A 42-year-old female presented with sudden onset severe left-sided chest pain radiating to the left arm while watching a movie at home. She was rushed to the hospital within 10 minutes. She was found having ST elevation myocardial infarction on ECG and ventricular fibrillation arrest 2 times requiring cardiac resuscitation and defibrillation. Retrospectively, the patient recalled some ill-defined episodes of chest pain with exercise in the past few months before the admission. Her past surgical history 20 years previous was significant for video-assisted thoracoscopic surgery and pericardial window for removal of large, nonhemorrhagic pericardial effusion of 1.2 L, which occurred ≈1 week after her chest wall injury from basketball. Bedside transthoracic echocardiography revealed mildly decreased left ventricular systolic ejection fraction of 40% to 45%, and pericardial thickening with small pericardial effusion. The patient underwent emergent cardiac catheterization and coronary angiography, which demonstrated linear filling defects involving multiple coronary segments (Figure 1) including the diagonal, obtuse marginal, and ramus branches, suggestive of extrinsic band-like compression of the coronaries. Cardiac MRI with gadolinium contrast demonstrated regional, thick enhancing fibrous scar tethering the pericardium to the lateral walls, with corresponding akinesis (Figure 2, Movie 1 in the online-only Data Supplement). But the chest x-ray, fluoroscopy, and computer tomography did not show any obvious pericardial calcification. Serial enzyme assays confirmed creatine kinase-MB peaked at 11.8 ng/mL, and troponin I 8.1 ng/mL. After extensive review of patient’s clinical presentation, initial coronary angiography images and noninvasive cardiac imaging, it was predominantly felt that she likely had a horizontal fibrous band compressing the coronary segments and causing acute ischemia, injury, and electric instability. The patient was brought back to the cardiac catheterization laboratory for percutaneous intervention. Intracoronary optical coherence tomography imaging confirmed discrete dynamic extrinsic compression of the coronary artery (Figure 3). Multivessel stenting was performed using drug-eluting stents to the ramus, obtuse marginal, and diagonal branches (Figure 4). Final optical coherence tomography imaging confirmed excellent stent expansion and apposition (Figure 5). Serology was positive for antibodies to Coxsackie virus B1, B2, B3, B4, B5, and B6 elevated with titers up to 1:32 (normal <1:8). A single chamber cardiac defibrillator was implanted for secondary prevention of sudden cardiac death before discharge. Our patient had a rare occurrence of external coronary systolic compression not involving the left anterior descending coronary artery, documented by multi-modality imaging of echocardiography, cardiac MRI, coronary angiography, and optical coherence tomography. This presentation is not consistent with primary myocardial bridging, which involves left anterior descending artery in 93% of patients. Clinically, she had acute ST segment elevation myocardial infarction without coronary atherosclerosis or coronary dissection. From her previous history of chest wall trauma, large pericardial effusion, pericardiectomy, and video-assisted thoracoscopic surgery, the patient most likely had fibrous tissue adhesion and progressive coronary compression over the course of many years. Acute chest trauma secondary to car accidents has been reported to cause acute coronary thrombosis. Some authors have reported other causes of epicardial coronary compression attributable to fibrosing mediastinitis. Our patient did not have any obvious recent trauma or new pericardial effusion. However, she had diffusely abnormal serology results indicating Coxsackie B virus infection and possibly subacute pericarditis causing worsening coronary compression and ischemia. Weiss and colleagues reported 2 cases of diastolic coronary compression attributable to postoperative pericardial calcification 10 to 20 years after the initial surgery. These 2 patients were treated with coronary stenting with good results. Based on our review, this is the first reported case of coronary artery compression involving multiple branches demonstrated by multi-modality imaging, and successfully treated by coronary stenting in the setting of acute myocardial infarction.

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Disclosures

None.

References


Figure 1. Coronary angiography demonstrating filling defects (arrowheads) in a linear fashion along the lateral epicardial coronary branches.

Figure 2. Cardiac MRI demonstrating a thick enhancing fibrous pericardium (arrowheads).

Figure 3. Optical coherence tomography imaging confirming extrinsic compression of the coronary artery (asterisks).

Figure 4. Final angiographic image demonstrating successful treatment of coronary compression with multivessel stenting (arrowheads).

Figure 5. Final optical coherence tomography imaging confirming adequate stent expansion of coronary lumen at previous site of extrinsic compression.
Epicardial Coronary Artery Compression Secondary to Pericardial Adhesions Demonstrated by Multi-Modality Imaging, and Treated by Coronary Stenting
David H. Hsi, Lynn B. McGrath, Judd Salamat, Mitchell Simon and Jon C. George

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