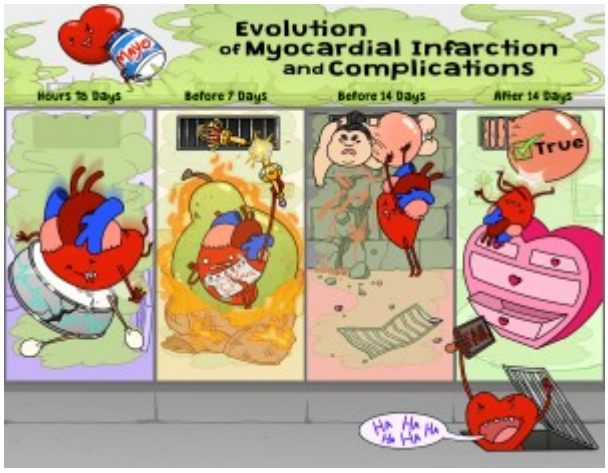
Evolution of Myocardial Infarction and Complications

In the time following a myocardial infarction, gross changes in the heart may lead to various complications in the recovery period. The cardiac timeline is the description of what complications occur and when they occur following a myocardial infarction. Knowing the evolution of myocardial infarction and the cardiac timeline provides direction for the appropriate assessment and treatment of the possible complications that may arise.



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Hours to Days

Arrhythmia

Broken Arrhythmia-drum

Injury to the myocardium occurs from ischemia and reperfusion in the first 24 hours after a myocardial infarction. During this time, a common complication is ventricular arrhythmia. Additionally, if an arrhythmia significantly disrupts the heart's normal pumping mechanism, cardiogenic shock, heart failure, and even sudden death may result. Within the first 24 hours, arrhythmia is the most common cause of death following a myocardial infarction.

Before 7 Days

Fibrinous Pericarditis

Fibrous Pear-heart-on-fire

The pericardium is often injured by a myocardial infarction, resulting in inflammation and the release of fibrin. Fibrinous pericarditis usually occurs after the first 24 hours but before 3 days post-infarction. It can present with chest pain and a friction rub on auscultation. Early intervention and management of myocardial infarction are the most effective ways to reduce the risk of pericarditis following a myocardial infarction. Treatment involves supportive management since NSAIDs are typically avoided due to their impairment of collagen deposition and increased risk of post-MI complications, such as ventricular wall rupture.

Papillary Muscle Rupture

Paper Muscle Rupture

Macrophages at the site of injured myocardium contribute to the risk of papillary muscle rupture. Normally, the papillary muscles help keep the tricuspid and mitral valves closed during systole. Injury to the papillary muscle leads to valvular regurgitation. The time frame for papillary muscle rupture may vary but mostly occurs within the first 7 days after a myocardial infarction. A holosystolic murmur will be appreciated. Treatment involves emergency surgery. Initial management before surgery includes supportive care, such as oxygen therapy and diuretics to prevent volume overload.

Interventricular Septum Rupture

In-vent Scepter Rupture

Macrophages at the site of injured myocardium contribute to the possibility of an interventricular septum rupture, which affects the wall of tissue that separates the two ventricles. A ruptured interventricular septum causes oxygenated blood to flow from the left ventricle to the right ventricle, resulting in increased oxygen saturation in the right heart. These patients often present critically ill in cardiogenic shock. The time frame for an interventricular septum rupture may vary, but most occur within 7 days of a myocardial infarction. Auscultation will reveal a new holosystolic murmur at the lower left sternal border. Treatment involves emergency surgery as the risk of cardiogenic shock is high

Before 14 Days

Ventricular Pseudoaneurysm

Vent Sumo-aneurysm

A ventricular pseudoaneurysm occurs as the result of a free wall rupture. Pericardial adhesions create a pseudoaneurysm by containing a free wall rupture. The pseudoaneurysm is prone to further rupture. A ventricular free wall rupture generally occurs before 7 days and the pseudoaneurysm arises in the days

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following with most occurring before 14 days.

Ventricular Free Wall Rupture

Vent Free Wall Rupture

The ventricular free wall is prone to rupture in the days following a myocardial infarction. The rupture may be contained by a pseudoaneurysm. The process of ventricular free wall rupture and pseudoaneurysm formation mostly occurs before 14 days from a myocardial infarction. Free wall rupture typically results in hemopericardium and death due to cardiac tamponade. In cases where free wall rupture is suspected or confirmed, emergency pericardiocentesis should be performed if fluid is observed

After 14 Days

True Ventricular Aneurysm

True Vent Aneurysm

A possible complication of a transmural myocardial infarction is the formation of a true aneurysm, which involves the entire wall of the heart. This typically occurs 2 weeks after the infarction and can be a site of thrombus formation. The thrombus can later embolize to the systemic circulation, causing various symptoms depending on the site of the infarction it causes.

Dressler Syndrome

Heart Dresser

Dressler syndrome which is also called post-cardiac injury syndromes, refers to a pericarditis that develops secondary to an autoimmune response against antigens present on the damaged or healing myocardium. This causes a fibrinous pericarditis which can present 2 weeks or later after a myocardial infarction. First line treatment is similar as in acute pericarditis and includes NSAIDs, colchicine or glucocorticoids.

Other

Left Ventricular Failure

Laughing-left Vent Fail-sign

Left ventricular failure can occur secondary to many of the complications of a myocardial infarction and therefore must be considered throughout the entire infarction recovery period.

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