COMPLICATIONS OF MYOCARDIAL INFARCTION

Left ventricular free wall rupture:
- Epidemiology: occurs in 3% of patients with acute MI.
- Risk factors: transmural MI, first MI, single vessel disease, lack of collaterals, and female gender.
- Timing: usually occurs 5-14 days after MI; earlier in patients who receive thrombolysis.
- Physical exam: acute decompensation related to cardiac tamponade (elevated JVP, pulsus paradoxus, diminished heart sounds).
- Diagnosis: echocardiography, right heart catheterization.
- Treatment: urgent pericardiocentesis and thoracotomy – cardiac rupture is a true cardiothoracic surgical emergency.

Ventricular septal defect (VSD):
- Epidemiology: occurs in approximately 1-2% of patients with acute MI.
- Risk factors: large infarct, single vessel disease, poor collateral circulation.
- Timing: usually occurs 3-7 days after MI.
- Physical exam: holosystolic murmur that radiates from left to right over the precordium, heard loudest over the left lower sternal border.
- Diagnosis: echocardiography, right heart catheterization.
- Treatment: surgical correction, vasodilators, intraaortic balloon pump.

Papillary muscle rupture:
- Epidemiology: occurs in 1% of patients with acute MI.
- Risk factors: inferior MI.
- Timing: usually occurs 2-7 days after MI.
- Physical exam: holosystolic murmur, loudest at the apex, radiates to the axilla. Intensity of the murmur does not correlate to severity of mitral regurgitation.
- Diagnosis: echocardiography, right heart catheterization.
- Treatment: vasodilators and surgical correction. If the patient is hypotensive, place intraaortic balloon pump as a bridge until surgical intervention can be performed.

Cardiogenic shock:
- Risk factors: anterior MI, diabetes, older age.
- Physical exam: look for signs of heart failure with associated hypotension. Decreased urine output is common.
- Diagnosis: chest x-ray, echocardiography, right heart catheterization.
- Treatment: revascularization, intraaortic balloon pump, dopamine/dobutamine.

LV aneurysm:
- Epidemiology: occurs in 10-30% of patients after acute MI.
- Risk factors: anterior MI.
- Timing: can occur acutely, but most commonly occurs chronically, persists for more than 6 wks post-MI.
- Physical exam: large, diffuse point of maximal impulse (PMI), S3 may be present.
- Diagnosis: ECG (Q waves in V1-3 with persistent ST elevation), echocardiography, cardiac MRI.
- Prevention: early revascularization.
- Treatment: acutely, treat associated cardiogenic shock. Chronically, if mural thrombus present, anticoagulate with heparin/warfarin; place defibrillator if ventricular arrhythmias become a problem.

Ischemic:
- Infarct extension, post-infarction angina, reinfarction.
Arrhythmic:
- Timing: can occur at any time post-MI.
- Diagnosis: ECG, telemetry.
- Treatment: defibrillator better than anti-arrhythmics.

Early Pericarditis:
- Epidemiology: occurs in 10% of patients with acute MI.
- Risk factors: transmural MI.
- Timing: usually occurs 1-4 days after MI.
- Symptoms: worse pain while supine, radiation of pain to the trapezius ridge.
- Physical exam: pericardial friction rub.
- Diagnosis: ECG may show evidence of pericarditis; echo may show pericardial effusion.
- Treatment: aspirin. Avoid NSAIDs and corticosteroids (may interfere with healing of infarcted myocardium)

Late Pericarditis (Dressler's Syndrome):
- Epidemiology: occurs in 1-3% of patients with acute MI. Secondary to immune-mediated injury.
- Timing: usually occurs 1-8 weeks after MI.
- Physical exam: pericardial rub, fever.
- Diagnosis: ECG may show evidence of pericarditis; echocardiography may show pericardial effusion.
- Treatment: aspirin. If > 4 weeks since MI, can use NSAIDs and/or corticosteroids.

Embolic:
- Epidemiology: occurs in 2% of patients with acute MI.
- Risk factors: anterior MI, large MI, LV aneurysm.
- Timing: usually occurs within 10 days after MI.
- Physical exam: depends on the site of embolization (stroke, limb ischemia, and intestinal ischemia).
- Treatment: anticoagulation with heparin/coumadin.

| TABLE 1. CHARACTERISTICS OF VENTRICULAR SEPTAL RUPTURE, RUPTURE OF THE VENTRICULAR FREE WALL, AND PAPILLARY-MUSCLE RUPTURE.* |
|-----------------|-------------------------------------------------|-------------------------------------------------|----------------------------------|
| CHARACTERISTIC   | VENTRICULAR SEPTAL RUPTURE                      | RUPTURE OF VENTRICULAR FREE WALL                 | PAPILLARY-MUSCLE RUPTURE         |
| Incidence        | 1–2% without reperfusion therapy,               | 0.8–6.2%, thrombolytic therapy does not reduce  | About 1% (posteromedial more       |
|                  | 0.2–0.34% with thrombolytic therapy, 3.9% among  | risk, primary PTCA seems to reduce risk         | frequent than anterolateral       |
|                  | patients with cardiogenic shock                 |                                                | papillary muscle)                |
| Time course      | 3–7 days without reperfusion therapy; median,  | 1–7 days without reperfusion therapy; mean, 2.7 | Median, 1 day (range, 1–14)      |
|                  | 24 hr with thrombolysis                         | days with thrombolysis                          |                                  |
| Clinical         | Chest pain, shortness of breath, hypotension   | Anginal, pleuritic, or pericardial chest pain,  | Abrupt onset of shortness of      |
| manifestations   |                                                | syncope, hypotension, arrhythmia, nausea, restlessness, hypotension, | breath and pulmonary edema;      |
|                  |                                                | sudden death                                     | hypotension                      |
| Physical         | Harsh holosystolic murmur, thrill (+), S3,     | Jugular venous distention (29% of patients),   | A soft murmur, in some cases, no  |
| findings         | accentuated 2nd heart sound, pulmonary edema,  | pulso paradoxic (47%), electromechanical        | thrill, variable signs of RV      |
|                  | RV and LV failure, cardiogenic shock            | dissociation, cardiogenic shock                 | overload, severe pulmonary edema,|
| Echocardiographic | Ventricular septal rupture, left-to-right shunt | >5 mm pericardial effusion not visualized       | Hypercontractile LV, torn papillary |
| findings         | on color flow Doppler echocardiography through  | in all cases, tachycardia, high-systolic        | muscle or chordae tendineae,      |
|                  | the ventricular septum, pattern of RV overload  | echoes within the pericardium (blood clot),     | frail leuker, severe mitral       |
| Right-heart      | Increase in oxygen saturation from              | Ventriculography insensitive, classic signs of  | No increase in oxygen saturation  |
| catheterization  | the RA to RV, large V waves                    | tamponade not always present                    | from the RA to RV, large V waves, |
|                  |                                                 | (equalization of diastolic pressures among the   | very high pulmonary-capillary     |
|                  |                                                 | cardiac chambers)                                | wedge pressures                  |

*PTCA denotes percutaneous transluminal coronary angioplasty, RA right atrium, RV right ventricle, and LV left ventricle.