Images in Cardiovascular Medicine

Ventricular Double Rupture after Myocardial Infarction

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An 81-year-old woman presented with dyspnea of 4 hours' duration associated with a systolic blood pressure of 180 mmHg. An electrocardiogram showed inferolateral ST-segment elevation and subtle PR-segment elevation in lead aVR (Fig. 1).

Results of emergency catheterization revealed occlusion of the distal right coronary artery. After being given a bolus of bivalirudin in preparation for percutaneous coronary intervention (PCI), the patient experienced cardiac arrest due to pulseless electrical activity. Spontaneous circulation returned after 10 minutes of cardiopulmonary resuscitation. Repeat angiography revealed slow flow in the right coronary artery (Fig. 2). Right-sided heart catheterization revealed an equalization of intracardiac filling pressures (22 mmHg) and an oxygenation step-up from the right atrium to the pulmonary artery (from 49% to 80% saturation). A surface echocardiogram showed a large pericardial effusion (Fig. 3). Emergency pericardiocentesis yielded 2.5 L of blood from the pericardial space. An intra-aortic balloon pump was placed for hemodynamic support.

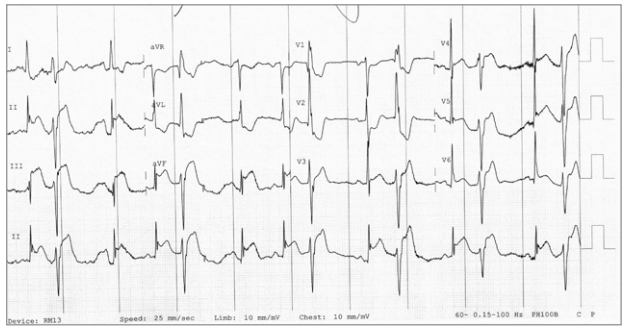

Fig. 1 *Electrocardiogram shows sinus rhythm with frequent premature ventricular contractions, ST-segment elevation inferolaterally with a single Q wave in lead III, and PR-segment elevation in lead aVR.*

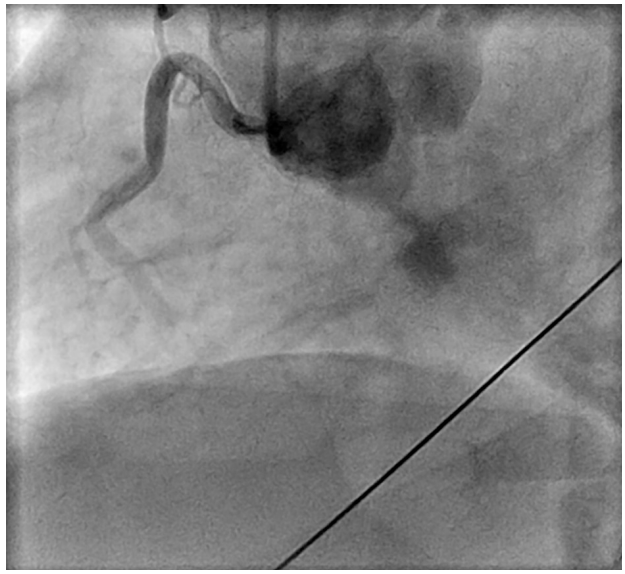

Fig. 2 *Coronary angiogram of the right coronary artery (left anterior oblique view) shows distal occlusion and evidence of slow flow.*

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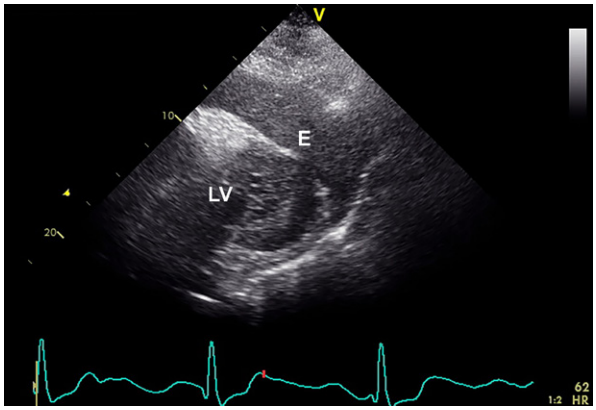

Fig. 3 *Transthoracic echocardiogram (subcostal view) shows a large anterior pericardial effusion (E) and the left ventricle (LV).*

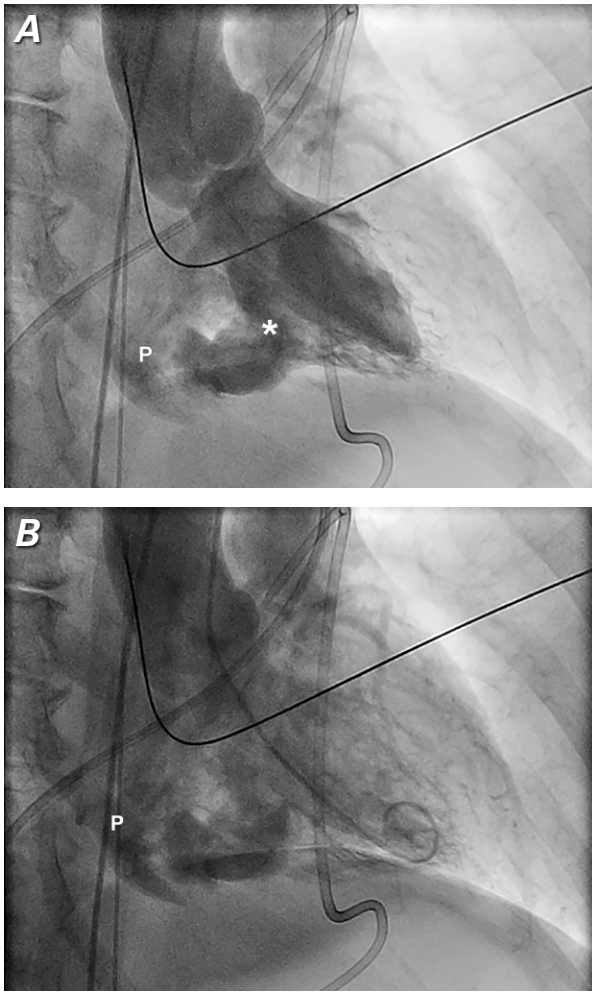

Fig. 4 ***A****) Left ventriculogram (right anterior oblique view) shows a ventriculoseptal defect with left-to-right flow (asterisk) and extravasation into the pericardial space (P).* ***B****) Delayed-injection image shows further extravasation into the pericardial space (P). Also visible are a pericardial drain, an intra-aortic balloon pump, a pulmonary artery catheter, pacing pads, and an angled pigtail catheter.*

Supplemental motion image is available for Figure 4.

A left ventriculogram showed ventricular double rupture involving the inferoposterior left ventricle and interventricular septum (Fig. 4). Operative repair was not feasible, and the patient died.

Comment

Risk factors for myocardial rupture after myocardial infarction (MI) include hypertension, first infarction, and the absence of collateral coronary circulation.[1] Combined rupture of the ventricular septum and left ventricular free wall, a form of ventricular double rupture, is a rare late presentation of acute MI. The authors of a single-center case series described ventricular double rupture in 0.3% of patients who presented with acute MI.[2]

In hospitalized patients who sustain cardiac rupture, the mortality rate remains elevated at 75%.[3] In ventricular double rupture, survival is exceedingly rare despite surgical intervention.[4]

Our patient's clinical presentation was probably caused by impending ventricular double rupture and recurrent ischemia after an initially silent MI earlier in the week. Anticoagulation might have disrupted a pseudoaneurysm, causing tamponade. This case illustrates the importance of alertness for potential mechanical complications in patients who are undergoing primary PCI for ST-segment-elevation MI.

References

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