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Home » Diseases and Conditions » Pericarditis » Diagnosis

Pericarditis Diagnosis

Overview

Symptoms

Diagnosis

Treatment

Diagnosis

Pericarditis is an inflammation of the pericardium, the sac-like membrane that surrounds and protects the heart. Figure 01 The pericardium secures the heart in the chest by preventing excessive movement, especially when the position of the body changes. The pericardium also protects the heart from infections in neighboring tissues, and prevents the heart from overfilling with blood.

Acute pericarditis is sudden inflammation of the pericardium that often causes a distinct type of chest pain. The pain is sharp and may feel like a heart attack, but it tends to be made worse by deep breathing, lying down, or coughing. The pain is the result of the heart rubbing against the irritated pericardium.

Pericarditis usually occurs in men between the ages of 20 to 50, although women and children are also susceptible. If treated promptly—most commonly with a nonsteroidal anti-inflammatory drug (NSAID)—pericarditis will resolve within a few weeks without permanent damage to the heart.

Pericarditis can progress to more serious conditions, including chronic forms of pericarditis and the most serious complication of pericarditis, cardiac tamponade. Figure 02

Chronic pericarditis is a long-lasting inflammation resulting in either gradual fluid accumulation (effusive pericarditis) or slow thickening of the pericardium into scar-like tissue (constrictive pericarditis). The cause of gradual accumulation of fluid is usually unknown. When the pericardium becomes thickened, over years it can contract and compress the heart. The smaller size of the heart impairs its ability to fill with blood. This eventually increases pressure within the veins and causes fluid to back up and accumulate under the skin (peripheral edema), abdomen (ascites), and sometimes around the lungs (pleural effusion, pulmonary edema).

Cardiac tamponade is usually considered an emergency situation. The fluid within the pericardium increases greatly and quickly, putting excess pressure on the heart. The heart cannot expand completely, limiting the amount of blood leaving the heart and reaching the organs. This situation can result in death if not treated immediately.

Click to enlarge: Pericarditis

Figure 01. Pericarditis

Click to enlarge: Cardiac tamponade

Figure 02. Cardiac tamponade

Most cases of pericarditis occur without a clear cause. A case of pericarditis with an unknown cause is called idiopathic pericarditis.

Common bacterial, viral, and fungal infections can lead to pericarditis. Pericarditis can be caused by bacterial, fungal, or viral infections such as polio, influenza, rheumatic fever, and tuberculosis. The adenovirus and cocksackie viruses are the most common identifiable cause in children. Patients with AIDS often develop infections that trigger pericarditis. Viral infections are a common causes of pericarditis in young, otherwise healthy people.

Recent heart attack can cause pericarditis. Pericarditis may be triggered by destruction of the heart muscle in a heart attack. Up to 15% of patients who have suffered a heart attack develop pericarditis over ensuing days to weeks. Dressler’s syndrome, a serious and late form of pericarditis following a heart attack, occurs weeks to months after the heart attack.

Cancer spreading from a nearby tumor can also be the culprit. Cells from tumors in other parts of the body, such as the breast or lungs, can spread to the pericardium, leading to irritation and inflammation. Pericarditis can also result from radiation therapy to treat cancers in the chest.

Systemic diseases such as kidney failure and lupus erythematosis can cause pericarditis. Pericarditis may occur in patients with uremia, a condition caused by kidney failure and characterized by accumulation of urea and other waste products in the blood. Pericarditis can also develop in patients with diseases in which the immune system becomes overactive and attacks the body's own tissues. Autoimmune disorders that can cause pericarditis include rheumatoid arthritis, lupus, and scleroderma.

Pericarditis can result from trauma to the chest. Heart damage caused by trauma, such as a severe blow to the chest, a stab wound, or cardiac surgery, can also cause pericarditis. Rupture of the esophagus or infection after heart surgery can lead to a rare form of pericarditis in which the infection produces a lot of purulent drainage, or pus.

Medications can contribute to immune responses that trigger pericarditis. Medications known to trigger pericarditis include the antibiotic penicillin, the antituberculosis medicine isoniazid (Nydrazid), the antiarrhythmic agent procainamide (Procanbid, Pronestyl), the blood pressure and heart failure medicine hydralazine (Apresoline), and the seizure medication phenytoin (Dilantin).

The most common symptom of pericarditis is chest pain. Chest pain associated with pericarditis can be mild or severe, and is commonly felt below the breastbone and below the ribs on the left side of the chest. Occasionally the pain spreads to the upper back or neck. When the lungs and heart move in the chest and rub against the irritated pericardium, pain often worsens. Therefore, the chest pain becomes more severe upon taking a deep breath, swallowing, coughing, or lying down. Sitting up or leaning forward may relieve the pain.

Swelling, shortness of breath, and fever are symptoms of severe pericarditis. Patients who have complications of pericarditis including chronic pericarditis, constrictive pericarditis, and cardiac tamponade can experience more severe symptoms. These include low blood pressure, shortness of breath, and swelling of the feet, ankles, legs, and abdomen.

Having a heart condition, being a man between the ages of 20 to 50, undergoing cardiac surgery, or having cancer are all considered risk factors for developing pericarditis. If you have HIV, lupus or kidney disease, you are also at risk.

Your doctor will perform a complete medical history and physical examination, and will order a blood test. Your doctor will review your medical history, especially any history of recent infections, heart attack, chest trauma, chest surgery, and chronic diseases. Your doctor will also ask you to describe specific details about your chest pain, including its location, what triggers it (e.g., cough, swallowing, deep breath), how long it lasts, and what relieves it.

Your doctor will also listen through a stethoscope for scratchy sounds called a pericardial rub, which are produced by heart muscle rubbing against the inflamed pericardium. Blood tests will look for increased numbers of white blood cells and other substances that would suggest the presence of infection and inflammation in the body.

Your doctor may recommend that you have an electrocardiogram (ECG), a test that monitors the electrical activity of the heart. Characteristic changes of electrical activity occur with pericarditis, and an ECG will detect these changes. The ECG can also help to rule out pericarditis by suggesting other causes of chest pain, such as a recent or past heart attack.

Your doctor may use an echocardiogram for a detailed view of your heart. An echocardiogram is a painless scan that uses sound waves to image structures in and around the heart. An echocardiogram easily detects accumulated fluid in the pericardial sac, which typically accompanies pericarditis. During this test, a microphone-like device sends sound waves through the chest wall to the heart. The sound waves are then reflected back to the device, where they are transformed into images of the heart and surrounding tissues. Echocardiograms allow physicians to estimate the amount of accumulated fluid and determine whether the fluid is compressing the chambers of the heart.

Other tests that may help your doctor diagnose pericarditis include a CT scan, an MRI scan, a chest x-ray, pericardiocentesis, and pericardial biopsy.

A CT scan (computed tomography) is an x-ray that takes pictures of the body from many angles. A dye may be injected into the bloodstream before the test so that your tissues can be better visualized.

An MRI is a noninvasive procedure that uses magnets and radio waves to produce an image of the inside of the body.

A chest x-ray is a standard x-ray of your chest, lungs, heart, large arteries, and the diaphragm. X-rays are a form of radiation that can penetrate the body to produce an image on film.

Pericardiocentesis is a procedure in which fluid is withdrawn from your pericardium. It can be done as a diagnostic test, and as treatment if there is too much fluid in your pericardium. For this procedure, the skin is anesthetized and a long, hollow needle is carefully inserted through the wall of the chest into the pericardium to withdraw fluid. This fluid is typically sent to a laboratory for study.

A pericardial biopsy is done to test for cancer within the pericardium. For this procedure, a sample of tissue is withdrawn and analyzed in a lab for cancerous cells.

Blood tests may be run to make sure the kidneys are working properly, to assess for immune disorder, and to detect certain infections.

Because pericarditis can be the result of many different illnesses, there are no standardized prevention guidelines. Practicing good hygiene and getting recommended immunizations may help prevent the heart-damaging infections that can cause pericarditis. Treating respiratory infections and other disorders promptly may also reduce the risk of pericarditis. Eating a low-fat diet, exercising regularly, not smoking, and controlling diabetes and hypertension can reduce the risk of heart attack and related pericarditis. Finally, wearing a seat belt whenever driving and wearing appropriate chest-protecting equipment when playing contact sports may reduce the risk of trauma-related pericarditis.

Many cases of pericarditis may not be preventable. Unfortunately, even if steps are taken to reduce the risk or pericarditis, there are some forms that cannot be prevented.

Prevention and Screening

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