A 71-year-old man with a medical history of hypertension and chronic renal failure presented to the emergency room with chest discomfort and dyspnea for 12 hours. The findings of the ECG (Figure 1) showed acute inferolateral ST-segment elevation myocardial infarction. The first troponin-I, creatine phosphokinase, and creatine kinase (CK-MB) measurements were 19.3 ng/mL, 575U/L, and 68.6 ng/mL, respectively. Coronary catheterization revealed a right dominant coronary system with 70% middle-segment thrombotic occlusion of the right coronary artery. A successful percutaneous transluminal coronary angioplasty of the right coronary artery with the placement of a drug-eluting stent was performed. Twenty-four hours after the procedure, the patient complained of dyspnea, and consequent transthoracic echocardiography suggested the presence of a left ventricle inferolateral pseudoaneurysm. A cardiac MRI study was performed and revealed the presence of a transmural infarct (>75%) involving the inferior wall, with no evidence of viability. It also showed an aneurysmal dilatation of the inferolateral segments, with signs of contained myocardial rupture at the left atrioventricular groove (Figure 2A and 2B). The patient was emergently taken to the operating room. Intraoperative inspection confirmed the diagnosis of contained myocardial rupture surrounded by an extensive area of myocardial hemorrhage. The rupture was repaired on cardiopulmonary bypass using a tailored Dacron patch.

On postoperative day 2, a transthoracic echocardiography and transesophageal echocardiography primarily performed...
to assess left ventricle function showed the presence of an 8-mm inferior ventricular septal defect with left-to-right shunt (Figure 3A). However, this postinfarction ventricular septal defect did not carry significant hemodynamic consequences, and the calculated pulmonary to systemic blood flow ratio was <2/1. The patient was extubated on postoperative day 5 and was recovering uneventfully. On postoperative day 8, the patient suddenly deteriorated hemodynamically and developed cardiogenic shock with massive pulmonary edema requiring intubation. A transesophageal echocardiography revealed a complete rupture of the posteromedial papillary muscle, with prolapse of the corresponding segments of the anterior and posterior mitral valve leaflets (Figure 3B). An intra-aortic balloon pump was inserted, and the patient underwent an emergent mitral valve replacement with a 25-mm bioprosthetic valve. The patient made a slow recovery after the second intervention and was discharged home on postoperative day 20. At 3 months, he was doing well, and a repeat transthoracic echocardiography showed a well-functioning prosthesis and a left ventricle ejection fraction of 38%.

Acute ST-segment elevation myocardial infarction may lead to the occurrence of mechanical complications such as ventricular free wall rupture, ventricular septal defect, and papillary muscle rupture. In the era of antifibrinolytic therapy and emergent percutaneous revascularization, these complications have become rare, accounting for 0.8%, 0.2%, and 0.7% of the cases, respectively.1,2 In almost all patients, these complications require surgical intervention, which is associated with a mortality rate ranging between 20% and 40% for each procedure.1,3 The highlights of this case are the occurrence of these 3 complications in the same patient despite a successful percutaneous transluminal coronary angioplasty 15 hours after ST-segment elevation myocardial infarction. An interesting observation was the sequential presentation of the events with ventricular free wall rupture within the first 24 hours after myocardial infarction, followed by the appearance of a ventricular septal defect at 72 hours, and finally the papillary muscle rupture 9 days later. In this particular case, a multi-modal imaging approach using cardiac MRI and echocardiography as well as early surgical intervention played a key role to success.
Disclosures

None.

References


Sequential Development of Multiple Mechanical Complications of Myocardial Infarction
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