Online Videos 1A and 1B).

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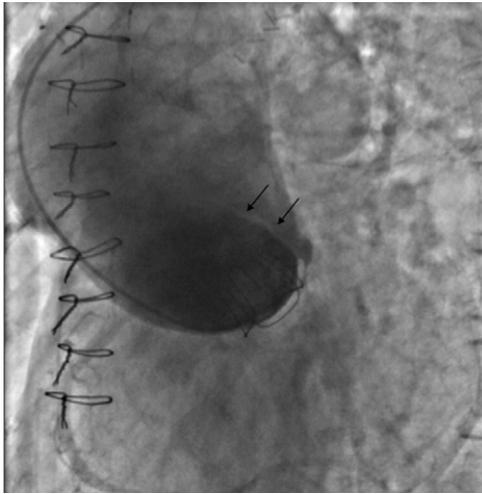


Figure 2. Ascending Root Aortogram

Ascending root aortogram demonstrating an enlarged aortic root and evidence of a dissection flap at the left sinus of Valsalva (arrows) (Online Video 2).

ostium and 2+ aortic insufficiency (Fig. 2, Online Video 2). During diagnostic imaging, the patient had become hemodynamically unstable, requiring inotropic support and multiple rounds of defibrillation because of pulseless ventricular tachycardia, and intra-aortic balloon pump support was contraindicated by the aortic dissection and insufficiency. The cardiothoracic surgical team was consulted urgently, but a surgical approach was deemed not feasible because of the patient's age, hemodynamic instability, and comorbidities.

A percutaneous approach to revascularization was thus undertaken. A 6-F multipurpose guide was placed and the

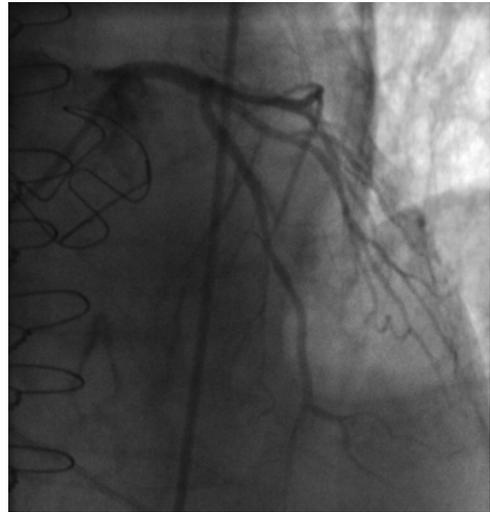


Figure 3. TIMI Flow Grade 3 After Stent Deployment in the Proximal LM

Coronary angiography of the left main coronary artery (LM) showing TIMI (Thrombolysis In Myocardial Infarction) flow grade 3 after stent deployment in the proximal LM (Online Video 3).

lesion was crossed into the left anterior descending artery with a 0.014-inch balanced middle weight wire (Abbott Vascular, Santa Clara, California). The ostial and proximal LM were pre-dilated with a 2.0 mm × 15 mm compliant balloon, followed by deployment of a 3.5 mm × 13 mm Cypher drug-eluting stent (Cordis Corp., Bridgewater, New Jersey) at 14 atm, resulting in TIMI flow grade 3 (Fig. 3, Online Video 3). The patient became hemodynamically stable after stent placement and was transferred to the

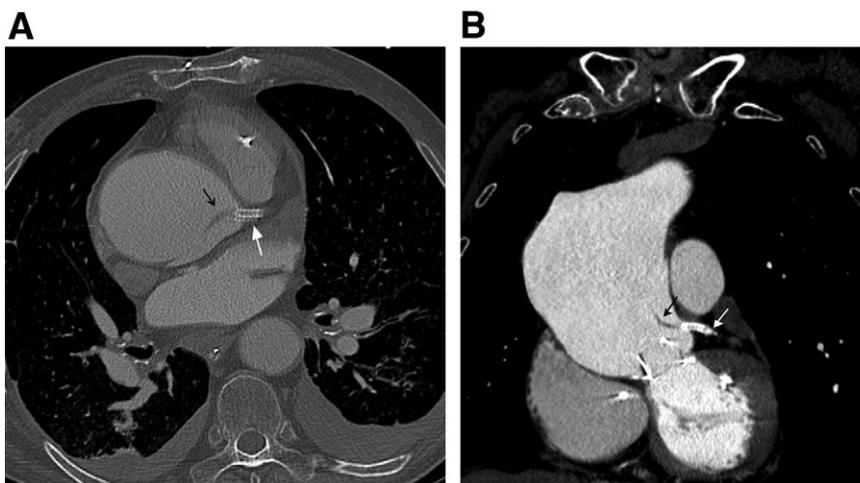


Figure 4. CT of the Ascending Aorta After Stent Placement at the Ostium of the LM

Computed tomography (CT) demonstrating origin of the dissection (black arrow) was at the sinus of Valsalva with the stent (white arrow) traversing into the aorta at the false lumen. (A) Axial view. (B) Coronal view. LM = left main coronary artery.

critical care unit for post-ST-segment elevation myocardial infarction care.

After the procedure, a 64-slice computed tomography of the thorax was performed that showed that the origin of the dissection was the sinus of Valsalva at the LM, with the stent traversing into the aorta at the false lumen (Fig. 4).

Aortic root dissection involving the LM is a rare cause of ST-segment elevation myocardial infarction (1). The standard approach in treating patient with a type A dissection and LM involvement is surgical (2). The role of pre-operative diagnostic angiography is still controversial in that elucidating the coronary anatomy before surgery can potentially increase mortality, but a recent large case series has suggested that prior cardiac catheterization does not have an impact on mortality (3). However, in cases such as this case, in which the patient is excluded from surgical repair by hemodynamic instability or comorbid conditions, a percutaneous interventional approach of stenting of the LM can be considered an alternative.

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APPENDIX

For supplementary videos, please see the online version of this article.